

UTAH BIG GAME RANGE TREND STUDIES 2000 Volume 2



Photo Courtesy of Larry Dalton

**PUBLICATION NUMBER 00-39
REPORT FOR FEDERAL AID PROJECT W-135-R-21**

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

**UTAH BIG GAME
RANGE TREND STUDIES
2000 Volume 2**

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Performance Report for Federal Aid Project W-135-R-21

Publication No. 00-39

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PROGRAM NARRATIVE

State: UTAH

Project Number: W-135-R

Project Title: Statewide Big Game Range Trend Studies

Problem and Need: The ability to monitor vegetation composition changes (range trend) on key big game areas is an important part of a big game management program. The health and vigor of big game populations are closely associated with the quality and quantity of forage in key areas. Key areas are defined as those areas "where deer or other big game have demonstrated a definite pattern of use during normal climatic conditions over a long period." This project will emphasize deer and elk habitat although monitoring efforts may include other big game species as needed. Winter ranges for both deer and elk will comprise the bulk of the trend studies, although there are certain herd units where summer range is the portion of the unit that limits carrying capacity. Most of the key areas are located on public lands (BLM, USFS or State Lands) that are impacted by livestock grazing programs. Most of these programs are summarized in allotment management plans (USFS) or resource management plans (BLM) which are used to direct the management of a variety of resources on public lands (rangelands, watersheds, energy and minerals, recreational opportunities, etc.). This project was initiated to direct the attention of local interagency committees on the proper management of key big game areas throughout the state. The Division adopted monitoring guidelines established by the Utah State Interagency Committee (staff level biologists from BLM, USFS and DWR) which assures that data collected by DWR is compatible with that collected by both federal agencies. This limits the amount of duplication involved in monitoring certain key areas where either BLM, USFS or DWR may have overlapping responsibilities or concerns about range trend.

Objective: To monitor, evaluate, and report range trend at designated key areas throughout the state during grant period. This includes monitoring wildlife habitat improvement projects and promoting cooperative efforts among Interagency personnel with respect to trend study site selection, sharing trend data, development of trend monitoring procedures and data analysis, and identification of management objectives for study areas.

Expected Results and Benefits:

Every five years the trend studies in each of the five regions will be reread and the status of the vegetation in key areas of each herd unit will be evaluated. The local interagency committee will be able to use the information to determine if key areas are declining in habitat value and if so, to recommend adjustments in management programs that would help restore big game habitat.

REMARKS

The work completed during the 2000 field season and reported in this publication involves the reading of interagency range trend studies in the DWR Northeastern and Northern Regions. Trend studies surveyed in these management units were established in 1982, 1988, 1995, and 2000, with rereads in 1988, 1995, and 2000.

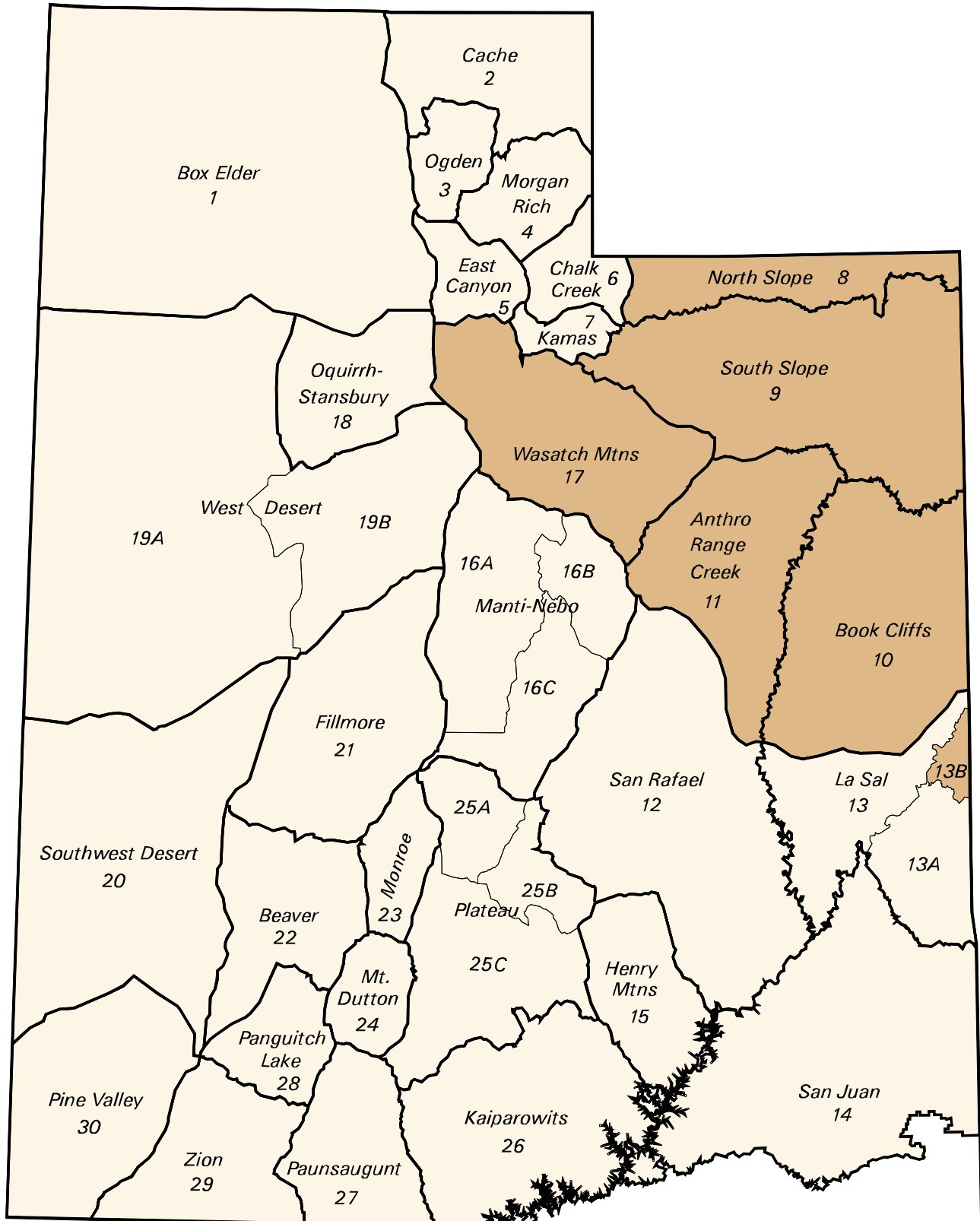
The following Bureau of Land Management and National Forest offices provided information and/or assistance in completion of the trend studies which greatly add to the value of this interagency report:

Bureau of Land Management
Vernal District Office

Ashley National Forest
Duchesne Ranger District
Roosevelt Ranger District
Vernal Ranger District

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

Utah Management Units Surveyed in 2000



RANGE TREND STUDY METHODS

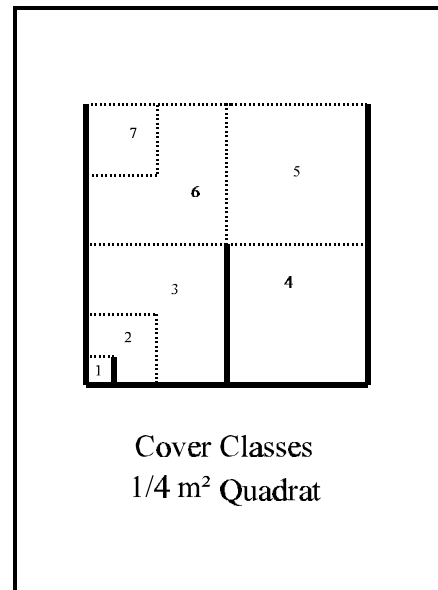
Studies monitoring range trend depend greatly on site selection, especially when dealing with large geographic areas such as wildlife management units. Since it is impossible to intensively monitor all vegetative or habitat types within a unit, it is necessary to concentrate on specific sites and/or “key” areas within distinct plant communities on big game ranges. These “key” areas should be where big game have 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 critical 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 beginning baseline stake, is marked with a metal tag for proper identification of the transect. The beginning of each belt is marked by rebar to ensure a more precise alignment of the originally sampled belt.

Vegetative composition

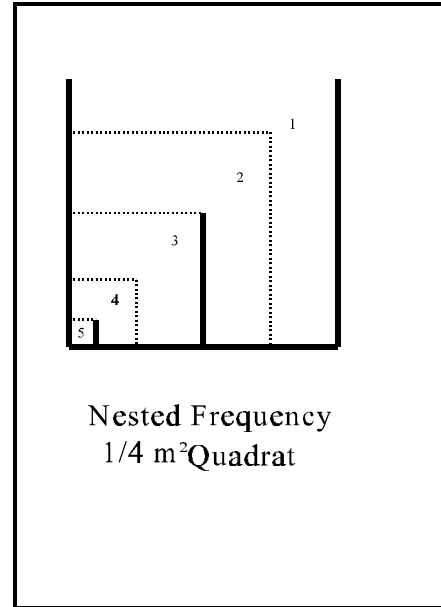
Determining vegetational characteristics for each “key” area is determined by setting up 5 consecutive 100 ft baseline transects in the area of interest. This 500 ft line is the baseline and one, 100 ft belt is placed perpendicular to each 100 ft section of the baseline at random foot marks and centered on the 50 ft mark. A 1/4 m² quadrat is centered every 5 feet along the same side of the belt. 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 species occurring within a quadrat, including annual species.

Cover is determined using a slightly modified Daubenmire (1959) cover class method (Bailey and Poulton, 1968). The seven cover class are: 1) .01-1%, 2) 1.1-5%, 3) 5.1-25%, 4) 25.1-50%, 5) 50.1-75%, 6) 75.1-95%, 7) 95.1-100%. For example, to estimate vegetative 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 average for a given site.

Canopy cover of shrubs or trees above eye level is estimated using the line intercept method. The 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 values for the quadrat range from 1-5 according to which area or which sub-quadrat the plant species 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.



Higher nested frequency scores represent a higher abundance for that plant species. 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 by themselves and do not necessarily indicate changes in composition and/or distribution of key plant species. Quadrat frequency is used as another quantitative, but less sensitive measure to help corroborate the trends being illustrated by the sum of nested frequency values.

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

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 placed in the following five classes. (U.S. Department of Interior Bureau of Land Management 1996).

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 1/5-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 the amount of use by placing shrubs in form classes 1 through 9.

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

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

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

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

Shrubs are also rated on their health by vigor classes 1-4.

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 possible sample of 50 plants per species depending on their respective densities. Tree density is determined by the point-center quarter method centered on two-hundred foot intervals, where 300 feet are 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, used to estimate shrub density, can in most cases effectively inventory seedling and young tree densities.

A more accurate method of determining shrub frequency is being used in this and all subsequent reports. It was found that nested and quadrat frequency of shrubs in previous reports did not usually reflect accurate trends in shrub populations which had particularly low or high densities. Therefore, each 1/100 acre shrub strip is divided into 20, five foot segments. Presence or absence is now determined in these strip segments to give a more accurate measure of shrub frequency. This larger sample will better reflect changing trends in the shrub populations. This data along with shrub cover is recorded in the browse trends table. For example, if a species was rooted in 25 of the shrub 100 strips, strip frequency for this species would be 25%.

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, height, crown diameter, form class, and age class are utilized to characterize shrub populations. Particular attention is paid to woody plants and their important role as trend indicators on critical winter ranges. A variety of parameters are used to help determine trend on key browse species through time. These include:

- 1) changes in density or number of plants/acre
- 2) proportion of decadent plants and percentage of decadent plants that are classified as dying
- 3) biotic potential or proportion of seedlings to the population
- 4) proportion of young plants in population
- 5) proportion of individuals moderately or heavily browsed
- 6) proportion of plants in poor vigor
- 7) changes in height and crown diameter measurements for mature age class
- 8) changes in browse species composition
- 9) strip frequency values
- 10) proportion of cover contributed by key species

Trends in herbaceous plants as a group or as a single "key" species can be determined by comparing the sum of nested and quadrat frequency values between readings. Attention is also given to changes in species composition of grasses and forbs through time. A non-parametric statistical test (Friedman test which is analogous to analysis of variance) (Conover 1980) is conducted on nested frequencies of each species to determine significant changes at $\alpha = .10$. Ground cover parameters are analyzed and compared in the discussions of the reread studies. Trends for soil are determined by comparing basic ground cover measurements and cover composition (herbs vs shrubs) between years as well as comparing photos and observer observations between readings. The ratio of bare soil nested frequency values to protective cover nested frequency values can also be used to help determine changes in soil trend. On newly established studies, a more subjective or apparent assessment is made from qualitative comparisons.

The following tables and partial tables are taken from study number 23-1 to help illustrate some basic comparisons that can be made with the data. The "herbaceous trends" table summarizes average cover, quadrat frequency, and nested frequency data for individual grass and forb species. The table contains all the grass and forb species found on site 23-1. Readings prior to mid-1992 include only nested and quadrat frequency data for *perennial* species. Beginning in mid-1992, all trend studies have data for perennial and annual species as well as cover estimates for individual species.

In the following example, grasses have a combined total cover of 11.39%. In 1985, *Agropyron spicatum* had a sum of nested frequency value of 227. In 1991, the sum of nested frequency value slightly decreased to 220. By 1998, sum of nested frequency declined to 183. The subscript letters indicate that the sum of nested frequency value between 1985 and 1991 were not statistically different. However, the 1998 sum of nested frequency for *A. spicatum* shows a significant decrease compared to 1985 and 1991. Quadrat frequency showed a slight increase from 1985 to 1991 and then a marked decrease in 1998. Cover was estimated at 7.78% for *A. spicatum* in 1998. Trend for this grass is down due to a significant decline in sum of nested frequency.

HERBACEOUS TRENDS --

Herd unit 23 , Study no: 1

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover % '98
		'85	'91	'98	'85	'91	'98	
G	<i>Agropyron spicatum</i>	_b 227	_b 220	_a 183	79	84	68	7.78
G	<i>Bromus tectorum</i> (a)	-	-	42	-	-	14	.43
G	<i>Oryzopsis hymenoides</i>	4	12	12	2	4	4	.17
G	<i>Poa fendleriana</i>	_a 6	_b 36	_b 49	3	16	21	.98
G	<i>Poa secunda</i>	_a 3	_b 18	_c 94	1	10	40	2.00
G	<i>Sitanion hystrix</i>	_b 25	_{ab} 20	_a 6	13	9	3	.01
Total Annual Grasses		0	0	42	0	0	14	.43
Total Perennial Grasses		265	313	344	98	123	136	10.96
Total for Grasses		265	313	386	98	123	150	11.39
F	<i>Agoseris glauca</i>	-	10	1	-	5	1	.00
F	<i>Arabis</i> spp.	_a -	_b 18	_a 1	-	9	1	.00
F	<i>Astragalus convallarius</i>	_a 2	_a 4	_b 6	1	1	6	.15
F	<i>Calochortus nuttallii</i>	_{ab} 4	_b 8	_a -	2	4	-	-
F	<i>Collinsia parviflora</i> (a)	-	-	3	-	-	1	.00
F	<i>Crepis acuminata</i>	-	6	7	-	2	2	.06
F	<i>Eriogonum racemosum</i>	-	-	4	-	-	1	.03
F	<i>Eriogonum umbellatum</i>	-	1	9	-	1	5	.16
F	<i>Phlox austromontana</i>	-	6	4	-	3	2	.16
F	<i>Phlox longifolia</i>	_a 8	_b 27	_a 16	4	14	6	.20
Total Annual Forbs		0	0	3	0	0	1	.00
Total Perennial Forbs		14	80	48	0	0	24	.78
Total for Forbs		14	80	51	7	39	25	.78

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

In 1985, perennial grasses had a sum of nested frequency value of 265. This value has steadily increased to 313 in 1991 and 344 in 1998. The summed value of 344 for 1998 was derived by subtracting the annual grass value (*Bromus tectorum*) from the total value of 386. These changes would indicate a slightly upward overall trend for perennial grasses on this site. The forb trend can be determined in a similar manner. The herbaceous

understory trend is determined using both (combined value for nested frequency) the grass and forb nested frequency value. For example, total herbaceous cover is 12.23% (total grass cover + total forb cover) with grass providing the bulk of the cover. Therefore, when determining herbaceous trend, the grass proportion should be weighted more heavily than the forb proportion in this example.

The following browse trends table summarizes strip frequency and cover for all shrub species occurring on this site. All of the shrubs encountered at study number 23-1 are listed. For example, mountain big sagebrush had a strip frequency of 40 out of a possible 100. Cover is determined using the 1/4m² quadrat and estimating the percent of the quadrat covered below eye level (~4 feet). In this case, mountain big sagebrush cover is estimated to be 2.54%.

BROWSE TRENDS --

Herd unit 23 , Study no: 1

Type	Species	Strip Frequency Ø8	Average Cover % Ø8
B	Artemisia nova	35	2.24
B	Artemisia tridentata vaseyana	40	2.54
B	Chrysothamnus depressus	1	-
B	Chrysothamnus viscidiflorus viscidiflorus	1	.15
B	Gutierrezia sarothrae	2	-
B	Juniperus osteosperma	4	5.51
B	Opuntia spp.	1	.15
B	Pinus edulis	4	5.99
B	Purshia tridentata	18	3.20
Total for Browse		106	19.79

To more accurately estimate overhead canopy cover for trees and tall shrubs, the line intercept method is used along each 100 ft belt. This data is reported in the canopy cover table which follows. For example, *Juniperus osteosperma* has an estimated average cover of 7%.

CANOPY COVER --

Herd unit 23 , Study no: 1

Species	Percent Cover Ø8
Juniperus osteosperma	7
Pinus edulis	3

The basic cover table summarizes nested frequency and average cover of vegetation, rock, pavement, litter, cryptogams, and bare ground. Average cover prior to mid-1992 adds up to only 100%, while cover with the current method (post mid-1992) estimates several layers of plant and ground cover and will usually exceed 100%. For vegetation cover, the previous method only determined basal vegetative cover (2.0 and 5.75), while the new method estimates projected vegetational cover (30.04). Therefore, comparisons can be made for all cover measurements except for general vegetation cover which now examines projected foliar cover rather than just basal cover.

BASIC COVER --
Herd unit 23 , Study no: 1

Cover Type	Nested Frequency '08	Average Cover %		
		'85	'91	'98
Vegetation	274	2.00	5.75	30.04
Rock	216	6.00	5.25	11.18
Pavement	279	30.50	24.25	26.32
Litter	381	46.50	46.50	42.49
Cryptogams	46	5.00	3.00	.93
Bare Ground	254	10.00	15.25	21.42

A summary of the soil data is found in the soil analysis data table. Effective rooting depth is an average of 25 soil penetrometer readings, 5 of the deepest probes possible near each of the 5 baseline starting stakes. The effective rooting depth is a relative index that can be used for site comparisons with regard to individual species differences, site preferences, and abundance. Average soil temperature is taken from the deepest probe, one at each of the 5 baseline starting stakes. The temperature is listed in the table as the top measurement (e.g., 64.4°F), with the average depth (in inches) as the lower measurement (12.7). Chemical and textural characteristics are also listed and were determined by laboratory analysis of a composite sample taken near each of the 5 baseline starting stakes.

SOIL ANALYSIS DATA --
Herd Unit 23, Study # 01, Study Name: Bear Ridge

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
11.2	64.4 (12.7)	7.3	40.0	33.4	26.6	3.4	9.0	57.6	.5

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

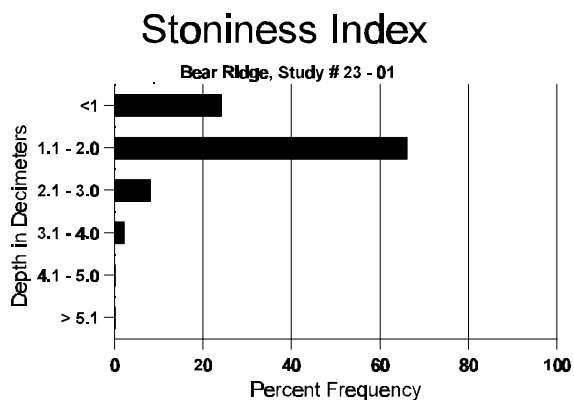
Ultra acid	<3.5
Extremely acid	3.5-4.4
Very strongly acid	4.5-5.0
Strongly acid	5.1-5.5
Moderately acid	5.6-6.0
Slightly acid	6.1-6.5
Neutral	6.6-7.3
Slightly alkaline	7.4-7.8
Moderately alkaline	7.9-8.4
Strongly alkaline	8.5-9.0
Very strongly alkaline	>9.1

Percent organic matter (% OM) refers to the amount of organic matter in the top 12 inches of soil. Parts per million of phosphorus and potassium are also included. Values for phosphorus and potassium less than 10 ppm and 70 ppm respectively have been shown to be limiting to plant growth and development.

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

To help become more aware of how rock is distributed throughout the upper soil profile, a stoniness index is determined for each of the sites. Depth to the nearest rock is estimated at the first 10 feet (at one-foot intervals) of each of the 5 baselines, which allows 50 measurements. These data are then analyzed for each of the 5 incremental decimeter measurements, making it possible to visually determine the proportion (relative percent of rock at each depth) of rock from <1 decimeter to >5 decimeters.



The pellet group frequency table summarizes the quadrat frequency of wildlife and livestock droppings found on the site. This data was not included in reports done prior to mid-1992. For example in 1998, rabbit pellet groups were found in 25% of the quadrats placed on study 23-1, indicating the relative amount of rabbit use. With future readings, this data can help characterize changes in wildlife use patterns on the site.

PELLET GROUP FREQUENCY --

Herd unit 23 , Study no: 1

Type	Quadrat Frequency		Pellet Transect	
	'93	'98	Pellet Groups per Acre	Days Use per Acre (ha)
			Ø8	Ø8
Rabbit	6	25	218	N/A
Elk	2	4	35	3 (5)
Deer	9	36	357	25 (62)

It was determined additional information on pellet groups was necessary. Therefore, a larger sample distributed over a larger area is now read in conjunction with the vegetative transects. The pellet group transect utilizes 50, 100ft² circular plots which are placed through the area. These are usually two parallel transects of 25 plots on each side of the vegetative transect which runs 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. If more precision is required, the transect is marked permanently (rebar) and the pellet groups within the circular plots are removed or marked.

On the following page is a section of a browse table which summarizes characteristics of shrubs on study 23-1. Total plants/acre for Mountain big sagebrush, excluding seedlings (S) and dead (X) was 1,400 in 1985, 1,065 in 1991, and 1,100 in 1998. Seedlings are excluded from the population estimate because with summer drought, they will most likely all die by late fall causing great fluctuations in population estimates between sampling dates. Since mid-1992, a larger shrub sample (more than three times larger) is used to better characterize the shrub populations. Therefore, changes in density (before and after 1992) may not necessarily indicate changes in trend, especially species 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 decadency, vigor, percent heavy hedging, biotic potential, etc. should be given more weight in determining shrub trend when comparing sampled years where sample sizes are different.

The following data on mountain big sagebrush shows the proportion of decadent shrubs (abbreviated as Dec: in the table) in the population has steadily increased from 57% in 1985, to 63% in 1991, and to 67% by 1998. More seedlings were encountered in 1985 and 1991, with slight fluctuations in the numbers of young plants. The percentage of plants displaying poor vigor has increased from 14% in 1985 to 38% in 1991, and is estimated at 40% in 1998. This percentage is determined by dividing the number of shrubs in vigor classes 3 and 4 by the total number of shrubs sampled (yearly totals for each grouping; Y, M, and D). The proportion of shrubs displaying heavy hedging declined from 24% in 1985, to 6% in 1991, and only 2% by 1998. This is determined by dividing the number of shrubs in form classes 3, 6 and 9 by the total number of shrubs sampled (total column). The proportion of shrubs displaying moderate use has fluctuated from 67% in 1985, down to 19% in 1991, and up to 56% in 1998. This is determined by dividing the number of shrubs in form classes 2 and 5 by the total number of shrubs sampled. The dead to live ratio is 2:1. This ratio is determined by dividing the number of dead plants by the number of live plants. The average height of sagebrush (mature plants) and

crown diameter has fluctuated from 13" x 15" to 12" x 13", and finally 15" x 23". Considering all these factors, trend for sagebrush in 1998 is slightly downward due to increased poor vigor and increased percent decadency. Also the number of dead plants encountered is more than double the number of live plants inventoried. An additional statistic to look at is the proportion of plants classified as dying in the decadent age class. For example, 60% of the decadent plants were reported as dying in 1991 and 41% of the decadent plants were reported as dying in 1998. This number is determined by dividing the number of plants in vigor class 4 by the total number of plants in the decadent age class. Both the dead to live ratio and the percentage of dying plants in the decadent age class indicate there has been a large shrub die-off in the past and this might continue into the future.

BROWSE CHARACTERISTICS --
Herd unit 23, Study no: 1

AGE	Y	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Artemisia tridentata vaseyana																		
S	85	4	-	-	-	-	-	-	-	-	4	-	-	-	266		4	
	91	-	-	-	1	-	-	4	-	-	5	-	-	-	333		5	
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	85	-	2	1	-	-	-	-	-	-	3	-	-	-	200		3	
	91	4	-	-	1	-	-	-	-	-	5	-	-	-	333		5	
	98	2	-	-	3	-	-	-	-	-	5	-	-	-	100		5	
M	85	1	4	1	-	-	-	-	-	-	4	-	2	-	400	13	15	6
	91	-	-	1	-	-	-	-	-	-	1	-	-	-	66	12	13	1
	98	2	9	1	1	-	-	-	-	-	12	-	1	-	260	15	23	13
D	85	1	8	3	-	-	-	-	-	-	11	-	1	-	800		12	
	91	5	3	-	2	-	-	-	-	-	4	-	-	6	666		10	
	98	14	22	-	1	-	-	-	-	-	16	-	6	15	740		37	
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	2300		115	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'85		67%			24%			14%			-24%							
'91		19%			06%			38%			+ 3%							
'98		56%			02%			40%										
Total Plants/Acre (excluding Dead & Seedlings)											'85	1400	Dec:	57%				
											'91	1065		63%				
											'98	1100		67%				

Management background information, photographs, and knowledgeable plant identification add to the data base for each site. Management and background information for each site is obtained from the administering agency. Permanently located photographs are taken; a general view down and back up the line, then a close-up of each half-high baseline post to further characterize individual sites. Correct plant identification is critical for a complete and accurate site analysis. Species identification mostly follows "A Utah Flora" (Welsh et al. 1987). In some cases, most notably *Agropyron* and *Purshia*, the species names used by the Range Trend Study Plant Species List (Giunta 1983) and the Intermountain Flora (Cronquist et al. 1977) are retained to maintain continuity and alleviate confusion with earlier published reports.

Sometimes information is requested for the production of shrubs and/or herbaceous species. These methods are described in a Interagency Technical Reference on Sampling Vegetation Attributes (²U.S. Department of Interior Bureau of Land Management 1996). The standard double weight sampling method is used for determining shrub production. This requires the establishment of a weight reference unit for each shrub species occurring in the area being sampled. Weights for 10 mature shrubs are determined for each species. Then this average weight is used with the population estimates to help estimate production by species on a per acre basis. When estimates for herbaceous species are needed, the same method is utilized except that three clipped quadrats are correlated to the herbaceous plant cover values.

REFERENCES

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Smith, S. D., S. C. Bunting, and M. Hironaka. 1987. Evaluation of the improvement in sensitivity of nested frequency plots to vegetational change by summation. *Great Basin Naturalist*. 47(2): 299-307.

Smith, S. D., S. C. Bunting, and M. Hironaka. 1986. Sensitivity of frequency plots for detecting vegetation change. *Northwest Science*. 60:279-286.

¹U.S. Department of Interior Bureau of Land Management. 1996. *Utilization Studies and Residual Measurements*, Interagency Technical Reference, BLM/RS/ST-96/004+1730.

²U.S. Department of Interior Bureau of Land Management. 1996. *Sampling vegetation attributes*, Interagency Technical Reference, BLM/RS/ST-96/002+1730.

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REPORT FORMAT

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

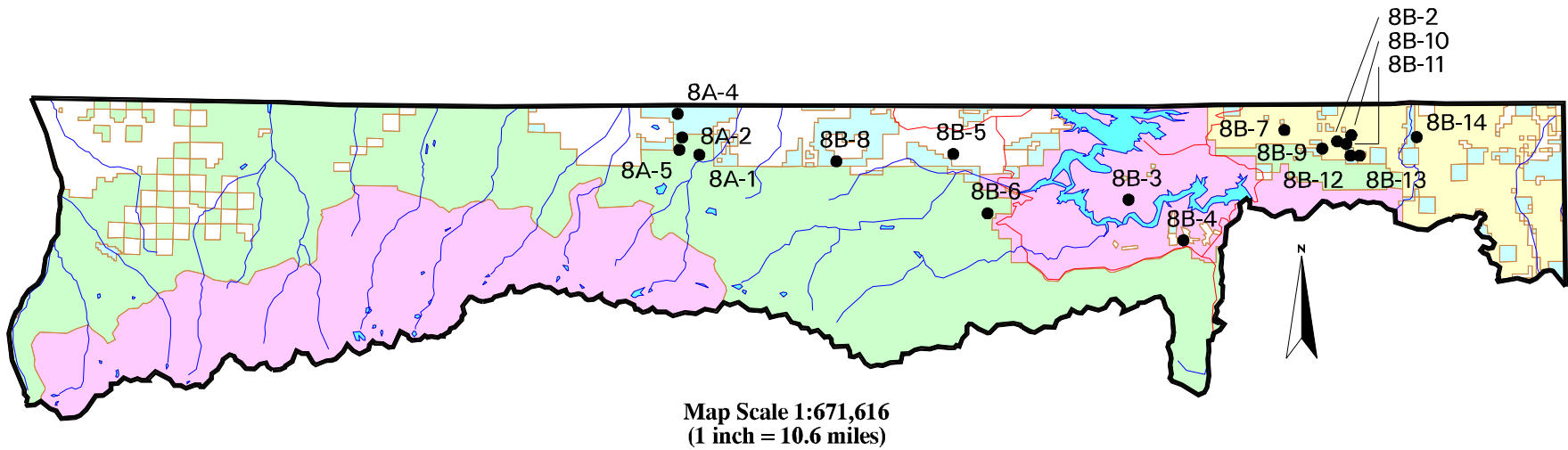
The name of the site and directions for locating the site are given on the location page. Due to many changes in management unit boundaries, trend studies have been renumbered. The previous trend study number is found in parenthesis following the trend study number currently being used. Also included on this page are the range type, arrangement and diagrammatic sketch of the baseline, and the location on a topographical map. The 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).

A discussion of the study site includes descriptions of the site's physical characteristics (elevation, slope, aspect), soil, ground cover, vegetative community, and species composition. The trend assessment is based upon the comparison of the recent year and the previous years data. Additional assessment is made by comparing photographs from year to year.

Tables with the compiled data follow the study discussions. 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, 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 change is indicated in the herbaceous trends table.

Summaries and evaluations at the end of each management unit address range trends in these key areas. This report will serve to identify and verify changes that are occurring on key areas for big game.

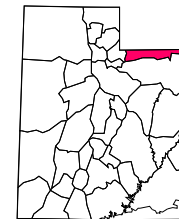
Management Units 8A & 8B



Legend

- Forest Service
- BLM
- State of Utah
- Other Federal Land
- Private
- Water Body
- Transect Location
- Road
- Perennial Stream

Unit Location



WILDLIFE MANAGEMENT UNIT 8A - NORTH SLOPE, SUMMIT

Boundary Description

Summit county - Boundary begins at the junction of Highway SR-150 and the Summit-Duchesne county line (summit of the Uinta Mountains); north along SR-150 to the Utah-Wyoming state line; east along this state line to the Brunt Fork-Birch Creek drainage divide; south along this drainage divide to the Burnt Fork-Sheep Creek drainage divide; south along this drainage divide to the Summit-Duchesne county line (summit of the Uinta Mountains); west along this county line to SR-150 and beginning point.

Unit Description

The North Slope, Summit Wildlife Management Unit is located along the north slope of the Uinta Mountains in Summit County. Unit 8A is a sub-unit of the North Slope Wildlife Management Unit. The other sub-unit, 8B, covers Daggett County. Elevation of unit 8A ranges from 7,500 feet to over 13,000 feet. Habitat varies from sagebrush and mountain brush communities to alpine tundra above the timberline which includes vast expanses of lodgepole pine. Several major drainages are located within the unit including: Bear River, Black's Fork, Smith's Fork, Henry's Fork, and Burnt Fork. Winter range in Utah is a critical limiting factor on the unit with many deer wintering in Wyoming.

In previous reports, the 5 trend study sites in this unit were included in Herd Unit 9 - Daggett. The study areas in herd unit 8A emphasize areas around Widdop Mountain and the Bald Range which are just west of the herd units eastern boundary and Burnt Fork-Birch Creek drainage divide. This area is considered important winter range for elk which summer on the north slope of the High Uinta mountains. According to the 1995 Big Game Harvest summary (Evans et. al 1995), there is approximately 365,000 acres of summer range on the unit, 88% of which is administered by the U.S. Forest Service. Private land owners control 11%, while the State of Utah administers 1%. There is about 35,100 acres of winter range with the majority (44%) being privately owned and another 42% administered by the Forest Service. The state owns 7%.

To meet the need for vegetative trend data on key elk winter ranges on the North Slope of the Uinta Mountains east of Beaver Creek, 6 new interagency range trend studies were established in the area in September 1988. The key areas are found on the mountain mahogany slopes of Phil Pico Mountain, Bald Range, Widdop Mountain, and Jessen Butte. These areas are mostly public land, although there is a considerable amount of private land in the Birch Creek and Beaver Creek drainages below the U.S. Forest boundary. The state of Utah owns several large sections, containing the study areas on Phil Pico Mountain (8B-8) and the Bald Range (8A-3 & 4). The study sites on Widdop Mountain (8A-1 & 2), including Telephone Hollow (8A-6), are on the Wasatch National Forest. The site on Phil Pico Mountain is now within sub-unit 8B and will be discussed in that section.

These sites receive moderate to heavy use by elk in the winter. Deer use is light to moderate in the winter with some summer use. Three of the 5 trend sites also show light winter use by moose, with year round antelope use of the area. Winter use by antelope and deer is dependent on weather conditions. All areas are permitted for livestock grazing. While the valleys are often heavily used by cattle, on-site observations indicate light or no use on the steep, mountain brush hillsides.

Unit Management Objectives

The management plan for Unit 8 (8A & 8B), includes a target herd size of 5,300 wintering deer with a composition of 15 bucks to 100 does. Thirty percent of the bucks are to be 3-point or better. The elk management objective is to achieve a target winter herd size of 2,100 (1,600 in Summit and West Daggett; and 500 in the Three Corners) with a minimum post season bull to cow ratio of 8:100. At least 4 of these bulls will be 2 ½ years of age or older.

Study Site Description

All range trend studies in Unit 8A sample the true (birchleaf) mountain mahogany range type. These studies provide a good representation of a majority of the key birchleaf mahogany winter range in the area. Except for Widdop Mountain North Slope (8A-2) which is situated on a north slope, the remainder of the study sites are located on south-facing slopes. These slopes tend to be moderately steep with rocky soil, typical of the dry, coarse, shallow soils often occupied by mountain mahogany.

All of the 5 trend study sites in sub-unit 8A were established in 1988 and reread in 1995. During the 2000 season, 4 of the 5 studies were reread with Bald Range South (8A-3) being discontinued due to its close proximity and similarity with Bald Range (8A-4).

Trend Study 8A-1-00

Study site name: Widdop Mountain South Slope.

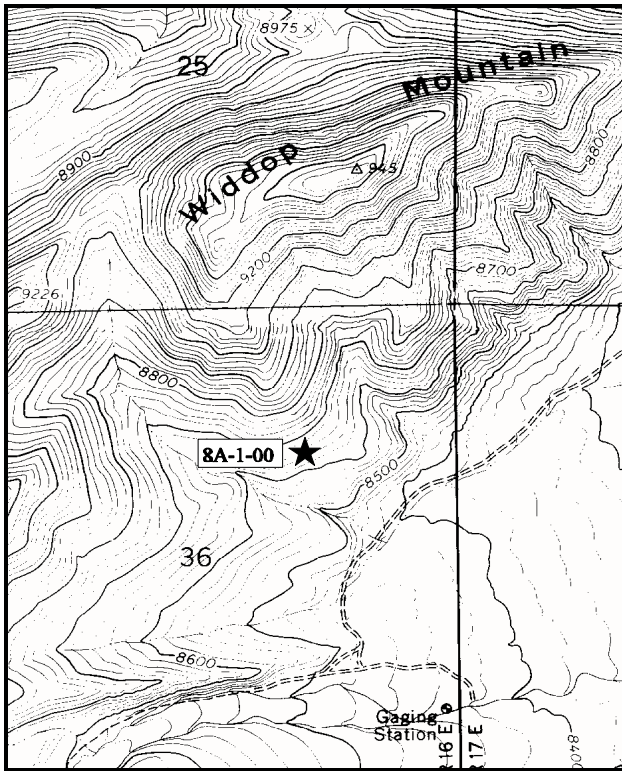
Range type: True Mountain Mahogany.

Compass bearing: frequency baseline 154°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

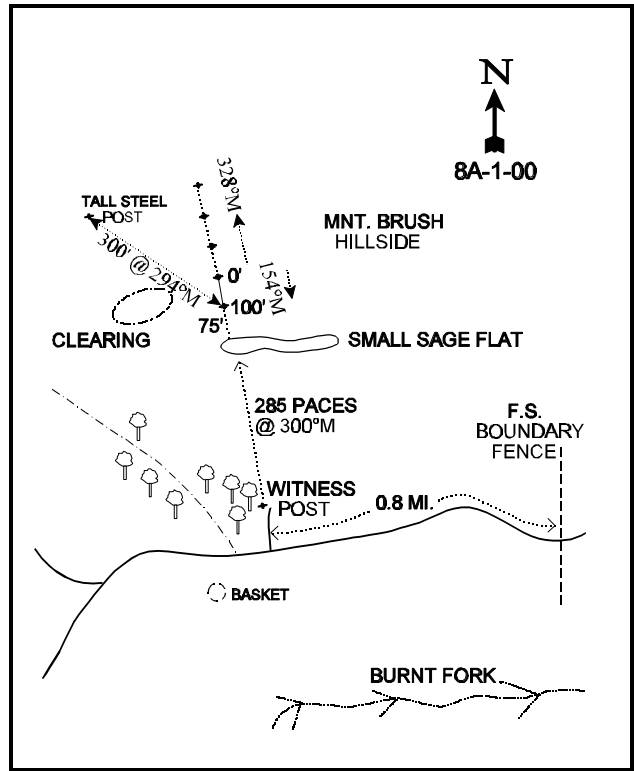
LOCATION DESCRIPTION

Two miles south of the Wyoming-Utah state line, on the Hoop Lake Road along the Middle Fork of Beaver Creek, turn east toward Gregory Basin. Go 0.6 miles to a private property fence. Continue east 1.1 miles, going past a cabin to a fence. Go 0.1 miles to a fork, continue straight. Go 0.4 miles to an old 4-way intersection south of Gregory Basin. Continue east for 0.7 miles to the FS boundary fence. Go 0.9 miles (past study 8A-2-00) to another FS fence. Continue 1.8 miles to a gate. Go through the gate and 0.4 miles to a fork. Bear right. Go 2.3 miles SW back to a FS boundary fence. Proceed 0.8 miles to a faint fork. Turn right and pull up about 50 yards along a small drainage. Stop by a witness post (tall green fencepost) next to a clump of aspens. From here, hike NW 500 yards up the slope. The 0-foot baseline stake is marked by browse tag #7155.



Map Name: Hoop Lake

Township 3N, Range 16E, Section 36



Diagrammatic Sketch

UTM 4533803 N, 578141 E

DISCUSSION

Trend Study No. 8A-1

The Widdop Mountain South Slope study is located on the south side of Widdop Mountain. The open mountain mahogany slope overlooks large sagebrush parks in the Burnt Fork drainage. The elevation at the site is 8,650 feet. It is on a moderately steep (26%), south-facing, well-drained slope. The land is administered by the Wasatch National Forest which is permitted for summer cattle grazing. The cows tend to stay in the valley bottom near water, so livestock use is light on the brushy mountain slopes. These slopes receive the most use from wintering elk as evidenced by the higher quadrat frequency of elk pellet groups. Pellet group transect data from 2000 estimate moderate elk use at 66 elk days use/acre (163 edu/ha). There is also indications of light use by moose and deer (see pellet group table). In 2000, nearly all of the deer pellet groups appeared to be from the fall, while most of the elk use seemed to be from winter, and moose use primarily from spring.

The soil is a moderately deep, rocky, sandy loam with an effective rooting depth of nearly 13 inches. Soil depth measurements (effective rooting depth) were deepest near serviceberry and mahogany plants. The soil profile contains a light colored horizon at approximately 3 to 6 inches in depth that contains calcium carbonate particles. Rock cobble and gravel are common on the soil surface and concentrated in the top 12 inches of the soil. Parent material consists of limestone and sandstone colluvially deposited from Widdop Mountain. Some limited soil movement is apparent in the form of soil pedestalling on the uphill side of shrubs and some terracing on the steeper slopes. However, erosion is not a problem on the site due to the abundant vegetation and litter cover.

True mountain mahogany is the key browse species which provided 84% of the browse cover in 1995 and 79% in 2000. During the 1995 reading, the proportion of mature plants increased, while the number of plants in all other form classes declined. The biggest decline was in the number of young plants which were abundant in 1988. The young plants counted in 1988, apparently got established during the favorable wet years of 1983 and 1984. Drought conditions that followed have reduced the number of seedlings and young within the population. Young plants accounted for about 56% of the mahogany population in 1988, declining to 27% and 29% in 1995 and 2000 respectively. Few seedlings were sampled in 1995 or 2000. Use of the more palatable mahogany has been moderate to heavy during all years, although slightly heavier in 2000. However, percent decadence is low and vigor is normal for most plants. Some insect damage was noted in 1995, with the dry conditions of 2000, some mahogany leaves have started to dry out and turn yellow by early August. Some of the heavy use reported in 2000 may be partly due to poor annual leader growth caused by the extremely dry conditions. Average annual leader growth was only 3 inches for mahogany.

Additional browse forage is provided by serviceberry, mountain big sagebrush, winterfat, bitterbrush and snowberry. Patches of sagebrush tend to dominate the more level areas on the hillside. Smaller plants like low rabbitbrush, horsebrush, and especially broom snakeweed, are fairly common yet unimportant as forage.

The abundant and well established grasses provided 34% of the vegetation cover in 1995 and 36% in 2000. Bluebunch wheatgrass is especially abundant on this site. A small sedge is also very common. These two species provided 84% of the grass cover in 1995 and 92% in 2000. Indian ricegrass is moderately abundant, while other grasses are found only occasionally. A good variety of forbs are present on the site. None are noteworthy except for thistle which appears to be increasing in the open areas, and the preferred low penstemon and flax.

1995 TREND ASSESSMENT

Since vegetative cover was estimated differently in 1995 than in 1988, care should be taken when directly comparing basic vegetation cover from the earlier readings. In 1988, points on the quadrat were used to estimate cover. As a result, only basal vegetation cover was estimated. In 1995, aerial cover for vegetation was estimated for all ground cover categories which can usually total more 100%. Refer to the methods section of this report for further information on the methods.

Ground cover characteristics haven't changed a great deal on this site. Percent bare ground has declined slightly while litter cover has gone down moderately due to drought. Erosion does not appear to be a problem on the site due to the abundant herbaceous vegetation which provides 44% of the vegetative cover. The high values for nested frequency for vegetation and litter (347 and 388 out of a possible 400) suggest well dispersed protective cover. Trend for soil is currently considered stable. Trend for the key browse species, true mountain mahogany, is mixed. On the positive side, percent decadency is less than one percent, but it was already low at 6% in 1988. The proportion of shrubs displaying heavy hedging has also declined while generally showing good vigor. On the slightly downward side, the numbers of seedlings and young have declined, but this is not critical for a fairly long-lived species. The large number of young plants and noted decline is most likely due to the wet years in the early to mid-1980's followed by several years of drought. Differences in young and seedling plants may also be to the much larger sample used in 1995 which more accurately estimates shrub populations. This trend is common throughout the herd unit and in other areas of the state. Trend for browse on the site is considered stable due to the low decadency rate, adequate reproductive potential (27%), stable vigor and reduced heavy hedging.

Trend for the herbaceous understory is slightly down due to a decline in sum of nested frequency for both perennial grasses and forbs. This is also a common trend through out the state during these drought years. Nested frequency of bluebunch wheatgrass increased significantly while frequency of most of the other perennial grasses declined.

TREND ASSESSMENT

soil - stable (3)

browse - stable but reduced reproductive potential (3)

herbaceous understory - slightly down (2)

2000 TREND ASSESSMENT

Trend for soil is fairly stable. Erosion is not a problem on the site due to the abundant and well dispersed vegetation and litter cover. Trend for the key browse species, true mountain mahogany, is also stable. Utilization is somewhat heavier than 1995 estimates. However, percent decadence is relatively low at 10%, vigor is normal on most plants, and 29% of the population consists of young plants. Some of what appears as increased use may be due to poor leader growth on mahogany in response to the extremely dry conditions of this growing season. Poor leader growth makes shrubs appear to be more heavily used. Trend for the herbaceous understory is stable with similar sum of nested frequencies for perennial grasses and forbs compared to 1995.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --

Herd unit 08A, Study no: 1

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	<i>Agropyron dasystachyum</i>	a-	ab3	b12	-	1	5	.03	.10
G	<i>Agropyron spicatum</i>	a233	b286	b276	86	94	94	9.56	12.51
G	<i>Bromus inermis</i>	a-	b10	ab2	-	3	1	.06	.00
G	<i>Carex spp.</i>	b188	a136	ab157	76	57	65	3.57	6.02
G	<i>Festuca ovina</i>	-	-	4	-	-	2	-	.03
G	<i>Koeleria cristata</i>	b60	ab45	a26	26	21	12	.58	.23
G	<i>Leucopoa kingii</i>	b23	a10	a10	11	4	5	.02	.07
G	<i>Oryzopsis hymenoides</i>	b65	ab59	a42	33	26	18	1.72	1.34
G	<i>Poa fendleriana</i>	a-	b14	a-	-	6	-	.08	-
G	<i>Poa secunda</i>	-	-	1	-	-	1	-	.00
G	<i>Stipa comata</i>	c40	b6	a-	19	3	-	.09	-
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		609	569	530	251	215	203	15.72	20.34
Total for Grasses		609	569	530	251	215	203	15.72	20.34
F	<i>Arabis spp.</i>	-	3	-	-	1	-	.03	-
F	<i>Aster chilensis</i>	b10	b4	a-	4	3	-	.06	-
F	<i>Astragalus spp.</i>	3	-	1	2	-	1	-	.03
F	<i>Calochortus flexuosus</i>	a-	b7	ab2	-	4	1	.07	.00
F	<i>Chaenactis douglasii</i>	-	1	6	-	1	2	.00	.01
F	<i>Chenopodium leptophyllum (a)</i>	-	2	-	-	2	-	.01	-
F	<i>Cirsium spp.</i>	59	48	57	32	25	28	1.62	1.47
F	<i>Comandra pallida</i>	1	1	-	1	1	-	.03	-
F	<i>Cryptantha spp.</i>	a42	b90	ab71	21	37	34	1.04	.94
F	<i>Cymopterus spp.</i>	-	-	1	-	-	1	-	.00
F	<i>Descurainia pinnata (a)</i>	a14	b54	a1	8	23	1	.22	.03
F	<i>Eriogonum umbellatum</i>	-	-	1	-	-	1	-	.00
F	<i>Hymenoxys acaulis</i>	2	-	-	2	-	-	-	-
F	<i>Lesquerella alpina</i>	b40	a19	ab40	20	11	23	.05	.31
F	<i>Leucelene ericoides</i>	21	10	15	8	4	6	.02	.13
F	<i>Linum lewisii</i>	a2	a5	b21	2	2	9	.03	.12
F	<i>Lithospermum ruderales</i>	a8	b26	b28	4	15	14	.39	.40
F	<i>Machaeranthera canescens</i>	-	-	1	-	-	1	-	.00
F	<i>Machaeranthera grindelioides</i>	a4	b18	b25	2	10	11	.20	.48
F	<i>Penstemon humilis</i>	b96	a38	a30	48	19	17	.24	.45
F	<i>Phlox hoodii</i>	b51	ab34	a34	24	16	17	.42	.60
F	<i>Senecio multilobatus</i>	b30	a6	b26	13	3	15	.01	.37

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
F	Taraxacum officinale	a-	b ¹⁰	a ²	-	6	1	.03	.03
F	Tragopogon dubius	-	-	1	-	-	1	-	.00
F	Zigadenus paniculatus	4	6	1	3	2	1	.01	.00
Total for Annual Forbs		14	56	1	8	25	1	0.23	0.03
Total for Perennial Forbs		373	327	363	186	161	184	4.30	5.38
Total for Forbs		387	383	364	194	186	185	4.53	5.41

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

BROWSE TRENDS --

Herd unit 08A, Study no: 1

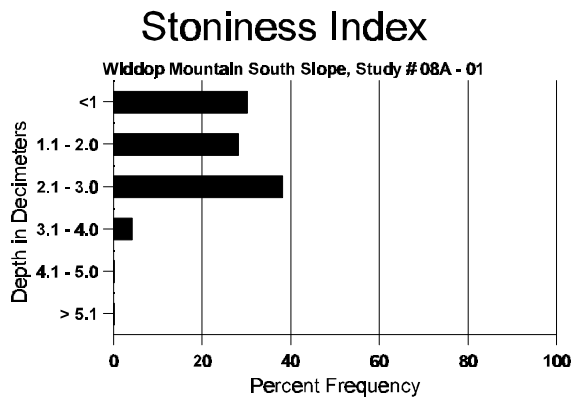
T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	6	5	1.06	1.52
B	Artemisia frigida	7	10	.03	.18
B	Artemisia tridentata vaseyana	5	6	.66	1.00
B	Ceratoides lanata	2	1	.00	-
B	Cercocarpus montanus	93	93	21.65	24.07
B	Chrysothamnus depressus	1	0	-	-
B	Chrysothamnus nauseosus hololeucus	0	1	-	-
B	Chrysothamnus viscidiflorus lanceolatus	23	24	.48	.33
B	Eriogonum microthecum	16	12	.12	.34
B	Gutierrezia sarothrae	26	60	.62	1.49
B	Purshia tridentata	1	1	.03	.15
B	Symphoricarpos oreophilus	4	3	.15	.41
B	Tetradymia canescens	34	32	.81	.77
Total for Browse		218	248	25.65	30.29

BASIC COVER --
Herd unit 08A, Study no: 1

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	347	350	8.00	39.14	51.17
Rock	219	163	3.75	6.31	5.54
Pavement	266	257	18.50	13.45	18.63
Litter	388	361	57.00	47.96	43.00
Cryptogams	3	-	0	.00	0
Bare Ground	224	226	12.75	10.57	15.58

SOIL ANALYSIS DATA --
Herd Unit 8A, Study # 1, Study Name: Widdop Mountain South Slope

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
12.83	59.2 (14.25)	6.6	72.0	13.4	14.6	7.0	19.6	208.0	0.6



PELLET GROUP FREQUENCY --
Herd unit 08A, Study no: 1

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre	Days Use per Acre (ha)
Rabbit	1	1	131	N/A
Antelope	-	3	44	4 (9)
Moose	4	-	165	9 (23)
Elk	40	28	853	66 (162)
Deer	20	-	191	15 (36)
Cattle	-	2	17	2 (4)

BROWSE CHARACTERISTICS --

Herd unit 08A, Study no: 1

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier alnifolia																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	4	-	-	1	-	-	-	-	-	5	-	-	-	100		5	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	-	1	1	-	2	1	-	-	-	5	-	-	-	100	27	31	
	00	1	-	1	-	2	-	-	-	-	4	-	-	-	80	20	28	
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	2	-	-	-	2	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		30%			20%			00%			-40%							
'00		33%			50%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	0%				
											'95	200		0%				
											'00	120		33%				
Artemisia frigida																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
	00	1	-	-	2	-	-	-	-	-	3	-	-	-	60		3	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	3	1	-	2	-	-	-	-	-	6	-	-	-	120	3	8	
	00	10	-	-	1	-	-	-	-	-	11	-	-	-	220	2	6	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		14%			00%			00%			+50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	-				
											'95	140		-				
											'00	280		-				

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4			
<i>Artemisia nova</i>								
M	88	-	-	-	-	-	-	-
	95	-	-	-	-	-	-	-
	00	-	-	-	-	-	-	-
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>	<u>%Change</u>			
	'88	00%	00%	00%				
	'95	00%	00%	00%				
	'00	00%	00%	00%				
Total Plants/Acre (excluding Dead & Seedlings)					'88	0	Dec:	-
					'95	0		-
					'00	0		-
<i>Artemisia tridentata vaseyana</i>								
Y	88	2	-	-	-	-	-	-
	95	-	2	-	-	-	-	-
	00	-	-	-	-	-	-	-
M	88	3	-	-	-	-	-	-
	95	3	1	-	-	-	-	-
	00	2	3	-	-	-	-	-
D	88	-	-	-	-	-	-	-
	95	-	-	-	-	-	-	-
	00	-	2	-	-	-	-	-
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>	<u>%Change</u>			
	'88	00%	00%	00%	-64%			
	'95	50%	00%	00%	+14%			
	'00	71%	00%	14%				
Total Plants/Acre (excluding Dead & Seedlings)					'88	333	Dec:	0%
					'95	120		0%
					'00	140		29%
<i>Ceratoides lanata</i>								
M	88	-	1	-	-	-	-	-
	95	1	-	-	1	-	-	-
	00	-	-	-	-	1	-	-
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>	<u>%Change</u>			
	'88	100%	00%	00%	-39%			
	'95	00%	00%	00%	-50%			
	'00	00%	00%	00%				
Total Plants/Acre (excluding Dead & Seedlings)					'88	66	Dec:	-
					'95	40		-
					'00	20		-

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total									
		1	2	3	4												
Cercocarpus montanus																	
S	88	3	-	-	-	-	3	-	-	6	-	-	-	400		6	
	95	2	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	7	-	-	-	-	-	-	-	7	-	-	-	140		7	
Y	88	12	17	9	5	1	-	13	-	56	-	1	-	3800		57	
	95	41	15	-	3	-	-	-	-	59	-	-	-	1180		59	
	00	29	33	10	4	-	-	-	-	76	-	-	-	1520		76	
M	88	-	12	25	-	1	-	-	-	37	-	-	1	2533	26 38	38	
	95	3	20	3	-	60	70	-	-	93	60	3	-	3120	31 50	156	
	00	-	12	26	-	28	89	1	-	156	-	-	-	3120	23 37	156	
D	88	-	1	5	-	-	-	-	-	6	-	-	-	400		6	
	95	-	-	-	1	-	-	-	-	-	-	-	1	20		1	
	00	1	1	7	-	1	16	-	-	19	-	-	7	520		26	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>									
'88		32%		39%		02%		-36%									
'95		44%		34%		02%		+16%									
'00		29%		57%		03%											
Total Plants/Acre (excluding Dead & Seedlings)										'88	6733	Dec:	6%				
										'95	4320		0%				
										'00	5160		10%				
Chrysothamnus depressus																	
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>									
'88		00%		00%		00%											
'95		00%		00%		00%											
'00		00%		00%		00%											
Total Plants/Acre (excluding Dead & Seedlings)										'88	0	Dec:	-				
										'95	20		-				
										'00	0		-				
Chrysothamnus nauseosus hololeucus																	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	00	1	-	-	-	-	-	-	-	1	-	-	-	20	-	1	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>									
'88		00%		00%		00%											
'95		00%		00%		00%											
'00		00%		00%		00%											
Total Plants/Acre (excluding Dead & Seedlings)										'88	0	Dec:	-				
										'95	0		-				
										'00	20		-				

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total				
		1	2	3	4		1	2					
Chrysothamnus viscidiflorus lanceolatus													
Y	88	1	-	-	-	-	-	-	1	-	66		1
	95	8	-	-	-	-	-	-	8	-	160		8
	00	-	-	-	-	-	-	-	-	-	0		0
M	88	1	-	-	3	-	-	-	4	-	266	10 11	4
	95	31	-	-	2	-	-	-	33	-	660	9 12	33
	00	25	-	-	7	-	-	-	32	-	640	6 11	32
D	88	-	1	-	-	-	-	-	-	-	66		1
	95	-	-	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	1	-	20		1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>		
'88		17%			00%			17%			+51%		
'95		00%			00%			00%			-20%		
'00		00%			00%			00%					
Total Plants/Acre (excluding Dead & Seedlings)										'88	398	Dec:	17%
										'95	820		0%
										'00	660		3%
Eriogonum microthecum													
S	88	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	0		0
	00	3	-	-	-	-	-	-	3	-	60		3
Y	88	-	-	-	-	-	-	-	-	-	0		0
	95	1	-	-	-	-	-	-	1	-	20		1
	00	-	-	-	-	-	-	-	-	-	0		0
M	88	-	-	-	-	-	-	-	-	-	0	- -	0
	95	29	-	-	-	-	-	-	29	-	580	4 10	29
	00	18	-	-	1	-	-	-	19	-	380	4 7	19
D	88	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	0		0
	00	2	-	-	-	-	-	-	1	-	40		2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>		
'88		00%			00%			00%					
'95		00%			00%			00%			-30%		
'00		00%			00%			05%					
Total Plants/Acre (excluding Dead & Seedlings)										'88	0	Dec:	0%
										'95	600		0%
										'00	420		10%

A G R E	Y R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	12	-	-	-	-	-	-	-	-	12	-	-	-	240		12	
Y	88	11	-	-	-	-	-	-	-	-	11	-	-	-	733		11	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
M	88	120	-	-	10	-	-	-	-	-	130	-	-	-	8666	7 5	130	
	95	38	-	-	-	-	-	-	-	-	38	-	-	-	760	7 6	38	
	00	118	-	-	1	-	-	-	-	-	119	-	-	-	2380	5 8	119	
D	88	-	-	-	1	-	-	-	-	-	-	-	-	1	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	3	-	-	-	-	-	-	-	-	2	-	-	1	60		3	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			.70%			-92%							
'95		00%			00%			00%			+69%							
'00		00%			00%			.79%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	9465	Dec:	1%				
											'95	780		0%				
											'00	2520		2%				
Leptodactylon pungens																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	5 8	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	-				
											'95	0		-				
											'00	0		-				
Purshia tridentata																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	1	-	-	-	-	-	-	-	-	-	1	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		100%			00%			00%			+ 0%							
'00		100%			00%			100%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	-				
											'95	20		-				
											'00	20		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	3	-	-	1	-	-	-	-	-	4	-	-	-	80	8	21	
	00	2	-	-	-	2	-	-	-	-	4	-	-	-	80	9	35	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%			+33%							
'00		33%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	80		-			
												'00	120		-			
Tetradymia canescens																		
S	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	2	3	-	1	-	-	-	-	-	6	-	-	-	400		6	
	95	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
	00	3	-	-	2	-	-	-	-	-	5	-	-	-	100		5	
M	88	3	-	-	2	-	-	2	-	-	6	-	1	-	466	7	7	
	95	51	2	-	7	-	-	-	-	-	60	-	-	-	1200	6	8	
	00	39	5	2	4	-	-	-	-	-	50	-	-	-	1000	6	10	
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	6	-	1	-	-	-	-	-	-	5	-	-	2	140		7	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		23%			00%			08%			+32%							
'95		03%			00%			00%			- 3%							
'00		08%			05%			03%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	866	Dec:	0%			
												'95	1280		0%			
												'00	1240		11%			

Trend Study 8A-2-00

Study site name: Widdop Mountain North Slope.

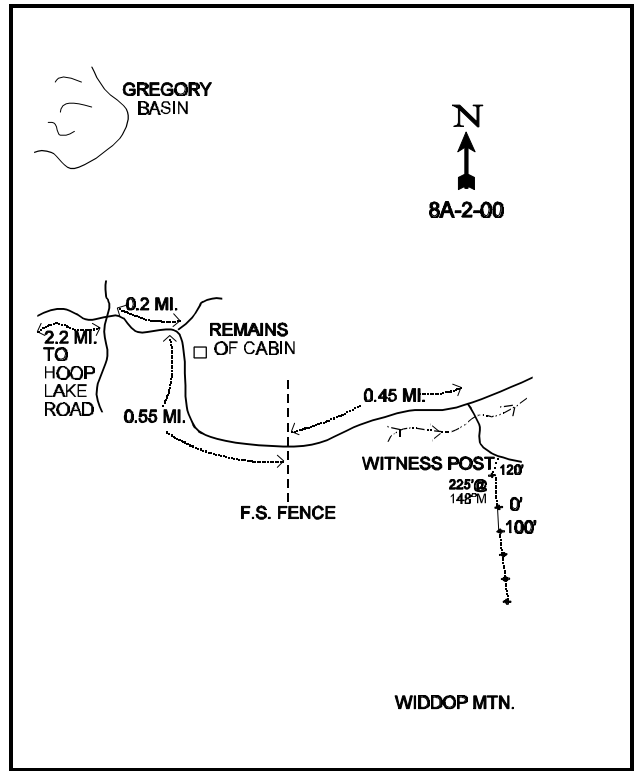
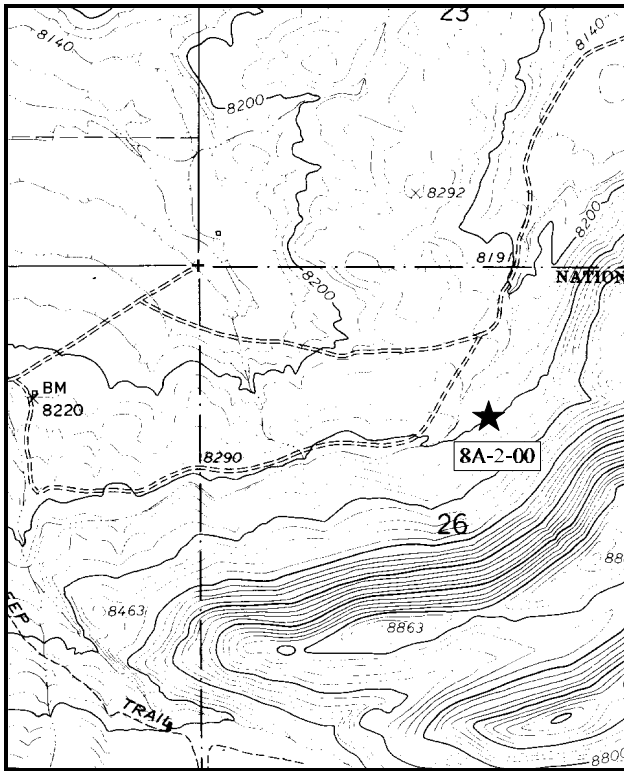
Range type: True Mountain Mahogany.

Compass bearing: frequency baseline 146°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft.), line 4 (71ft).

LOCATION DESCRIPTION

Two miles south of the Wyoming-Utah state line, on the Hoop Lake Road along the Middle Fork of Beaver Creek, turn east toward Gregory Basin. Go 0.6 miles to a private property fence. Continue east 1.1 miles, going past a cabin to a fence. Go 0.1 miles to a fork, continue straight. Go 0.4 miles to an old 4-way intersection south of Gregory Basin. Continue straight east 0.2 miles to an old cabin, bear right. Proceed 0.55 miles to the FS boundary fence. Go along the bottom 0.45 miles to a faint fork. Bear right and go across the stream. Continue east 0.1 miles towards the base of Widdop Mountain. On the south side of the road, look for a witness post in the sagebrush. The 0-foot baseline stake is 225 feet south of the witness post at 148°M.



Map Name: Hoop Lake

Diagrammatic Sketch

Township 3N, Range 16E, Section 26

UTM 4535338 N, 576248 E

DISCUSSION

Trend Study No. 8A-2

The Widdop Mountain North Slope study is located on the opposite side of the mountain from the previous study (#8A-1). This site on Widdop Mountain also samples a true mountain mahogany type that has a northwest aspect. It is moderately steep at the top, but more gentle towards the bottom where the study is located. The site has a slope of approximately 22% and an elevation of 8,300 feet. Although located on a northerly exposure, this hillside receives considerable use by elk in the winter. Pellet group data from 2000 estimate 44 elk, 3 deer and 12 cow days use/acre (109 edu/ha, 7 ddu/ha and 30 cdu/ha). Quite a few moose also appear to be using this site along with a few antelope. Most of the elk pellet groups appear to be from winter use while moose seem to be using the site more in the spring. There is excellent thermal and escape cover provided by a nearby dense conifer stand.

Soils on the site are moderately deep but variable. Effective rooting depth is estimated at nearly 14 inches, but soil depth varies between 11 inches at the bottom of the slope to 16 inches further up the slope at the end of the baseline. The study site begins further up slope where mountain mahogany is found and runs downhill where black sagebrush becomes dominant on more shallow soils at the bottom of the slope. Near the top of the slope there is abundant gravel in the soil profile which becomes small cobble further down. There is also calcium carbonate deposits on the rocks. Soil penetrometer readings suggest that most of the rock is concentrated within the top 8 inches of the soil profile. The soil has a loam texture with a slightly alkaline reactivity (pH of 7.4). It is high in percent organic matter but very low in phosphorus at only 3.4 ppm. Values less than 10 ppm can limit normal plant growth and development. Soil parent material is identical to 8A-1, with both limestone and sandstone. The ground surface is well covered by vegetation and litter leaving little bare ground exposed. Aside from some mild soil pedestaling on the uphill side of shrubs, there is little soil movement or erosion on the site.

The slope is dominated by true mountain mahogany, associated with snowberry, pockets of black sagebrush and occasionally mountain big sagebrush and serviceberry. These secondary browse comprise about 37%-38% of the browse cover and show mostly light to moderate use. Mahogany provides nearly half of the browse cover with a current ('00) density of 7,360 plants/acre. Mountain mahogany density was estimated at 24,332 plants/acre in 1988. Similar to site #1, the majority of the population consisted of young plants (89%) in 1988, which became established during years of above average precipitation, then thinned out during the extended drought. Mature plants numbered 2,066 plants/acre in 1988 and averaged about 2 feet in height. Twelve percent of the population displayed heavy utilization with generally good vigor. During the 1995 reading, there were an estimated 6,880 plants/acre. The drop in density is primarily from the great reduction in the number of young plants. Changes in density could also be due to the greatly enlarged sample size used beginning in 1992 which more accurately estimates shrub populations. Seedlings also declined from 6,600 in 1988 to 2,440 by 1995 and 1,180 in 2000. The number of mature plants increased from 2,066 plants/acre in 1988, to 3,680 plants/acre in 1995 and 2000. Use is lighter on this site compared to 8A-1 Widdop Mountain South Slope. Use was light to moderate in 1988 increasing to moderate to heavy in 1995. Currently ('00), 41% of the mahogany is heavily browsed. Some of the increase in heavy use may be due to the poor annual leader growth of only 2.4 inches in 2000. Poor leader growth gives plants the appearance of heavier use than what actually occurred. Even with the heavy use, the mahogany is healthy, vigor is normal and percent decadence is low.

Grasses are diverse and moderately abundant, accounting for nearly 13% cover in 1995 and 15% in 2000. Prominent species include: bluebunch wheatgrass, Carex, mutton bluegrass and needle-and-thread. Forbs are diverse with over 20 species encountered in 1995 and 2000. Common species are low growing forbs like desert phlox, pussytoes, ballhead sandwort and sulfur eriogonum. Desirable species include: yellow Indian paintbrush, Lewis flax and low penstemon.

1995 TREND ASSESSMENT

Even with drought conditions, ground cover characteristics have improved on this site. Percent bare ground has declined from 12% to 6% and percent litter cover has remained steady at 57%. There is more than adequate ground cover to control erosion. Trend for soil is up. The browse trend is stable for most of the palatable species, especially so for the key species, true mountain mahogany. The large numbers of seedlings and young estimated in 1988, were inflated due to above average precipitation in the mid-1980's in conjunction with the much smaller sample size used in 1988. The number of mature plants increased in 1995 and percent decadence remained low at 2%. The number of seedlings and young declined, but they remain at a high level and are adequate to maintain the population. Secondary browse species, serviceberry, black sagebrush, mountain big sagebrush and snowberry provide additional forage. These species generally display stable to improving trends with light to moderate use. The herbaceous trend is mixed. Sum of nested frequency of grasses has remained stable while nested frequency of forbs declined. This is a common trend during dry years. Combined nested frequency for grasses and forbs have declined slightly indicating a slightly downward trend.

TREND ASSESSMENT

soil - up (5)

browse - stable (3)

herbaceous understory - slightly down (2)

2000 TREND ASSESSMENT

Trend for soil is stable even though percent bare ground increased slightly. The ratio of protective cover (vegetation, litter and cryptogams) to bare ground has remained identical to 1995 at 3.8 to 1. Vegetation and litter cover are abundant and well dispersed and erosion is minimal. Trend for the key browse species, mountain mahogany, is also stable. Use is heavier with 41% of the shrubs sampled being heavily browsed. However, vigor is normal and percent decadence is still relatively low. Biotic potential (# of seedlings) has declined from 35% to 16%, but the proportions of young and mature plants have remained similar. Trend for the herbaceous understory is mixed. Sum of nested frequency of perennial grasses has declined slightly, with frequency of perennial forbs declining moderately. This decline is a common trend in the state this year due to the dry conditions. Trend is considered down slightly since forbs and grasses both showed downward trends.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly down due to drought (2)

HERBACEOUS TRENDS --
Herd unit 08A, Study no: 2

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	<i>Agropyron dasystachyum</i>	a-	a-	b7	-	-	3	-	.04
G	<i>Agropyron spicatum</i>	151	154	169	55	61	63	2.74	5.26
G	<i>Bromus inermis</i>	-	3	-	-	2	-	.01	-
G	<i>Carex spp.</i>	a59	b115	b132	32	45	54	2.68	5.48
G	<i>Koeleria cristata</i>	a-	b29	b17	-	13	7	.16	.18
G	<i>Leucopoa kingii</i>	b26	a9	ab18	12	3	8	.04	.43
G	<i>Oryzopsis hymenoides</i>	-	3	3	-	1	2	.15	.03
G	<i>Poa fendleriana</i>	b104	a17	a42	42	7	15	.28	2.90
G	<i>Poa secunda</i>	a-	b32	b37	-	14	15	.14	.25
G	<i>Stipa comata</i>	a174	a148	b43	63	53	18	6.46	.67
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		514	510	468	204	199	185	12.69	15.27
Total for Grasses		514	510	468	204	199	185	12.69	15.27
F	<i>Allium spp.</i>	-	3	-	-	1	-	.00	-
F	<i>Antennaria rosea</i>	a17	b39	ab22	7	16	10	.25	.29
F	<i>Androsace septentrionalis (a)</i>	-	1	2	-	1	1	.00	.00
F	<i>Arabis spp.</i>	b33	b23	a5	18	12	2	.08	.03
F	<i>Arenaria congesta</i>	a96	a101	b58	42	44	25	1.25	.54
F	<i>Astragalus convallarius</i>	a-	a3	b10	-	1	6	.03	.15
F	<i>Astragalus spp.</i>	17	25	14	10	11	8	.20	.06
F	<i>Castilleja flava</i>	b21	ab10	a6	12	7	3	.11	.04
F	<i>Calochortus nuttallii</i>	a-	b5	a-	-	4	-	.02	-
F	<i>Chenopodium leptophyllum (a)</i>	-	b8	a-	-	3	-	.01	-
F	<i>Crepis acuminata</i>	b5	a-	a-	4	-	-	-	-
F	<i>Cruciferae</i>	2	-	-	1	-	-	-	-
F	<i>Cryptantha spp.</i>	ab4	a-	b8	2	-	5	-	.05
F	<i>Descurainia pinnata (a)</i>	-	-	5	-	-	2	-	.01
F	<i>Erigeron eatonii</i>	b90	a32	a22	39	16	12	.08	.11
F	<i>Eriogonum umbellatum</i>	b24	ab25	b49	12	12	22	.62	.68
F	<i>Heuchera parvifolia</i>	b8	ab1	a-	5	1	-	.03	-
F	<i>Hymenoxys acaulis</i>	-	7	3	-	2	1	.03	.15
F	<i>Lesquerella spp.</i>	b46	a8	ab23	23	7	15	.03	.12
F	<i>Linum lewisii</i>	2	10	5	1	5	3	.10	.07
F	<i>Lupinus spp.</i>	b21	a-	a-	10	-	-	-	-
F	<i>Lychnis drummondii</i>	-	2	3	-	1	1	.00	.00
F	<i>Machaeranthera canescens</i>	a-	b8	b6	-	4	3	.19	.18

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
F	<i>Machaeranthera grindelioides</i>	-	-	1	-	-	1	-	.03
F	<i>Penstemon humilis</i>	_b 92	_b 90	_a 39	44	38	20	1.05	.64
F	<i>Penstemon</i> spp.	-	3	-	-	1	-	.00	-
F	<i>Petroradia pumila</i>	_b 3	_a -	_a -	3	-	-	-	-
F	<i>Phlox austromontana</i>	144	133	113	57	57	44	3.98	3.90
F	<i>Phlox longifolia</i>	_b 143	_a 75	_a 70	55	36	32	.40	.58
F	<i>Potentilla gracilis</i>	_a -	_b 21	_b 14	-	11	6	.08	.05
F	<i>Sedum lanceolatum</i>	-	-	1	-	-	1	-	.03
F	<i>Senecio multilobatus</i>	_a -	_a -	_b 7	-	-	4	-	.09
F	<i>Taraxacum officinale</i>	-	1	-	-	1	-	.00	-
F	<i>Zigadenus paniculatus</i>	36	32	32	17	19	15	.12	.14
Total for Annual Forbs		0	9	7	0	4	3	0.01	0.01
Total for Perennial Forbs		804	657	511	362	307	239	8.70	7.98
Total for Forbs		804	666	518	362	311	242	8.72	8.00

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

BROWSE TRENDS --

Herd unit 08A, Study no: 2

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	<i>Amelanchier utahensis</i>	21	29	1.14	1.81
B	<i>Artemisia nova</i>	40	25	1.20	.97
B	<i>Artemisia tridentata vaseyana</i>	3	8	.41	.66
B	<i>Cercocarpus montanus</i>	97	97	19.55	19.04
B	<i>Chrysothamnus viscidiflorus lanceolatus</i>	80	73	3.75	3.28
B	<i>Eriogonum microthecum</i>	80	78	2.24	3.62
B	<i>Gutierrezia sarothrae</i>	23	16	.11	.39
B	<i>Mahonia repens</i>	1	2	-	.03
B	<i>Symphoricarpos oreophilus</i>	82	85	13.37	12.45
B	<i>Tetradymia canescens</i>	26	27	.34	.45
Total for Browse		453	440	42.15	42.73

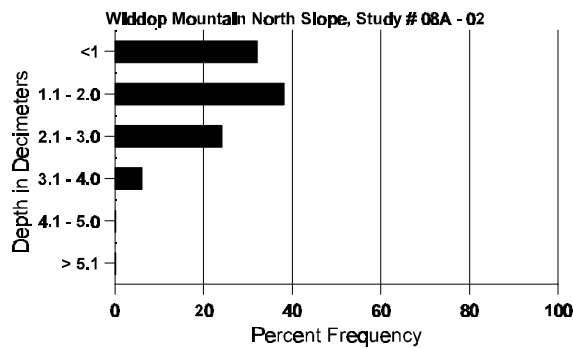
BASIC COVER --
Herd unit 08A, Study no: 2

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	359	354	12.75	53.54	60.28
Rock	159	65	2.75	2.89	1.05
Pavement	166	163	15.25	3.31	7.23
Litter	397	383	57.25	57.47	59.54
Cryptogams	25	23	0	.15	.33
Bare Ground	205	198	12.00	6.32	13.68

SOIL ANALYSIS DATA --
Herd Unit 8A, Study # 2, Study Name: Widdop Mountain North Slope

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
13.84	57.6 (15.83)	7.4	43.3	34.2	22.6	5.5	3.4	115.2	0.9

Stoniness Index



PELLET GROUP FREQUENCY --
Herd unit 08A, Study no: 2

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre (00)	Days Use per Acre (ha) (00)
Antelope	-	14	139	12 (29)
Moose	8	-	278	16 (38)
Elk	19	17	574	44 (109)
Deer	4	1	44	3 (8)
Cattle	-	1	139	12 (29)

BROWSE CHARACTERISTICS --

Herd unit 08A, Study no: 2

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier utahensis																		
S	88	1	-	-	-	-	-	1	-	-	2	-	-	-	133		2	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	6	-	-	-	-	-	-	-	-	6	-	-	-	120		6	
Y	88	4	1	-	2	-	-	-	-	-	6	-	1	-	466		7	
	95	6	6	-	4	-	-	-	-	-	16	-	-	-	320		16	
	00	7	5	-	1	2	-	2	-	-	17	-	-	-	340		17	
M	88	-	-	1	-	-	-	-	-	-	1	-	-	-	66	39 31	1	
	95	-	1	-	5	7	2	-	-	-	15	-	-	-	300	39 42	15	
	00	3	3	1	1	2	3	1	-	-	14	-	-	-	280	28 22	14	
D	88	-	-	1	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	1	-	-	1	-	-	-	1	-	-	1	40		2	
	00	1	-	3	-	1	1	-	-	-	5	-	-	1	120		6	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		11%			22%			11%			+ 9%							
'95		42%			12%			03%			+11%							
'00		35%			22%			03%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	598	Dec:	11%				
											'95	660		6%				
											'00	740		16%				
Artemisia frigida																		
M	88	3	-	-	1	-	-	-	-	-	3	-	1	-	266	5 4	4	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			25%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	266	Dec:	-				
											'95	0		-				
											'00	0		-				

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4			
Artemisia nova								
S	88	19	-	-	-	-	-	19
	95	9	-	2	-	-	-	11
	00	3	-	-	-	-	-	3
Y	88	25	1	-	2	-	-	28
	95	7	4	-	3	-	-	14
	00	10	-	-	-	-	-	10
M	88	33	2	-	3	-	1	39
	95	35	20	1	13	-	-	69
	00	49	1	-	-	1	1	52
D	88	12	1	-	-	-	-	13
	95	3	-	-	1	-	-	4
	00	2	-	-	-	-	-	2
X	88	-	-	-	-	-	-	0
	95	-	-	-	-	-	-	160
	00	-	-	-	-	-	-	160
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>	<u>% Change</u>			
'88		05%	00%	05%	-67%			
'95		28%	01%	01%	-26%			
'00		02%	02%	00%				
Total Plants/Acre (excluding Dead & Seedlings)					'88	5332	Dec:	16%
					'95	1740		5%
					'00	1280		3%
Artemisia tridentata vaseyana								
Y	88	-	-	-	-	-	-	0
	95	-	-	-	-	-	-	0
	00	1	-	-	-	-	-	20
M	88	-	-	-	-	-	-	0
	95	-	1	-	3	-	-	80
	00	6	-	-	-	-	-	120
D	88	-	-	-	-	-	-	0
	95	-	-	-	-	-	-	0
	00	1	-	-	-	-	-	20
X	88	-	-	-	-	-	-	0
	95	-	-	-	-	-	-	40
	00	-	-	-	-	-	-	0
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>	<u>% Change</u>			
'88		00%	00%	00%				
'95		25%	00%	00%	+50%			
'00		00%	00%	00%				
Total Plants/Acre (excluding Dead & Seedlings)					'88	0	Dec:	0%
					'95	80		0%
					'00	160		13%

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total									
		1	2	3	4												
Cercocarpus montanus																	
S	88	36	-	2	47	-	-	14	-	-	98	-	1	-	6600		99
	95	72	3	7	40	-	-	-	-	-	122	-	-	-	2440		122
	00	54	-	-	5	-	-	-	-	-	59	-	-	-	1180		59
Y	88	146	59	22	45	1	-	52	-	-	323	-	2	-	21666		325
	95	59	42	8	40	4	-	-	-	-	153	-	-	-	3060		153
	00	56	40	4	30	10	4	17	-	-	161	-	-	-	3220		161
M	88	2	9	20	-	-	-	-	-	-	31	-	-	-	2066	25 18	31
	95	3	18	21	15	93	34	-	-	-	184	-	-	-	3680	26 37	184
	00	6	36	57	8	9	68	-	-	-	184	-	-	-	3680	22 30	184
D	88	3	3	2	-	-	-	1	-	-	8	-	1	-	600		9
	95	-	-	-	-	4	3	-	-	-	6	-	-	1	140		7
	00	1	3	7	-	1	11	-	-	-	16	-	-	7	460		23
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'88		20%			12%			.82%			-72%						
'95		47%			19%			.29%			+ 7%						
'00		27%			41%			02%									
Total Plants/Acre (excluding Dead & Seedlings)										'88	24332	Dec:	2%				
										'95	6880		2%				
										'00	7360		6%				
Chrysothamnus viscidiflorus lanceolatus																	
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	1	-	-	1	-	-	-	-	-	2	-	-	-	40		2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
Y	88	31	1	-	1	-	-	-	-	-	28	1	4	-	2200		33
	95	9	-	-	2	-	-	-	-	-	11	-	-	-	220		11
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5
M	88	21	-	-	2	-	-	4	-	-	27	-	-	-	1800	11 9	27
	95	161	-	-	33	-	-	-	-	-	194	-	-	-	3880	12 14	194
	00	117	2	-	18	-	-	2	-	-	139	-	-	-	2780	10 11	139
D	88	-	-	-	-	-	-	1	-	-	1	-	-	-	66		1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	5	1	-	1	-	-	-	-	-	4	-	-	3	140		7
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'88		02%			00%			07%			-21%						
'95		00%			00%			00%			- 6%						
'00		02%			00%			02%									
Total Plants/Acre (excluding Dead & Seedlings)										'88	4066	Dec:	2%				
										'95	4100		0%				
										'00	3020		5%				

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4			
<i>Eriogonum microthecum</i>								
S	88	5	-	-	-	-	-	5
	95	7	-	2	-	-	-	9
	00	1	-	-	-	-	-	1
Y	88	55	-	7	-	1	-	63
	95	4	-	-	-	-	-	4
	00	9	-	-	-	-	-	9
M	88	71	2	14	-	5	-	92
	95	219	2	23	-	5	-	249
	00	146	6	31	-	-	-	181
D	88	2	-	-	-	-	-	2
	95	-	-	-	-	-	-	0
	00	2	-	-	-	-	2	40
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>				<u>%Change</u>
'88		01%	00%	17%				-52%
'95		.79%	02%	00%				-23%
'00		03%	00%	02%				
Total Plants/Acre (excluding Dead & Seedlings)					'88	10466	Dec:	1%
					'95	5060		0%
					'00	3880		1%
<i>Gutierrezia sarothrae</i>								
S	88	6	-	-	-	-	-	6
	95	-	-	-	-	-	-	0
	00	-	-	-	-	-	-	0
Y	88	23	-	1	-	-	-	24
	95	7	-	-	-	-	-	7
	00	-	-	-	-	-	-	0
M	88	44	-	1	-	-	-	45
	95	29	-	1	-	-	-	30
	00	21	-	-	-	-	-	21
D	88	2	-	-	-	-	-	2
	95	-	-	-	-	-	-	0
	00	-	-	-	-	-	-	0
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>				<u>%Change</u>
'88		00%	00%	01%				-84%
'95		00%	00%	00%				-43%
'00		00%	00%	00%				
Total Plants/Acre (excluding Dead & Seedlings)					'88	4733	Dec:	3%
					'95	740		0%
					'00	420		0%

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Mahonia repens																		
M	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	5	4	3
	'00	6	-	-	-	-	-	-	-	-	6	-	-	-	120	3	6	6
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%			+50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	60		-			
												'00	120		-			
Pediocactus simpsonii																		
M	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	4	0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	0		-			
												'00	0		-			
Pseudotsuga menziesii																		
S	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	0		-			
												'00	0		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total							
		1	2	3	4										
Symphoricarpos oreophilus															
S	88	4	1	-	1	-	-	-	6	-	-	-	400		6
	95	4	-	-	5	-	-	-	9	-	-	-	180		9
	00	6	-	-	2	-	-	-	8	-	-	-	160		8
Y	88	23	7	-	1	-	-	2	32	-	1	-	2200		33
	95	25	2	3	9	-	-	3	42	-	-	-	840		42
	00	13	-	-	2	-	-	-	15	-	-	-	300		15
M	88	33	2	-	4	-	-	-	38	-	1	-	2600	11 10	39
	95	126	12	6	70	1	-	-	215	-	-	-	4300	12 31	215
	00	120	3	-	52	1	-	7	165	1	17	-	3660	11 25	183
D	88	12	-	3	2	-	-	-	14	-	-	3	1133		17
	95	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	3	-	-	3	-	-	-	3	-	-	3	120		6
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>				
'88		10%			03%			06%			-13%				
'95		06%			04%			00%			-21%				
'00		02%			00%			10%							
Total Plants/Acre (excluding Dead & Seedlings)										'88	5933	Dec:	19%		
										'95	5140		0%		
										'00	4080		3%		
Tetradymia canescens															
S	88	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	4	-	-	-	-	-	-	4	-	-	-	80		4
	00	1	-	-	-	-	-	-	1	-	-	-	20		1
Y	88	25	1	-	-	-	-	-	26	-	-	-	1733		26
	95	6	-	-	-	-	-	-	6	-	-	-	120		6
	00	5	-	-	-	-	-	-	5	-	-	-	100		5
M	88	12	3	-	2	-	-	-	17	-	-	-	1133	11 6	17
	95	25	7	-	6	-	-	-	38	-	-	-	760	9 9	38
	00	26	2	-	-	-	-	1	29	-	-	-	580	7 8	29
D	88	1	-	-	-	-	-	1	2	-	-	-	133		2
	95	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	1	4	-	-	-	-	-	4	-	-	1	100		5
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>				
'88		09%			00%			00%			-71%				
'95		16%			00%			00%			-11%				
'00		15%			00%			03%							
Total Plants/Acre (excluding Dead & Seedlings)										'88	2999	Dec:	4%		
										'95	880		0%		
										'00	780		13%		

Trend Study 8A-3-00

Study site name: Bald Range South.

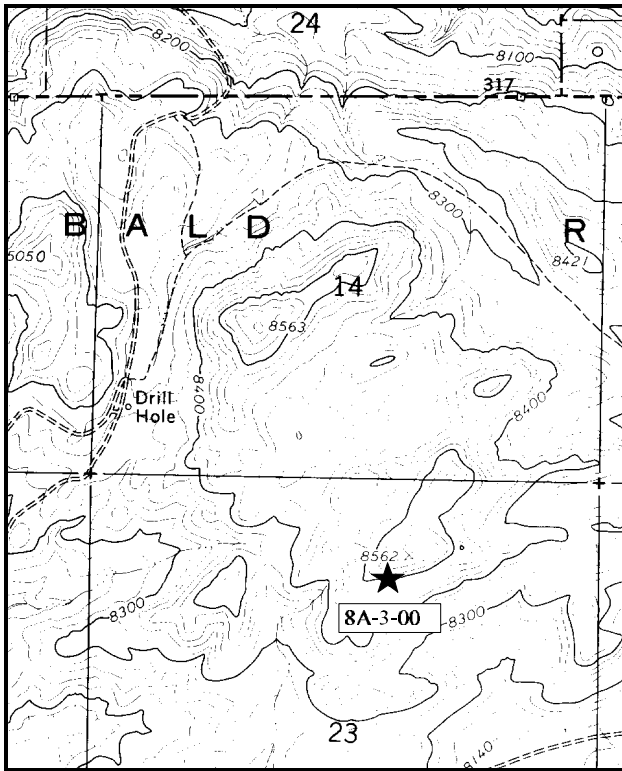
Range type: True Mountain Mahogany.

Compass bearing: frequency baseline 155°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11, 59, & 95ft), line 2 (34, & 71ft).

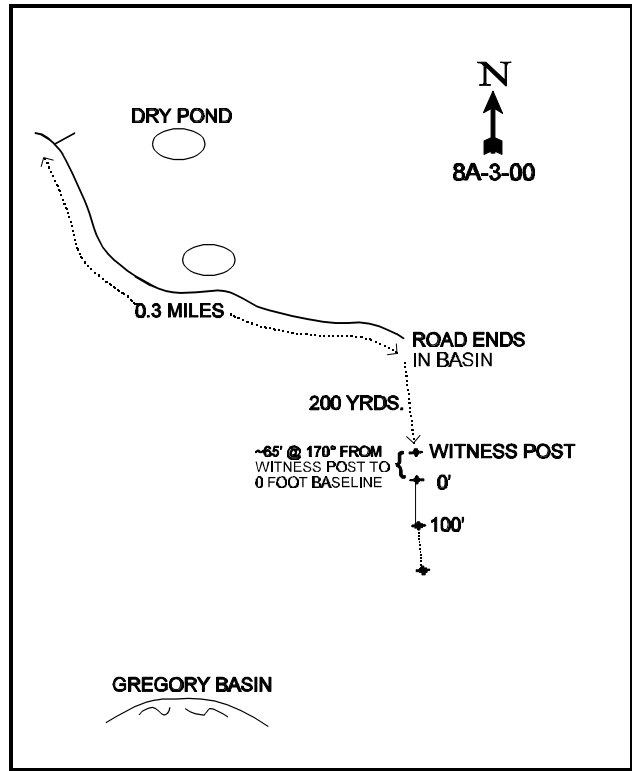
LOCATION DESCRIPTION

From the Bald Range study 8A-4, proceed southeasterly across the basin, past another dry pond, for about 0.3 miles to where the road ends. From the end of the road, walk about 200 yards up the ridge to the south (it is also possible to drive up) to the top. A witness post is located on the rocky top. The study is on the south-facing slope. Walk 13 paces at 170°M to the 0-foot baseline stake.



Map Name: Hoop Lake

Township 3N, Range 16E, Section 23



Diagrammatic Sketch

UTM 4537129 N, 576277 E

DISCUSSION

Trend Study No. 8A-3

*** This site was not read in 2000, but text has been retained. Consult the 1995 "Utah Big Game Range Trend Studies" report for maps and data tables.

The Bald Range South range study is located on the appropriately named Bald Range consists of low, rolling sagebrush/grass hills with patches of mountain brush mostly on south slopes. It is located less than ½ of a mile south of trend study 8A-4, Bald Range. The open range, owned by the State of Utah, is mostly utilized by cattle and antelope. The mountain mahogany slopes also appear to be important to wintering elk. There was only light cattle use on the study site, which is located on a steep (42%), south-facing slope overlooking Gregory Basin. Elevation on the ridge, one of the highest in the range, is just over 8,500 feet.

The soil surface is extremely rocky. A large number of rocks occur with the soil profile, resulting in variable soil depth. Black sagebrush thrives on the more shallow soils. Vegetative and litter cover are generally good, but rock and smaller pavement fragments cover 36% of the surface. Total protective ground cover is good at 94%, leaving only 6% bare soil. Soil erosion is not currently a problem on this slope, yet soil movement down slope in the form of pedestaling on the uphill side of shrubs is evident due to the steep slope.

True mountain mahogany dominates the slopes and makes up 70% of the total browse cover. Estimated density was 7,066 plants/acre in 1988 and 5,740 in 1995. Sixty-six percent of the population consisted of young plants in 1988, a high proportion similar to many of the mahogany sites in the unit. Mature plants averaged just over two feet in height with 73% of them displaying heavy hedging in 1988. Vigor was good and percent decadency low at 2%. During the 1995 reading, there were an estimated 3,720 mature plants/acre, with 30% being classified as heavily hedged. The number of seedlings and young are lower than in 1988, but adequate to maintain the population. The population change is mostly due to the greatly increased sample size and much better sampling distribution used in 1995 and a die-off of the young age class plants due to drought.

Other valuable browse include serviceberry, black sagebrush, and snowberry. Mature serviceberry average nearly three feet in height. These shrubs are lightly to moderately utilized. Patches of black sagebrush are common and showed more heavy use in 1995. Currently, 30% of the mature and decadent plants display heavy use. Percent decadency has declined from 31% to 14%. Snowberry accounts for 10% of the browse cover on the site. With the new larger sample used in 1995, more snowberry was picked up than during the previous reading. Currently, there is an estimated 700 mostly mature plants/acre, 23% of which are heavily utilized.

Increasesers have tough competition from a well established grass understory. Bluebunch wheatgrass, Carex, and Sandberg bluegrass are common and vigorous. They have been lightly grazed by cattle. Forbs are diverse and moderately abundant, but contain few valuable forage species.

1995 TREND ASSESSMENT

Protective ground cover has increased slightly on the site from 93% to 94%. Litter cover has declined due to drought while rock and pavement cover have remained stable at 36%. Active erosion is not a problem on the site, but some down slope soil movement is evident and unavoidable on the site this steep. Trend for soil is currently stable. Trend for the key browse species, true mountain mahogany, is slightly up even with the decline in population density which is more of a reflection of a much larger sample size. The number of seedlings and young are lower, but still excellent and adequate to maintain the population. Percent decadency is less than 1%, and the proportion of mature shrubs heavily hedged declined from 73% to 30%. Secondary browse species, serviceberry, black sagebrush, and snowberry, all exhibit heavier use, yet show stable population trends. Trends

for perennial grasses and forbs are both down slightly due to reduced sum of nested frequencies. All grasses, except Indian ricegrass and Sandberg bluegrass, declined in quadrat and nested frequency. Forbs are diverse but contain only a few useful species.

TREND ASSESSMENT

soil - stable (3)

browse - slightly up (4)

herbaceous understory - slightly down with continued drought (2)

Trend Study 8A-4-00

Study site name: Bald Range.

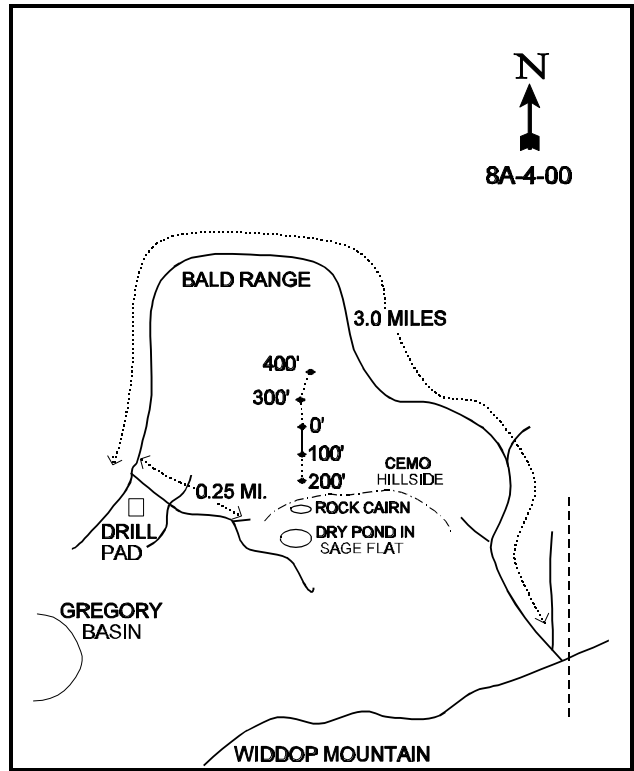
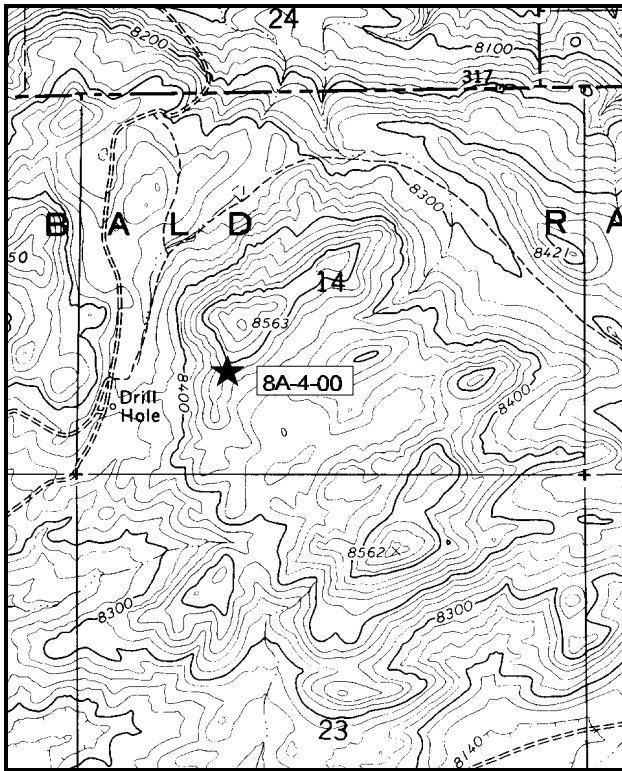
Range type: True Mountain Mahogany.

Compass bearing: frequency baseline 158°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft.), line 4 (71ft).

LOCATION DESCRIPTION

From the Hoop Lake-Beaver Creek Road, turn off east towards Gregory Basin. Go 0.6 miles to a gate onto private land. Continue past the cabins for 1.1 miles to a fence. Go along a canal 0.5 miles to the 4-way intersection. Proceed east 0.7 miles to a cattle guard at the boundary, and 0.9 miles more to the eastern FS boundary fence. Continue 1.8 miles to another fence. Just on the west side of the fence, make a 45° turn to the left and follow the jeep road NW up the drainage about 0.5 miles to a fork at the top. Continue on the main jeep road 2.55 miles to an old drill pad. Just past the pad, turn left onto a faint road that goes east about 0.25 miles to the top of a ridge. From the ridge, walk about 0.1 miles along the edge of the sage and mahogany to a rock cairn. From there it is 13 paces north to the 200 foot baseline stake. The 0-foot baseline stake is marked by browse tag #9076.



Map Name: Hoop Lake

Diagrammatic Sketch

Township 3N, Range 16E, Section 14

UTM 4537733 N, 575817 E

DISCUSSION

Trend Study No. 8A-4

The Bald Range trend study is located less than ½ mile northwest of the Bald Range South study (8A-3). It also samples a south-facing mountain mahogany slope. Due to the close proximity of these two sites, Bald Range South (8A-3) was dropped and Bald Range (8A-4) was retained. The Bald Range trend study is more representative of the area. At the time the study was established ('88), the area was exceptionally dry. Water often limits livestock grazing in the area. Cattle use this state land in the spring when the nearby stock ponds contain water. Elk sign is concentrated on the rocky, windswept ridges where they bed down. The mahogany type provides the bulk of the forage. There is little deer sign because the high elevation (8,470 feet) is not suited for deer winter range. Pellet group data from 2000 estimate 40 elk days use/acre (99 edu/ha). About 10% of the pellet groups encountered were from spring use with all of the others appearing to be from fall and winter. Antelope also use the area and some were seen near the site in 2000.

The slope is moderately steep at about 22%. The soil is moderately shallow and rocky with an effective rooting depth of just over 9 inches. It has a sandy loam texture with a slightly alkaline pH and a high percentage of rock and gravel on the surface and throughout the profile. A hard pan layer is found at 6" to 8" in depth. The surface soil is loose and easily disturbed. Trampling can have deleterious effects, with recurrent open interspaces that lack litter and vegetative cover displaying noticeable erosion. Phosphorus is limited at just 3.6 ppm. Values less than 10 ppm can limit normal plant growth and development.

True mountain mahogany is the key browse species. It provided 80% of the browse cover in 1995 and 82% in 2000. Population density was estimated at 5,599 plants/acre in 1988. Similar to other mahogany sites in the area, the proportion of young plants in the population was high in 1988 at 55%. Use was moderate to heavy. Density declined in 1995 due to a reduction in young plants, but use was more moderate and vigor normal on most plants. Changes in density are also likely due to the greatly enlarged sample size used in 1995 which more accurately estimates shrub populations. Density has remained stable in 2000 at 3,560 plants/acre. Use is heavy on 69% of the plants sampled. The population is healthy however, with young plants accounting for 21% of the population, vigor normal on most plants and percent decadence is relatively low at 7%. Some of the heavy use may be partly due to the poor leader growth in 2000. Average annual leader growth of mahogany was only 1.2 inches. This lack of leader growth often gives shrubs a heavily hedged growth form.

Other desirable browse are limited to a few scattered serviceberry, a moderate population of black sagebrush, and a small number of snowberry. The population of black sagebrush did not show much evidence of use in 1988, but did demonstrate more moderate use in 1995. Currently ('00) use is mostly light. The large increase in population density of black sagebrush between 1988 and 1995 is due to the much larger sample size in 1995. Broom snakeweed was very common in 1988 and appeared to be increasing. This short lived shrub declined considerably during the following drought years and now has a population density of only 800 plants/acre.

Grass composition is very similar to other mahogany sites on the unit. The dominant grasses include: bluebunch wheatgrass, a Carex, Indian ricegrass and thickspike wheatgrass. Nested frequency of bluebunch wheatgrass and Carex increased significantly between 1988 and 1995. Both of these species decreased in 2000 but the change was not significant. Indian ricegrass has significantly declined in nested frequency with each reading. Carex was heavily utilized in 2000. All the other grasses displayed poor seed production due to the dry conditions. Forbs are diverse but contain only a few useful species. The dominant forbs include low growing species like sulfur eriogonum, low penstemon and desert phlox. Many of the forbs encountered in 2000, were already dried up by August 1st due to the extremely dry conditions.

1995 TREND ASSESSMENT

Basic ground cover characteristics have improved slightly on the site. Protective ground cover has increased, although litter cover declined slightly which is typical for an extended drought. Trend for soil is considered stable. Trend for the key browse species, true mountain mahogany, is stable. Biotic potential (# seedlings) has increased while the number of young plants has declined. Young plants are still abundant and adequate to maintain the stand. The extremely high number of young plants sampled in 1988, appear to have established during the wet years of 1983-84. They are now declining in number with a return to drier conditions. The number of young in the population also may have been overestimated with the smaller sample size used in 1988. The number of decadent mahogany has declined from 18% to 1% with the proportion of shrubs displaying heavy use decreasing from 45% to 25%. The less preferred browse species, black sagebrush, displays a stable population trend. Another positive factor in the trend is the significant decline in the population of broom snakeweed. The herbaceous understory is very similar to other sites in the unit. Grass composition is good, while forbs contain several low growing weedy species. Sum of nested frequency for grasses increased slightly, while sum of nested frequency for perennial forbs declined. Combined sum of nested frequency for grasses and forbs declined slightly, but not enough to suggest a downward trend since the decline is due to forbs which provide only 26% of the total herbaceous cover. Trend for the herbaceous understory is considered stable.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

2000 TREND ASSESSMENT

Trend for soil is still considered stable. Percent bare ground has increased, but the ratio of protective ground cover to bare ground has remained similar to 1995. There is little erosion occurring on the site. Trend for the key browse species, true mountain mahogany, is stable. There is more heavy use, yet vigor is normal on most plants, percent decadence is low at only 7%, and young plants account for 21% of the population. Sum of nested frequency of perennial grasses declined slightly, while frequency of forbs remained stable. Nested frequency of thickspike wheatgrass increased significantly, with bluebunch wheatgrass and Carex declining slightly but not significantly. Sum of nested frequency for Indian ricegrass continued to decline significantly and is now found in only 3 quadrats. Desert phlox has remained stable while the preferred low penstemon declined significantly in nested frequency. Weighing all of these factors, trend for the herbaceous understory is considered down slightly.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - down slightly (2)

HERBACEOUS TRENDS --
Herd unit 08A, Study no: 4

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	<i>Agropyron dasystachyum</i>	_a 37	_a 50	_b 106	17	20	37	.44	1.18
G	<i>Agropyron spicatum</i>	_a 158	_b 217	_{ab} 187	64	80	69	3.98	6.72
G	<i>Carex</i> spp.	_a 94	_b 136	_{ab} 123	43	58	53	3.55	5.14
G	<i>Koeleria cristata</i>	_b 54	_a 22	_a 1	27	9	1	.22	.00
G	<i>Leucopoa kingii</i>	_a -	_a -	_b 9	-	-	4	-	.33
G	<i>Oryzopsis hymenoides</i>	_c 96	_b 65	_a 5	40	33	3	1.89	.18
G	<i>Poa fendleriana</i>	_a -	_b 8	_b 13	-	4	5	.04	.36
G	<i>Poa secunda</i>	27	19	10	13	9	5	.17	.07
G	<i>Stipa comata</i>	_b 49	_{ab} 27	_a 19	23	13	8	.22	.96
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		515	544	473	227	226	185	10.53	14.98
Total for Grasses		515	544	473	227	226	185	10.53	14.98
F	<i>Antennaria rosea</i>	13	8	5	5	4	2	.21	.03
F	<i>Arabis</i> spp.	2	3	-	1	2	-	.01	-
F	<i>Arenaria congesta</i>	_a -	_a -	_b 14	-	-	6	-	.20
F	<i>Astragalus</i> spp.	_a 5	_b 51	_a 7	3	24	4	.64	.05
F	<i>Calochortus nuttallii</i>	-	1	-	-	1	-	.00	-
F	<i>Chenopodium leptophyllum</i> (a)	-	_b 10	_a -	-	5	-	.05	-
F	<i>Cirsium</i> spp.	_b 26	_{ab} 12	_a 15	13	6	6	.11	.10
F	<i>Cryptantha</i> spp.	-	1	3	-	1	1	.03	.00
F	<i>Descurainia pinnata</i> (a)	-	_b 78	_a -	-	31	-	.31	-
F	<i>Eriogonum umbellatum</i>	_a -	_b 8	_c 61	-	3	25	.09	1.48
F	<i>Haplopappus acaulis</i>	_a 7	_{ab} 15	_b 24	3	7	12	.37	.57
F	<i>Hackelia patens</i>	_a -	_a -	_b 7	-	-	3	-	.33
F	<i>Heterotheca villosa</i>	-	-	1	-	-	1	-	.00
F	<i>Hymenoxys acaulis</i>	_a -	_b 6	_{ab} 5	-	3	2	.04	.03
F	<i>Hymenoxys richardsonii</i>	-	-	3	-	-	1	-	.15
F	<i>Ipomopsis aggregata</i>	4	-	-	2	-	-	-	-
F	<i>Lappula occidentalis</i> (a)	-	1	-	-	1	-	.00	-
F	<i>Lesquerella alpina</i>	_b 45	_c 76	_a 5	23	37	3	.23	.01
F	<i>Leucelene ericoides</i>	-	1	1	-	1	1	.00	.00
F	<i>Lepidium</i> spp. (a)	-	3	-	-	1	-	.00	-
F	<i>Lithospermum ruderale</i>	_a -	_b 6	_{ab} 2	-	3	1	.01	.03
F	<i>Machaeranthera canescens</i>	_a -	_a -	_b 8	-	-	4	-	.04
F	<i>Machaeranthera grindelioides</i>	6	6	10	3	4	4	.09	.09
F	<i>Penstemon humilis</i>	_c 150	_b 79	_a 37	71	41	18	.50	.31

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
F	Phlox hoodii	61	75	64	24	32	26	1.21	1.27
F	Phlox longifolia	_c 77	_a -	_b 28	32	-	10	-	.05
F	Senecio multilobatus	_a 3	_a -	_b 12	1	-	6	-	.03
F	Trifolium dasyphyllum	_b 37	_a -	_b 31	16	-	15	-	.61
F	Zigadenus paniculatus	_b 65	_a 31	_a 18	32	17	9	.16	.21
Total for Annual Forbs		0	92	0	0	38	0	0.37	0
Total for Perennial Forbs		501	379	361	229	186	160	3.74	5.67
Total for Forbs		501	471	361	229	224	160	4.11	5.67

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

BROWSE TRENDS --

Herd unit 08A, Study no: 4

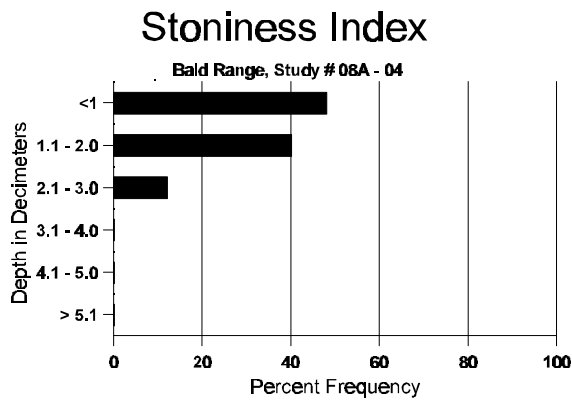
Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	1	1	-	-
B	Artemisia frigida	3	0	.03	-
B	Artemisia nova	58	54	3.34	1.33
B	Cercocarpus montanus	82	79	21.40	16.20
B	Chrysothamnus viscidiflorus lanceolatus	27	33	.54	.80
B	Eriogonum microthecum	2	9	-	.06
B	Leptodactylon pungens	17	22	-	-
B	Pediocactus simpsonii	0	1	-	-
B	Gutierrezia sarothrae	0	1	.40	.10
B	Symphoricarpos oreophilus	23	20	.93	1.19
B	Tetradymia canescens	13	11	.18	.15
Total for Browse		226	231	26.84	19.86

BASIC COVER --
Herd unit 08A, Study no: 4

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	326	325	6.75	35.36	39.93
Rock	253	212	2.75	8.05	6.74
Pavement	291	301	27.50	15.50	16.87
Litter	385	362	46.00	39.70	36.90
Cryptogams	7	8	0	.21	.07
Bare Ground	281	294	17.00	13.14	22.08

SOIL ANALYSIS DATA --
Herd Unit 8A, Study # 4, Study Name: Bald Range

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
9.39	65.6 (11.10)	7.5	58.4	24.1	17.6	3.3	3.6	112.0	0.9



PELLET GROUP FREQUENCY --
Herd unit 08A, Study no: 4

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre (00)	Days Use per Acre (ha) (00)
Rabbit	1	-	-	-
Elk	21	24	522	40 (99)
Deer	8	2	-	-
Cattle	2	1	26	2 (5)
Moose	-	-	44	3 (8)

BROWSE CHARACTERISTICS --

Herd unit 08A, Study no: 4

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier alnifolia																		
M	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	1	-	-	-	-	-	-	-	1	-	-	-	20	20	34	1
	'00	-	1	-	-	-	-	-	-	-	-	-	1	-	20	31	62	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			+ 0%							
'95		100%			00%			00%										
'00		100%			00%			100%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	20		-			
												'00	20		-			
Artemisia frigida																		
S	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	1	5	1
	'95	2	-	-	3	-	-	-	-	-	5	-	-	-	100	2	5	5
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			+34%							
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	66	Dec:	-			
												'95	100		-			
												'00	0		-			

A Y G R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
	1	2	3	4	5	6	7	8	9	1	2	3	4			
Artemisia nova																
S	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	3	-	-	-	-	-	-	-	-	-	-	-	60		3
	00	5	-	-	-	-	-	-	-	-	-	-	-	100		5
Y	88	5	-	-	1	-	-	1	-	-	-	-	-	466		7
	95	1	1	-	-	-	-	-	-	-	-	-	-	40		2
	00	11	-	-	-	-	-	-	-	-	-	-	-	220		11
M	88	3	-	-	-	-	-	-	-	-	-	-	-	200	9 8	3
	95	44	31	7	17	6	-	-	-	-	-	-	-	2100	8 14	105
	00	77	4	1	7	-	-	2	-	-	-	-	-	1820	6 12	91
D	88	3	-	-	-	-	-	-	-	-	-	-	-	200		3
	95	6	1	-	-	1	-	-	-	-	-	-	5	160		8
	00	13	2	-	-	-	-	-	-	-	-	-	5	300		15
X	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	100		5
	00	-	-	-	-	-	-	-	-	-	-	-	-	120		6
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>					
'88		00%			00%			00%			+62%					
'95		35%			06%			04%			+ 2%					
'00		05%			.85%			04%								
Total Plants/Acre (excluding Dead & Seedlings)											'88	866	Dec:	23%		
											'95	2300		7%		
											'00	2340		13%		
Cercocarpus montanus																
S	88	1	-	-	-	-	-	-	-	-	-	-	-	66		1
	95	4	-	-	12	-	-	-	-	-	-	-	-	320		16
	00	8	-	-	-	-	-	-	-	-	-	-	-	160		8
Y	88	15	26	5	-	-	-	-	-	-	-	-	-	3066		46
	95	6	11	2	21	1	-	-	-	-	-	-	-	820		41
	00	13	9	16	-	-	-	-	-	-	-	-	-	760		38
M	88	-	4	19	-	-	-	-	-	-	-	-	-	1533	24 27	23
	95	-	9	1	-	77	38	-	-	-	-	-	-	2500	29 48	125
	00	-	15	82	1	9	20	-	-	-	-	-	-	2540	29 44	127
D	88	-	1	14	-	-	-	-	-	-	-	-	-	1000		15
	95	-	-	-	-	-	1	-	-	-	-	-	-	20		1
	00	2	1	3	-	5	2	-	-	-	-	-	-	260		13
X	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	20		1
	00	-	-	-	-	-	-	-	-	-	-	-	-	20		1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>					
'88		37%			45%			05%			-40%					
'95		59%			25%			14%			+ 6%					
'00		22%			69%			04%								
Total Plants/Acre (excluding Dead & Seedlings)											'88	5599	Dec:	18%		
											'95	3340		1%		
											'00	3560		7%		

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total				
		1	2	3	4							
Chrysothamnus viscidiflorus lanceolatus												
Y	88	5	-	-	-	-	-	5	333		5	
	95	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	1	20		1	
M	88	4	-	-	-	-	1	5	333	7 10	5	
	95	32	-	-	8	-	-	40	800	10 16	40	
	00	45	2	-	3	-	-	46	1000	6 10	50	
D	88	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	0		0	
	00	6	-	-	4	-	-	6	200		10	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'88		00%		00%		00%		+17%				
'95		00%		00%		00%		+34%				
'00		03%		00%		13%						
Total Plants/Acre (excluding Dead & Seedlings)									'88	666	Dec:	0%
									'95	800		0%
									'00	1220		16%
Eriogonum microthecum												
Y	88	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	0		0	
	00	7	-	-	-	-	-	7	140		7	
M	88	-	-	-	-	-	-	-	0	- -	0	
	95	1	-	-	1	-	-	2	40	8 14	2	
	00	23	-	-	-	-	-	23	460	6 9	23	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'88		00%		00%		00%						
'95		00%		00%		00%		+93%				
'00		00%		00%		00%						
Total Plants/Acre (excluding Dead & Seedlings)									'88	0	Dec:	-
									'95	40		-
									'00	600		-
Gutierrezia sarothrae												
Y	88	32	-	-	-	-	-	32	2133		32	
	95	2	-	-	-	-	-	2	40		2	
	00	1	-	-	-	-	-	1	20		1	
M	88	256	-	-	-	-	-	256	17066	6 6	256	
	95	22	-	-	-	-	-	22	440	5 6	22	
	00	38	-	-	1	-	-	37	780	5 6	39	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'88		00%		00%		00%		-97%				
'95		00%		00%		00%		+40%				
'00		00%		00%		05%						
Total Plants/Acre (excluding Dead & Seedlings)									'88	19199	Dec:	-
									'95	480		-
									'00	800		-

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4		1	2									
Leptodactylon pungens																	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	1	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'88		00%			00%			00%									
'95		00%			00%			00%									
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)										'88	0	Dec:	-				
										'95	0		-				
										'00	20		-				
Pediocactus simpsonii																	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	1	-	-	-	-	-	-	-	1	-	-	-	20	1	2	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'88		00%			00%			00%									
'95		00%			00%			00%									
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)										'88	0	Dec:	-				
										'95	0		-				
										'00	20		-				
Symphoricarpos oreophilus																	
S	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	4	-	-	1	-	-	-	-	5	-	-	-	100			5
	00	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	1	2	-	-	-	-	-	-	3	-	-	-	200	10	15	3
	95	13	-	2	9	1	1	-	-	26	-	-	-	520	9	24	26
	00	18	-	-	7	-	-	2	-	21	1	5	-	540	12	22	27
D	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	1	-	-	-	-	1	-	-	1	40			2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'88		67%			00%			00%			+68%						
'95		03%			10%			00%			- 6%						
'00		00%			00%			21%									
Total Plants/Acre (excluding Dead & Seedlings)										'88	200	Dec:	0%				
										'95	620		0%				
										'00	580		7%				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Tetradymia canescens																		
Y	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	88	1	-	-	-	-	-	1	-	-	2	-	-	-	133	9	6	2
	95	12	1	-	2	-	-	-	-	-	15	-	-	-	300	6	9	15
	00	13	2	-	1	-	-	-	-	-	16	-	-	-	320	4	9	16
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	1	-	-	-	1	-	-	-	1	-	-	1	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			00%			+34%							
'95		07%			00%			00%			+21%							
'00		16%			05%			05%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	199	Dec:	0%			
												'95	300		0%			
												'00	380		11%			

Trend Study 8A-5-00

Study site name: Telephone Hollow.

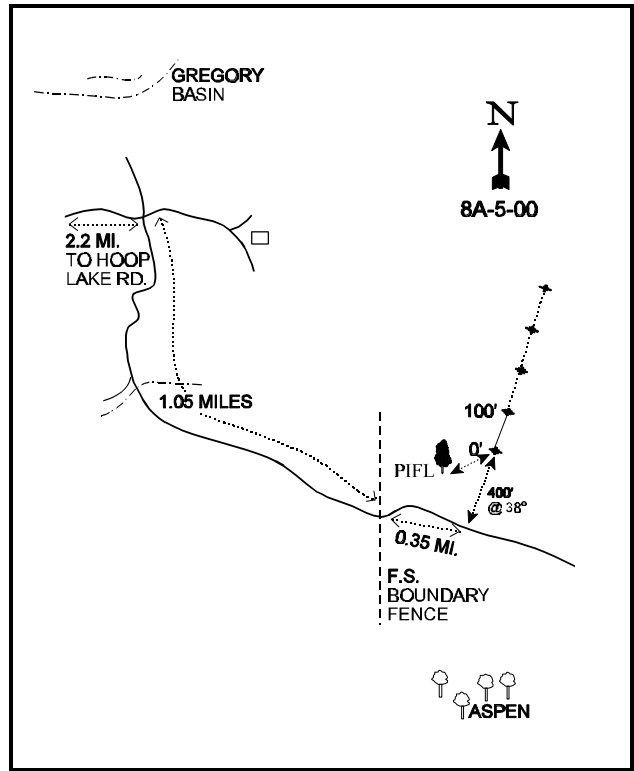
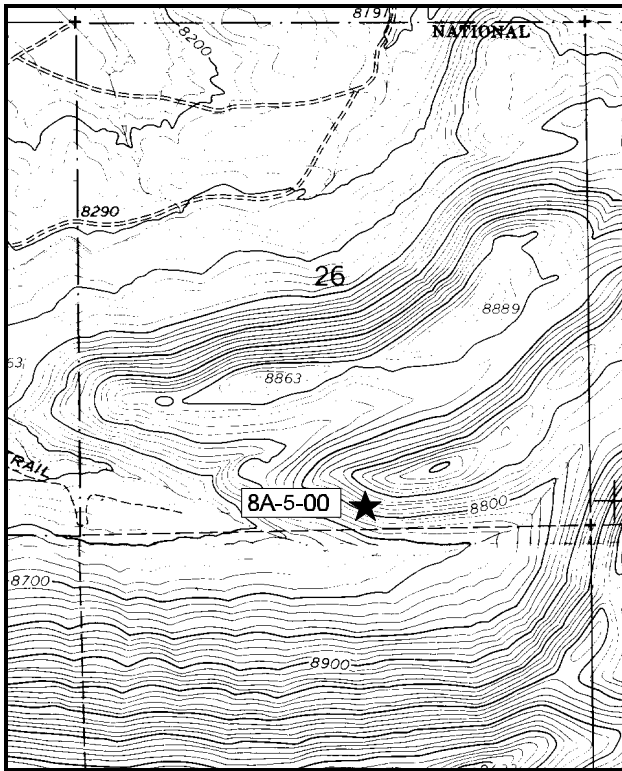
Range type: True Mountain Mahogany.

Compass bearing: frequency baseline 22°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft.), line 4 (71ft).

LOCATION DESCRIPTION

From the Hoop Lake Road along Beaver Creek, proceed east on the road to Gregory Basin. Go 0.6 miles to a gate at a private property line. Continue east 1.7 miles to the 4-way intersection south of Gregory Basin. Turn right and go 0.2 miles to a creek. Cross the creek and drive 0.85 miles to a gate at the FS boundary. Go through the gate and continue for 0.35 miles. Stop across from a lone *Pinus flexilis* on the bottom of the south facing slope. The 0-foot stake is approximately 100 feet to the east of the lone *Pinus flexilis*. There is a red browse tag, #7148, attached to the green fencepost marking the 0-foot end of the frequency baseline.



Map Name: Hoop Lake

Diagrammatic Sketch

Township 3N, Range 16E, Section 26

UTM 4534297 N, 576175 E

DISCUSSION

Trend Study No. 8A-5

The Telephone Hollow study is located on the northeast side of Widdop Mountain, on land administered by the Forest Service. Access is through state and privately owned land. The study is located on the south-facing hillside with a slope of approximately 38% to 40% and an elevation of 8,750 feet. At this elevation, the valley is generally covered by snow through the winter and much of the spring. On the hillside above the seeded hollow, the south slope is dominated by true mountain mahogany. These south slopes are important to wintering elk and are also commonly used by moose and to a lesser extent deer. Cover is provided by conifer on the north-facing slopes. Cattle graze the area early in the season, mostly in the seeded hollow at the base of the slope. Pellet group data from 2000 estimate 31 elk days use/acre and 16 moose days use/acre (77 edu/ha and 40 mdu/ha). A small number of deer and cattle also use the site (3 ddu/acre and 2 cdu/acre respectively).

Soil on the Telephone Hollow site is similar to the other trend studies on Widdop Mountain. It is moderately deep but very rocky on the surface and throughout the profile. The surface horizon is loose, while the layer six inches below the surface is compacted with more rock and gravel. The soil has a loam texture with a slightly alkaline pH (7.4). Parent material is a conglomerate rock formation composed of both limestone and sandstone cobble. Phosphorus and potassium are both limited at just 2.8 ppm and 35.2 ppm respectively. Levels less than 10 ppm for phosphorus and 70 ppm for potassium can limit normal plant growth and development. There is a high erosion potential due to the slope. There is evidence of down slope soil movement in the form of pedestaling and terracing. However, protective ground cover is abundant and well dispersed, keeping soil movement to a minimum.

The key browse species is the abundant and vigorous true mountain mahogany. It provided 94% of the browse cover in 1995 and 75% in 2000. In 1988, population density was estimated at 7,266 plants/acre, 55% being young plants. Mature plants numbered 3,133 plants/acre. During the 1995 reading, the population was estimated at 6,200 plants/acre with mature plants numbering 4,360 plants/acre. Density of young plants declined from 4,000 plants/acre in 1988 to 1,800 plants/acre in 1995. Forty-five percent of the mahogany was heavily hedged in 1988. By 1995, only 22% displayed heavy use. Although heavily hedged, the plants appeared quite vigorous. Leader growth was good at 4 to 8 inches in 1995. Vigor was reduced on 42% of the mature mahogany due mostly to insect damage from caterpillars. Population density remained fairly stable in 2000 at 6,720 plants/acre. Heavy use increased to 63% of the plants sampled, but vigor remains normal on most plants with percent decadence low at 4%. Due to the dry conditions of 2000, annual leader growth was low averaging only 2.5 inches. As a result, average height/crown measurements declined. Heavy use estimates may also be overestimated since poor leader growth makes these shrubs appear to be more heavily utilized.

The less preferred browse include moderately low numbers of serviceberry and black sagebrush. In 1995, 42% of the black sagebrush displayed heavy use. By far the most numerous shrub is broom snakeweed which had an estimated density of 16,932 plants/acre in 1988. This short lived shrub declined by 89% in 1995 due in part to prolonged drought conditions.

The herbaceous understory on Telephone hollow is not as diverse or abundant as it is on the other mahogany sites in the unit. Common species include: bluebunch wheatgrass, a dry land sedge, and Indian ricegrass. Forbs are moderately diverse but none are very abundant. The most common forbs are low growing species such as cryptantha, low penstemon and hood's phlox.

1995 TREND ASSESSMENT

Ground cover characteristics are similar to those of 1988 with the exception of a slight increase in bare ground

(5% to 7%). Unlike some other sites, litter cover did not decline a great deal. Erosion potential on this site is high, but due to the well dispersed litter and herbaceous vegetation cover, it is not a serious problem. The only soil movement consists of the inevitable, gradual, down slope soil movement with the associated steep slope. Future increases in bare ground should be watched closely. Trend for soil is considered stable at this time. Trend for the dominant browse species, true mountain mahogany, is stable. There has been a slight population decline, with the number of mature plants increasing. Percent decadency decreased, with the proportion of plants displaying heavy use has also declining. Some of this decline can be attributed to the much larger sample size and better sampling design giving a much better estimate of the browse population. The proportion of seedlings and young have declined, yet they are still more than adequate to maintain this moderately long-lived population of true mountain mahogany. Trend for herbaceous understory is slightly up. Sum of nested frequency for grasses increased slightly with nested frequency for bluebunch and Carex both increasing. Forb nested frequency also increased.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly up (4)

2000 TREND ASSESSMENT

Trend for soil is down slightly. Percent bare ground increased more than three-fold from 7% to 23% and sum of nested frequency of perennial grasses declined slightly since 1995. Trend for the key browse, mountain mahogany, is stable. Use is heavier but vigor is good and percent decadence is low at only 4%. Recruitment from young plants is excellent at 29%. Some of the heavy use may be due to the poor annual leader growth in 2000 (averaged only 2.5 inches) which gives the shrubs a more clubbed growth form. Trend for the herbaceous understory is slightly down. Sum of nested frequency of perennial grasses declined slightly while frequency of perennial forbs remained stable. Frequency of Carex and Indian ricegrass declined significantly, while bluebunch wheatgrass remained stable.

TREND ASSESSMENT

soil - down slightly due to drought (2)

browse - stable (3)

herbaceous understory - down slightly (2)

HERBACEOUS TRENDS --
Herd unit 08A, Study no: 5

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	<i>Agropyron dasystachyum</i>	-	4	3	-	2	2	.15	.01
G	<i>Agropyron spicatum</i>	200	215	229	82	85	88	4.35	7.43
G	<i>Carex</i> spp.	_{ab} 121	_b 162	_a 127	54	69	54	2.70	3.10
G	<i>Koeleria cristata</i>	_a -	_b 6	_b 8	-	3	3	.06	.18
G	<i>Leucopoa kingii</i>	-	-	2	-	-	1	-	.03
G	<i>Oryzopsis hymenoides</i>	_b 78	_{ab} 67	_a 43	36	31	23	1.71	1.43
G	<i>Stipa comata</i>	44	10	1	20	4	1	.04	.00
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		443	464	413	192	194	172	9.03	12.19
Total for Grasses		443	464	413	192	194	172	9.03	12.19
F	<i>Antennaria rosea</i>	-	-	3	-	-	1	-	.03
F	<i>Arabis</i> spp.	-	2	-	-	2	-	.01	-
F	<i>Astragalus</i> spp.	_a -	_b 56	_a 2	-	20	2	1.50	.18
F	<i>Chenopodium leptophyllum</i> (a)	-	_b 26	_a -	-	10	-	.05	-
F	<i>Cirsium</i> spp.	21	23	26	10	13	13	.39	.46
F	<i>Comandra pallida</i>	_a 2	_{ab} 15	_b 24	2	7	10	.06	.54
F	<i>Cryptantha</i> spp.	79	91	97	40	39	44	.79	.91
F	<i>Erigeron eatonii</i>	_a -	_a -	_b 10	-	-	4	-	.02
F	<i>Erigeron</i> spp.	-	-	2	-	-	1	-	.00
F	<i>Heterotheca villosa</i>	-	-	2	-	-	1	-	.03
F	<i>Hymenoxys acaulis</i>	_a 3	_b 13	_a 3	1	7	1	.03	.01
F	<i>Lesquerella alpina</i>	_a 13	_b 50	_b 48	6	22	30	.13	.44
F	<i>Lithospermum incisum</i>	19	12	14	9	8	7	.11	.16
F	<i>Linum lewisii</i>	_a -	_b 10	_b 17	-	4	7	.02	.20
F	<i>Machaeranthera grindelioides</i>	34	46	24	20	21	12	.26	.34
F	<i>Oenothera</i> spp.	-	-	1	-	-	1	-	.00
F	<i>Penstemon humilis</i>	63	91	73	32	45	35	.74	.69
F	<i>Phlox hoodii</i>	61	47	68	28	21	29	.50	1.53
F	<i>Townsendia incana</i>	_b 7	_a -	_b 4	4	-	3	-	.09
F	<i>Trifolium dasyphyllum</i>	_b 5	_a -	_b 53	3	-	18	-	1.61
F	<i>Zigadenus elegans</i>	_a -	_b 13	_a -	-	7	-	.03	.00
Total for Annual Forbs		0	26	0	0	10	0	0.05	0
Total for Perennial Forbs		307	469	471	155	216	219	4.61	7.29
Total for Forbs		307	495	471	155	226	219	4.66	7.29

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

BROWSE TRENDS --
Herd unit 08A, Study no: 5

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	5	9	-	1.08
B	Artemisia frigida	18	22	.22	.40
B	Artemisia nova	12	14	.05	1.08
B	Cercocarpus montanus	97	96	19.10	17.37
B	Chrysothamnus viscidiflorus lanceolatus	1	1	-	-
B	Eriogonum microthecum	8	12	.36	.27
B	Gutierrezia sarothrae	40	82	.54	2.98
B	Pinus flexilis	0	2	-	-
B	Tetradymia canescens	8	7	.03	.06
Total for Browse		189	245	20.31	23.27

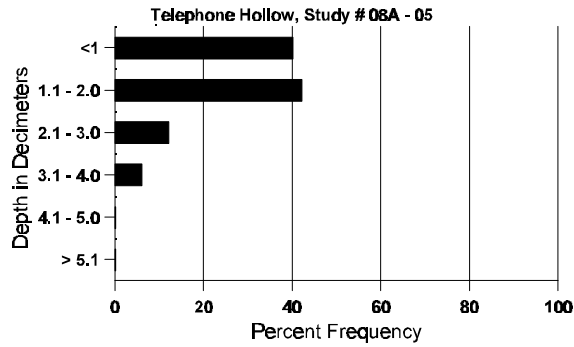
BASIC COVER --
Herd unit 08A, Study no: 5

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	332	342	9.25	32.12	42.25
Rock	308	259	8.00	16.22	12.11
Pavement	336	327	45.50	21.33	25.05
Litter	374	347	32.25	30.12	29.00
Cryptogams	8	-	0	.12	0
Bare Ground	261	299	5.00	7.17	23.39

SOIL ANALYSIS DATA --
Herd Unit 8A, Study # 5, Study Name: Telephone Hollow

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
14.91	56.8 (16.30)	7.4	49.4	33.0	17.6	4.1	2.8	35.2	0.6

Stoniness Index



PELLET GROUP FREQUENCY -- Herd unit 08A, Study no: 5

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'95	'00	00	00
Moose	6	9	287	16 (39)
Elk	15	12	400	31(76)
Deer	4	-	44	3 (8)
Cattle	-	-	17	2 (4)

BROWSE CHARACTERISTICS -- Herd unit 08A, Study no: 5

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Amelanchier alnifolia																	
Y	88	-	1	-	-	-	-	1	-	-	2	-	-	-	133		2
	95	-	-	-	2	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	1	-	-	-	1	-	-	-	20		1	
M	88	-	1	-	-	-	-	-	-	1	-	-	-	66	20	39	1
	95	-	2	-	1	2	-	-	-	4	1	-	-	100	20	31	5
	00	-	6	2	-	-	1	-	-	9	-	-	-	180	17	25	9
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
		'88			67%			00%			00%			-30%			
		'95			57%			00%			00%			+30%			
		'00			70%			30%			00%						
Total Plants/Acre (excluding Dead & Seedlings)												'88	199	Dec:	-		
												'95	140		-		
												'00	200		-		

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia frigida																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5	
M	88	6	-	-	-	-	-	-	-	-	6	-	-	-	400	4	4	6
	95	16	-	-	8	-	-	-	-	-	24	-	-	-	480	4	7	24
	00	26	-	-	3	-	-	1	-	-	30	-	-	-	600	3	6	30
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			+20%							
'95		00%			00%			00%			+29%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	400	Dec:	-			
												'95	500		-			
												'00	700		-			
Artemisia nova																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	7	8	1
	95	-	-	11	15	-	-	-	-	-	26	-	-	-	520	6	15	26
	00	13	2	-	2	-	-	-	-	-	17	-	-	-	340	5	13	17
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	4	1	-	-	-	-	-	-	-	4	-	-	1	100		5	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			+87%							
'95		00%			42%			00%			-12%							
'00		13%			00%			04%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	66	Dec:	0%			
												'95	520		0%			
												'00	460		22%			
Ceratoides lanata																		
Y	88	1	-	-	-	-	-	-	-	-	-	-	1	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			100%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	66	Dec:	-			
												'95	0		-			
												'00	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cercocarpus montanus																		
S	88	-	1	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	10	-	-	2	-	-	-	-	-	12	-	-	-	240		12	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
Y	88	34	17	8	-	-	-	1	-	-	60	-	-	-	4000		60	
	95	17	51	14	5	3	-	-	-	90	-	-	-	1800		90		
	00	57	26	3	-	-	8	2	-	94	-	2	-	1920		96		
M	88	1	6	40	-	-	-	-	-	47	-	-	-	3133	25	23	47	
	95	2	14	17	7	142	36	-	-	126	66	26	-	4360	21	36	218	
	00	7	16	97	-	13	93	-	-	226	-	-	-	4520	18	28	226	
D	88	-	1	1	-	-	-	-	-	1	-	1	-	133			2	
	95	-	-	1	-	1	-	-	-	1	-	1	-	40			2	
	00	-	-	2	1	1	9	1	-	9	-	-	5	280			14	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	60			3	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		22%			45%			.91%			-15%							
'95		68%			22%			09%			+ 8%							
'00		17%			63%			02%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	7266	Dec:	2%				
											'95	6200		1%				
											'00	6720		4%				
Chrysothamnus viscidiflorus lanceolatus																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	1	-	-	-	-	-	-	-	1	-	-	-	20	5	8	1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0	9	13	0	
D	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	00	-	-	-	1	-	-	-	-	1	-	-	-	20			1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%			+ 0%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	0%				
											'95	20		0%				
											'00	20		100%				

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Eriogonum microthecum																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	15	-	-	-	-	-	-	-	-	15	-	-	-	300	5	11	15
	00	20	-	-	-	-	-	-	-	-	20	-	-	-	400	5	7	20
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%			+32%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	0%				
											'95	300		0%				
											'00	440		5%				
Gutierrezia sarothrae																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
Y	88	19	-	-	-	-	-	-	-	-	19	-	-	-	1266		19	
	95	9	-	-	-	-	-	-	-	-	9	-	-	-	180		9	
	00	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7	
M	88	231	-	-	-	-	-	-	-	-	231	-	-	-	15400	7	5	231
	95	88	-	-	-	-	-	-	-	-	88	-	-	-	1760	5	6	88
	00	255	-	-	1	-	7	-	-	-	263	-	-	-	5260	5	9	263
D	88	4	-	-	-	-	-	-	-	-	2	-	1	1	266		4	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	6	-	-	-	-	-	-	-	-	5	-	-	1	120		6	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			.78%			-89%							
'95		00%			00%			00%			+65%							
'00		00%			03%			.36%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	16932	Dec:	2%				
											'95	1940		0%				
											'00	5520		2%				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Pinus flexilis																		
Y	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
	'88	00%			00%			00%										
	'95	00%			00%			00%										
	'00	00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	66	Dec:	-				
											'95	0		-				
											'00	40		-				
Tetradymia canescens																		
Y	'88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	4	7	1
	'95	6	3	-	-	-	-	-	-	-	9	-	-	-	180	6	11	9
	'00	5	2	1	-	-	-	-	-	-	8	-	-	-	160	7	9	8
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
	'88	00%			00%			00%			+ 1%							
	'95	30%			00%			00%			-20%							
	'00	25%			13%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	199	Dec:	-				
											'95	200		-				
											'00	160		-				

SUMMARY

WILDLIFE MANAGEMENT UNIT - 8A NORTH SLOPE, SUMMIT

Five trend study sites were established on this management unit in 1988 and reread in 1995. In 2000, Bald Mtn. South (8A-3) was not reread due to its close proximity to Bald Mtn (8A-4). However, a pellet group transect was read and annual growth of mountain mahogany was measured. Three trend studies are located around Widdop Mountain and 2 are on the Bald Range. They all sample true mountain mahogany stands which are considered important elk winter range. Moose and to a lesser extent deer and antelope, also use these sites. Pellet group data from 2000 indicate an average of 43 elk use days/acre (106 edu/ha) on the five trend studies in unit 8A. A high of 66 elk days use/acre (163 edu/ha) was found on Widdop Mtn. South Slope (8A-1) and a low of 31 elk days use/acre (77 edu/ha) occurred at Telephone Hollow (8A-5). Moose use was found on 3 of the 5 sites, Widdop Mtn. South Slope (8A-1), Widdop Mtn. North Slope (8A-2) and Telephone Hollow (8A-5). Both Widdop Mtn. North Slope and Telephone Hollow had an estimated 16 moose days use/acre (40 mud/ha). Widdop Mtn. South Slope had 9 moose days use/acre (22 mdu/ha).

The key browse species on all 5 trend study sites consists of true mountain mahogany. Browse trends are currently stable on all sites but due to the dry conditions of 2000, annual leader growth averaged only 2.4 inches. Height/crown measurements also declined on 3 of the 4 sites. Browsing of mahogany was heavy in 2000, averaging 58%. Some of the increased heavy use in 2000 is likely due in part to poor leader growth which gives mahogany a more heavily hedged appearance. All of the mahogany populations on these sites are in good health with abundant young plants, stable mature populations, good vigor and low decadence.

Herbaceous trends are slightly down on 3 of the 4 sites but these trends will improve with a return to normal precipitation patterns.

Trend Summary

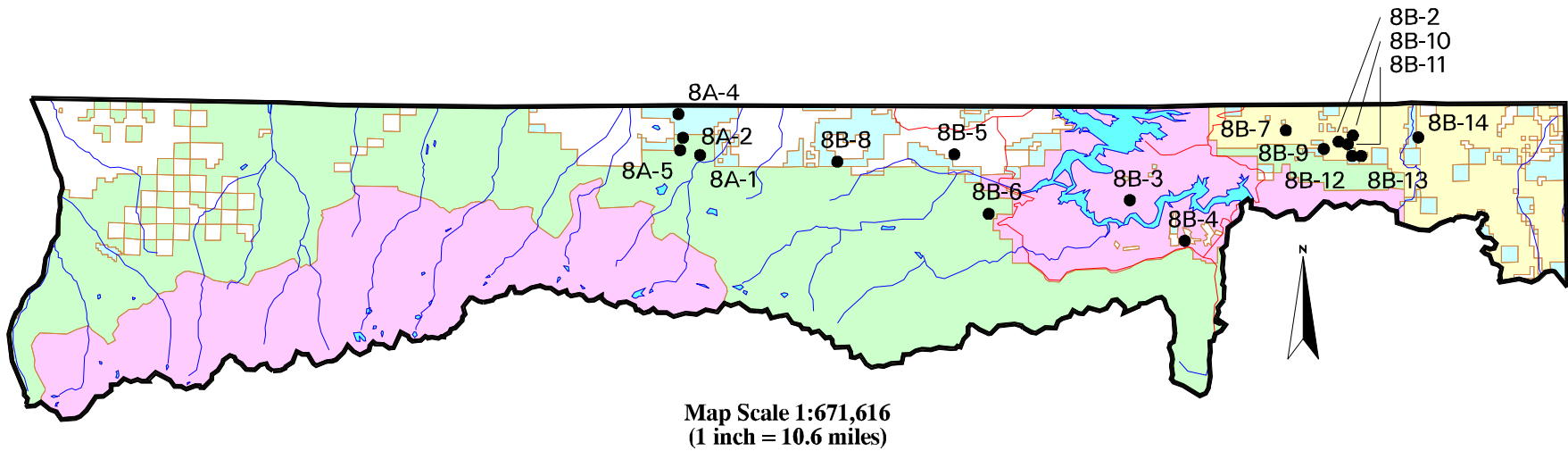
	Category	1982	1995	2000
8A-1 Widdop Mtn. South Slope	soil	est	3	3
	browse	est	3	3
	herbaceous understory	est	2	3
8A-2 Widdop Mtn North Slope	soil	est	5	3
	browse	est	3	3
	herbaceous understory	est	2	2
8A-3 Bald Range South	soil	est	3	NR
	browse	est	4	NR
	herbaceous understory	est	2	NR
8A-4 Bald Range	soil	est	3	3
	browse	est	3	3
	herbaceous understory	est	3	2

(1) = down, (2) = slightly down, (3) = stable, (4) = slightly up, (5) = up,
(est) = site established, (NR) = site not read

	Category	1982	1995	2000
8A-5 Telephone Hollow	soil	est	3	2
	browse	est	3	3
	herbaceous understory	est	4	2

(1) = down, (2) = slightly down, (3) = stable, (4) = slightly up, (5) = up,
(est) = site established, (NR) = site not read

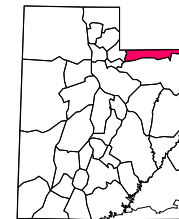
Management Units 8A & 8B



Legend

- Forest Service
- BLM
- State of Utah
- Other Federal Land
- Private
- Water Body
- Transect Location
- Road
- Perennial Stream

Unit Location



WILDLIFE MANAGEMENT UNIT 8B - NORTH SLOPE, DAGGETT

Boundary Description

Daggett and Summit counties - Boundary begins at the Utah-Wyoming state line and the Burn Fork-Birch Creek drainage divide; then east along this state line to the Utah-Wyoming-Colorado state lines (Three corners); south along the Utah-Colorado state line to the Green River; west along the Green River to Flaming Gorge Reservoir; west along the south shore of Flaming Gorge Reservoir to Cart Creek; south along Cart creek to Highway SR-191; south on SR-191 to the Uintah-Daggett County line (summit of the Uinta Mountains); west along this summit to the Burnt Fork-Sheep Creek drainage divide; north along this drainage divide to the Burnt Fork-Birch Creek drainage divide; north along this drainage divide to the Utah-Wyoming state line and beginning point.

Management Unit Description

The majority of the deer and elk winter range in unit 8 (8A & 8B) is on U.S. Forest Service and BLM managed lands. Privately owned lands comprise about 19% of the winter range, most notably the bottomland in the Lucerne Valley around Manila, Brown's Park, and Clay Basin. Elsewhere, privately owned land is used as rangeland for cattle or for summer homes. Manila and Dutch John are the only towns in sub-unit 8B. BLM lands are used primarily for cattle grazing, with oil and gas operations being the major activities in Clay Basin. Winter range on Forest Service land is mainly part of the Flaming Gorge National Recreation Area. Following construction of the Flaming Gorge dam, approximately 14,000 acres of deer winter range was flooded, but the reservoir does not appear to be a serious barrier to migration (Warren 1973). Concurrently, most livestock grazing was eliminated within the Green River corridor. The area is now managed for recreation and electrical power generation associated with the reservoir.

Because the majority of the land within this herd unit is public, this unit did not rank high on the winter range acquisition list. However, a property boundary survey of DWR land, which included Red Creek and Goslin Mountain, was ranked the top enhancement project in 1990.

Key Areas

Several important normal winter concentration areas were identified in the 1974 range inventory. They are: Dowd, Bear, and Goslin Mountains; Dutch John Flat, Little Hole, Red Creek Flat, Taylor Flat, Death Valley, and Digger Basin. Even with very generous estimates, these areas provide only about 20% of the winter range, with all being under federal management. The DWR owns some critical lands in Brown's Park (Taylor Flat and Red Creek) and on Goslin Mountain.

Grazing Summary

Local BLM and Forest Service personnel have provided information on past and current livestock grazing programs. With heavy season-long grazing on the Forest in the first half of the 1900's, cattle grazing since then has been reduced and adjusted downward, in particular since construction of Flaming Gorge Reservoir. There is little cattle use permitted in the Flaming Gorge Recreation Area. Currently, grazing takes place primarily along the southern boundary between the herd unit and Ashley National Forest. Cattle are in the Greendale area in summer, but currently stocking is light at 13.4 suitable acres/AUM. Eighty-five cows graze the allotment on a deferred rotation from June 1st to September 30th. The Death Valley area in the Sheep Creek Mountain allotment is also lightly stocked at 15.4 suitable acres/AUM. It is currently permitted for 173 cows with calves from June 1 to September 15 on a deferred rotation schedule. The sampled BLM grazing allotments are

generally grazed by cattle in spring and/or summer. Antelope Flat is part of the Goslin Mountain allotment, which is part of a deferred rotation system that is grazed either spring or fall. The higher country on Goslin Mountain, where DWR owns isolated parcels, is grazed from mid-July to early or mid-September on a deferred rotation basis for 400 AUM's.

Unit Management Objectives

The management plan for Unit 8 (8A & 8B), includes a target herd size of 5,300 wintering deer with a composition of 15 bucks to 100 does. Thirty percent of the bucks are to be 3-point or better. The elk management objective is to achieve a target winter herd size of 2,100 (1,600 in Summit and West Daggett; 500 in the Three Corners) with a minimum post season bull to cow ratio of 8:100. At least 4 of these bulls will be 2 ½ years of age or older.

Study Site Description

Trend studies were originally established at Cedar Springs (8B-1), Goslin Mountain (8B-2), Bear Top Mountain (8B-3), Greendale (8B-4) and Bennett Ranch (8B-5) in 1982. These sites were reread in 1988 along with 2 new trend studies which were established on BLM land at Antelope Flat (8B-7) and on Forest land at Phil Pico Mountain (8B-8). All of these sites were reread in 1995. Due to heavy livestock use of riparian areas on State land in the Goslin Mountain area, five new trend studies were established in 1995. Most of this heavy use was brought on by the extended drought and poor distribution of livestock. Two studies sample mountain big sagebrush-grass range (West Goslin 8B-9 and Sagebrush Ridge 8B-10) and 3 sites monitor meadows which receive concentrated livestock and elk use (Triangle Meadow 8B-11, Big Meadow 8B-12 and Lower Big Meadow 8B-13). In 2000, all sites were reread except for Cedar Springs which was dropped. One new site was added at Clay Basin Bench (8B-14).

Trend Study 8B-1-00

Study site name: Cedar Springs .

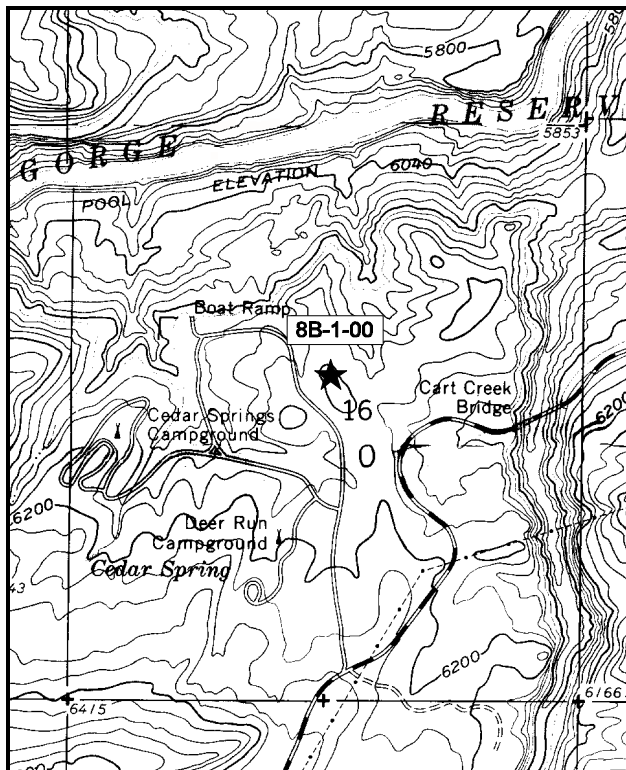
Range type: Pinyon-Juniper .

Compass bearing: frequency baseline 316°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

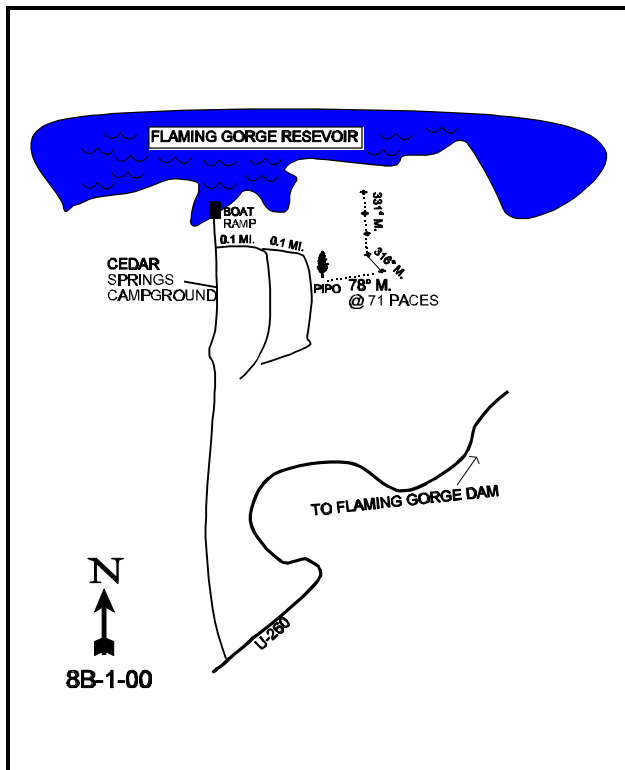
LOCATION DESCRIPTION

From the intersection of Highway U-260 and the road to Cedar Springs Campground, proceed north towards Cedar Springs Boat Ramp. Turn right (east) just before reaching the boat ramp. Go 0.1 miles to a dirt road on the left. Turn and travel 0.1 miles to a lone Ponderosa pine on the left side of the road. The 0-foot baseline stake is on top of the ridge, 71 paces away at a bearing of 78°M from the pine.



Map Name: Dutch John

Township 2N Range 22E ,Section 16



Diagrammatic Sketch

UTM 4530342 N, 631153 E

DISCUSSION

Trend Study No. 8B-1 (9-1)

*** This site was not read in 2000. Text has been retained in this report but consult the 1995 Utah Big Game Range Trend Studies report for maps and data tables. The site is dominated by pinyon and juniper with a few decadent and dying shrubs in the understory. The site provides good thermal cover but it is not representative of deer winter range. Pellet group data was collected in 2000 and is described below.

The Cedar Springs study is on deer winter range slightly east of the Cedar Springs campground and marina. It samples a pinyon-juniper type on a ridge top with a slight northern aspect. The area is at the lower end of critical winter range south of Flaming Gorge Reservoir at an elevation of 6,050 feet. Use of the area by deer has been intense in the past and pellet group data from 1995 indicates moderate deer use with a quadrat frequency of 38%. Quadrat frequency for elk pellet groups is 14%. A pellet group transect was read along the study site baseline in 2000. It estimates 34 deer and 3 elk days use/acre (84 ddu/ha and 7 edu/ha). A few pellet groups were fresh but most appear to be from winter use.

Soils are sandy to gravelly in texture and moderately shallow. Erosion is apparent from the amount of bare ground, rock and erosion pavement on the surface. Total vegetative cover is only 25%, with the herbaceous species only contributing 14% of the total. Most of the vegetation cover (85% of the browse cover) is contributed by pinyon and juniper trees. As a result, plants are pedestaled and numerous small gullies originate on the small ridge top where the study is located.

Key browse on the site consists of mountain big sagebrush with lesser amounts of antelope bitterbrush. Density of sagebrush was estimated at 2,366 plants/acre in 1982. Eighty percent of these plants were mature, 16% were decadent and only 3% were young. Poor vigor was noted on 12% of the mature plants and on 100% of the decadent individuals (33% classified as dying). Utilization was heavy on 58% of the population. By 1988, density was essentially the same, but 90% of the sagebrush was classified as decadent with 31% of these displaying poor vigor. Utilization was again heavy with 63% of the shrubs sampled showing heavy use. During the 1995 reading, the sagebrush density was estimated at only 1,040 plants/acre. The drop in density came primarily from the decadent age class which declined from 2,133 to only 640 plants/acre. Of these, 81% were classified as dying. After the thinning of the population, most of the mature plants now show good vigor. Those plants showing heavy use dropped to 31%.

Antelope bitterbrush is a preferred species yet it only occurs in small numbers. The population has steadily fallen from 700 plants/acre in 1982 to 266 in 1988 and 140 by 1995. Since 1988, the number of mature plants has remained nearly the same, while all of the decadent plants seem to have died out. Heavy use has declined from a high of 90% in 1982 to 38% by 1988. Use was light to moderate in 1995 with no bitterbrush displaying heavy use.

The downward trends in bitterbrush and sagebrush can be attributed to heavy use combined with prolonged drought and the dominance of pinyon-juniper trees on the site. These trees were not counted in the shrub strips in 1995, but point-center quarter data taken during that year estimate 504 pinyon trees/acre and 121 juniper with an overhead canopy cover of 44%. These trees shade out understory plants and effectively tie up the water and mineral resources.

The herbaceous understory is poor with very low sum nested frequencies of both perennial grasses and forbs. All grasses combined provide only a little over 2% cover. The most common species include bluebunch wheatgrass and cheatgrass brome. Forbs are diverse but combine for a total of barely one percent cover.

1982 APPARENT TREND ASSESSMENT

By almost any measure, range condition appears to be declining. Herbaceous vegetative cover is inadequate to hold the soil, and litter is ineffective. Utilization of browse, especially the key species, is heavy and vigor is poor with insufficient reproduction.

1988 TREND ASSESSMENT

Aside from small changes in each ground cover category, the percentage of total ground cover is similar. There is almost 28% bare soil. Soil pedestaling is evident on most plants. The 10% cover of erosion pavement is related to past soil loss. Trend for soil is stable but in poor condition. Trends for sagebrush and bitterbrush are both down due to heavy use, poor vigor, high decadency rates, and lack of reproduction. Trend for the herbaceous understory is slightly up due to an increase in the sum quadrat frequency of forbs. Frequency of grasses declined slightly. The understory is in extremely poor condition.

TREND ASSESSMENT

soil - stable, but poor condition (3)

browse - down (1)

herbaceous understory - slightly up for forbs, but still poor condition (4)

1995 TREND ASSESSMENT

Trend for soil is slightly up due to a decrease in percent bare ground. However, condition is still poor and erosion is continuing. The browse trend is down due to heavy use, poor vigor, high decadency rates, almost no reproduction, a 44% decline in density of sagebrush, and 53% decline in bitterbrush since 1988. The herbaceous understory is in very poor condition but shows a stable trend since the last reading. This site is totally dominated by pinyon and juniper trees which are out competing the understory shrubs. The surviving understory shrubs are in poor condition and heavily hedged due in part to their low numbers. This site needs to be treated. It is not representative of deer winter range.

TREND ASSESSMENT

soil - slightly up but in poor condition (4)

browse - down (1)

herbaceous understory - stable but in poor condition (3)

Trend Study 8B-2-00

Study site name: Goslin Mountain.

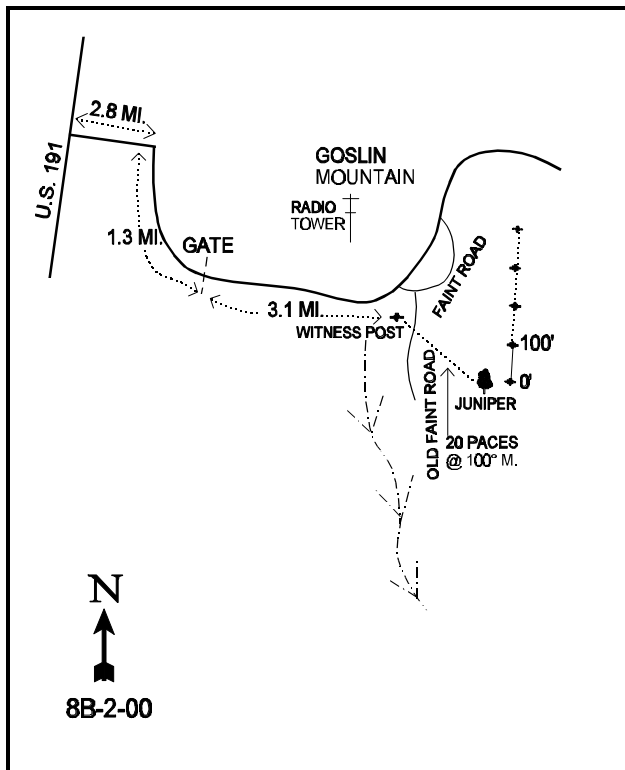
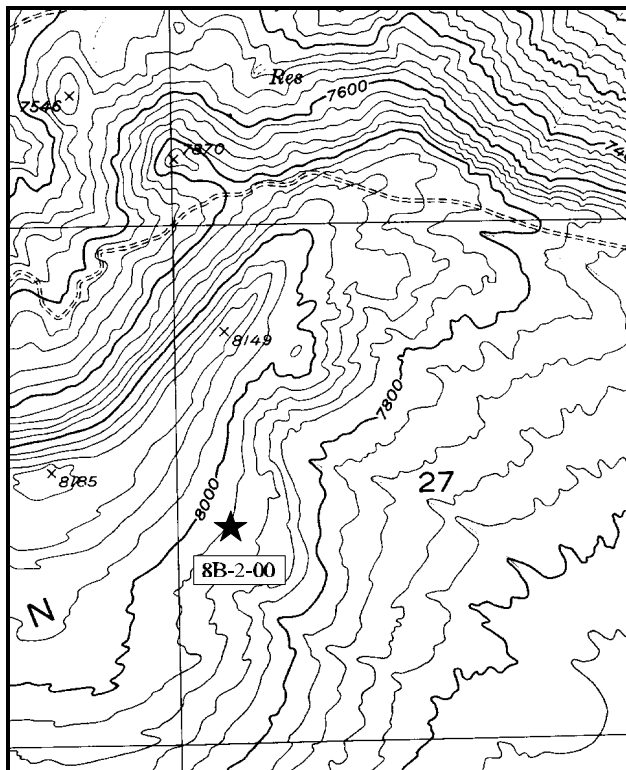
Range type: Big Sagebrush-Grass.

Compass bearing: frequency baseline 18°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191 for approximately 8 miles. Before the Wyoming border, turn east on the Antelope Flat Road toward Goslin Mountain. Go 2.8 miles and turn right towards Goslin Mountain. Proceed 1.3 miles to a gate. Continue up the mountain 3.1 miles to a turnoff to the left which goes to a radio tower. A little further down the main road there is a road to the right. Stop here and walk 20 paces down the right fork to a juniper on the left. The 0-foot baseline stake is located two paces east of the juniper.



Map Name: Goslin Mountain

Diagrammatic Sketch

Township 3N, Range 23E, Section 27

UTM 4536284.097 N, 641644.204 E

DISCUSSION

Trend study No. 8B-2 (9-2)

The Goslin Mountain trend study samples a mountain big sagebrush-grass site near the summit of Goslin Mountain at an elevation of 7,920 feet. Aspect is to the east-southeast with a gradual slope of 10% to 15%. Deer, elk and antelope utilize the site year-round with less use occurring during severe winters. Cattle grazing is permitted in the area as part of the Goslin Mountain allotment managed by the BLM. Cattle grazing in this area takes place during the summer months on a deferred rotation schedule for 400 AUM's. The area is also considered important habitat for sage grouse. Pellet group quadrat frequency data from 1995 and 2000 indicate light use by elk, deer and cattle. A pellet group transect read along the study site baseline in 2000 estimates 15 deer and 3 elk days use/acre (37 ddu/ha and 7 edu/ha).

Soils are moderately shallow, coarse, rocky and well-drained. Effective rooting depth is estimated at just over 12 inches. Pavement and rocks are not abundant on the surface but occur throughout the profile. Soil texture is sandy loam which has a slightly acid pH (6.2). Phosphorus is limited at 4.6 ppm. Values less than 10 ppm can limit normal plant growth and development. Protective ground cover is abundant and well dispersed. However, there are some signs of past erosion in the form of soil pedestaling around shrubs and the bare areas which occur show some signs of active erosion. Many of these bare areas have very shallow soil at less than 4 inches in depth.

The key browse species on the site consists of a moderately dense stand of mountain big sagebrush which produced over half of the shrub cover in 1995 and 2000. Density has remained relatively stable over the years at around 2,500 plants/acre. The exception would be the increase in young plants in 1988. Use of the sagebrush has been mostly light to moderate with an increase in heavy use in 1995. Percent decadence increased from 3% in 1982 to 52% in 1988. Percent decadency has decreased and stabilized in 1995 and 2000 at just over 1/3 of the population. The proportion of the population showing poor vigor has steadily increased from 0% in 1982 to 18% in 2000. Decadent plants classified as dying numbered 361 plants/acre in 1995 and 320 in 2000. Reproduction needed to replace these plants has been quite variable. No seedlings or young were encountered in 1995. Currently ('00), biotic potential (#of seedlings) is marginal at 9% while young plants account for only 7% of the population.

Other important browse on the site consist of serviceberry, bitterbrush, and snowberry. Bitterbrush currently ('00) numbers 420 plants/acre, and provides 21% of the total shrub cover. They have a prostrate growth form with an average height of less than 2 feet. Bitterbrush currently ('00) shows mostly moderately hedging, has good vigor, and has a low incidence of decadence. The proportion of plants heavily hedged (>60% of twigs browsed) has steadily decreased from 63% in 1982 to 0% in 2000. Currently, two-thirds of the bitterbrush population show moderate use. There are small numbers of serviceberry and snowberry scattered throughout the site which are only lightly utilized.

The herbaceous understory is diverse and abundant. Grasses and forbs accounted for 46% of the total vegetative cover in 1995, increasing to 54% in 2000. Grasses make up the majority of the herbaceous cover, 69% in 1995 and 81% in 2000. The dominant grasses consist of needle-and-thread, oniongrass, Letterman needlegrass, and thickspike wheatgrass. It was reported in 1988 that the Poa's were identified to genus only because of the difficulty identifying grasses that year.

Forbs are also very diverse on the site but none are very abundant. Important species include silver lupine and low penstemon.

1982 APPARENT TREND ASSESSMENT

This site appears stable. Soil loss is not currently a serious problem. However, roadways and vehicle tracks are a point source for erosion. Off-road vehicle use should be discouraged if possible. The soil is fairly shallow and has a high erosion potential if disturbed. Shrubs, especially mountain big sagebrush, are the dominant species on the site and will continue to be so. The more preferred species, such as bitterbrush and serviceberry, are both heavily utilized and may eventually decline. Hopefully, ways can be found to prevent this or to encourage their expansion.

1988 TREND ASSESSMENT

Ground cover is almost unchanged from 1982. There is adequate litter cover (57%) and basal vegetative cover (12%). Although there is 25% bare ground with some soil movement occurring, especially along trails, the canopy and basal vegetative cover minimize the erosion hazard. Trend for the key browse species, mountain big sagebrush, is stable. Even though the population density has increased, percent decadence has also increased to 52%. The herbaceous understory trend is up due to an increase in the quadrat frequency of perennial grasses and especially forbs.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - up (5)

1995 TREND ASSESSMENT

Ground cover characteristics have improved since 1988. Percent litter cover has declined slightly due to prolonged drought, but percent bare ground has also declined from 25% to 17%. The high nested frequency values of vegetation and litter indicate well dispersed cover which protects the soil from serious erosion. The browse trend for mountain big sagebrush is mixed. Population density has declined from 4,866 plants/acre in 1988 to 2,480 by 1995. Much of this decrease can be attributed to the much larger sampling design that gives better estimates for shrub populations. The proportion of plants displaying heavy use and poor vigor have both increased. In addition, no seedlings or young plants were encountered in 1995. On the favorable side, percent decadency has declined from 52% to 33%. Trend is considered slightly down at this time but by the time of the next reading this population will most likely be smaller but more healthy with the continuation of drought. Trend for the herbaceous understory is slightly up with an increase in sum of nested frequency of perennial forbs and stable nested frequency values for the key perennial grasses, thickspike wheatgrass, oniongrass, needle-and-thread and Letterman needlegrass.

TREND ASSESSMENT

soil - slightly up (4)

browse - slightly down for mountain big sagebrush (2)

herbaceous understory - slightly up (4)

2000 TREND ASSESSMENT

Trend for soil is up slightly. Relative percent cover of vegetation increased, while cover of bare ground has declined. As a result, the proportion of protective cover (vegetation, litter and cryptogams) to bare ground has increased from 2.8 : 1 to 3.4 : 1. Erosion is currently not a problem on this site. Trend for the key browse species, mountain big sagebrush and bitterbrush is stable. Both have similar population densities compared to 1995. Use is lighter than 1995 levels and vigor is normal on most plants. Percent decadency on sagebrush is

stable as is the number of decadent plants that are classified as dying (361 plant/acre in 1995 and 320 in 2000). However, reproduction of sagebrush is poor and there is currently not enough young plants to replace all of the decadent and dying. This may lead to a slight decline in the sagebrush population in the future if drought conditions continue. Some of the vigor problems on sagebrush are obviously due to the dry conditions of the past few years. Trend for the herbaceous understory is up for perennial grasses, but slightly down for perennial forbs. Overall, the herbaceous trend is considered slightly up since perennial grasses provide the majority of the herbaceous cover. Needle-and-thread and Letterman needlegrass both declined significantly in nested frequency, while oniongrass increased significantly. Thickspike wheatgrass remained stable.

TREND ASSESSMENT

soil - slightly up (4)

browse - stable (3)

herbaceous understory - slightly up (4)

HERBACEOUS TRENDS --

Herd unit 08B, Study no: 2

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	136	144	150	58	51	58	55	1.06	2.82
G	Agropyron spicatum	a-	c37	b14	155	-	15	7	.42	.63
G	Agropyron trachycaulum	-	-	6	-	-	-	2	-	.30
G	Bromus carinatus	-	-	6	-	-	-	2	-	.18
G	Bromus tectorum (a)	-	2	-	-	-	1	-	.00	-
G	Carex spp.	22	32	31	-	9	15	13	.88	.75
G	Dactylis glomerata	-	1	-	-	-	1	-	.00	-
G	Koeleria cristata	b11	a-	ab2	-	5	-	1	-	.03
G	Leucopoa kingii	a-	ab3	b7	-	-	2	4	.06	.44
G	Melica bulbosa	a86	a102	b156	50	33	43	59	2.94	3.74
G	Muhlenbergia richardsonis	-	4	3	-	-	3	1	1.01	.00
G	Poa spp.	171	-	-	-	67	-	-	-	-
G	Poa bulbosa	-	3	22	-	-	1	8	.03	.17
G	Poa fendleriana	-	38	87	-	-	16	34	.45	2.25
G	Poa pratensis	-	5	43	-	-	2	15	.06	1.37
G	Poa secunda	-	25	38	43	-	9	15	.09	.36
G	Sitanion hystrix	b63	a-	a-	2	31	-	-	-	-
G	Stipa columbiana	b89	a7	b86	-	35	4	33	.07	2.58
G	Stipa comata	a118	b190	a139	27	51	62	49	4.46	7.60
G	Stipa lettermani	a54	b89	a34	49	25	34	14	1.57	.68
G	Unknown grass - perennial	b14	a-	a-	-	5	-	-	-	-

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
	Total for Annual Grasses	0	2	0	0	0	1	0	0.00	0
	Total for Perennial Grasses	764	680	824	244	312	265	312	13.11	23.96
	Total for Grasses	764	682	824	244	312	266	312	13.12	23.96
F	<i>Achillea millefolium</i>	b15	a-	a-	3	7	-	-	-	-
F	<i>Agoseris glauca</i>	a-	b53	b64	-	-	26	26	.28	1.06
F	<i>Allium</i> spp.	a21	b139	a35	-	9	61	18	.81	.12
F	<i>Antennaria rosea</i>	b14	a3	ab9	1	7	1	5	.00	.07
F	<i>Arabis</i> spp.	3	3	2	-	3	1	1	.00	.00
F	<i>Arenaria congesta</i>	a1	b20	b31	1	1	10	12	.20	.33
F	<i>Astragalus argophyllus</i>	a3	a5	b15	3	1	2	7	.01	.13
F	<i>Aster chilensis</i>	16	16	7	-	7	7	4	.06	.07
F	<i>Chaenactis douglasii</i>	-	3	-	-	-	1	-	.00	-
F	<i>Collomia linearis</i> (a)	-	b151	a37	-	-	61	17	.75	.25
F	<i>Comandra pallida</i>	-	-	1	-	-	-	1	-	.00
F	<i>Collinsia parviflora</i> (a)	-	b234	a22	-	-	83	9	1.48	.09
F	<i>Crepis acuminata</i>	3	5	3	-	1	4	2	.04	.03
F	<i>Cymopterus longipes</i>	a-	b19	b12	-	-	10	5	.05	.10
F	<i>Delphinium nuttallianum</i>	-	1	2	-	-	1	1	.00	.00
F	<i>Descurainia pinnata</i> (a)	-	5	6	-	-	2	3	.01	.01
F	<i>Erigeron eatonii</i>	a-	a7	b28	-	-	2	13	.04	.11
F	<i>Erigeron flagellaris</i>	b94	a11	a5	16	39	7	3	.06	.06
F	<i>Eriogonum umbellatum</i>	b46	a3	a14	9	20	2	6	.02	.25
F	<i>Gilia inconspicua</i> (a)	-	4	-	-	-	1	-	.00	-
F	<i>Heterotheca villosa</i>	a-	a-	b8	-	-	-	3	.03	.06
F	<i>Lomatium</i> spp.	-	4	-	-	-	2	-	.01	-
F	<i>Lupinus argenteus</i>	35	44	37	4	17	21	20	.51	.80
F	<i>Microsteris gracilis</i> (a)	-	31	29	-	-	15	10	.15	.07
F	<i>Penstemon humilis</i>	a-	b7	b5	-	-	3	3	.16	.06
F	<i>Petroradia pumila</i>	-	-	1	-	-	-	1	-	.03
F	<i>Phlox longifolia</i>	b117	a73	a70	-	51	32	30	.36	.40
F	<i>Polygonum douglasii</i> (a)	-	b71	a33	-	-	30	13	.17	.06
F	<i>Senecio integerrimus</i>	a-	b13	a2	-	-	8	1	.09	.00
F	<i>Senecio multilobatus</i>	-	4	-	-	-	2	-	.03	-
F	<i>Taraxacum officinale</i>	a4	b36	a13	-	2	15	6	.25	.22
F	<i>Tragopogon dubius</i>	-	3	5	-	-	1	2	.00	.06
F	<i>Trifolium gymnocarpon</i>	a8	b57	b63	18	4	25	23	.15	.80
F	Unknown forb-perennial	b33	a-	a-	-	19	-	-	-	-
F	<i>Viola</i> spp.	a-	a-	b12	-	-	-	5	-	.24

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Zigadenus paniculatus	8	2	-	-	4	1	-	.00	-
Total for Annual Forbs		0	496	127	0	0	192	52	2.57	0.50
Total for Perennial Forbs		421	531	444	55	192	245	198	3.21	5.09
Total for Forbs		421	1027	571	55	192	437	250	5.78	5.59

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

BROWSE TRENDS --

Herd unit 08B, Study no: 2

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	3	4	.30	1.54
B	Artemisia tridentata vaseyana	72	72	13.53	12.76
B	Chrysothamnus viscidiflorus lanceolatus	7	7	.42	.18
B	Eriogonum heracleoides	51	54	3.26	1.81
B	Gutierrezia sarothrae	3	0	.15	-
B	Mahonia repens	12	5	.48	.15
B	Purshia tridentata	15	20	3.13	5.00
B	Symphoricarpos oreophilus	10	8	.72	2.87
Total for Browse		173	170	22.01	24.33

CANOPY COVER --

Herd unit 08B, Study no: 2

Species	Percent Cover	
	'95	'00
Juniperus scopulorum	-	2

BASIC COVER --

Herd unit 08B, Study no: 2

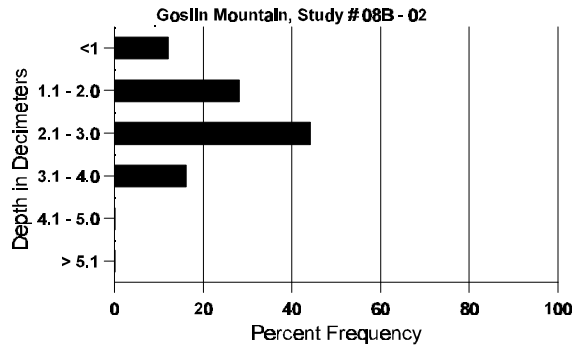
Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	363	370	8.50	12.00	41.94	57.47
Rock	149	80	2.75	2.00	3.28	5.05
Pavement	107	133	0	3.00	.84	2.42
Litter	395	384	60.25	57.50	50.97	58.79
Cryptogams	13	32	1.00	.25	.10	.38
Bare Ground	278	229	27.50	25.25	16.86	12.69

SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 2, Study Name: Goslin Mountain

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	%OM	PPM P	PPM K	dS/m
12.44	53.0 (14.02)	6.2	69.3	16.2	14.6	2.6	4.6	121.6	0.5

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 2

Type	Quadrat Frequency	
	'95	'00
Rabbit	-	1
Elk	3	1
Deer	7	4
Cattle	5	3

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
00	00
35	N/A
44	3 (8)
191	15 (36)
-	-

BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 2

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier alnifolia																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	1	-	-	-	2	-	-	-	-	3	-	-	-	60	17	37	3
	'00	3	-	-	1	-	-	-	-	-	4	-	-	-	80	30	50	4
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	1	-	-	-	1	-	-	-	20			1
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		50%			25%			00%			+ 0%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	0		0%			
												'95	80		25%			
												'00	80		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Artemisia tridentata vaseyana</i>																		
S	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	10	-	-	1	-	-	-	-	-	11	-	-	-	733		11	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	8	-	-	3	-	-	-	-	-	11	-	-	-	220		11	
Y	'82	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	'88	14	1	-	-	-	-	-	-	-	15	-	-	-	1000		15	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	9	-	-	-	-	-	-	-	-	8	-	1	-	180		9	
M	'82	32	-	-	-	-	-	-	-	-	32	-	-	-	2133	27	33	32
	'88	8	12	-	-	-	-	-	-	-	20	-	-	-	1333	27	39	20
	'95	19	35	22	1	5	1	-	-	-	83	-	-	-	1660	51	59	83
	'00	55	10	1	2	3	-	-	-	-	68	-	3	-	1420	23	36	71
D	'82	1	-	-	-	-	-	-	-	-	-	1	-	-	66		1	
	'88	22	15	-	-	-	1	-	-	-	34	1	3	-	2533		38	
	'95	5	19	11	-	6	-	-	-	-	23	-	-	18	820		41	
	'00	33	2	1	9	-	-	-	-	-	27	-	2	16	900		45	
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	800		40	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	640		32	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%			+52%							
'88		38%			01%			04%			-49%							
'95		52%			27%			15%			+ 1%							
'00		12%			02%			18%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	2332	Dec:	3%			
												'88	4866		52%			
												'95	2480		33%			
												'00	2500		36%			
<i>Chrysothamnus viscidiflorus lanceolatus</i>																		
M	'82	3	-	-	-	-	-	-	-	-	3	-	-	-	200	9	7	3
	'88	1	-	-	1	-	-	-	-	-	2	-	-	-	133	15	7	2
	'95	9	-	-	1	-	-	-	-	-	10	-	-	-	200	12	21	10
	'00	11	-	-	-	-	-	-	-	-	11	-	-	-	220	9	13	11
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%			+ 1%							
'95		00%			00%			00%			+ 9%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	200	Dec:	0%			
												'88	199		33%			
												'95	200		0%			
												'00	220		0%			

A Y G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
<i>Eriogonum heracleoides</i>																	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	24	-	-	-	-	-	-	-	-	24	-	-	-	480		24
	00	6	-	-	-	-	-	-	-	-	6	-	-	-	120		6
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	95	125	-	-	-	-	-	-	-	-	125	-	-	-	2500	7 18	125
	00	113	-	-	12	-	-	-	-	-	125	-	-	-	2500	5 15	125
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	1	-	-	-	-	-	-	-	-	-	1	20		1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		00%			00%			00%									
'88		00%			00%			00%									
'95		00%			.66%			.66%			-13%						
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%		
												'88	0		0%		
												'95	3000		1%		
												'00	2620		0%		
<i>Gutierrezia sarothrae</i>																	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	95	9	-	-	-	-	-	-	-	-	9	-	-	-	180	4 7	9
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		00%			00%			00%									
'88		00%			00%			00%									
'95		00%			00%			00%									
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-		
												'88	0		-		
												'95	180		-		
												'00	0		-		

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Mahonia repens																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	20	4	-	2	-	-	3	-	-	29	-	-	-	1933		29	
	95	50	-	-	-	-	-	-	-	-	50	-	-	-	1000		50	
	00	12	-	-	-	-	-	-	-	-	12	-	-	-	240		12	
M	82	9	-	-	-	-	-	-	-	-	9	-	-	-	600	5	4	9
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	95	-	-	-	-	-	-	-	-	95	-	-	-	1900	4	6	95
	00	16	-	-	-	-	-	-	-	-	16	-	-	-	320	4	4	16
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+69%							
'88		14%			00%			00%			+33%							
'95		00%			00%			00%			-81%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	600	Dec:	-			
												'88	1933		-			
												'95	2900		-			
												'00	560		-			
Purshia tridentata																		
Y	82	-	1	1	-	-	-	-	-	-	1	1	-	-	133		2	
	88	-	3	-	1	-	-	-	-	-	1	-	3	-	266		4	
	95	1	1	-	1	-	-	-	-	-	3	-	-	-	60		3	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	82	1	1	4	-	-	-	-	-	-	4	2	-	-	400	11	21	6
	88	-	1	4	-	1	2	-	-	-	8	-	-	-	533	14	22	8
	95	-	4	7	-	4	2	-	-	-	17	-	-	-	340	13	45	17
	00	4	9	-	-	4	-	-	-	-	17	-	-	-	340	20	63	17
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	1	-	-	-	-	1	-	-	1	40		2	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		25%			63%			00%			+33%							
'88		42%			50%			25%			-50%							
'95		45%			45%			00%			+ 5%							
'00		67%			00%			05%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	533	Dec:	0%			
												'88	799		0%			
												'95	400		0%			
												'00	420		10%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	8	-	-	5	-	-	-	-	-	13	-	-	-	260	15	41	13
	00	4	-	-	3	-	-	1	-	-	7	-	1	-	160	24	63	8
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			-60%							
'00		00%			00%			13%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	400		-			
												'00	160		-			

Trend Study 8B-3-00

Study site name: Bear Top Mountain .

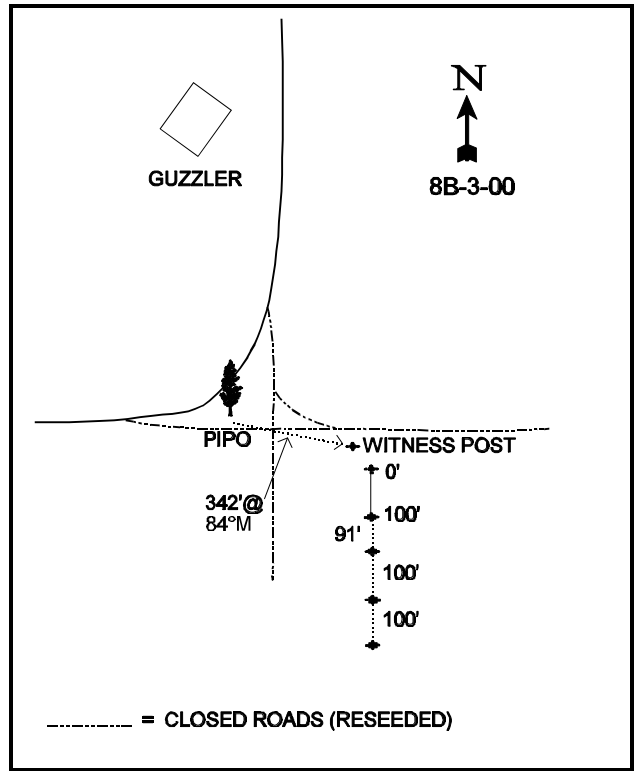
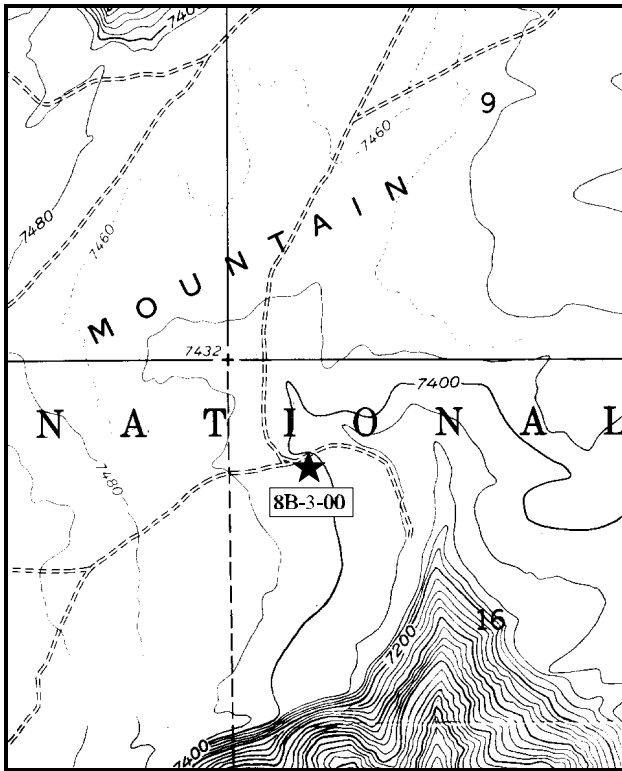
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 165°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the intersection of Highway U-260 and U.S. 191 northwest of Dutch John, proceed west towards Antelope Flat campground for 3.6 miles. Turn left, and proceed on the dirt road towards Bear Top Mountain for 0.35 miles to a locked gate. Go through the gate and continue 0.1 miles to a new fence. Continue up the mountain approximately 5.2 miles to a large Ponderosa pine. From the pine, the witness post is 342 feet at 84°M. The 0-foot stake is 13 feet south of the witness post. It is marked with a red browse tag #7095.



Map Name: Flaming Gorge

Diagrammatic Sketch

Township 2N, Range 21E, Section 16

UTM 4530102.930 N, 620962.749 E

DISCUSSION

Trend Study No. 8B-3 (9-3)

The Bear Top Mountain study is on Bear Top Mountain at an elevation of 7,400 feet. The site is on nearly level terrain with a slight southeast aspect and lies about 1/4 mile from the cliffs overlooking Flaming Gorge Reservoir. The area is classified as a sagebrush-grass type, which demonstrates great diversity in both vegetative composition and wildlife use. Antelope, mule deer, elk, bighorn sheep, and sage grouse have been observed in close proximity to the site during past readings. Rocky Mountain bighorn sheep were transplanted in the early 1980's and utilize the area as summer range. Two nearby guzzlers provide water for wildlife. Livestock have been excluded since the early 1960's. The area was burned in 1998 as part of a prescribed fire to clear the rim of Bear Top Mountain for big horn sheep habitat. However, the fire eliminated most of the shrubs on the site. Pellet group transect data collected near the trend study baseline in 2000 estimate 7 elk days use/acre (18 edu/ha). In addition, sage grouse, coyote, and marmot droppings were all sampled in the pellet group transect as well.

Soil on the site is moderately shallow and very rocky. Effective rooting depth is estimated at just over 10 inches with most of the rock found in the top 8 inches of the soil profile. Bed rock is also exposed in many places on the surface with rock and pavement providing nearly 14% cover. Soil texture is a sandy loam which has a neutral pH. Phosphorus is limited at only 4.5 ppm. Values less than 10 ppm can limit normal plant growth and development. Due to the levelness of the terrain, erosion is not a problem on this site. Between 1995 and 2000, vegetation and litter both decreased sharply, while bare ground tripled over the same period. These drastic changes are due mostly to the loss of vegetative cover, especially browse cover, following the burn that occurred between the two sampling periods. However, this effect has also been made more severe by the drought that occurred during the fall of 1999, and the winter and spring of 2000.

The key browse species prior to the fire was a moderately dense stand of mountain big sagebrush which made up 81% of the browse cover in 1995. Other browse species included bitterbrush, mountain low rabbitbrush, gray horsebrush, and low numbers of broom snakeweed. Mountain big sagebrush cover was estimated at 19% in 1988 and 15% in 1995. Density has ranged from 9,065 plants/acre in 1988 to 5,200 in 1995. The number of young and decadent sagebrush fluctuated between 1982 and 1995, but the number of mature plants remained stable at around 4,000 individuals/acre. Percent decadency was low at 11% in 1995 with normal vigor on all but 36% of the decadent shrubs which were classified as dying. Use was light to moderate in 1982 and 1988, but heavy in 1995 with 60% of the plants displaying heavy use (>60% of twigs browsed).

Antelope bitterbrush was picked up in the larger sample used in 1995. Density was estimated at 120 mature plants/acre, 50% of which were heavily hedged. Even at this moderately low density, bitterbrush made up 14% of the total browse cover in 1995, making it the second most productive browse species. Mountain low rabbitbrush was fairly common but mostly unutilized. The change in density between 1988 and 1995 is primarily the result of the greatly increased sample size which better estimates shrubs with clumped or discontinuous distributions.

After the area was burned in 1998, total shrub cover declined from 18% in 1995 to 2% in 2000. Due to the spotty nature of the fire, some sagebrush survived. Density of mountain big sagebrush is currently ('00) estimated at 320 plants/acre. Use is light to moderate and vigor is normal on most plants. However, percent decadence has increased to 44%. One seedling and no young plants were sampled in 2000. There are also a few surviving and/or resprouting bitterbrush, fendler ceanothus, and gray horsebrush. The most common shrub on the site is the resprouting mountain low rabbitbrush which numbers 880 plants/acre. They are small plants averaging only 4 inches in height. They show no use and good vigor.

Grasses and forbs are abundant and diverse. Ten perennial grasses were encountered in 1995 which provided 20% of the vegetative cover. The most numerous species included: mutton bluegrass, needle-and-thread, Sandberg bluegrass, and thickspike wheatgrass. Forbs provided 36% of the vegetative cover with 27 perennial and 7 annual species sampled in 1995. Sulfur eriogonum and silvery lupine were numerous and provided good forage for summering big game animals. After the burn, the grass composition was basically unchanged except that total grass cover increased from 8% in 1995 to 14% in 2000. Forbs are still diverse yet the sum of nested frequency and cover have declined by about 50%. Sulfur eriogonum, silvery lupine, rock goldenrod and phlox are still the dominant perennial species. Much of the lupine was heavily utilized in 2000.

1982 APPARENT TREND ASSESSMENT

The overall range trend appears stable. Soil trend may even be improving as a result of level terrain and the withdrawal of livestock grazing. Vegetatively, the area supports a fair density of rather low-growing mountain big sagebrush with a strong grass understory which may be equally dominant. At this point, it is difficult to judge which vegetative element is gaining the upper hand. Future readings of the study should provide some useful data in this regard.

1988 TEND ASSESSMENT

Basal vegetative cover has remained stable, although protective ground cover of litter and cryptogams has increased only slightly. Percent bare ground is currently estimated at 19%. Due to the level terrain and abundant vegetation and litter cover, erosion is not a problem. Trend for soil is slightly improved. The browse trend is up with an increase in population density of the key browse species, mountain big sagebrush. Percent decadency has increased, but 28% of the population is classified as young. The herbaceous trend is also up with an increase in the quadrat frequency of grasses and forbs.

TREND ASSESSMENT

soil - slightly up (4)

browse - up (5)

herbaceous understory - up (5)

1995 TREND ASSESSMENT

Ground cover characteristics have changed somewhat since 1988. Percent cover of rock has increased while litter cover has declined. Much of this can be attributed to the prolonged drought we have been experiencing since the late 1980's. Percent bare ground has remained low and is currently 17%. Trend for soil is considered stable. Trend for browse is also currently stable. The number of young and decadent plants have fluctuated considerably over the past readings, but the number of mature plants has remained constant at about 4,000 plants/acre. Percent decadency is currently low at 11% with vigor being generally good. The only negative aspect is the high number of heavily hedged sagebrush (60%) and the number of decadent plants (560 plants/acre) in which 36% were classified as dying. Trend for the herbaceous understory is slightly down due to a decline in the sum of nested frequency for perennial grasses and forbs.

TREND ASSESSMENT

soil - stable (3)

browse - stable for sagebrush (3)

herbaceous understory - slightly down (2)

2000 TREND ASSESSMENT

Trend for soil is currently down. Since the fire in 1998, percent cover of vegetation and litter have declined considerably while percent cover for bare ground has increased from 17% to 50%. Herbaceous vegetation is still abundant. However, erosion is minimized due to the level terrain. The ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil decreased from 3.4:1 to 2:1 in 2000. Trend for browse is also down with some sagebrush and bitterbrush surviving the fire. Use on the surviving shrubs is light to moderate with percent decadence increasing to 44%. Vigor is normal on most plants. Currently, there is no recruitment of young plants. The resprouting mountain low rabbitbrush is currently the most abundant shrub at 880 plants/acre. These are small plants averaging only 4 inches in height. Trend for the herbaceous understory is mixed. The herbaceous species composition remained basically unchanged following the fire. However, the sum of nested frequency for perennial grasses have increased while frequency of forbs has declined. In 1995, annual and perennial forbs accounted for 64% of the herbaceous understory. After the fire, perennial forbs account for 32% of the herbaceous cover while perennial grasses provide 63%. Some of decline in forb frequency is obviously due to the fire although drought has also greatly influenced the outcome. The herbaceous trend is considered down slightly.

TREND ASSESSMENT

soil - down (1)

browse - down due to fire (1)

herbaceous understory - slightly down overall, up for grasses but down for forbs (2)

HERBACEOUS TRENDS --
Herd unit 08B, Study no: 3

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	a-	b ¹¹⁸	c ¹⁹¹	-	-	50	70	1.03	2.88
G	Agropyron spicatum	b ²⁰⁸	a ⁷⁷	a ⁶⁸	20	78	31	27	.96	1.82
G	Bromus inermis	-	-	-	-	-	-	-	-	.00
G	Bromus tectorum (a)	-	a ²⁶	b ⁵⁵	-	-	13	23	.21	.65
G	Carex spp.	b ⁷²	a ¹⁷	a ¹⁶	20	31	11	7	.15	.52
G	Koeleria cristata	b ¹¹⁹	a ¹³	a ⁹	33	53	8	4	.09	.04
G	Poa fendleriana	111	128	129	-	48	50	50	2.51	2.37
G	Poa secunda	b ¹⁶⁶	a ¹⁰⁵	a ¹³⁶	27	69	44	53	1.27	1.12
G	Sitanion hystrix	a ¹⁴	b ⁴¹	b ³⁴	21	8	18	18	.45	.82
G	Sporobolus cryptandrus	-	7	-	-	-	2	-	.15	-
G	Stipa comata	129	82	111	29	58	36	49	1.50	3.74
G	Stipa lettermani	b ³⁹	a-	b ²	7	15	-	1	-	.15
Total for Annual Grasses		0	26	55	0	0	13	23	0.20	0.65
Total for Perennial Grasses		858	588	696	157	360	250	279	8.15	13.49
Total for Grasses		858	614	751	157	360	263	302	8.36	14.14
F	Agoseris glauca	a-	b ²⁷	c ⁶³	-	-	11	26	.05	.48
F	Allium spp.	a-	b ¹⁰	a-	-	-	6	-	.03	-
F	Antennaria rosea	b ¹²⁴	a ⁴¹	a ³⁰	59	51	17	13	.86	.33
F	Androsace septentrionalis (a)	-	2	-	-	-	2	-	.01	-
F	Arabis spp.	11	3	2	1	5	1	1	.00	.00
F	Arenaria congesta	ab ⁷	b ¹⁷	a ³	-	3	8	1	.23	.15
F	Astragalus convallarius	b ⁷	b ¹⁴	a-	3	4	5	-	.10	-
F	Aster spp.	a-	b ²³	a-	-	-	10	-	.12	-
F	Balsamorhiza sagittata	5	9	11	11	2	7	6	.69	.68
F	Calochortus nuttallii	-	3	-	-	-	1	-	.00	-
F	Comandra pallida	-	13	14	9	-	6	8	.25	.09
F	Collinsia parviflora (a)	-	b ¹⁴⁸	a ¹⁰⁰	-	-	47	41	2.28	.30
F	Crepis acuminata	a-	b ⁹	a-	-	-	6	-	.03	-
F	Cymopterus spp.	a-	b ¹⁰	a-	1	-	5	-	.05	-
F	Descurainia pinnata (a)	-	-	1	-	-	-	1	-	.00
F	Draba spp. (a)	-	12	1	-	-	5	1	.02	.00
F	Erigeron flagellaris	-	2	5	-	-	1	2	.00	.06
F	Erigeron pumilus	b ⁸³	a ²⁰	a ⁶	30	40	10	3	.19	.04
F	Eriogonum umbellatum	b ⁷⁹	b ⁷⁸	a ³⁰	22	33	31	17	2.25	1.48
F	Gayophytum ramosissimum (a)	-	8	7	-	-	4	3	.02	.01
F	Gilia aggregata	-	-	-	1	-	-	-	-	-

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Heterotheca villosa	ab31	b50	a20	8	12	21	8	.83	.22
F	Lepidium spp. (a)	-	b9	a-	-	-	5	-	.02	-
F	Linum lewisii	b38	a4	a6	-	24	2	3	.01	.01
F	Lithospermum ruderales	18	4	8	-	7	2	4	.19	.04
F	Lupinus argenteus	b176	a100	a91	28	75	44	41	1.97	1.92
F	Machaeranthera canescens	b7	a-	a-	-	4	-	-	-	-
F	Mertensi fusiformis	-	-	1	-	-	-	1	-	.00
F	Orthocarpus tolmiei (a)	-	b35	a7	-	-	15	3	.15	.04
F	Penstemon humilis	b11	a-	a1	3	6	-	1	-	.03
F	Petrorhiza pumila	a7	b31	ab17	3	6	14	9	1.41	.86
F	Phlox longifolia	b59	a3	a7	-	25	2	3	.01	.04
F	Phlox multiflora	b66	ab66	a30	37	28	23	14	2.30	.26
F	Polygonum douglasii (a)	-	b60	a-	-	-	27	-	.13	-
F	Senecio integerrimus	a-	a-	b6	-	-	-	3	-	.01
F	Sedum lanceolatum	b76	b100	a24	16	36	40	10	.42	.10
F	Trifolium gymnocarpon	18	16	7	24	9	7	3	.03	.01
F	Zigadenus spp.	4	-	-	-	2	-	-	-	-
Total for Annual Forbs		0	274	116	0	0	105	49	2.65	0.37
Total for Perennial Forbs		827	653	382	255	372	280	177	12.10	6.86
Total for Forbs		827	927	498	255	372	385	226	14.75	7.24

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

BROWSE TRENDS --

Herd unit 08B, Study no: 3

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata vaseyana	88	9	14.65	1.29
B	Ceanothus fendleri	0	1	-	.18
B	Chrysothamnus viscidiflorus lanceolatus	25	21	.75	.20
B	Gutierrezia sarothrae	3	4	-	.21
B	Juniperus osteosperma	-	-	.15	-
B	Pediocactus simpsonii	10	6	.01	.02
B	Purshia tridentata	6	1	2.59	.01
B	Tetradymia canescens	4	1	.03	.00
Total for Browse		136	43	18.19	1.91

BASIC COVER --

Herd unit 08B, Study no: 3

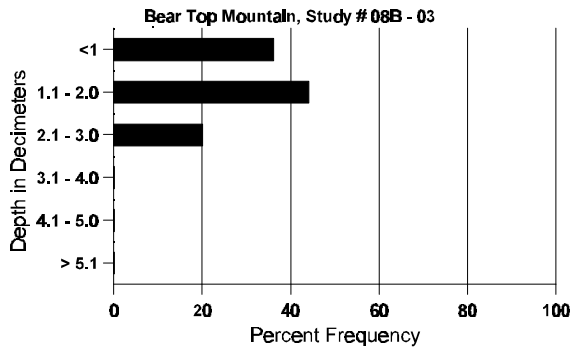
Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	362	322	12.00	12.00	38.31	27.03
Rock	118	120	1.00	4.75	11.07	13.54
Pavement	26	98	0	0	.04	.57
Litter	386	348	58.25	59.75	46.33	23.65
Cryptogams	140	38	2.25	4.50	3.25	.76
Bare Ground	259	357	26.50	19.00	16.85	49.63

SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 3, Study Name: Bear Top Mountain

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
10.43	57.2 (10.94)	6.8	65.4	19.7	14.9	2.2	4.5	201.6	0.9

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 3

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre 00	Days Use per Acre (ha) 00
Rabbit	3	6	9	N/A
Moose	-	15	287	16 (39)
Grouse	-	2	9	N/A
Elk	7	5	96	7 (18)
Deer	16	5	-	-
Antelope	-	4	313	24 (60)
Coyote	-	2	-	-

BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 3

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Amelanchier alnifolia</i>																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	13	21	0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'82 00%			'82 00%			'82 00%										
		'88 00%			'88 00%			'88 00%										
		'95 00%			'95 00%			'95 00%										
		'00 00%			'00 00%			'00 00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	0		-			
<i>Artemisia tridentata vaseyana</i>																		
S	'82	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	'82	20	3	-	-	-	-	-	-	-	23	-	-	-	1533			23
	'88	25	13	-	-	-	-	-	-	-	36	-	2	-	2533			38
	'95	2	9	21	-	-	-	-	-	-	31	-	-	1	640			32
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	'82	49	14	-	-	-	-	-	-	-	63	-	-	-	4200	15	24	63
	'88	33	31	-	-	-	-	-	-	-	64	-	-	-	4266	16	18	64
	'95	15	46	114	-	21	4	-	-	-	200	-	-	-	4000	15	29	200
	'00	5	4	-	-	-	-	-	-	-	5	4	-	-	180	12	29	9
D	'82	4	3	1	-	-	-	-	-	-	6	-	2	-	533			8
	'88	19	13	2	-	-	-	-	-	-	33	-	1	-	2266			34
	'95	-	4	14	-	7	3	-	-	-	18	-	-	10	560			28
	'00	5	2	-	-	-	-	-	-	-	6	-	-	1	140			7
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	380			19
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'82 21%			'82 01%			'82 02%			'82 +31%							
		'88 42%			'88 01%			'88 02%			'88 -43%							
		'95 33%			'95 60%			'95 04%			'95 -94%							
		'00 38%			'00 00%			'00 06%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	6266	Dec:	9%			
												'88	9065		25%			
												'95	5200		11%			
												'00	320		44%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Ceanothus fendleri</i>																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'00	-	-	-	1	-	-	-	-	-	1	-	-	-	20	8	18	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'82 00%			'82 00%			'82 00%										
		'88 00%			'88 00%			'88 00%										
		'95 00%			'95 00%			'95 00%										
		'00 00%			'00 00%			'00 00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	0	Dec:	-				
											'88	0		-				
											'95	0		-				
											'00	20		-				
<i>Chrysothamnus viscidiflorus lanceolatus</i>																		
S	'82	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	'82	16	-	-	-	-	-	-	-	-	16	-	-	-	1066			16
	'88	26	2	-	2	-	-	-	-	-	29	-	1	-	2000			30
	'95	1	-	-	1	-	-	-	-	-	2	-	-	-	40			2
	'00	15	-	-	-	-	-	-	-	-	15	-	-	-	300			15
M	'82	13	-	-	-	-	-	-	-	-	13	-	-	-	866	8	12	13
	'88	14	-	-	3	-	-	-	-	-	14	-	3	-	1133	9	11	17
	'95	40	-	-	4	-	-	-	-	-	44	-	-	-	880	10	15	44
	'00	29	-	-	-	-	-	-	-	-	29	-	-	-	580	4	5	29
D	'82	6	-	-	-	-	-	-	-	-	-	-	6	-	400			6
	'88	3	2	1	-	-	-	-	-	-	5	-	1	-	400			6
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'82 00%			'82 00%			'82 17%			+34%							
		'88 08%			'88 02%			'88 09%			-73%							
		'95 00%			'95 00%			'95 00%			- 6%							
		'00 00%			'00 00%			'00 00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	2332	Dec:	17%				
											'88	3533		11%				
											'95	940		2%				
											'00	880		0%				

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4		1	2									
Gutierrezia sarothrae																	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	1	-	-	-	-	-	-	-	1	-	-	-	66	5	6	1
	95	2	-	-	-	-	-	-	-	2	-	-	-	40	4	4	2
	00	7	-	-	-	-	-	-	-	7	-	-	-	140	6	13	7
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		00%			00%			00%									
'88		00%			00%			00%			- 9%						
'95		00%			00%			00%			+57%						
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-				
										'88	66		-				
										'95	60		-				
										'00	140		-				
Pediocactus simpsonii																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	2	-	-	-	-	2	-	-	-	40		2	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	10	-	-	-	-	-	-	-	10	-	-	-	200	2	3	10
	00	5	-	-	-	-	-	-	-	5	-	-	-	100	2	16	5
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	1	-	-	-	-	-	-	-	1	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		00%			00%			00%									
'88		00%			00%			00%									
'95		00%			00%			00%			-27%						
'00		00%			00%			13%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	0%				
										'88	0		0%				
										'95	220		0%				
										'00	160		13%				

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4		1	2									
Purshia tridentata																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	1	2	3	-	-	-	-	-	6	-	-	-	120	20	78	
	00	1	-	-	-	-	-	-	-	1	-	-	-	20	4	9	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>		<u>%Change</u>							
'82		00%			00%			00%									
'88		00%			00%			00%									
'95		33%			50%			00%		-83%							
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-				
										'88	0		-				
										'95	120		-				
										'00	20		-				
Tetradymia canescens																	
M	82	1	-	-	-	-	-	-	-	1	-	-	-	66	17	8	1
	88	-	2	-	-	-	-	-	-	2	-	-	-	133	13	18	2
	95	4	-	-	1	-	-	-	-	5	-	-	-	100	10	13	5
	00	4	-	-	-	-	-	-	-	4	-	-	-	80	-	-	4
D	82	2	-	-	-	-	-	-	-	-	-	2	-	133			2
	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>		<u>%Change</u>							
'82		00%			00%			67%		-33%							
'88		100%			00%			00%		-10%							
'95		00%			00%			00%		-33%							
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	199	Dec:	67%				
										'88	133		0%				
										'95	120		17%				
										'00	80		0%				

Trend Study 8B-4-00

Study site name: Greendale .

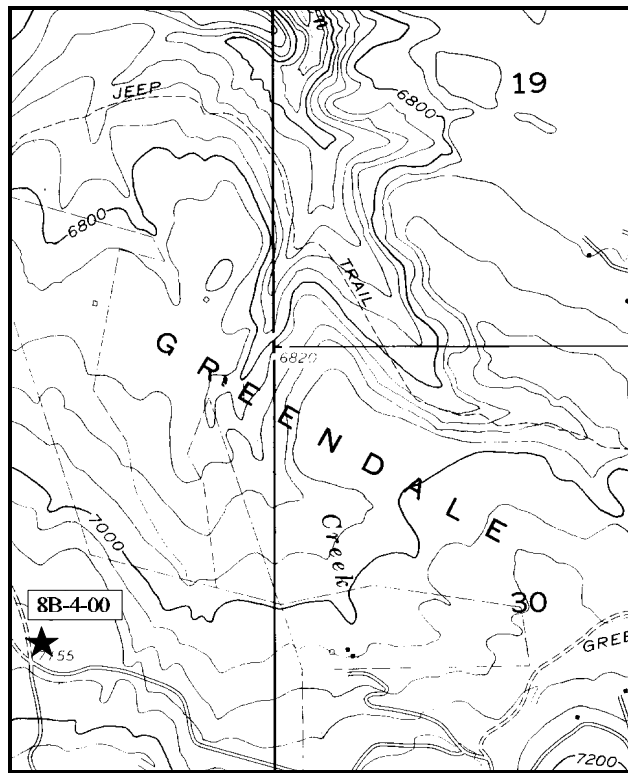
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 347°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

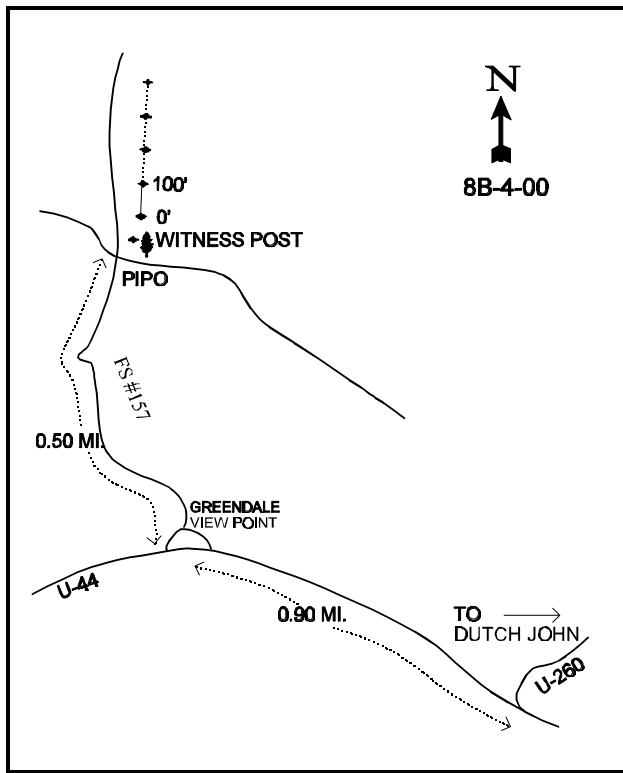
LOCATION DESCRIPTION

From the junction of Highways U-44 and U.S. 191, proceed towards Manilla for 0.9 miles. Turn off at the Greendale view point. Take the dirt road (FS 157) to the north which goes to the Canyon Rim trail. Go 0.5 miles to an intersection. From the Ponderosa pine northeast of the intersection, the 0-foot baseline stake is 21 paces away bearing 26°.



Map Name: Dutch John

Township 2N, Range 21E, Section 25



Diagrammatic Sketch

UTM 4526159.833 N, 626500.233 E

DISCUSSION

Trend Study No. 8B-4 (9-4)

The Greendale study samples a sagebrush/grass park surrounded by montane forest at 7,100 feet in elevation. The site is nearly level (0-5%) with a slight north aspect. The area is classified as deer and elk winter range, but depending on the weather, it actually receives year-round use by big game. Pellet group data from 2000 indicate moderate deer use at 28 deer days use/acre (69 ddu/ha). Elk use is moderately high at an estimated 62 days use/acre (153 edu/ha). This area is also used by rabbits and a few moose (see pellet group table). Cattle also graze the area at a level of 13.4 suitable acres per AUM from June 1st to September 30th. Livestock use is estimated at 10 cow days use/acre (25 cdu/ha) in 2000.

Soil on the site is fairly deep for a range site with gravel and rock uncommon on the surface and evenly dispersed throughout the profile. Effective rooting depth is estimated a nearly 20 inches. It has a sandy clay loam texture and is slightly acidic in reactivity (pH of 6.3). Phosphorus is limited at only 3.3 ppm. Values less than 10 ppm can limit normal plant growth and development. Erosion is minimal due to the level terrain and the abundance of vegetation and litter cover. Percent cover for bare ground has steadily declined from a high of 36% in 1982, to 12% in 2000.

The key browse species on the site are mountain big sagebrush and antelope bitterbrush. Sagebrush is more numerous and provides the majority of the browse cover. It had an estimated density of 1,733 plants/acre in 1982, increasing to 4,400 by 1988. The population has remained fairly stable since then and currently ('00) numbers 4,800 plants/acre. Use has varied from light to moderate. Percent decadency has been relatively low in the past (19% in 1982 to 6% in 1995), but increased to 29% in 2000 due to drought conditions. Approximately 20% (280 plants/acre) of the decadent plants sampled in 2000 appear to be dying. Young plants appear numerous enough to maintain the population however.

Bitterbrush contributed 15% of the total browse cover in 1995, increasing to 23% in 2000. Density is currently ('00) estimated at 1,380 plants/acre. Use was moderate to heavy in 1982 and 1988, but mostly moderate in 1995 and 2000. Percent decadence has remained low and vigor normal on most plants since 1982.

The low growing Fendler ceanothus is also abundant and contributed 25% of the total browse cover in 1995, and 15% in 2000. It is a short stature plant with an average height of only 8 or 9 inches, yet it has a crown of 3½ to 4 feet. It is capable of producing good quantities of forage in the winter if the snows are not deep. There appears to be little use on this shrub however. The increase in density for this species since 1982 is more reflective of the much larger sample used in 1995 and 2000 which gives better population estimates for species with discontinuous and/or clumped distributions.

Other browse growing on the site include: mountain low rabbitbrush, snakeweed, Oregon grape, Wood's rose and snowberry. These species show little or no utilization. Ponderosa pine surround the site and a few mature and young trees are scattered on the site. Point-center quarter data from 2000 estimate 21 trees/acre with an average diameter of 3.4 inches. Overhead canopy cover averages 2% directly on the site.

The herbaceous understory is diverse and abundant with grasses and forbs combining to produce 49% of the total vegetative cover in 1995 and 58% in 2000. The dominant grass by far is Kentucky bluegrass which currently ('00) provides 85% of the total grass cover. It forms a dense sod over much of the area which tends to exclude other native grass and forb species. The only other common grass species is needle-and-thread.

Forbs are diverse and produced as much cover as grasses in 1995, with 32 perennial and 4 annual species being encountered. Cover of forbs decreased in 2000 while that of grasses increased. Sum of nested frequency of

forbs and grasses both declined in 2000, due primarily to drought. The most numerous perennial forbs include: arrowleaf balsamroot, pussytoes and rock goldenrod. Two annual forbs, slenderleaf collomia and littleflower collinsia were abundant in 1995, but due to the dry conditions in 2000, they declined significantly.

1982 APPARENT TREND ASSESSMENT

Soil trend appears stable with little evidence of extensive soil movement. The vegetative cover is irregular and somewhat unevenly spaced but quite dense where it occurs. Vegetative trend also appears stable, although open to more question. Shrub density could be better, especially among the more preferred species which show relatively heavy levels of use. Undesirable shrubs are not currently abundant and show few signs of rapid increase. Grasses and forbs are fairly dense and may inhibit, to some extent, shrub reproduction.

1988 TREND ASSESSMENT

Vegetative and litter cover remain excellent, providing adequate ground cover, yet the data shows an increase in the proportion of pavement and rock cover. As a result, bare soil decreased from 36% to 25%. Aside from rather significant soil loss from the roads and a nearby large gully, soil erosion is not a problem on the well-vegetated study site. Trend for soil is slightly improved. The browse trend is also up for the preferred species, mountain big sagebrush and bitterbrush. Densities have increased, decadency rates are low, vigor is generally good and reproduction is excellent. Trend for the herbaceous understory is up with an increase in the quadrat frequency of grasses and forbs.

TREND ASSESSMENT

soil - slightly up (4)

browse - up (5)

herbaceous understory - up (5)

1995 TREND ASSESSMENT

Ground cover characteristics continue to improve with percent bare ground declining from 25% to 17%. Litter cover has also increased slightly. Herbaceous plants make up 50% of the vegetation cover, further protecting the soil from erosion. The browse trend is improving for mountain big sagebrush due to increased density, good vigor, low percent decadency, and good recruitment. Trend for bitterbrush is slightly up due to reduced heavy use, good vigor, and a reduction in percent decadency. Overall, trend for browse is up. Trend for the herbaceous understory is also up due to a large increase in sum nested frequency for perennial grasses and forbs.

TREND ASSESSMENT

soil - up (5)

browse - up (5)

herbaceous understory - up (5)

2000 TREND ASSESSMENT

Trend for soil is up. Percent cover of vegetation and litter have moderately increased while percent cover of bare ground continues to decrease. This has resulted in an improvement in the ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground from 2.9:1 to 4.1:1. Herbaceous cover has also increased from 27% to 32% since 1995. There is no significant erosion occurring on the site. Trend for the key browse species, mountain big sagebrush and bitterbrush, are stable. Sagebrush shows only light to moderate use but percent decadence has increased from 6% to 29% due to drought. Vigor continues to be normal on most plants

and recruitment from young plants is currently good at 11%. Bitterbrush is moderately browsed, in good vigor, and has low decadency. Trend for the herbaceous understory is slightly down and still dominated by Kentucky bluegrass. Sum of nested frequency of perennial grasses and forbs have declined slightly. Kentucky bluegrass currently provides 85% of the grass cover and 66% of the herbaceous cover. It actually increased significantly in nested frequency and nearly doubled in cover. Nested frequency of thickspike wheatgrass, orchardgrass, prairie Junegrass, Sandberg bluegrass, and bottlebrush squirreltail declined significantly but they were never very abundant. Nested frequency of perennial forbs declined slightly while frequency of the annual forbs, slenderleaf collomia and littleflower collinsia, declined significantly due to the dry conditions.

TREND ASSESSMENT

soil - up (5)

browse - stable (3)

herbaceous understory - slightly down, still dominated by Kentucky bluegrass (2)

HERBACEOUS TRENDS --
Herd unit 08B, Study no: 4

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	_a 37	_b 110	_a 19	-	21	37	10	.88	.12
G	Agropyron spicatum	-	4	3	-	-	2	1	.03	.00
G	Agropyron trachycaulum	-	-	4	4	-	-	2	-	.03
G	Bromus tectorum (a)	-	5	-	-	-	2	-	.15	-
G	Carex spp.	20	17	18	4	11	7	9	.08	.16
G	Dactylis glomerata	_a -	_b 25	_a 4	-	-	10	2	.07	.18
G	Elymus junceus	-	-	-	1	-	-	-	-	-
G	Danthonia spicata	-	-	1	-	-	-	1	-	.00
G	Koeleria cristata	_b 18	_b 18	_a 3	-	9	8	1	.11	.03
G	Poa fendleriana	_a -	_b 28	_b 11	-	-	11	6	.25	.08
G	Poa pratensis	_a 303	_a 287	_b 352	-	98	91	99	10.21	21.30
G	Poa secunda	_a 8	_b 33	_a 11	44	5	13	4	.26	.04
G	Sitanion hystrix	_b 54	_b 40	_a 3	21	27	17	1	.28	.00
G	Stipa comata	_a 36	_b 82	_b 82	19	19	35	35	.97	3.17
G	Stipa lettermani	1	-	-	10	1	-	-	-	-
Total for Annual Grasses		0	5	0	0	0	2	0	0.15	0
Total for Perennial Grasses		477	644	511	98	191	231	171	13.18	25.17
Total for Grasses		477	649	511	98	191	233	171	13.33	25.17
F	Achillea millefolium	_a -	_a 1	_b 11	-	-	1	3	.00	.09
F	Agoseris glauca	_a -	_b 27	_a -	-	-	13	-	.09	-
F	Allium spp.	_a -	_b 46	_a -	26	-	22	-	.18	-
F	Antennaria rosea	_a 6	_b 37	_b 35	-	3	14	15	1.11	.92

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Arabis spp.	-	5	2	-	-	2	1	.01	.00
F	Artemisia ludoviciana	-	-	4	-	-	-	2	-	.18
F	Aster chilensis	_a 4	_b 24	_b 17	1	2	8	10	.26	.32
F	Astragalus spp.	-	-	2	-	-	-	1	-	.00
F	Balsamorhiza sagittata	_a 8	_b 57	_b 59	2	4	29	31	3.67	3.95
F	Calochortus nuttallii	_a -	_b 7	_a -	2	-	3	-	.01	-
F	Castilleja spp.	-	1	-	-	-	1	-	.00	-
F	Collomia linearis (a)	-	_b 195	_a 3	-	-	71	1	1.56	.00
F	Comandra pallida	54	72	66	18	22	30	29	.39	.65
F	Collinsia parviflora (a)	-	_b 255	_a 3	-	-	81	2	2.95	.01
F	Cymopterus longipes	8	7	19	-	3	3	9	.01	.07
F	Eriogonum alatum	_b 45	_a 6	_a 4	11	21	3	2	.07	.01
F	Erigeron divergens	28	-	-	-	12	-	-	-	-
F	Erigeron eatonii	_a 12	_a 11	_b 28	2	5	5	14	.02	.45
F	Erigeron flagellaris	_a -	_a 3	_b 36	-	-	1	14	.03	.93
F	Eriogonum umbellatum	6	6	4	4	3	2	2	.03	.15
F	Gayophytum ramosissimum (a)	-	2	-	-	-	1	-	.00	-
F	Gilia aggregata	-	-	-	3	-	-	-	-	-
F	Heterotheca villosa	_b 110	_a 39	_a 17	45	46	17	9	.29	.46
F	Holosteum umbellatum (a)	-	-	1	-	-	-	1	-	.03
F	Ipomopsis aggregata	_a -	_a -	_b 7	-	-	-	3	.00	.01
F	Lepidium spp. (a)	-	5	-	-	-	2	-	.01	-
F	Linum lewisii	40	35	35	20	19	16	16	.10	.24
F	Lithospermum ruderales	_a -	_a 2	_b 12	-	-	1	6	.03	.10
F	Lomatium spp.	_a -	_b 6	_a -	-	-	4	-	.02	-
F	Lupinus argenteus	1	-	-	-	1	-	-	-	-
F	Lychnis drummondii	-	-	-	3	-	-	-	-	-
F	Oenothera pallida	_b 26	_a 6	_a -	-	11	2	-	.01	-
F	Penstemon humilis	_a 2	_b 18	_{ab} 9	3	2	8	4	.14	.04
F	Petrorhiza pumila	40	27	23	19	19	14	10	.92	1.00
F	Phlox austromontana	_a -	_b 8	_{ab} 3	-	-	5	1	.51	.00
F	Phlox longifolia	_a -	_b 7	_b 6	-	-	3	3	.01	.04
F	Phlox spp.	_a -	_b 21	_a -	-	-	7	-	.03	-
F	Polygonum douglasii (a)	-	_b 51	_a 14	-	-	24	7	.19	.03
F	Sedum lanceolatum	_c 23	_b 13	_a -	-	11	5	-	.02	-
F	Solidago sparsiflora	17	27	10	-	8	14	6	.51	.24
F	Taraxacum officinale	_a -	_b 11	_{ab} 6	-	-	5	2	.05	.01
F	Tragopogon dubius	5	8	5	1	2	5	3	.02	.04

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Trifolium gymnocarpon	a-	b10	b6	-	-	5	4	.03	.02
F	Zigadenus spp.	-	3	-	-	-	1	-	.00	-
Total for Annual Forbs		0	508	21	0	0	179	11	4.72	0.08
Total for Perennial Forbs		435	551	426	160	194	249	200	8.65	10.01
Total for Forbs		435	1059	447	160	194	428	211	13.38	10.09

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

BROWSE TRENDS --

Herd unit 08B, Study no: 4

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	0	1	-	.38
B	Artemisia tridentata vaseyana	84	90	14.17	13.44
B	Ceanothus fendleri	23	32	6.81	3.92
B	Chrysothamnus viscidiflorus lanceolatus	26	21	.71	.33
B	Gutierrezia sarothrae	3	1	.03	.15
B	Mahonia repens	10	13	.45	.16
B	Pinus ponderosa	0	2	-	1.23
B	Purshia tridentata	52	46	3.98	6.00
B	Rosa woodsii	2	0	-	-
B	Symphoricarpos oreophilus	4	2	.79	.21
Total for Browse		204	208	26.97	25.85

CANOPY COVER --

Herd unit 08B, Study no: 4

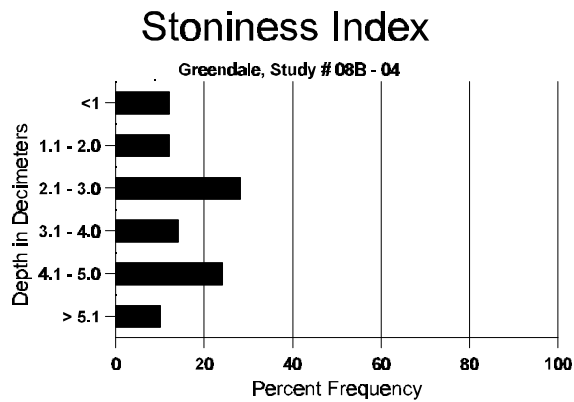
Species	Percent Cover	
	'95	'00
Pinus ponderosa	-	2

BASIC COVER --
Herd unit 08B, Study no: 4

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	384	364	9.25	10.75	46.69	59.22
Rock	144	84	2.25	4.00	2.57	1.79
Pavement	158	118	0	7.00	1.43	1.28
Litter	398	389	51.25	53.25	55.45	65.27
Cryptogams	33	40	1.25	0	.57	.75
Bare Ground	280	193	36.00	25.00	16.99	11.93

SOIL ANALYSIS DATA --
Herd Unit 8B, Study # 4, Study Name: Greendale

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
19.86	56.2 (18.11)	6.3	61.4	21.7	16.9	2.5	3.3	227.2	0.6



PELLET GROUP FREQUENCY --
Herd unit 08B, Study no: 4

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre	Days Use per Acre (ha)
Rabbit	-	11	348	N/A
Elk	2	6	800	62 (152)
Deer	8	35	366	28 (69)
Cattle	1	3	122	10 (25)
Moose	-	-	9	0.5 (1)

BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 4

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Amelanchier alnifolia</i>																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	29	45	0
	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	26	35	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
		'82 00%			'82 00%			'82 00%										
		'88 00%			'88 00%			'88 00%										
		'95 00%			'95 00%			'95 00%										
		'00 00%			'00 00%			'00 00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	20		-			
<i>Artemisia tridentata vaseyana</i>																		
S	'82	2	-	-	-	-	-	-	-	-	-	2	-	-	133			2
	'88	13	-	-	-	-	-	-	-	-	10	-	3	-	866			13
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	16	4	-	-	-	-	1	-	-	19	2	-	-	1400			21
	'95	6	20	-	-	-	-	-	-	-	26	-	-	-	520			26
	'00	25	1	-	-	-	-	-	-	-	26	-	-	-	520			26
M	'82	21	-	-	-	-	-	-	-	-	17	4	-	-	1400	24	31	21
	'88	15	17	2	1	1	-	-	-	-	36	-	-	-	2400	26	26	36
	'95	50	105	25	-	3	-	-	-	-	183	-	-	-	3660	19	30	183
	'00	82	51	-	4	1	4	2	-	-	144	-	-	-	2880	19	27	144
D	'82	2	3	-	-	-	-	-	-	-	-	5	-	-	333			5
	'88	5	3	1	-	-	-	-	-	-	9	-	-	-	600			9
	'95	6	6	1	-	-	-	-	-	-	10	-	-	3	260			13
	'00	29	30	-	8	1	-	2	-	-	56	-	-	14	1400			70
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	220			11
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	400			20
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
		'82 12%			'82 00%			'82 00%			+61%							
		'88 38%			'88 05%			'88 00%			+ 1%							
		'95 60%			'95 12%			'95 01%			+ 8%							
		'00 35%			'00 02%			'00 06%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	1733	Dec:	19%			
												'88	4400		14%			
												'95	4440		6%			
												'00	4800		29%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total				
		1	2	3	4		1	2					
Ceanothus fendleri													
Y	82	1	-	-	-	-	-	-	1	66		1	
	88	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	0			0	
	00	4	-	-	-	-	-	-	4			4	
M	82	-	-	-	-	-	-	-	0	-	-	0	
	88	-	-	-	-	-	-	-	0	-	-	0	
	95	39	-	-	-	-	-	-	39	9	49	39	
	00	39	-	-	2	-	-	-	41	8	37	41	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>		<u>% Change</u>			
'82		00%			00%			00%					
'88		00%			00%			00%					
'95		00%			00%			00%		+13%			
'00		00%			00%			00%					
Total Plants/Acre (excluding Dead & Seedlings)										'82	66	Dec:	-
										'88	0		-
										'95	780		-
										'00	900		-
Chrysothamnus viscidiflorus lanceolatus													
Y	82	-	-	-	-	-	-	-	0			0	
	88	-	-	-	-	-	-	-	0			0	
	95	2	-	-	-	-	-	-	2			2	
	00	1	-	-	-	-	-	-	1			1	
M	82	6	-	-	-	-	-	-	6	10	9	6	
	88	6	-	-	-	-	1	-	6	12	10	7	
	95	30	1	-	9	-	-	-	40	14	16	40	
	00	28	-	-	1	-	-	-	29	10	12	29	
D	82	-	-	-	-	-	-	-	0			0	
	88	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	0			0	
	00	-	-	-	-	-	1	-	1			1	
X	82	-	-	-	-	-	-	-	0			0	
	88	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	20			1	
	00	-	-	-	-	-	-	-	0			0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>		<u>% Change</u>			
'82		00%			00%			00%		+14%			
'88		00%			00%			00%		+45%			
'95		02%			00%			00%		-26%			
'00		00%			00%			00%					
Total Plants/Acre (excluding Dead & Seedlings)										'82	400	Dec:	0%
										'88	466		0%
										'95	840		0%
										'00	620		3%

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Gutierrezia sarothrae</i>																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	6	10	1
	'95	4	-	-	-	-	-	-	-	-	4	-	-	-	80	7	7	4
	'00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	-	-	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
		'82 00%			'82 00%			'82 00%										
		'88 00%			'88 00%			'88 00%			+18%							
		'95 00%			'95 00%			'95 00%			-50%							
		'00 00%			'00 00%			'00 00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	0	Dec:	-				
											'88	66		-				
											'95	80		-				
											'00	40		-				
<i>Mahonia repens</i>																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	71	-	-	-	-	-	-	-	-	71	-	-	-	1420			71
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	244	-	-	-	-	-	-	-	-	244	-	-	-	4880	3	4	244
	'00	16	-	-	-	-	-	-	-	-	16	-	-	-	320	2	2	16
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
		'82 00%			'82 00%			'82 00%										
		'88 00%			'88 00%			'88 00%										
		'95 00%			'95 00%			'95 00%			-64%							
		'00 00%			'00 00%			'00 00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	0	Dec:	-				
											'88	0		-				
											'95	4880		-				
											'00	1740		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Pinus ponderosa																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	-	2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	0	Dec:	-				
											'88	0		-				
											'95	0		-				
											'00	60		-				
Purshia tridentata																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	1	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	1	-	-	1	-	-	-	20		1	
Y	82	-	1	-	-	-	-	-	-	-	-	1	-	-	66		1	
	88	4	-	-	-	2	-	1	-	-	6	1	-	-	466		7	
	95	1	4	-	-	-	-	-	-	-	5	-	-	-	100		5	
	00	4	-	-	1	-	-	1	-	-	6	-	-	-	120		6	
M	82	-	17	3	-	-	-	-	-	-	8	12	-	-	1333	22	26	20
	88	3	8	8	-	1	-	2	-	-	18	-	4	-	1466	19	25	22
	95	4	35	5	2	11	-	-	-	-	57	-	-	-	1140	14	33	57
	00	20	21	-	4	10	1	-	-	-	56	-	-	-	1120	17	35	56
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	3	1	-	-	-	-	-	-	4	-	-	-	266		4	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	4	-	2	-	-	-	-	-	5	-	-	2	140		7	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		86%			14%			00%			+36%							
'88		42%			27%			12%			-44%							
'95		81%			08%			00%			+10%							
'00		51%			01%			03%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	1399	Dec:	0%				
											'88	2198		12%				
											'95	1240		0%				
											'00	1380		10%				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Rosa woodsii																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	7	8	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	180		-			
												'00	0		-			
Symphoricarpos oreophilus																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66	9	17	
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	10	19	
	95	5	-	-	-	-	-	-	-	-	5	-	-	-	100	17	53	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	20	66	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+ 0%							
'88		00%			00%			00%			+34%							
'95		00%			00%			00%			-60%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	66	Dec:	-			
												'88	66		-			
												'95	100		-			
												'00	40		-			

Trend Study 8B-5-00

Study site name: Bennett Ranch .

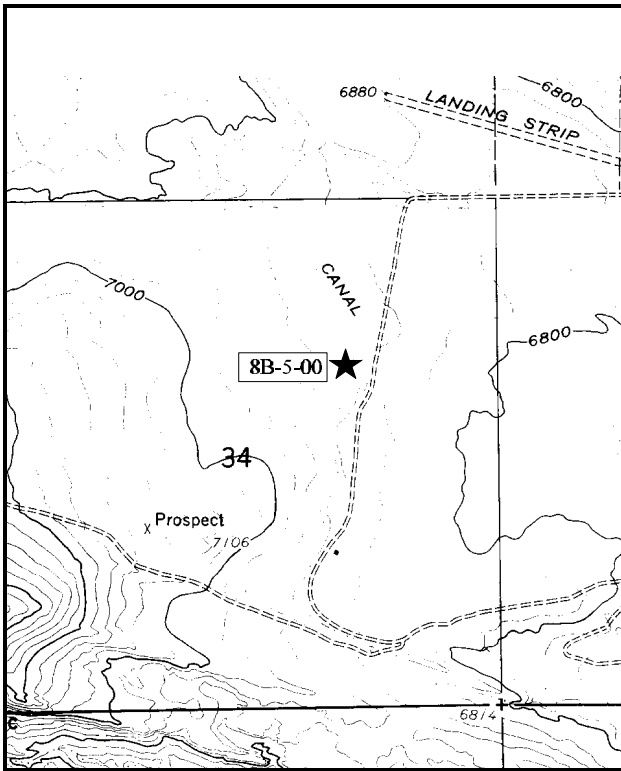
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 200°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

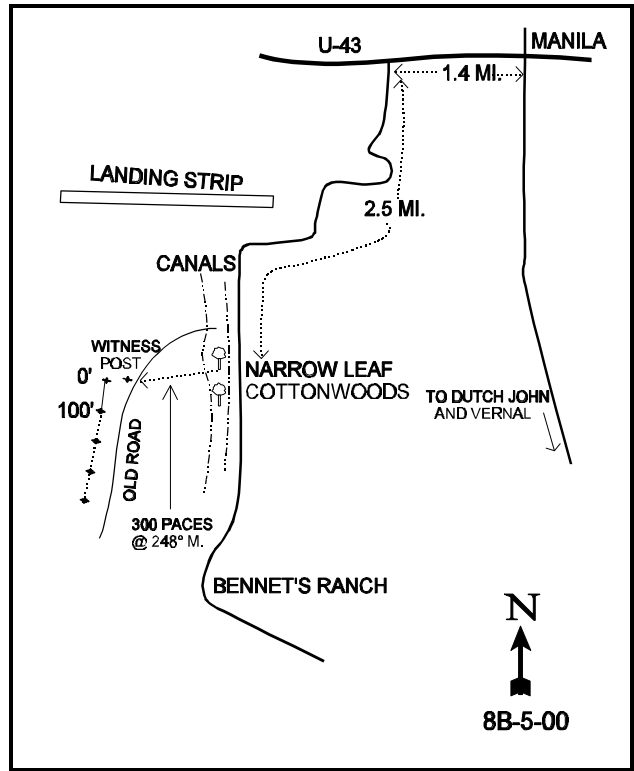
LOCATION DESCRIPTION

From the intersection of Highway U-43 and Main Street in Manila, proceed west on U-43 for 1.4 miles to a dirt road (Bennion Lane) on the left. Turn south and go 2.5 miles to a narrowleaf cottonwood on the right (west) side of the road. From the cottonwood, the 0-foot baseline stake is 300 paces away at a bearing of 234°M.



Map Name: Jessen Butte

Township 3N , Range 19E , Section 34



Diagrammatic Sketch

UTM 4534184 N , 603794 E

DISCUSSION

Trend Study No. 8B-5 (9-5)

The Bennett Ranch trend study is located on Bennett Ranch property which is privately owned. It samples a Wyoming big sagebrush community, located at the foot of Jensen Butte and above the irrigated hay fields and pastures near Manila. Slope is 5% to 10% with a northeast facing aspect and an elevation of approximately 6,920 feet. The area is used by cattle and wintering deer and elk. Pellet group data from 2000 estimate 14 elk, 9 deer, and 6 cow days use/acre (35 edu/ha, 22 ddu/ha and 15 cdu/ha). Deer and cattle use appears to have been much heavier in 1995, due to the substantially higher quadrat frequencies of pellet groups (see pellet group table).

Soils are relatively shallow, alluvially deposited, and rocky on the surface and throughout the profile. Rooting depth is restricted in some areas as evidenced by the abundance of black sagebrush. Effective rooting depth is estimated at a little less than 9 inches. Soil texture is a sandy clay loam with a neutral pH. Phosphorus is limited at only 6 ppm, where values less than 10 ppm can limit normal plant growth and development. Ground cover is typical for a Wyoming big sagebrush site with a moderately high percentage of bare ground. Some erosion is occurring on the site but it is not serious due to the lack of slope.

The key browse includes Wyoming big sagebrush and black sagebrush which provide over 80% of the browse cover. Wyoming big sagebrush currently provides 68% of the shrub cover with a density estimated at 5,260 plants/acre in 2000. These shrubs have been heavily utilized in the past with 88% of the plants sampled being heavily hedged (>60% of stems browsed) in 1982. Vigor was also poor on 29% of the population. Use was more moderate in 1988 and 1995 with improved vigor. Use is currently ('00) moderate to heavy. However, due to the dry conditions, 21% of the population was classified as having poor vigor. Percent decadence has increased from 7% in 1995 to 39% in 2000. In addition, 54% of the decadent plants sampled were classified as dying. No seedlings were encountered in 2000, with young plants only accounting for 2% of the population. As a result, the population of Wyoming big sagebrush appears to be in a state of decline. Due to the limited effective rooting depth of the soil, this is a marginal site for Wyoming big sagebrush with this high of a density during drought years. Sagebrush sampled during the very dry summer of 2000 produced very small leaves with few seed heads. Many of the plants were dropping leaves to conserve water.

Black sagebrush appears to have a more stable population of 4,060 plants/acre in 2000. They are relatively small plants, measuring only 6 inches in height with a crown diameter averaging 15 inches. Use has been light to moderate since 1982 with normal vigor on most plants. Other preferred browse encountered on the site include small numbers of winterfat, white rubber rabbitbrush and slenderbush eriogonum.

Grasses and forbs are quite diverse for a Wyoming big sagebrush site. Grasses combine to produce about 8% average cover, while forbs on average make up about 5% cover. Dominant grasses include: thickspike wheatgrass, muttongrass, Sandberg bluegrass, bottlebrush squirreltail and needle-and-thread grass. The only abundant forbs include Hood's phlox and scarlet globemallow. Utilization of the grasses has been heavy in the past but there was no apparent use observed in 2000.

1982 APPARENT TREND ASSESSMENT

Soil trend appears stable to declining. It is fortunate that this site occurs on nearly level terrain, otherwise erosion and soil loss would be much greater. Vegetative condition is rather poor due to heavy browsing. Trend is difficult to judge but it is considered slightly downward at this time. The herbaceous understory is obviously depleted but it is not immediately apparent if the shrub density is also declining.

1988 TREND ASSESSMENT

An increase in most ground cover components was noted in 1988. The percentage of bare soil decreased from 34% in 1982 to 23.5%. There is some soil movement in the bare interspaces. A healthier herbaceous understory would do much to help limit erosion on the gentle slope. Trend for soil is slightly up. Trend for black sagebrush and Wyoming big sagebrush is up with increased densities, reduced heavy use, and improved vigor. Trend for the herbaceous understory is also up slightly due to increased quadrat frequency of grasses and forbs.

TREND ASSESSMENT

soil - slightly up (4)

browse - up (5)

herbaceous understory - slightly up (4)

1995 TREND ASSESSMENT

Percent litter cover has declined slightly as has percent bare ground. The soil trend is considered stable at this time. Trend for Wyoming big sagebrush is slightly up due to decreased heavy use, improved vigor, good recruitment, and a low decadency rate of only 7%. The population density has declined since 1988 but this decline came mostly from the decadent age class. The number of mature plants has increased. Black sagebrush is of secondary importance on this site. It displays a stable trend but produces little forage due to its small size. The herbaceous understory has a slightly downward trend. Sum of nested frequency of perennial grasses and forbs declined slightly.

TREND ASSESSMENT

soil - stable (3)

browse - slightly up (4)

herbaceous understory - slightly down (2)

2000 TREND ASSESSMENT

Trend for soil continues to be stable. Percent cover of bare ground increased slightly while cover from litter declined slightly. However, percent cover of vegetation has increased and the ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground has improved. Trend for the key browse species, Wyoming big sagebrush, is down. Density has declined and poor vigor and percent decadence have increased. In addition, over half of the 2,060 decadent plants sampled were classified as dying. Reproduction is poor with no seedlings sampled and young plants account for only 2% of the population. It appears that the restricted rooting depth of the shallow soil makes this a marginal site for Wyoming big sagebrush at these densities during dry years. In contrast, black sagebrush, which is adapted to more shallow soils, has a stable trend. It displays light to moderate use, good vigor and low decadence. Since Wyoming big sagebrush provides 68% of the browse cover and the majority of the available forage (with winter snow cover), the browse trend is considered slightly down at this time. Trend for the herbaceous understory is stable. Sum of nested frequency for perennial grasses and forbs declined slightly but not enough to warrant a downward trend. The most dominant grasses, thickspike wheatgrass, mutton bluegrass and needle-and-thread, did not change significantly in nested frequency.

TREND ASSESSMENT

soil - stable (3)

browse - slightly down (2)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 08B, Study no: 5

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	<i>Agropyron cristatum</i>	1	-	-	-	1	-	-	-	-
G	<i>Agropyron dasystachyum</i>	a209	ab220	b247	14	77	79	82	2.75	3.98
G	<i>Agropyron intermedium</i>	-	-	3	-	-	-	1	-	.03
G	<i>Hilaria jamesii</i>	-	-	3	-	-	-	1	-	.00
G	<i>Koeleria cristata</i>	b47	a19	a7	1	18	8	4	.11	.07
G	<i>Oryzopsis hymenoides</i>	a24	b35	a14	29	10	21	8	.43	.19
G	<i>Poa fendleriana</i>	b177	a47	a81	45	67	21	32	.88	1.50
G	<i>Poa secunda</i>	a68	b71	a61	-	30	31	28	.74	.46
G	<i>Sitanion hystrix</i>	40	81	17	13	19	32	8	1.36	.38
G	<i>Stipa comata</i>	b111	ab104	a87	55	59	48	32	1.99	1.93
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		677	577	520	157	281	240	196	8.27	8.57
Total for Grasses		677	577	520	157	281	240	196	8.27	8.57
F	<i>Agoseris glauca</i>	a-	a-	b12	-	-	-	5	-	.02
F	<i>Arabis spp.</i>	b4	b16	a-	-	3	6	-	.03	-
F	<i>Astragalus spp.</i>	3	-	1	2	2	-	1	-	.00
F	<i>Calochortus nuttallii</i>	b7	b6	a-	-	3	3	-	.01	-
F	<i>Castilleja spp.</i>	a-	a-	b4	-	-	-	3	-	.04
F	<i>Chaenactis douglasii</i>	a-	a1	b17	-	-	1	8	.00	.09
F	<i>Chenopodium leptophyllum (a)</i>	-	b47	a-	2	-	20	-	.10	-
F	<i>Cirsium spp.</i>	-	-	3	-	-	-	1	-	.00
F	<i>Crepis acuminata</i>	b16	b12	a1	-	11	8	1	.04	.00
F	<i>Descurainia pinnata (a)</i>	ab13	b32	a2	-	9	17	1	.16	.00
F	<i>Erigeron spp.</i>	a-	b4	b3	7	-	4	3	.02	.01
F	<i>Haplopappus acaulis</i>	-	-	3	-	-	-	1	-	.03
F	<i>Hymenoxys richardsonii</i>	b17	a1	ab7	5	8	1	3	.03	.09
F	<i>Lesquerella alpina</i>	-	4	2	-	-	2	1	.03	.00
F	<i>Leucelene ericoides</i>	ab23	a5	b31	-	10	3	17	.04	.38
F	<i>Linum lewisii</i>	ab37	b62	a26	3	21	29	15	.21	.13
F	<i>Machaeranthera canescens</i>	1	3	8	-	1	2	4	.18	.09
F	<i>Penstemon humilis</i>	b7	a-	a1	-	4	-	1	-	.03
F	<i>Physaria acutifolia</i>	-	-	1	-	-	-	1	-	.00
F	<i>Phlox hoodii</i>	b146	a94	ab124	42	63	45	56	2.59	2.97
F	<i>Senecio multilobatus</i>	-	-	4	-	-	-	2	-	.03
F	<i>Sphaeralcea coccinea</i>	a80	b119	ab98	38	38	50	44	1.36	1.22
F	<i>Townsendia incana</i>	b7	a-	a-	-	3	-	-	-	-

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Unknown forb-perennial	_b 8	_a -	_a -	-	3	-	-	-	-
	Total for Annual Forbs	13	79	2	0	9	37	1	0.26	0.00
	Total for Perennial Forbs	356	327	346	27	170	154	167	4.57	5.19
	Total for Forbs	369	406	348	27	179	191	168	4.84	5.19

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

BROWSE TRENDS --

Herd unit 08B, Study no: 5

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia nova	46	51	5.64	4.62
B	Artemisia tridentata wyomingensis	97	94	16.11	16.09
B	Ceratoides lanata	8	7	.60	.04
B	Chrysothamnus nauseosus hololeucus	1	0	.15	-
B	Chrysothamnus viscidiflorus viscidiflorus	9	19	.33	.39
B	Eriogonum microthecum	3	4	.03	.01
B	Gutierrezia sarothrae	25	61	.04	1.34
B	Juniperus osteosperma	-	-	.93	-
B	Opuntia spp.	30	41	1.58	1.11
B	Pinus edulis	0	0	-	.00
	Total for Browse	219	277	25.44	23.62

BASIC COVER --

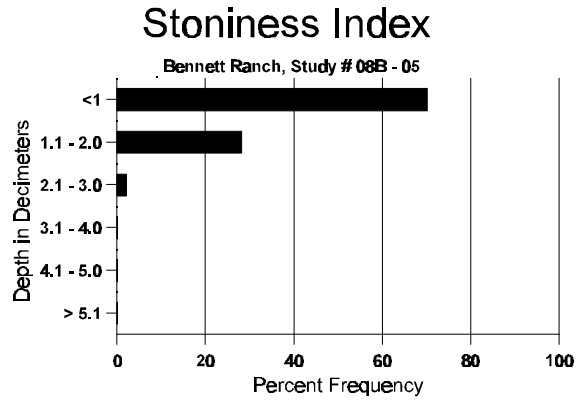
Herd unit 08B, Study no: 5

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	334	339	3.00	6.75	32.09	41.79
Rock	239	129	5.50	9.00	9.55	5.67
Pavement	256	285	11.50	14.25	5.40	8.54
Litter	390	366	45.25	41.25	39.65	36.47
Cryptogams	96	194	.75	5.25	3.51	6.07
Bare Ground	319	315	34.00	23.50	21.24	29.50

SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 5, Study Name: Bennett Ranch

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	%OM	PPM P	PPM K	dS/m
8.83	73.6 (10.16)	7.1	61.4	16.0	22.6	2.1	6.0	92.8	0.9



PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 5

Type	Quadrat Frequency	
	'95	'00
Rabbit	3	2
Elk	10	9
Deer	32	7
Cattle	10	3

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
00	00
70	N/A
183	14 (35)
122	9 (23)
70	6 (14)

BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 5

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia frigida																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	1	1	-	-	-	5	-	-	7	-	-	-	466	5	0	7
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		13%			13%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	532		-			
												'95	0		-			
												'00	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Artemisia nova																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	11	-	-	1	-	-	-	-	-	11	1	-	-	800		12
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2
Y	82	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2
	88	12	3	1	-	-	-	-	-	-	16	-	-	-	1066		16
	95	18	8	-	-	-	-	-	-	-	26	-	-	-	520		26
	00	13	-	-	-	-	-	-	-	-	13	-	-	-	260		13
M	82	25	2	-	-	-	-	-	-	-	27	-	-	-	1800	6 12	27
	88	14	26	8	-	-	-	-	-	-	48	-	-	-	3200	7 14	48
	95	77	29	5	-	-	-	-	-	-	111	-	-	-	2220	7 20	111
	00	139	22	8	5	-	-	-	-	-	174	-	-	-	3480	6 15	174
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	10	7	1	-	-	-	-	-	-	14	-	2	2	1200		18
	95	-	-	-	1	-	-	-	-	-	-	-	-	1	20		1
	00	15	1	-	-	-	-	-	-	-	9	-	-	7	320		16
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'82		07%			00%			00%			+65%						
'88		44%			12%			05%			-50%						
'95		27%			04%			.72%			+32%						
'00		11%			04%			03%									
Total Plants/Acre (excluding Dead & Seedlings)												'82	1933	Dec:	0%		
												'88	5466		22%		
												'95	2760		1%		
												'00	4060		8%		

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Artemisia tridentata wyomingensis</i>																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	10	-	-	-	-	-	-	-	-	10	-	-	-	666		10	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	88	11	3	-	-	-	-	-	-	-	14	-	-	-	933		14	
	95	17	11	3	-	-	-	-	-	-	31	-	-	-	620		31	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
M	82	3	3	47	-	-	-	-	-	-	41	-	12	-	3533	11	17	53
	88	2	31	24	-	-	-	-	-	-	51	1	4	1	3800	13	16	57
	95	41	149	59	-	2	-	-	-	-	243	4	4	-	5020	14	27	251
	00	42	54	32	-	6	22	-	-	-	149	7	-	-	3120	12	25	156
D	82	-	-	5	-	-	-	-	-	-	-	-	1	4	333		5	
	88	15	12	9	-	-	-	-	-	-	21	2	4	9	2400		36	
	95	-	7	14	1	-	-	-	-	-	15	-	-	7	440		22	
	00	32	55	10	-	-	6	-	-	-	45	2	-	56	2060		103	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	280		14	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	200		10	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		05%			88%			29%			+45%							
'88		43%			31%			17%			-15%							
'95		56%			25%			04%			-13%							
'00		44%			27%			21%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	3932	Dec:	8%				
											'88	7133		34%				
											'95	6080		7%				
											'00	5260		39%				
<i>Ceratoides lanata</i>																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
	00	1	3	-	-	-	-	-	-	-	4	-	-	-	80		4	
M	82	4	-	-	-	-	-	-	-	-	4	-	-	-	266	4	6	4
	88	-	2	4	-	1	-	-	-	-	7	-	-	-	466	4	5	7
	95	2	6	1	-	1	-	-	-	-	10	-	-	-	200	5	8	10
	00	3	1	-	-	-	-	-	-	-	4	-	-	-	80	4	6	4
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%			+43%							
'88		43%			57%			00%			-53%							
'95		64%			09%			00%			-27%							
'00		50%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	266	Dec:	-				
											'88	466		-				
											'95	220		-				
											'00	160		-				

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4		1	2				
Chrysothamnus nauseosus hololeucus												
M	82	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	20	17	13	1
	00	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>				<u>%Change</u>				
'82		00%	00%	00%								
'88		00%	00%	00%								
'95		00%	00%	00%								
'00		00%	00%	00%								
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	-			
						'88	0		-			
						'95	20		-			
						'00	0		-			
Chrysothamnus viscidiflorus viscidiflorus												
Y	82	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	40			2
M	82	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	0	-	-	0
	95	10	2	-	-	-	-	-	240	9	14	12
	00	20	-	-	-	-	-	-	400	9	15	20
D	82	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	0			0
	00	2	1	-	-	-	-	-	60			3
X	82	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	20			1
	00	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>				<u>%Change</u>				
'82		00%	00%	00%								
'88		00%	00%	00%								
'95		17%	00%	00%				+52%				
'00		04%	00%	08%								
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	0%			
						'88	0		0%			
						'95	240		0%			
						'00	500		12%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total		
		1	2	3	4		1	2			
<i>Eriogonum microthecum</i>											
Y	82	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	20		1
M	82	-	-	-	-	-	-	-	0	-	0
	88	-	-	-	-	-	-	-	0	-	0
	95	7	-	-	-	-	-	-	140	4	7
	00	3	-	-	-	-	-	-	60	4	7
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>			<u>%Change</u>				
'82		00%	00%	00%							
'88		00%	00%	00%							
'95		00%	00%	00%			-43%				
'00		00%	00%	00%							
Total Plants/Acre (excluding Dead & Seedlings)					'82	0	Dec:				
					'88	0					
					'95	140					
					'00	80					
<i>Gutierrezia sarothrae</i>											
S	82	-	-	-	-	-	-	-	0		0
	88	1	-	-	-	-	-	-	66		1
	95	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	20		1
Y	82	-	-	-	-	-	-	-	0		0
	88	51	-	-	2	-	-	-	3533		53
	95	-	-	-	-	-	-	-	0		0
	00	4	-	-	-	-	-	-	80		4
M	82	47	-	-	-	-	-	-	3133	5	5
	88	62	-	-	1	-	-	1	4266	5	4
	95	32	-	-	2	-	-	-	680	12	14
	00	157	-	-	2	-	-	-	3180	5	7
D	82	-	-	-	-	-	-	-	0		0
	88	1	-	-	-	-	-	-	66		1
	95	-	-	-	-	-	-	-	0		0
	00	2	-	-	-	-	-	-	40		2
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>			<u>%Change</u>				
'82		00%	00%	00%			+60%				
'88		00%	00%	.84%			-91%				
'95		00%	00%	00%			+79%				
'00		00%	00%	.60%							
Total Plants/Acre (excluding Dead & Seedlings)					'82	3133	Dec:				
					'88	7865					
					'95	680					
					'00	3300					

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4		1	2				
Opuntia spp.												
S	82	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	66		1	
	95	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	20		1	
Y	82	-	-	-	-	-	-	-	0		0	
	88	8	-	-	2	-	-	-	666		10	
	95	1	-	-	-	-	-	-	20		1	
	00	3	-	-	1	-	-	-	80		4	
M	82	15	-	-	-	-	-	-	1000	4	6	15
	88	19	-	-	1	-	-	-	1333	3	5	20
	95	37	4	-	1	-	-	-	840	4	15	42
	00	61	-	-	-	-	-	-	1220	4	11	61
D	82	-	-	-	-	-	-	-	0		0	
	88	2	-	-	-	-	-	-	133		2	
	95	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>	<u>%Change</u>							
'82		00%	00%	00%	+53%							
'88		00%	00%	13%	-60%							
'95		09%	00%	00%	+35%							
'00		00%	00%	00%								
Total Plants/Acre (excluding Dead & Seedlings)					'82	1000	Dec:	0%				
					'88	2132		6%				
					'95	860		0%				
					'00	1320		2%				
Pinus edulis												
S	82	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>	<u>%Change</u>							
'82		00%	00%	00%								
'88		00%	00%	00%								
'95		00%	00%	00%								
'00		00%	00%	00%								
Total Plants/Acre (excluding Dead & Seedlings)					'82	0	Dec:	-				
					'88	0		-				
					'95	0		-				
					'00	0		-				

Trend Study 8B-6-00

Study site name: Death Valley .

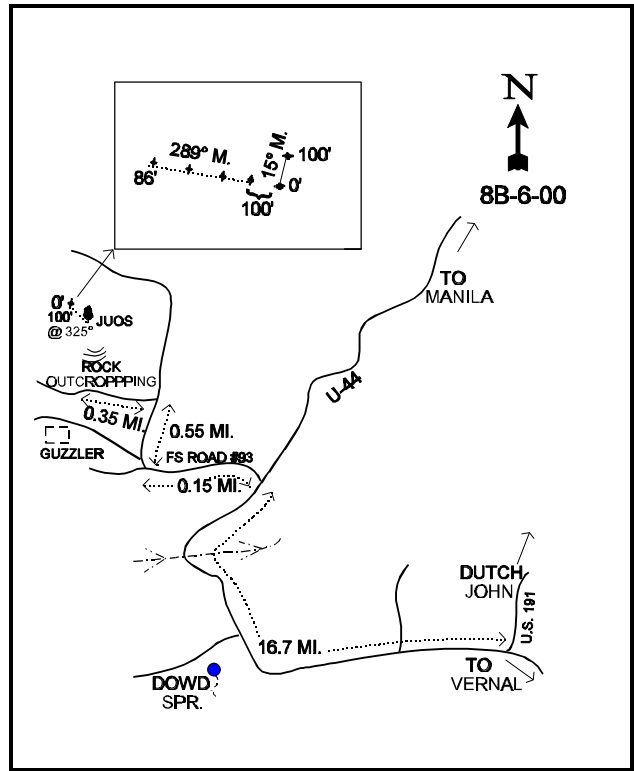
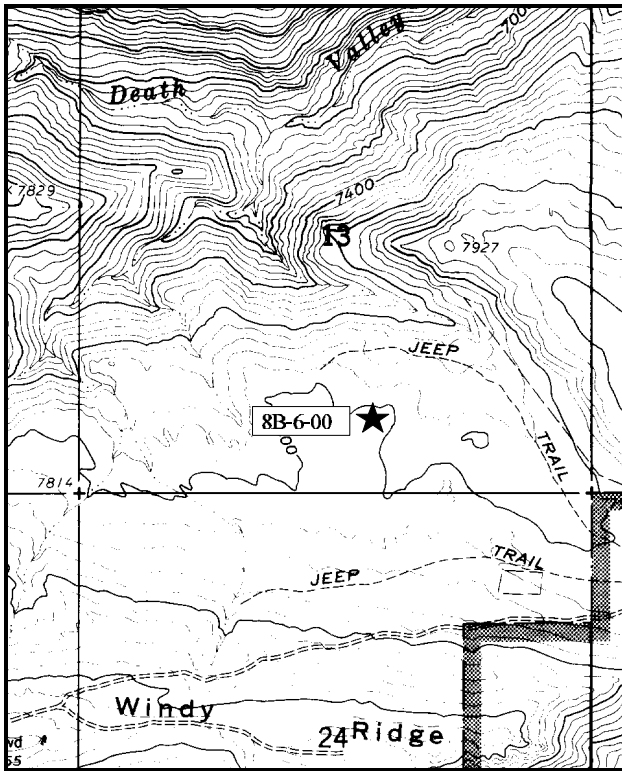
Range type: Mixed Mountain Brush .

Compass bearing: frequency baseline 15°M .

First frame placement on frequency belts 5 Feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the Dutch John turnoff on Highway U-44, proceed 16.7 miles towards Manila. As you reach the summit before dropping down into Sheep Creek, there will be a dirt road to the left. Turn left on FS road #93 and drive west for 0.75 miles until you pass a grove of ponderosa pines. Turn to the right. The road forks again almost immediately, keep to the right and proceed 0.55 miles to another faint fork. Turn left and drive west 0.35 miles to the top of a small knoll. To the north, two rock outcroppings mark the highest point of the knoll. From the juniper on top, the 0-foot baseline stake is 100 feet away at a bearing of 325 °M.



Map Name: Manila

Diagrammatic Sketch

Township 2N , Range 19E , Section 13

UTM 4528499.648 N, 606945.431 E

DISCUSSION

Trend Study No. 8B-6 (9-6)

This trend study is located on critical deer and elk winter range in Death Valley. It samples a sagebrush-mixed mountain brush range type at an elevation of 7,800 feet. Death Valley is a broad bench that drops off very rapidly towards Death Valley Creek to the north. The site slope is gentle (3%-5%) with a slight west aspect. Deer and elk use the area heavily in the winter. Pellet group data from 2000 estimate 58 deer and 48 elk use days/acre (143 ddu/ha and 119 edu/ha). Most of the pellet groups encountered appeared to be from winter use. A few cow pats from last season were encountered along with one moose pellet group.

Soils are sandy and shallow with some rock outcrops in the area. Effective rooting depth is estimated at nearly 10 inches. Soil texture is a loamy sand with a neutral pH. Phosphorus is limited at only 2.5 ppm. Values less than 10 ppm can limit normal plant growth and development. Erosion is not a problem due to the lack of slope, abundant well dispersed vegetation, and litter cover.

The most important aspect of this site is the browse composition. Eleven species of shrubs were identified during the 1995 reading and 12 in 2000. The key species are true mountain mahogany and mountain big sagebrush. Mahogany provided 59% of the total browse cover in 1995 and 55% in 2000. Mountain big sagebrush accounted for 20% of the total browse cover in 1995, increasing to 31% in 2000. Mahogany density declined from 933 plants/acre in 1982 to 533 by 1988. No decadent plants were encountered either year and vigor was good. Shrubs displaying heavy use increased from zero in 1982 to 13% in 1988. With the new, larger sample used in 1995, estimated mahogany density was 1,680 plants/acre. Vigor was generally good and percent decadence was low at 2%, even though heavy use had increased to 35%. Density is currently ('00) estimated at 1,060 plants/acre. Use is moderate to heavy and percent decadence has increased to 23%. Half of the decadent plants sampled (120 plants/acre) were classified as dying. At this time there are no dead plants in the population. Currently ('00), reproduction in the form of seedling and young plants is poor.

Mountain big sagebrush has a fairly stable population of about 2,200 plants/acre. Most plants have been classified with light use in 1988, 1995, and 2000. The majority of the time (3 of the 4 sampling periods), more of the utilization has been classified as moderate rather than heavy. The exception was in 1995. Vigor has been normal on most plants over the years, although percent decadence was moderately high in 1982 and 1988 before a decline in 1995, down to 18%. Currently ('00) percent decadence is 37% with poor vigor displayed by 19% of the population. In addition, 46% of the decadent plants sampled were classified as dying (380 plants/acre). No seedlings have been encountered on the site since 1988. The average number of young plants for each sampling period is almost 17%, while the average percent of the population that is dead is 17%. These data would indicate that this population is just barely maintaining their numbers. If drought conditions continue, this population would probably decline in numbers. However, a return to normal precipitation patterns could reverse this trend.

Other important browse include a few large serviceberry, black sagebrush, and antelope bitterbrush. Some fringed sage, rabbitbrush, Oregon grape, snowberry and gray horsebrush were also sampled in low numbers.

The herbaceous understory is abundant and diverse. Grasses are dominated by alpine fescue and Sandberg bluegrass which combined to produce 67% of the grass cover in 1995, increasing to 84% in 2000. Thickspike wheatgrass is also fairly common. Forbs are very diverse, but only a few species produce more than 1% cover.

1982 APPARENT TREND ASSESSMENT

This is one of the better winter range sites on the unit. Overall range condition appears good and trend appears

stable. From a trend monitoring point of view, one of the more important items will be to keep track of the key species, especially reproduction. The field observers saw few established seedlings or young plants but also no decadent plants. A fairly large number of seedlings-of-the-year were observed but were not sampled.

1988 TREND ASSESSMENT

Trend for soil is up. Increases in the measured percentages of vegetative and cryptogamic ground cover led to a significant decrease in the amount of bare soil. Percent bare ground has decreased from 29% in 1982 to 14% in 1988. The browse trend is mixed. Trend for one of the key species, mountain mahogany, is slightly down due to a slight decrease in population density. Trend for the other key species, mountain big sagebrush, is up due to a 54% increase in the population, excellent reproductive potential and a slight decrease in percent decadency. Overall, browse trend is up. Trend for the herbaceous understory is also up due to a dramatic increase in the quadrat frequency of grasses and forbs.

TREND ASSESSMENT

soil - up (5)

browse - up (5)

herbaceous understory - up (5)

1995 TREND ASSESSMENT

The soil trend is stable. The browse trend is mixed. Trend for mountain big sagebrush is slightly down, but it only contributes 20% of the total browse cover. The density of mature plants is stable, yet 32% of the decadent plants were classified as dying. This condition appears to be caused by heavy use, as 41% of the mature and decadent plants display heavy hedging (>60% of twigs browsed). Continued heavy use combined with prolonged drought will cause a downward trend in sagebrush. Another downward indicator for the population is the ratio of dead to live plants which is quite high at 1:9. True mountain mahogany shows a slightly upward trend. Population density increased, but much of this difference would mostly be due to the greatly increased sample size used in 1995. Vigor is generally good and percent decadence is low at 2%. Heavy use has continually increased since 1982. Currently, 35% of the population displays heavy hedging. However, this is not excessive. According to Shepherd (1971), shrubs from the Rosaceae family like serviceberry, bitterbrush, and mountain mahogany, can withstand heavy use for many years without causing reduced vigor. Overall, trend for browse is stable. The herbaceous understory trend is stable. Sum of nested frequency for grasses declined slightly while frequency of perennial forbs increased slightly. Nested frequency of alpine fescue which accounts for 45% of the grass cover increased significantly. Other dominant grasses are thickspike wheatgrass and Sandberg bluegrass which declined significantly in nested frequency.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

2000 TREND ASSESSMENT

Trend for soil is fairly stable. Percent cover of bare ground increased slightly, while litter cover declined. However, vegetative cover increased and perennial grass cover increased three-fold from 6% to 19%. Erosion is minimal due to the abundant and well dispersed protective ground cover combined with the gentle terrain. Trend for the key browse species, true mountain mahogany, is down slightly. Use is similar to 1995 estimates, but density has declined, percent decadence has increased from 2% to 23% and half of the decadent plants sampled appear to be dying. However, this only accounts for about 120 plants/acre. Few seedlings were encountered

and no young plants were sampled. The very dry conditions of this season are mostly responsible for the trend on mahogany. A return to normal precipitation patterns will reverse this trend on this long lived shrub. Mountain big sagebrush, the other key browse on the site, displays many of the same trends as mahogany. Use is actually more moderate compared to 1995, but percent decadence has doubled and 46% of the decadent sagebrush were classified as dying. No seedlings were encountered and recruitment from young plants is poor. Trend for the herbaceous understory is up slightly. Sum of nested frequency of perennial grasses increased slightly and cover increased three-fold. The dominant grass, sheep fescue, increased significantly in nested frequency. Nested frequency of perennial forbs remained fairly stable.

TREND ASSESSMENT

soil - stable (3)

browse - down slightly (2)

herbaceous understory - up slightly (4)

HERBACEOUS TRENDS --

Herd unit 08B, Study no: 6

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	b153	a114	b162	20	64	51	61	.79	2.04
G	Bouteloua gracilis	-	-	3	-	-	-	1	-	.15
G	Carex spp.	42	31	23	6	19	14	9	.45	.26
G	Festuca ovina	a62	b118	c226	36	27	54	76	2.84	10.77
G	Koeleria cristata	b28	ab26	a13	25	14	10	5	.12	.10
G	Oryzopsis hymenoides	a-	b5	a-	2	-	3	-	.21	-
G	Poa secunda	b221	a132	a120	50	85	55	39	1.36	5.42
G	Sitanion hystrix	a-	a-	b6	-	-	-	3	-	.06
G	Stipa comata	a28	b57	a23	19	15	25	9	.52	.39
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		534	483	576	158	224	212	203	6.31	19.22
Total for Grasses		534	483	576	158	224	212	203	6.31	19.22
F	Agoseris glauca	-	-	2	-	-	-	1	-	.00
F	Allium spp.	70	78	64	36	30	32	29	.36	.57
F	Antennaria rosea	b15	a3	a6	10	8	2	2	.03	.06
F	Androsace septentrionalis (a)	-	1	-	-	-	1	-	.00	-
F	Arabis spp.	b35	a6	a3	1	18	3	2	.01	.01
F	Aster spp.	c72	a-	b10	4	32	-	4	-	.09
F	Balsamorhiza sagittata	3	-	-	-	1	-	-	-	-
F	Calochortus nuttallii	a-	b13	a-	3	-	6	-	.03	-
F	Chenopodium fremontii (a)	-	b8	a-	-	-	3	-	.04	-
F	Collomia linearis (a)	-	b74	a-	-	-	30	-	.43	-
F	Comandra pallida	a19	ab30	b55	5	10	17	25	.19	.45
F	Collinsia parviflora (a)	-	b143	a20	-	-	52	10	.91	.05
F	Cryptantha spp.	22	13	30	20	11	5	13	.33	.55

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	<i>Delphinium nuttallianum</i>	-	4	-	-	-	2	-	.01	-
F	<i>Descurainia pinnata</i> (a)	-	_b 12	_a -	-	-	4	-	.04	-
F	<i>Draba</i> spp. (a)	-	_a 87	_b 104	-	-	34	49	.59	1.08
F	<i>Erigeron eatonii</i>	_b 43	_b 43	_a 5	22	21	19	3	.92	.09
F	<i>Erigeron speciosus</i>	_a -	_b 13	_c 56	-	-	5	23	.22	1.09
F	<i>Eriogonum umbellatum</i>	_a 24	_{ab} 47	_b 57	10	11	20	25	1.33	1.27
F	<i>Gilia aggregata</i>	-	-	-	4	-	-	-	-	-
F	<i>Heterotheca villosa</i>	17	14	26	3	9	7	11	.23	.78
F	<i>Hymenoxys acaulis</i>	19	37	21	19	9	17	10	.23	.29
F	<i>Ipomopsis aggregata</i>	_a -	_a -	_b 11	-	-	-	5	-	.05
F	<i>Lepidium</i> spp. (a)	-	2	-	-	-	2	-	.01	-
F	<i>Lithospermum ruderales</i>	-	-	2	2	-	-	1	.00	.03
F	<i>Lupinus argenteus</i>	-	2	1	-	-	1	1	.00	.01
F	<i>Machaeranthera canescens</i>	_b 6	_a -	_b 6	3	3	-	4	.00	.02
F	<i>Microsteris gracilis</i> (a)	-	_b 96	_a 5	-	-	44	3	.53	.01
F	<i>Phacelia sericea</i>	_a 6	_b 34	_a 1	5	5	16	1	.08	.03
F	<i>Polygonum douglasii</i> (a)	-	_b 45	_a 8	-	-	21	3	.10	.01
F	<i>Sedum lanceolatum</i>	_a 50	_b 103	_b 85	37	26	40	43	.79	.68
F	<i>Senecio multilobatus</i>	1	6	3	-	1	3	2	.04	.01
F	<i>Taraxacum officinale</i>	-	3	-	-	-	2	-	.01	-
F	<i>Townsendia incana</i>	1	-	-	-	1	-	-	-	-
F	Unknown forb-perennial	-	3	-	47	-	1	-	.03	-
F	<i>Zigadenus paniculatus</i>	-	-	3	-	-	-	1	-	.03
Total for Annual Forbs		0	468	137	0	0	191	65	2.67	1.16
Total for Perennial Forbs		403	452	447	231	196	198	206	4.90	6.14
Total for Forbs		403	920	584	231	196	389	271	7.58	7.31

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

BROWSE TRENDS --
Herd unit 08B, Study no: 6

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	4	1	.91	.21
B	Artemisia frigida	0	2	-	-
B	Artemisia nova	3	0	-	-
B	Artemisia tridentata vaseyana	63	61	5.65	6.80
B	Cercocarpus montanus	61	43	16.22	12.24
B	Chrysothamnus viscidiflorus viscidiflorus	44	48	1.65	1.72
B	Gutierrezia sarothrae	0	2	-	-
B	Juniperus osteosperma	0	1	-	-
B	Mahonia repens	9	9	.69	.19
B	Opuntia spp.	22	23	.57	.24
B	Pediocactus simpsonii	3	8	-	.33
B	Purshia tridentata	4	3	1.38	.30
B	Symphoricarpos oreophilus	2	0	.21	-
B	Tetradymia canescens	6	10	.30	.18
Total for Browse		221	211	27.61	22.24

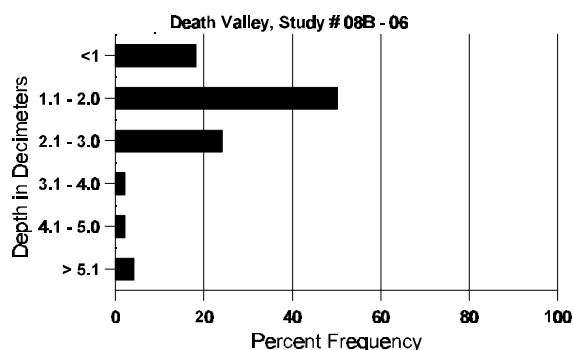
BASIC COVER --
Herd unit 08B, Study no: 6

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	354	361	7.00	12.00	35.36	48.55
Rock	63	62	4.00	5.25	2.33	3.81
Pavement	27	57	0	.25	.47	.39
Litter	396	381	59.25	58.75	60.37	53.99
Cryptogams	118	151	1.00	9.50	2.96	5.01
Bare Ground	221	241	28.75	14.25	18.35	20.98

SOIL ANALYSIS DATA --
Herd Unit 8B, Study # 6, Study Name: Death Valley

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
9.97	66.8 (11.26)	6.9	85.4	5.7	8.9	1.5	2.45	76.8	0.7

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 6

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre 00	Days Use per Acre (ha) 00
Rabbit	12	26	435	N/A
Moose	-	1	9	0.5 (1)
Elk	17	19	618	48 (117)
Deer	37	14	757	58 (144)

BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 6

A G R E	Y	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier alnifolia																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	'95	1	1	-	-	2	-	-	-	-	-	-	-	80	64	69	4	
	'00	1	-	-	-	-	-	-	-	-	-	-	-	20	49	58	1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
		'82			00%			00%			00%							
		'88			00%			00%			00%							
		'95			75%			00%			-75%							
		'00			00%			00%			00%							
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	80		-			
												'00	20		-			

A G R E	Y R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia frigida																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	4	-	-	-	-	-	-	-	-	4	-	-	-	266	4	5	4
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	7	0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	4	4	2
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	0	Dec:	-				
											'88	332		-				
											'95	0		-				
											'00	40		-				
Artemisia nova																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	1	-	1	-	-	-	-	2	-	-	-	40	11	20	2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	1	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		33%			67%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	0	Dec:	0%				
											'88	0		0%				
											'95	60		33%				
											'00	0		0%				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Artemisia tridentata vaseyana																	
S	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1
	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200		3
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
Y	82	5	-	-	-	-	-	-	-	-	5	-	-	-	333		5
	88	10	5	-	-	-	-	1	-	-	16	-	-	-	1066		16
	95	5	2	1	1	-	-	-	-	-	9	-	-	-	180		9
	00	5	1	-	-	-	-	-	-	-	6	-	-	-	120		6
M	82	6	6	-	-	-	-	-	-	-	12	-	-	-	800	14 25	12
	88	9	10	3	-	-	-	-	-	-	22	-	-	-	1466	11 15	22
	95	25	16	34	3	1	-	-	-	-	79	-	-	-	1580	14 26	79
	00	30	21	3	4	4	2	-	-	-	63	-	1	-	1280	16 28	64
D	82	-	7	-	-	-	-	-	-	-	6	-	1	-	466		7
	88	5	8	1	-	-	-	-	-	-	14	-	-	-	933		14
	95	6	5	6	2	-	-	-	-	-	13	-	-	6	380		19
	00	13	21	1	3	2	-	1	-	-	21	-	1	19	820		41
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	240		12
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	520		26
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'82		54%			00%			04%			+54%						
'88		44%			08%			00%			-38%						
'95		22%			38%			06%			+ 4%						
'00		44%			05%			19%									
Total Plants/Acre (excluding Dead & Seedlings)											'82	1599	Dec:	29%			
											'88	3465		27%			
											'95	2140		18%			
											'00	2220		37%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4		1	2									
Cercocarpus montanus																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	3	-	-	-	-	-	-	-	3	-	-	-	60		3	
	00	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	3	-	-	-	-	-	-	-	3	-	-	-	200		3	
	95	2	2	1	2	-	-	-	-	7	-	-	-	140		7	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	10	4	-	-	-	-	-	-	14	-	-	-	933	34	8	14
	88	-	4	1	-	-	-	-	-	5	-	-	-	333	36	44	5
	95	1	3	9	1	43	18	-	-	75	-	-	-	1500	34	51	75
	00	2	13	-	3	14	8	1	-	41	-	-	-	820	38	62	41
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	1	1	-	-	1	-	-	1	40		2	
	00	4	2	-	1	2	2	-	-	6	-	-	6	240		12	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>									
'82		29%		00%		00%		-43%									
'88		50%		13%		00%		+68%									
'95		58%		35%		01%		-37%									
'00		58%		21%		11%											
Total Plants/Acre (excluding Dead & Seedlings)										'82	933	Dec:	0%				
										'88	533		0%				
										'95	1680		2%				
										'00	1060		23%				
Chrysothamnus viscidiflorus viscidiflorus																	
Y	82	6	-	-	-	-	-	-	-	6	-	-	-	400		6	
	88	5	-	-	-	-	-	-	-	5	-	-	-	333		5	
	95	2	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	5	-	-	-	-	-	-	-	5	-	-	-	100		5	
M	82	14	-	-	-	-	-	-	-	14	-	-	-	933	7	8	14
	88	21	-	-	-	-	-	-	-	18	-	3	-	1400	10	11	21
	95	70	1	-	3	-	-	-	-	74	-	-	-	1480	10	15	74
	00	77	-	1	9	-	-	3	-	74	-	16	-	1800	9	11	90
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	2	-	-	-	-	-	-	-	2	-	-	-	133		2	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	4	1	-	2	-	-	-	-	6	-	-	1	140		7	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>									
'82		00%		00%		00%		+29%									
'88		00%		00%		11%		-19%									
'95		01%		00%		00%		+25%									
'00		.98%		.98%		17%											
Total Plants/Acre (excluding Dead & Seedlings)										'82	1333	Dec:	0%				
										'88	1866		7%				
										'95	1520		0%				
										'00	2040		7%				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	7	-	-	-	-	-	-	-	-	7	-	-	-	466	7	7	7
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	5	4	0
	'00	1	-	-	-	-	-	-	-	-	-	-	1	-	20	-	-	1
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			100%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	599		22%			
												'95	0		0%			
												'00	40		50%			
Juniperus osteosperma																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	-	-	-	-	-	-	1	-	-	1	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	20		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Mahonia repens																		
S	82	4	-	-	-	-	-	-	-	-	4	-	-	-	266		4	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	12	-	-	-	-	-	-	-	-	12	-	-	-	800		12	
	88	25	-	-	-	-	-	-	-	-	25	-	-	-	1666		25	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	9	-	-	-	-	-	-	-	-	9	-	-	-	180		9	
M	82	20	-	-	-	-	-	-	-	-	20	-	-	-	1333	7	2	20
	88	6	-	-	-	-	-	-	-	-	6	-	-	-	400	2	2	6
	95	29	-	-	31	-	-	8	-	-	68	-	-	-	1360	3	6	68
	00	42	-	-	9	-	-	-	-	-	51	-	-	-	1020	3	6	51
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			- 3%							
'88		00%			00%			00%			-34%							
'95		00%			00%			00%			-12%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	2133	Dec:	-				
											'88	2066		-				
											'95	1360		-				
											'00	1200		-				
Opuntia spp.																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333		5	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	11	-	-	4	-	-	-	-	-	15	-	-	-	300		15	
M	82	7	-	-	-	-	-	-	-	-	7	-	-	-	466	2	7	7
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333	3	9	5
	95	56	-	-	1	-	-	-	-	-	57	-	-	-	1140	3	9	57
	00	42	-	-	3	1	-	-	-	-	46	-	-	-	920	2	7	46
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	-	-	1	20		1		
	00	2	-	-	-	-	-	-	-	-	1	-	1	40		2		
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+20%							
'88		00%			00%			00%			+44%							
'95		00%			00%			02%			+ 6%							
'00		02%			00%			02%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	532	Dec:	0%				
											'88	666		0%				
											'95	1180		2%				
											'00	1260		3%				

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Pediocactus simpsonii																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	2	5	3
	00	6	-	-	2	-	-	-	-	-	7	-	1	-	160	5	9	8
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	1	-	-	-	-	-	-	-	-	1	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			+67%							
'00		00%			00%			22%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	0		0%			
												'95	60		0%			
												'00	180		11%			
Purshia tridentata																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	2	-	3	2	-	-	-	-	7	-	-	-	140	19	50	7
	00	1	-	-	1	1	-	-	-	-	3	-	-	-	60	16	41	3
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		57%			00%			00%			-57%							
'00		33%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	140		-			
												'00	60		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Rosa woodsii																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333		5	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
	'82	00%			00%			00%										
	'88	00%			00%			00%										
	'95	00%			00%			00%										
	'00	00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	333		-			
												'95	0		-			
												'00	0		-			
Symphoricarpos oreophilus																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20	15	25	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	21	71	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
	'82	00%			00%			00%										
	'88	00%			00%			00%										
	'95	00%			00%			00%										
	'00	00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	40		-			
												'00	0		-			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Tetradymia canescens																	
Y	'82	4	-	-	-	-	-	-	-	-	4	-	-	-	266		4
	'88	8	2	-	-	-	-	-	-	-	10	-	-	-	666		10
	'95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2
	'00	2	-	-	-	-	-	-	-	-	1	-	1	-	40		2
M	'82	10	-	-	-	-	-	-	-	-	8	2	-	-	666	8 13	10
	'88	3	1	-	-	-	-	1	-	-	5	-	-	-	333	9 10	5
	'95	12	2	-	-	-	-	-	-	-	14	-	-	-	280	10 15	14
	'00	8	-	-	1	-	-	-	-	-	3	-	6	-	180	9 14	9
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'88	8	-	-	-	-	-	-	-	-	8	-	-	-	533		8
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'00	2	-	-	-	-	-	-	-	-	1	-	-	1	40		2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'82		00%			00%			00%			+39%						
'88		13%			00%			00%			-79%						
'95		13%			00%			00%			-19%						
'00		00%			00%			62%									
Total Plants/Acre (excluding Dead & Seedlings)											'82	932	Dec:	0%			
											'88	1532		35%			
											'95	320		0%			
											'00	260		15%			

Trend Study 8B-7-00

Study site name: Antelope Flat .

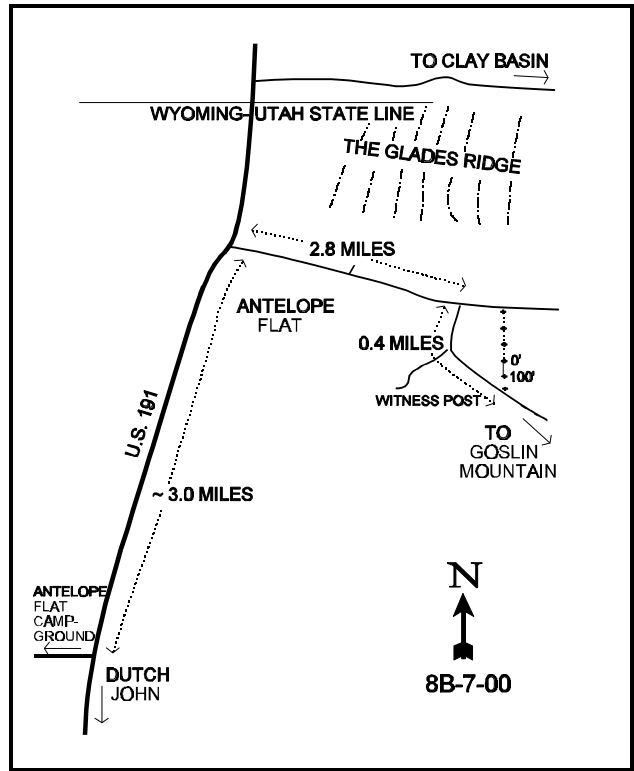
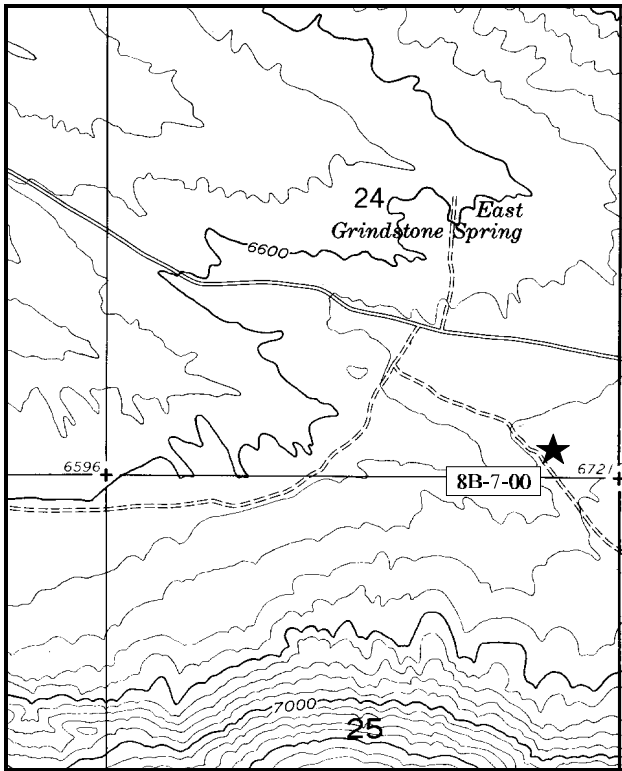
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 165°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft.), line 4 (71ft). Belt 2 rebar @ 1ft.

LOCATION DESCRIPTION

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



Map Name: Dutch John

Diagrammatic Sketch

Township 3N , Range 22E ,Section 24

UTM 4537316.266 N, 636375.882 E

DISCUSSION

Trend Study No. 8B-7 (9-10)

This trend study was established on Antelope Flat in September of 1988. The long sagebrush covered valley stretches from Flaming Gorge Reservoir, east to Goslin Mountain. The study is located at the base and north side of Dutch John and Goslin Mountains at an elevation of 6,650 feet. The slope is gentle (2-3%) with a northwest aspect. Deer and antelope can be found in the valley year round, while elk from Goslin Mountain also utilize the lower valleys as winter range. Pellet group data from 2000 estimate 22 elk, 7 deer and 9 cow days use/acre (54 edu/ha, 17 ddu/ha, and 22 cdu/ha). Approximately half of the elk pellet groups appeared to be from the previous fall, while the other half were from the spring of 2000. Deer pellet groups were all from winter use. Approximately 90% of the cattle pats were from the previous fall while about 10% were fresh. There were some cattle in the area when the site was read on July 6th 2000, but they should be moving further up the mountain soon. Cattle graze this allotment on a deferred rotation system. They are on the unit either early (May 1 to July 20) or late (September 5-November 20) in the season. Cattle use was light in 1995, likely due to prolonged drought and the distance from water. Utilization was light to moderate in 2000. Rabbits appear to be abundant on this site (see pellet group table). A few antelope and sage grouse also use the area.

The soil would appear to be moderately deep, but compacted below in the sub-surface horizons. A clay hardpan is found at approximately 9-10 inches in depth. As a result, effective rooting depth is estimated at only about 10 inches. The surface layer is a sandy loam with a neutral pH. Very little rock or gravel are on the surface or within the profile. Consequently, it is more susceptible to wind and water erosion. Phosphorus is limited at only 4.9 ppm. Values less than 10 ppm can limit normal plant growth and development. Percent cover of bare ground is moderately high with most occurring in the shrub interspaces. Cover is a relatively high for cryptogams which covered 6% of the soil surface in 1988, increasing to nearly 8% by 1995 and down to 5% in 2000. This along with the vegetative and litter cover, combined with the gentle terrain, adequately protect the soil from severe erosion.

The site supports a moderately dense stand of Wyoming big sagebrush which had an estimated density of 7,200 plants/acre in 1988 and 5,620 by 1995. The change in density comes primarily from a reduction in the proportion of decadent plants in the population which declined from 3,400 plants/acre in 1988 to 1,220 by 1995. The number of mature sagebrush actually increased from 2,800 to 3,820 plants/acre. During the 1988 reading, 47% of the sagebrush was classified as decadent with 43% of the population displaying heavy use. Vigor was generally good but annual growth was low (<1") with the average mature plant measuring 15" in height with a crown measurement of 17".

During the 1995 reading, 35% of the sagebrush displayed heavy use. Vigor was generally good with percent decadency declining to 22%. One noted downward trend was that the percentage of the decadent plants which were classified as dying (>50% crown death) had increased from 8% in 1988 to 31% in 1995. Photos showed an improvement in annual growth due to the wet spring of 1995. Average height and crown measurements increased respectively that year to 18 x 32 inches. Reproductive potential and the number of young plants declined, but they were still acceptable at 1% and 10% respectively. Density remained stable in 2000, but percent decadence increased to 46% with about 36% of the decadent sagebrush classified as dying. Use was only light to moderate, indicating that the increase in decadence was primarily due to drought. Because of the dry conditions in 2000, many of the sagebrush were already dropping their leaves during the first week of July. Reproduction in the form of seedlings and young would be considered marginal and not enough to maintain the population if conditions do not improve. These trends are primarily being driven by the prolonged drought in conjunction with intraspecific competition. Trends will improve with a return to normal or near-normal precipitation patterns.

Mountain low rabbitbrush is also numerous with an estimated density of 7,199 plants/acre in 1988 and 6,000 by 2000. These shrubs are mostly not utilized and in good vigor. Small numbers of slenderbush eriogonum, snakeweed and prickly pear were also encountered on the site.

Grasses and forbs are diverse and fairly abundant for a Wyoming big sagebrush site. Most are found growing in close proximity to sagebrush plants. The most abundant grasses include Sandberg bluegrass, mutton bluegrass and thickspike wheatgrass. A variety of forbs are found on the site but most are uncommon. The most numerous perennial forbs include: hoods phlox, longleaf phlox and Eaton fleabane. Several annual forbs are also found on the site.

1988 APPARENT TREND ASSESSMENT

The site has 46% litter cover and 10% basal vegetative cover. Although the shrub interspaces are well vegetated for this range type, there is a significant amount of bare ground (37%). The browse trend appears to be declining due to heavy use and a high decadency rate (47%). Recruitment appears good however with abundant seedlings and young. The herbaceous understory is fairly abundant for a Wyoming sagebrush site.

1995 TREND ASSESSMENT

Basic ground cover characteristics have improved since 1988. Even though percent litter cover declined slightly, cover of cryptogams increased, and percent cover for bare ground decreased to 26%. Trend for soil is up slightly. The browse trend is stable. The key browse species, Wyoming big sagebrush, has declined in overall density but shows less heavy use and an improving rate of decadency (47% to 22%). The population could decline further because 380 decadent plants/acre are classified as dying. However, there appears to be a sufficient number of young plants (580/acre) to replace them. The herbaceous trend is slightly down due to a decline in the sum of nested frequency of perennial grasses and forbs. Annual forbs were sampled in 1995. They dominated the forb composition by providing 71% of the forb cover.

TREND ASSESSMENT

soil - slightly up (4)

browse - stable (3)

herbaceous understory - slightly down (2)

2000 TREND ASSESSMENT

Trend for soil is down slightly. Relative percent cover of bare ground has increased slightly, while cover of cryptogams has declined slightly. Relative percent cover of litter has declined slightly with relative cover for vegetation increasing slightly since 1995. In addition, the proportion of protective ground cover (vegetation, litter and cryptogams) to bare ground has declined slightly from 2.9:1 to 2.7:1. Trend for browse is down slightly due to an increase in percent decadence of Wyoming big sagebrush from 22% to 46%. In addition, 36% or 960 plants/acre of the decadent sagebrush were classified as dying. Recruitment from young plants is currently marginal at 8%. Use is actually more moderate compared to 1995, indicating that these trends are being driven more by drought. A return to normal precipitation patterns will reverse these downward browse trends. Trend for the herbaceous understory is stable. Sum of nested frequency for perennial grasses and forbs have remained similar to 1995. Nested frequency for cheatgrass, an annual, increased significantly while frequency of all annual forbs declined.

TREND ASSESSMENT

soil - down slightly (2)

browse - down slightly (2)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 08B, Study no: 7

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	<i>Agropyron dasystachyum</i>	238	190	158	89	71	59	.83	2.54
G	<i>Agropyron spicatum</i>	_a 18	_b 110	_a 22	6	42	9	.61	.32
G	<i>Bromus tectorum</i> (a)	-	_a 66	_b 120	-	27	41	.50	2.74
G	<i>Carex</i> spp.	_b 9	_a -	_{ab} 3	4	-	1	-	.03
G	<i>Koeleria cristata</i>	_c 55	_a -	_b 36	24	-	13	-	.62
G	<i>Oryzopsis hymenoides</i>	13	20	12	6	10	7	.20	.25
G	<i>Poa fendleriana</i>	_a 5	_b 32	_c 113	2	13	45	.43	2.86
G	<i>Poa secunda</i>	184	159	173	75	58	66	3.00	1.90
G	<i>Sitanion hystrix</i>	_b 67	_a 34	_a 35	33	19	14	.30	1.06
G	<i>Stipa comata</i>	_c 87	_b 31	_a 5	37	16	2	.28	.03
G	<i>Vulpia octoflora</i> (a)	-	1	3	-	1	1	.00	.01
Total for Annual Grasses		0	67	123	0	28	42	0.50	2.75
Total for Perennial Grasses		676	576	557	276	229	216	5.65	9.63
Total for Grasses		676	643	680	276	257	258	6.17	12.39
F	<i>Agoseris glauca</i>	_a -	_b 22	_a 1	-	10	1	.05	.01
F	<i>Allium</i> spp.	_{ab} 4	_b 11	_a -	2	6	-	.04	-
F	<i>Antennaria rosea</i>	_c 62	_a 1	_b 28	26	1	12	.00	.54
F	<i>Arabis</i> spp.	9	10	7	4	5	3	.02	.01
F	<i>Astragalus convallarius</i>	31	23	29	12	12	14	.25	.28
F	<i>Collinsia parviflora</i> (a)	-	_b 57	_a 24	-	21	8	.25	.14
F	<i>Cordylanthus ramosus</i> (a)	-	_b 187	_a 57	-	73	24	6.05	.27
F	<i>Crepis acuminata</i>	-	3	-	-	1	-	.00	-
F	<i>Cymopterus longipes</i>	_a 15	_a 15	_b 34	7	7	17	.03	.26
F	<i>Descurainia pinnata</i> (a)	-	3	-	-	1	-	.00	-
F	<i>Erigeron eatonii</i>	_a 7	_a 19	_b 47	4	11	23	.08	.51
F	<i>Eriogonum umbellatum</i>	-	-	3	-	-	1	-	.03
F	<i>Gayophytum ramosissimum</i> (a)	-	_b 17	_a -	-	6	-	.03	-
F	<i>Gilia inconspicua</i> (a)	-	_b 10	_a 1	-	4	1	.02	.00
F	<i>Lepidium</i> spp. (a)	-	3	-	-	1	-	.00	-
F	<i>Lomatium</i> spp.	_a -	_a -	_b 5	-	-	3	-	.06
F	<i>Machaeranthera canescens</i>	-	5	-	-	2	-	.03	-
F	<i>Microsteris gracilis</i> (a)	-	_b 118	_a 40	-	40	16	.42	.08
F	<i>Penstemon humilis</i>	_b 60	_b 54	_a 24	28	25	12	.45	.11
F	<i>Phlox hoodii</i>	_b 139	_a 95	_a 90	68	44	39	1.23	2.40
F	<i>Phlox longifolia</i>	_b 153	_a 97	_a 82	66	41	32	.22	.31
F	<i>Polygonum douglasii</i> (a)	-	_b 45	_a 7	-	19	3	.09	.01

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
F	Ranunculus testiculatus (a)	-	-	3	-	-	1	-	.00
F	Schoenocrambe linifolia	a-	b12	b5	-	5	3	.02	.04
F	Sphaeralcea coccinea	40	26	26	16	11	13	.18	.31
F	Trifolium gymnocarpon	a-	b55	c74	-	25	33	.15	.49
Total for Annual Forbs		0	440	132	0	165	53	6.88	0.51
Total for Perennial Forbs		520	448	455	233	206	206	2.79	5.37
Total for Forbs		520	888	587	233	371	259	9.67	5.89

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

BROWSE TRENDS --

Herd unit 08B, Study no: 7

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata wyomingensis	97	100	16.13	19.50
B	Chrysothamnus viscidiflorus viscidiflorus	90	89	5.16	6.06
B	Eriogonum microthecum	2	4	.01	.04
B	Gutierrezia sarothrae	1	8	-	.09
B	Opuntia polyacantha	18	20	.36	.84
Total for Browse		208	221	21.67	26.54

BASIC COVER --

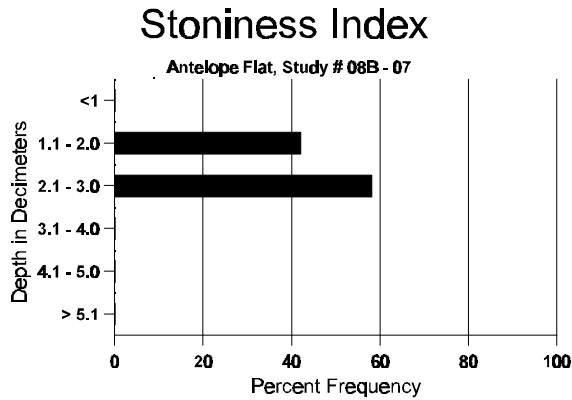
Herd unit 08B, Study no: 7

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	348	345	10.25	36.86	47.01
Rock	64	4	0	.19	.01
Pavement	150	75	1.00	.55	.36
Litter	394	371	45.50	42.59	46.87
Cryptogams	207	118	6.00	7.77	5.06
Bare Ground	328	305	37.25	26.36	35.77

SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 7, Study Name: Antelope Flat

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	%OM	PPM P	PPM K	dS/m
9.98	68.8 (9.92)	7.0	65.4	17.0	17.6	1.7	4.9	118.4	0.8



PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 7

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre 00	Days Use per Acre (ha) 00
Rabbit	8	4	-	-
Elk	5	5	287	22 (55)
Deer	38	1	87	7 (17)
Antelope	-	-	9	1 (2)
Sage Grouse	-	-	26	N/A
Cattle	1	1	113	9 (23)

BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 7

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
<i>Artemisia tridentata wyomingensis</i>																	
S	88	6	-	-	2	-	-	-	-	-	8	-	-	-	533		8
	95	3	-	-	-	-	-	-	-	3	-	-	-	60		3	
	00	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	88	9	5	1	-	-	-	-	-	14	1	-	-	1000		15	
	95	19	6	2	2	-	-	-	-	29	-	-	-	580		29	
	00	21	1	-	-	-	-	-	-	20	-	2	-	440		22	
M	88	2	16	24	-	-	-	-	-	41	1	-	-	2800	15 17	42	
	95	3	99	59	-	12	18	-	-	191	-	-	-	3820	18 32	191	
	00	100	30	3	2	-	-	-	-	134	-	1	-	2700	19 31	135	
D	88	12	18	21	-	-	-	-	-	43	2	2	4	3400		51	
	95	4	25	9	-	10	11	2	-	42	-	-	19	1220		61	
	00	93	33	8	-	-	-	-	-	79	-	7	48	2680		134	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	620		31	
	00	-	-	-	-	-	-	-	-	-	-	-	-	760		38	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'88		36%			43%			06%			-22%						
'95		54%			35%			07%			+ 3%						
'00		22%			04%			20%									
Total Plants/Acre (excluding Dead & Seedlings)											'88	7200	Dec:	47%			
											'95	5620		22%			
											'00	5820		46%			
<i>Ceratoides lanata</i>																	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	3	7	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'88		00%			00%			00%									
'95		00%			00%			00%									
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	-			
											'95	0		-			
											'00	0		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4				
Chrysothamnus viscidiflorus viscidiflorus									
S	88	2	-	-	-	-	-	2	2
	95	1	2	-	-	-	-	3	3
	00	-	-	-	-	-	-	0	0
Y	88	17	3	1	2	-	-	23	23
	95	32	1	-	3	-	-	36	36
	00	15	-	-	-	-	-	15	15
M	88	30	5	-	4	-	-	39	9 8 39
	95	224	4	1	24	-	-	251	10 16 253
	00	237	-	-	4	-	4	233	9 15 245
D	88	23	12	9	2	-	-	37	46
	95	3	-	-	-	-	-	2	3
	00	36	-	-	3	-	1	26	40
X	88	-	-	-	-	-	-	0	0
	95	-	-	-	-	-	-	20	1
	00	-	-	-	-	-	-	0	0
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>				<u>% Change</u>	
'88		19%	09%	08%				-19%	
'95		02%	.34%	01%				+ 3%	
'00		00%	00%	08%					
Total Plants/Acre (excluding Dead & Seedlings)					'88	7199	Dec:	43%	
					'95	5840		1%	
					'00	6000		13%	
Eriogonum microthecum									
S	88	-	-	-	-	-	-	0	0
	95	1	-	-	-	-	-	1	1
	00	-	-	-	-	-	-	0	0
Y	88	-	-	-	-	-	-	0	0
	95	-	-	-	-	-	-	0	0
	00	3	-	-	-	-	-	3	3
M	88	-	-	-	-	-	-	0	0
	95	3	-	-	-	-	-	60	6 8 3
	00	1	-	-	-	-	-	20	5 4 1
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>				<u>% Change</u>	
'88		00%	00%	00%					
'95		00%	00%	00%				+25%	
'00		00%	00%	00%					
Total Plants/Acre (excluding Dead & Seedlings)					'88	0	Dec:	-	
					'95	60		-	
					'00	80		-	

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
S	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	88	14	-	-	-	-	-	-	-	-	13	-	1	-	933	5	4	14
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	9	13	1
	00	23	-	-	1	-	-	-	-	-	24	-	-	-	480	5	7	24
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			07%			-98%							
'95		00%			00%			00%			+96%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	999	Dec:	-			
												'95	20		-			
												'00	480		-			
Opuntia polyacantha																		
S	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	88	4	-	-	-	-	-	-	-	-	4	-	-	-	266		4	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333	4	7	5
	95	27	-	-	-	-	-	-	-	-	27	-	-	-	540	3	12	27
	00	22	-	-	-	-	-	-	-	-	22	-	-	-	440	4	9	22
D	88	3	-	-	-	-	-	-	-	-	2	-	-	1	200		3	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	3	-	-	-	-	-	-	-	-	-	-	-	3	60		3	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			08%			-30%							
'95		00%			00%			00%			- 7%							
'00		00%			00%			12%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	799	Dec:	25%			
												'95	560		0%			
												'00	520		12%			

Trend Study 8B-8-00

Study site name: Phil Pico Mountain .

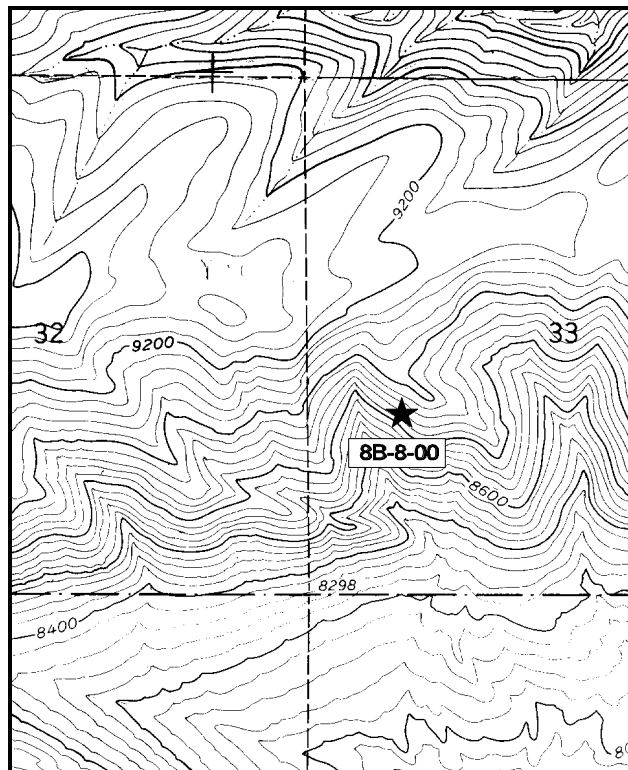
Range type: True Mountain Mahogany .

Compass bearing: frequency baseline 215°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft.), line 4 (71ft).

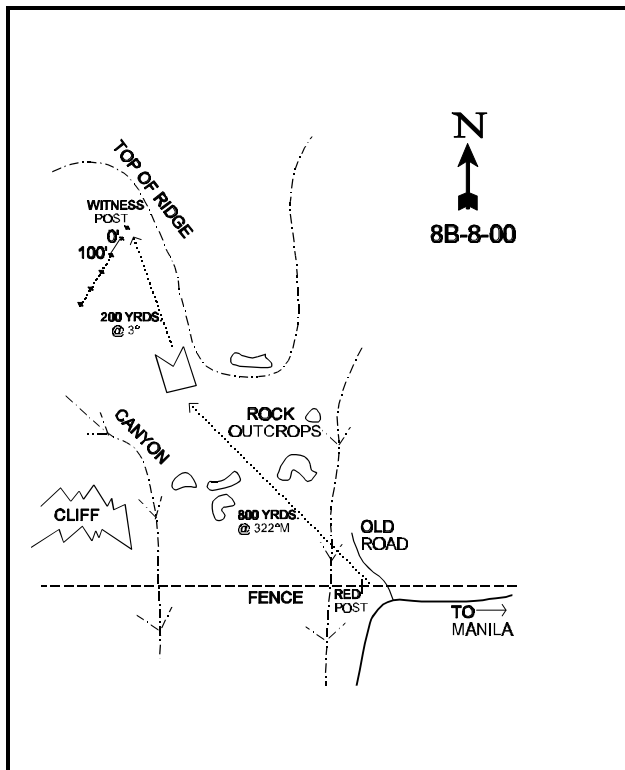
LOCATION DESCRIPTION

West of Manila, on Highway U-43 1.9 miles from the Wyoming-Utah stateline, turn south off the highway. Follow Rt. 166 for 3.6 miles to an intersection. Turn to the right and go 1.6 miles to another fork. Bear right before crossing the creek and go 0.9 miles on a fairly rough road to the FS boundary fence. Continue 0.8 miles west along the fence. Stop where the road turns left away from the fence by a red post. The study is located on the slope below the ridge to the northwest. From the red witness post along the fence, hike about 1/4 mile NNW (322°M) up across the slope to a large square rock outcrop. Continue hiking about 200 yards directly north to the study site. The 0-foot baseline stake is tagged with browse tag #9080.



Map Name: Phil Pico Mountain

Township 3N, Range 18E, Section 33



Diagrammatic Sketch

UTM 4533503 N, 591689 E

DISCUSSION

Trend Study No. 8B-8 (9-18)

The Phil Pico Mountain trend study site is located on the south side of Phil Pico Mountain which is steep and rocky and covered mostly with mountain brush. There are scattered clumps of aspen and conifer in the protected drainages and an open sagebrush-grass type on the upper slopes and ridgetops. The site is located just below a narrow windswept ridge. It samples a steep (65% to 70%) southwest facing slope dominated by true mountain mahogany at an elevation of 8,800 feet. These south slopes are used mostly by wintering elk and to a lesser extent by deer. While cattle graze this state-owned land in summer, they utilize mainly the valley bottoms and more gentle slopes. Pellet group data taken along the study site baseline in 2000 estimate 40 elk and 7 deer days use/acre (99 edu/ha and 17 ddu/ha). Most of the pellet groups appear to be from fall use. Elk appear to have used the area more heavily in 1995 since quadrat frequency of elk pellet groups was twice as high compared to 2000. The decline in use is likely due to several mild winters since 1995.

Considering the harshness of the site on the dry, steep, rocky slope, there is a surprisingly high amount of vegetative cover (39.5% in 1995 and 57% in 2000). Sandstone and limestone rock are very common on the surface, making the slope loose and talus-like in places. Outcrops of old conglomerate rock are scattered throughout the hillside. The soil is relatively deep for this type of site with an effective rooting depth estimated at just over 12 inches. Texture is a sandy loam with a neutral pH. Soil penetrometer readings suggest that the majority of the rock is concentrated 4 to 8 inches below the surface. With the steep, talus slope, some erosion is expected. There is definite down slope soil movement, especially along game trails. Soil is also pedestalled on the uphill side of shrubs and bunch grasses but soil erosion does not appear to be serious. Herbaceous vegetative cover is critical for minimizing soil movement on this type of site.

True mountain mahogany provides the majority of the browse cover and the bulk of the available forage. There was an estimated density of 4,132 plants/acre in 1988. Eighteen percent were decadent plants. Some of the young and mature plants showed signs of insect damage. Use was heavy on 73% of the population. Seed production was moderate and leader growth about 4 to 5 inches in length. There was a fair amount of reproduction evident, with young and seedling age classes comprising 37% and 5% of the population respectively. During the 1995 reading, there were an estimated 3,120 plants/acre, 79% mature and only 2% decadent. Vigor was mostly good with 6% of the population displaying reduced vigor due to insect damage. During the 2000 reading, density remained identical to 1995 estimates. Use continues to be mostly moderate to heavy. Percent decadence increased from 3% to 15%. Due to the dry conditions, annual leader growth was relatively low averaging only 3.3 inches. Some plants displayed yellowing leaves and 33% of the decadent mahogany were classified as dying. No seedlings were found in 2000, but young plants account for 13% of the population which appear to be abundant enough to maintain the population. On average, the percentage of young plants within the population is 23%, where on average the number of dead plants in the population is less than 1%.

Mountain big sagebrush occurs across the slope offers additional and more nutritional winter forage. It has displayed mostly light to moderate use since 1988. Mountain big sagebrush is also showing the effects of the prolonged drought. Percent decadence is now ('00) moderately low, but 70% of the decadent plants were classified as dying. No seedlings were encountered in 2000 yet young plants accounted for 13% of the population and appear to be abundant enough to maintain the population. On average, the percentage of young within the population is 13%, while the average percent dead is less the 12%. Other browse include: serviceberry, fringed sagebrush, black sagebrush, winterfat, mountain low rabbitbrush and slenderbush eriogonum.

The herbaceous understory is surprisingly abundant with grasses producing almost 17% cover in 1995, increasing to 27% by 2000. Forbs are diverse but provide only about 3 to 4% cover on this harsh site. By far the most abundant grass consists of bluebunch wheatgrass which exhibits considerable vegetative production. Other common grasses include Indian ricegrass and the annual cheatgrass. Forbs are represented by a variety of species, but only a few including cryptantha, hoary aster and Hoods phlox are abundant.

1988 APPARENT TREND ASSESSMENT

The amount of total rock cover reflects the rocky nature of the site. Rock cover is 19% and pavement cover is 24%. Together, they contribute to 43% of the surface cover, which is considered very high. Basal vegetative cover is good at 11%, but litter cover is unsatisfactory at only 38%. Trend for browse appears stable with adequate numbers of seedlings and young for mountain big sagebrush and true mountain mahogany. The composition of the herbaceous understory is good and dominated by native grasses. Forbs are diverse but not as numerous.

1995 TREND ASSESSMENT

Percent bare ground has declined from 8% to only 2%. Soil movement down slope is unavoidable but not severe due to the abundance of well dispersed vegetation and litter cover. Trend for soil is slightly up. Trend for the key species, true mountain mahogany which makes up 81% of the total browse cover, is slightly up. The number of mature plants increased, while the number of decadent shrubs declined from 18% to only 3%. The proportion of shrubs displaying heavy use also declined from 73% in 1988 to 54% in 1995. The number of seedlings and young plants declined, but they still appear adequate to maintain the population. Trend for the secondary browse species, mountain big sagebrush, is slightly down, but only contributes to 7% of the total browse cover. The population has declined significantly with 55% of the decadent sagebrush classified as dying, indicating a further decline in population density in the future. However, there are not very many dead plants within the population, indicating that most of the decrease is because of the much larger sample now used to determine the density of shrubs giving a more accurate estimate of its population. This would still be considered a marginal site for mountain big sagebrush. The shallow, rocky soils coupled with drought conditions have further stressed the population. Since mountain mahogany provides 81% of the browse cover and the bulk of the forage on the site, overall browse trend is considered slightly up. It should be noted that with the increased sample size and much better sampling distribution, the population estimates for shrubs are much closer to reality. Trend for the herbaceous understory is down. Nested frequency of nearly all grass species have declined significantly. Sum of nested frequency of perennial forbs have also declined.

TREND ASSESSMENT

soil - slightly up (4)

browse - slightly up (4)

herbaceous understory - down (1)

2000 TREND ASSESSMENT

Trend for soil appears fairly stable. Percent cover of bare ground has increased slightly, while litter cover has declined slightly. However, vegetation cover increased and herbaceous cover rose by 64%. In addition, the ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground increased slightly. There is still unavoidable down slope soil movement but it is not severe. Trend for the key browse species, true mountain mahogany, is stable. Population density has remained stable and use is similar to 1995 estimates. Vigor is normal on most plants and percent decadence has risen but it is still low at 15%. Due to the dry conditions of 2000, some shrubs are displaying yellowing leaves and 33% of the decadent mahogany were classified as dying. No seedlings were encountered but young plants account for 13% of the population. Mountain big sagebrush

also appears stable but many plants are showing the effects of drought. Trend for the herbaceous understory is stable with similar sum of nested frequency values for perennial grasses and forbs.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --

Herd unit 08B, Study no: 8

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	Agropyron spicatum	297	287	309	97	96	97	10.99	19.74
G	Bromus tectorum (a)	-	_b 152	_a 53	-	55	22	2.53	.18
G	Carex spp.	_b 36	_b 33	_a 9	17	11	5	.50	.39
G	Koeleria cristata	_b 16	_{ab} 7	_a 4	9	5	1	.08	.03
G	Leucopoa kingii	-	2	4	-	1	1	.03	.03
G	Oryzopsis hymenoides	115	85	104	57	39	38	2.16	6.56
G	Poa fendleriana	-	-	2	-	-	2	-	.03
G	Poa secunda	_b 45	_a 23	_a 19	19	11	7	.18	.18
Total for Annual Grasses		0	152	53	0	55	22	2.53	0.18
Total for Perennial Grasses		509	437	451	199	163	151	13.95	26.98
Total for Grasses		509	589	504	199	218	173	16.49	27.16
F	Arabis spp.	_a -	_b 7	_b 6	-	4	3	.02	.01
F	Aster chilensis	_b 25	_a -	_a 2	12	-	1	-	.00
F	Astragalus convallarius	-	7	8	-	3	3	.21	.21
F	Astragalus spp.	8	4	3	5	3	2	.06	.15
F	Balsamorhiza hookeri	1	-	-	1	-	-	-	-
F	Castilleja linariaefolia	_a -	_a -	_b 3	-	-	3	-	.04
F	Camelina microcarpa (a)	-	_a -	_b 27	-	-	15	-	.10
F	Castilleja spp.	_b 26	_a -	_a -	12	-	-	-	-
F	Chaenactis douglasii	28	24	19	16	10	12	.10	.14
F	Chenopodium leptophyllum (a)	-	_b 19	_a 3	-	11	2	.05	.01
F	Cirsium spp.	12	2	4	6	2	1	.06	.03
F	Comandra pallida	6	-	-	2	-	-	-	-
F	Collinsia parviflora (a)	-	3	2	-	1	1	.00	.00
F	Cruciferae	2	-	-	2	-	-	-	-
F	Cryptantha spp.	_b 81	_a 35	_a 57	41	17	23	.48	1.06
F	Delphinium nuttallianum	65	52	6	29	25	2	.48	.09
F	Descurainia pinnata (a)	-	_b 67	_a 5	-	34	3	.39	.01
F	Erigeron spp.	-	1	3	-	1	2	.00	.01
F	Hymenoxys acaulis	-	2	-	-	1	-	.03	-

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
F	<i>Ipomopsis aggregata</i>	-	3	-	-	2	-	.01	-
F	<i>Lappula occidentalis</i> (a)	-	_b 8	_a -	-	6	-	.03	-
F	<i>Leucelene ericoides</i>	_b 10	_a -	_a -	4	-	-	-	-
F	<i>Lepidium</i> spp. (a)	-	3	-	-	1	-	.03	-
F	<i>Lesquerella</i> spp.	_b 65	_{ab} 66	_a 31	33	32	15	.47	.22
F	<i>Linum lewisii</i>	6	5	2	3	2	1	.03	.03
F	<i>Lithospermum</i> spp.	1	-	1	1	-	1	-	.00
F	<i>Lomatium</i> spp.	-	-	3	-	-	1	-	.03
F	<i>Lychnis drummondii</i>	-	2	-	-	1	-	.00	-
F	<i>Machaeranthera canescens</i>	_b 48	_a 15	_a 20	25	7	11	.07	.49
F	<i>Microsteris gracilis</i> (a)	-	1	-	-	1	-	.03	-
F	<i>Oenothera</i> spp.	_a -	_a -	_b 9	-	-	4	-	.07
F	<i>Oxytropis sericea</i>	12	2	14	6	2	6	.19	.26
F	<i>Penstemon humilis</i>	_b 66	_a 35	_a 21	30	16	11	.37	.43
F	<i>Physaria acutifolia</i>	_a -	_a -	_b 8	-	-	4	-	.07
F	<i>Phlox hoodii</i>	_a -	_c 24	_b 41	-	11	17	.22	.43
F	<i>Phlox longifolia</i>	_c 46	_a -	_b 5	22	-	3	-	.01
F	<i>Senecio multilobatus</i>	_a -	_b 9	_b 8	-	3	4	.04	.05
Total for Annual Forbs		0	101	37	0	54	21	0.53	0.12
Total for Perennial Forbs		508	295	274	250	142	130	2.89	3.88
Total for Forbs		508	396	311	250	196	151	3.43	4.01

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

BROWSE TRENDS --

Herd unit 08B, Study no: 8

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier utahensis	2	2	.01	.03
B	Artemisia frigida	63	62	.91	1.03
B	Artemisia tridentata vaseyana	36	36	1.51	2.73
B	Ceratoides lanata	2	0	-	-
B	Cercocarpus montanus	82	84	18.02	19.50
B	Chrysothamnus viscidiflorus lanceolatus	14	14	.07	.48
B	Eriogonum microthecum	55	40	1.59	1.51
B	Symphoricarpos oreophilus	5	6	.00	.30
B	Tetradymia canescens	1	1	.06	-
Total for Browse		260	245	22.21	25.60

BASIC COVER --

Herd unit 08B, Study no: 8

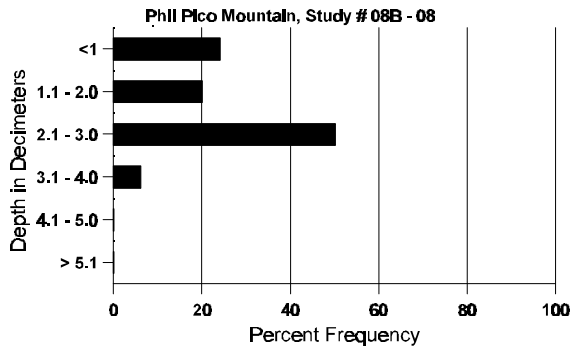
Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	343	346	11.00	39.45	57.22
Rock	338	311	19.25	23.53	19.75
Pavement	274	326	23.25	11.68	30.17
Litter	391	372	38.00	40.21	36.86
Cryptogams	8	13	.25	.02	.11
Bare Ground	160	153	8.25	2.26	4.55

SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 8, Study Name: Phil Pico Mountain

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
12.31	N/A	7.0	69.0	20.1	10.9	3.7	5.2	86.4	1.4

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 8

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre 00	Days Use per Acre (ha) 00
Rabbit	8	-	9	N/A
Elk	51	26	96	40 (99)
Deer	25	7	522	7 (17)

BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 8

A G R E	Y	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total		
		1	2	3	4	5	6	7	8	9	1	2	3	4						
Amelanchier utahensis																				
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0		
	95	-	-	-	4	-	-	-	-	-	-	-	-	4	-	-	-	80	4	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0		
	95	5	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	100	5	
	00	4	-	-	12	-	-	-	-	-	-	-	-	16	-	-	-	320	16	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0		
	95	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	20	16 9	1
	00	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	20	16 12	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>									
'88		00%			00%			00%												
'95		00%			17%			00%			+65%									
'00		06%			00%			00%												
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-					
												'95	120		-					
												'00	340		-					

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Artemisia frigida</i>																		
S	88	5	-	-	1	-	-	-	-	-	6	-	-	-	400		6	
	95	2	-	-	6	-	-	-	-	-	8	-	-	-	160		8	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	75	2	1	14	-	-	6	-	-	98	-	-	-	6533		98	
	95	10	-	-	12	-	-	-	-	-	22	-	-	-	440		22	
	00	11	-	-	3	-	-	-	-	-	14	-	-	-	280		14	
M	88	103	4	3	12	-	-	4	-	-	125	-	1	-	8400	5 4	126	
	95	122	-	-	51	-	-	-	-	-	173	-	-	-	3460	9 7	173	
	00	143	1	-	6	-	-	7	-	-	157	-	-	-	3140	5 7	157	
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	-	-	1	20		1		
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		03%			02%			.44%			-74%							
'95		00%			00%			00%			-12%							
'00		.58%			00%			.58%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	14933	Dec:	0%				
											'95	3900		0%				
											'00	3440		1%				
<i>Artemisia nova</i>																		
M	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	4 7	1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	66	Dec:	-				
											'95	0		-				
											'00	0		-				

A G R E	Y	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Artemisia tridentata vaseyana</i>																		
S	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	2	1	-	2	-	-	-	-	-	5	-	-	-	333		5	
	95	4	-	-	1	-	-	-	-	-	5	-	-	-	100		5	
	00	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7	
M	88	11	4	2	-	-	-	-	-	-	17	-	-	-	1133	11 16	17	
	95	10	12	4	4	4	-	-	-	-	34	-	-	-	680	11 24	34	
	00	26	7	1	3	-	1	-	-	-	38	-	-	-	760	12 22	38	
D	88	4	1	2	-	-	-	-	-	-	7	-	-	-	466		7	
	95	2	6	1	1	1	-	-	-	-	5	-	-	6	220		11	
	00	3	4	1	2	-	-	-	-	-	3	-	-	7	200		10	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	160		8	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	80		4	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		21%			14%			00%			-48%							
'95		46%			10%			12%			+ 9%							
'00		20%			05%			13%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	1932	Dec:	24%			
												'95	1000		22%			
												'00	1100		18%			
<i>Ceratoides lanata</i>																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0	
	95	1	-	-	1	-	-	-	-	-	2	-	-	-	40	11 13	2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	40		-			
												'00	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cercocarpus montanus																		
S	88	2	-	-	1	-	-	-	-	-	3	-	-	-	200		3	
	95	3	-	-	5	-	-	-	-	-	8	-	-	-	160		8	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	5	5	12	1	-	-	-	-	-	21	-	2	-	1533		23	
	95	9	5	3	8	3	-	-	-	-	28	-	-	-	560		28	
	00	16	2	1	1	-	-	-	-	-	20	-	-	-	400		20	
M	88	-	3	25	-	-	-	-	-	-	27	-	1	-	1866	27 24	28	
	95	1	1	5	-	44	73	-	-	-	115	-	9	-	2480	29 39	124	
	00	8	17	26	10	28	23	-	-	-	104	6	2	-	2240	29 40	112	
D	88	1	2	8	-	-	-	-	-	-	11	-	-	-	733		11	
	95	-	-	-	1	-	3	-	-	-	4	-	-	-	80		4	
	00	2	2	2	-	7	10	1	-	-	15	1	-	8	480		24	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		16%			73%			05%			-24%							
'95		34%			54%			06%			+ 0%							
'00		36%			40%			06%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	4132	Dec:	18%				
											'95	3120		3%				
											'00	3120		15%				
Chrysothamnus viscidiflorus lanceolatus																		
M	88	3	-	-	2	-	-	-	-	-	3	-	2	-	333	9 7	5	
	95	16	-	-	4	-	-	-	-	-	20	-	-	-	400	10 14	20	
	00	17	-	2	3	-	-	-	-	-	22	-	-	-	440	10 16	22	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			40%			+17%							
'95		00%			00%			00%			+ 9%							
'00		00%			09%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	333	Dec:	-				
											'95	400		-				
											'00	440		-				

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Eriogonum microthecum																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	2	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	15	-	-	1	-	-	-	-	-	16	-	-	-	1066		16	
	95	2	-	-	1	-	-	-	-	-	3	-	-	-	60		3	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	88	53	8	3	2	-	-	-	-	-	66	-	-	-	4400	5	6	66
	95	95	-	-	29	-	-	-	-	-	124	-	-	-	2480	6	12	124
	00	92	-	-	8	-	-	-	-	-	100	-	-	-	2000	5	8	100
D	88	-	1	1	-	-	-	-	-	-	2	-	-	-	133		2	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	1	-	-	1	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		11%			05%			00%			-55%							
'95		00%			00%			00%			-19%							
'00		00%			00%			.97%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	5599	Dec:	2%				
											'95	2540		0%				
											'00	2060		2%				
Gutierrezia sarothrae																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	6	8	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	-				
											'95	0		-				
											'00	0		-				
Pediocactus simpsonii																		
Y	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	3	4	1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	132	Dec:	-				
											'95	0		-				
											'00	0		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Purshia tridentata</i>																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	9	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	0		-			
												'00	0		-			
<i>Symphoricarpos oreophilus</i>																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333			5
	95	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	9	15	1
	95	-	-	-	7	-	-	-	-	-	7	-	-	-	140	9	32	7
	00	10	-	-	-	-	-	1	-	-	11	-	-	-	220	7	19	11
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			-40%							
'95		00%			00%			00%			+20%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	399	Dec:	-			
												'95	240		-			
												'00	300		-			
<i>Tetradymia canescens</i>																		
M	88	4	-	-	-	-	-	-	-	-	4	-	-	-	266	6	7	4
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	8	12	1
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	9	12	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			-92%							
'95		00%			00%			00%			+50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	266	Dec:	-			
												'95	20		-			
												'00	40		-			

Trend Study 8B-9-00

Study site name: West Goslin .

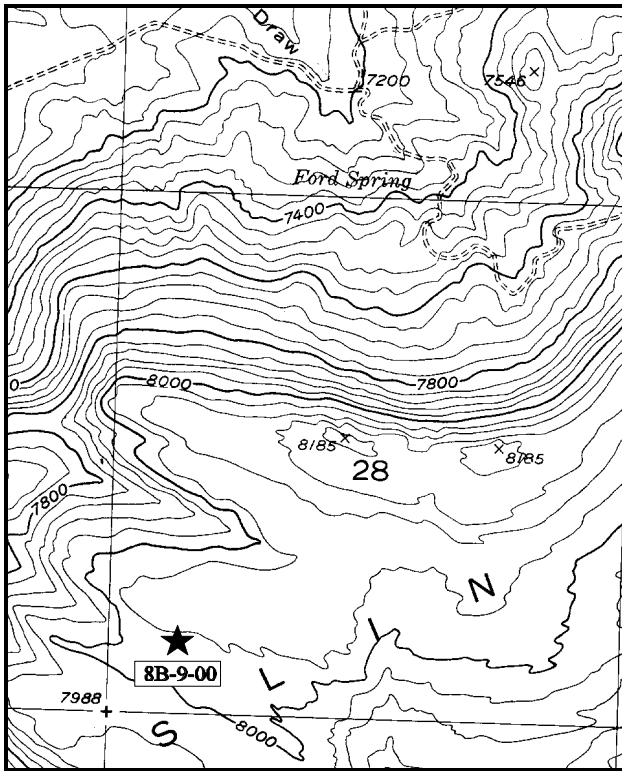
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 264°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

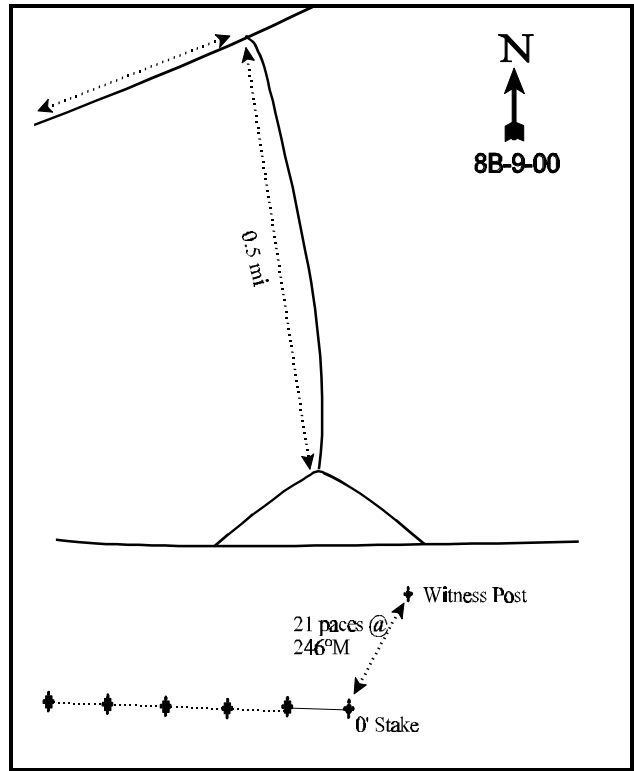
LOCATION DESCRIPTION

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



Map Name: Goslin Mtn.

Township 3N , Range 23E ,Section 28



Diagrammatic Sketch

UTM 4535540.855 N, 640174.418 E

DISCUSSION

Trend Study No. 8B-9 (9-20)

Five new study sites were established in 1995 in the Goslin Mountain area to monitor key habitat used by both livestock and elk. The area is used for livestock during the summer. Two of the sites were placed in the mountain big sagebrush-grass type and the remaining three monitor meadows which receive concentrated use. This particular site, West Goslin, was placed on a ridge top at an elevation of 8,000 feet with a south-east aspect and gently slope (2% to 3%). An elk herd of about 30 individuals was encountered when setting up the study in early July of 1995. Elk pellet groups were found in 7% of the quadrats placed on the site in 1995, while deer pellet-groups were less common. A few cattle pats were also scattered through the area in small numbers, but none were encountered within a quadrat. Pellet group data from 2000 estimated 30 elk, 7 deer, and 4 cow days use/acre (104 edu/ha, 17 ddu/ha and 10 cdu/ha). Most of the deer and elk pellet groups were from spring use. All cattle pats were from last fall. Cows use this area for one month with 400 AUMs in June, July or August.

The soil is moderately deep and rocky. Effective rooting depth is restricted in some places as evidenced by the presence of black sagebrush. Average effective rooting depth on the site is estimated at nearly 14 inches. Soil texture is a sandy loam with a slightly acidic soil reaction (pH of 6.1). The surface soil horizon, down to about 4 to 5 inches, is relatively rock free with large gravel and rocks common further down. There are also a few large boulders on the soil surface. Phosphorus is limited at only 4.7 ppm where values less than 10 ppm can limit normal plant growth and development. Due to the abundant vegetation and litter cover, there is little bare ground exposed. Vegetation and litter cover are also very well dispersed (as indicated by the very high nested frequency values) further protecting the soil from erosion.

The key browse species on the site consists of a fairly dense stand of mountain big sagebrush. Total cover of sagebrush was almost 25% in 1995 and 24% in 2000. These relatively large sagebrush account for over 70% of the browse cover. Population density was estimated at 3,380 plants/acre in 1995 with 80% of the population consisting of large mature plants. Density in 2000 was estimated at 3,600 plants/acre. Use is mostly light but percent decadence has risen from 14% to 29%. Vigor is normal on most plants but some of the older mature sagebrush appeared chlorotic with 25% of the decadent plants classified as dying (vigor class 4). Reproduction is good however, with a biotic potential (# of seedlings) of 6% and 7% of the population consisting of young plants.

Other less abundant preferred species include a few scattered serviceberry and true mountain mahogany which are more heavily utilized than sagebrush. Additional browse species include a small number of black sagebrush, bitterbrush, and snowberry.

Due to the high elevation of this site (8,000 feet) and the apparent spring use by big game, the herbaceous understory is the key component on this site. The understory is diverse and abundant. Grasses and forbs combine to produce about 30% cover or nearly half of the vegetative cover. Several species are common but letterman needlegrass, mutton bluegrass, and onion grass are the most abundant.

Thirty-one species of forbs were encountered on the site in 1995 and on 23 in 2000 with drought. Silvery lupine is the dominate forb. It provided nearly 7% cover in both 1995 and 2000. Lupine currently ('00) accounts for 54% of the forb cover. Other common forbs include: sulfur eriogonum, desert and longleaf phlox and hollyleaf clover. Preferred forbs include arrowleaf balsamroot, yellow Indian paintbrush, low penstemon, lambstongue and bluebell.

1995 APPARENT TREND ASSESSMENT

Due to the abundant vegetation and litter cover, little bare ground is found on the site. The high nested frequency values for vegetation and litter also suggest well dispersed cover. This, combined with the gentle terrain, limits erosion. Trend for soil appears stable at this time. The browse trend is stable. The population of mountain big sagebrush is healthy and vigorous with low numbers of seedlings and a moderate density of young to maintain the population. Percent decadence is moderately low at 14% and use is mostly light to moderate. The one negative aspect of the population is that one in seven plants are dead and 30% of the decadent plants are classified as dying. The herbaceous understory is abundant and diverse. There are several known increaser species on the site including Kentucky bluegrass, Columbia needlegrass, and letterman needlegrass. Combined, these species makeup only 40% of the grass cover with the more preferred grasses accounting for 60%. The forb component also contains some increaser species but the overall composition is good. Trend for grasses and forbs appears stable.

2000 TREND ASSESSMENT

Trend for soil is stable. There is abundant and well dispersed protective ground cover to prevent significant erosion. Trend for the key browse species, mountain big sagebrush, is also stable. Population density has remained similar and use is mostly light. Seedlings and young are moderately abundant but decadent plants have increased to 29% of the population. Drought conditions appear to be effecting the sagebrush, even at this elevation. About 3% of the mature plants were classified as chlorotic while 25% of the decadent sagebrush were classified as dying. However, there appears to be adequate seedling and young recruitment to maintain the population. Trend for the herbaceous understory is down slightly. Sum of nested frequency of perennial grasses has declined slightly while frequency of perennial forbs declined substantially.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - down slightly (2)

HERBACEOUS TRENDS --
Herd unit 08B, Study no: 9

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
		G	Agropyron dasystachyum	180	*116	55	45
G	Carex spp.	39	33	14	15	.56	.99
G	Dactylis glomerata	49	*-	13	-	.31	-
G	Festuca ovina	26	*17	12	7	.35	.28
G	Melica bulbosa	213	*80	60	32	4.51	1.95
G	Poa compressa	15	*-	7	-	.13	-
G	Poa fendleriana	43	*188	16	55	.86	3.37
G	Poa pratensis	13	*50	3	13	.06	1.43
G	Sitanion hystrix	28	34	13	14	.16	.61
G	Stipa columbiana	96	72	30	25	1.70	1.35
G	Stipa comata	16	*66	6	24	.13	1.90
G	Stipa lettermani	174	141	55	44	3.47	4.26
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		892	797	284	274	13.07	17.13
Total for Grasses		892	797	284	274	13.07	17.13
F	Agoseris glauca	151	*9	56	4	.90	.19
F	Allium spp.	86	*13	41	5	.42	.02
F	Antennaria rosea	4	-	1	-	.03	-
F	Arenaria congesta	16	16	6	8	.51	.11
F	Arabis drummondi	9	6	4	3	.02	.01
F	Astragalus convallarius	4	8	2	4	.18	.24
F	Astragalus spp.	8	4	2	1	.01	.15
F	Balsamorhiza sagittata	4	3	2	2	.01	.04
F	Castilleja flava	4	8	2	3	.03	.04
F	Collomia linearis (a)	169	*3	61	1	1.07	.00
F	Collinsia parviflora (a)	154	*5	49	2	.99	.01
F	Crepis acuminata	36	*8	14	4	.34	.07
F	Cymopterus longipes	11	16	5	7	.07	.06
F	Delphinium nuttallianum	18	*-	8	-	.04	-
F	Draba spp. (a)	2	-	1	-	.03	-
F	Erigeron eatonii	11	5	4	3	.02	.04
F	Eriogonum umbellatum	52	59	19	24	1.31	1.56
F	Heterotheca villosa	3	9	1	3	.00	.21
F	Hymenoxys spp.	2	-	1	-	.03	-
F	Lomatium triternatum	9	*-	3	-	.01	-
F	Lupinus argenteus	197	184	69	70	6.85	6.93

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
		F	Mertensia fusiformis	3	-	1	-
F	Penstemon humilis	9	*-	4	-	.04	-
F	Phlox austromontana	27	36	10	13	.56	1.34
F	Phlox longifolia	129	*47	51	19	1.36	.41
F	Polygonum douglasii (a)	69	*27	28	9	.19	.26
F	Senecio integerrimus	16	13	7	7	.09	.06
F	Sedum lanceolatum	9	11	3	3	.06	.09
F	Taraxacum officinale	58	*3	23	1	.21	.03
F	Trifolium gymnocarpon	75	59	29	22	.73	.96
F	Unknown forb-annual (a)	3	-	1	-	.00	-
Total for Annual Forbs		397	35	140	12	2.29	0.28
Total for Perennial Forbs		951	517	368	206	13.90	12.60
Total for Forbs		1348	552	508	218	16.19	12.88

* Indicates significant difference at % = 0.10

BROWSE TRENDS --

Herd unit 08B, Study no: 9

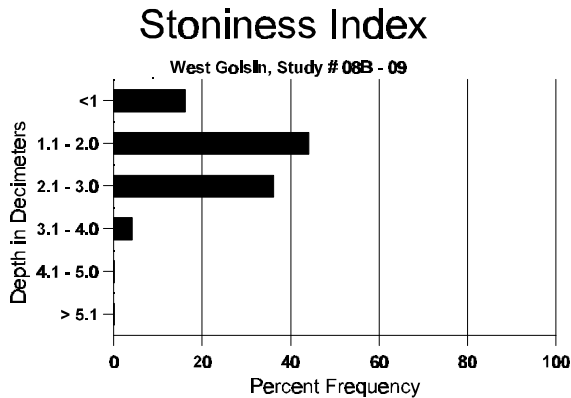
T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
		B	Amelanchier utahensis	7	4
B	Artemisia nova	4	0	.00	-
B	Artemisia tridentata vaseyana	82	87	24.90	23.68
B	Chrysothamnus viscidiflorus viscidiflorus	7	8	.53	.21
B	Eriogonum heracleoides	67	65	7.47	7.94
B	Gutierrezia sarothrae	2	0	.15	-
B	Purshia tridentata	1	1	-	.03
B	Symphoricarpos oreophilus	9	10	.96	1.19
Total for Browse		179	175	34.23	33.23

BASIC COVER --
Herd unit 08B, Study no: 9

Cover Type	Nested Frequency		Average Cover %	
	'95	'00	'95	'00
Vegetation	474	459	55.49	61.42
Rock	112	63	1.75	1.41
Pavement	52	79	.12	1.22
Litter	495	492	61.50	70.24
Cryptogams	22	1	.07	.00
Bare Ground	211	143	8.76	6.59

SOIL ANALYSIS DATA --
Herd Unit 8B, Study # 9, Study Name: West Goslin

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
13.48	59.4 (14.09)	6.1	64.0	21.4	14.6	3.0	4.7	134.4	0.6



PELLET GROUP FREQUENCY --
Herd unit 08B, Study no: 9

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre	Days Use per Acre (ha)
Rabbit	-	3	26	N/A
Elk	7	7	392	30 (74)
Deer	3	4	87	7 (17)
Cattle	-	5	52	4 (11)

BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 9

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Amelanchier utahensis</i>																		
Y	95	2	1	-	-	-	-	-	-	-	3	-	-	-	60		3	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	95	6	1	-	-	1	1	-	-	-	9	-	-	-	180	27	41	
	00	-	-	1	1	1	1	-	-	-	4	-	-	-	80	27	33	
D	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		23%			08%			00%			-69%							
'00		25%			50%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	260	Dec:	8%			
												'00	80		0%			
<i>Artemisia nova</i>																		
M	95	-	2	1	-	-	-	-	-	-	3	-	-	-	60	6	9	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
D	95	-	-	1	-	-	-	-	-	-	-	-	-	1	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		50%			50%			25%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	80	Dec:	25%			
												'00	0		0%			
<i>Artemisia tridentata vaseyana</i>																		
S	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	10	-	-	-	-	-	-	-	-	10	-	-	-	200		10	
Y	95	11	-	-	-	-	-	-	-	-	11	-	-	-	220		11	
	00	12	-	-	-	-	-	-	-	-	12	-	-	-	240		12	
M	95	92	39	4	-	-	-	-	-	-	135	-	-	-	2700	30	43	
	00	107	7	1	1	-	-	-	-	-	113	-	3	-	2320	28	43	
D	95	19	3	-	1	-	-	-	-	-	16	-	-	7	460		23	
	00	45	6	1	-	-	-	-	-	-	39	-	-	13	1040		52	
X	95	-	-	-	-	-	-	-	-	-	-	-	-	-	480		24	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	660		33	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		25%			02%			04%			+ 6%							
'00		07%			01%			09%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	3380	Dec:	14%			
												'00	3600		29%			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cercocarpus montanus																		
M	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	68	84	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	0	Dec:	-			
												'00	0		-			
Chrysothamnus viscidiflorus viscidiflorus																		
Y	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	95	9	-	-	-	-	-	-	-	-	9	-	-	-	180	8	12	9
	00	9	-	-	-	-	-	-	-	-	9	-	-	-	180	9	14	9
D	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%			+23%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	200	Dec:	0%			
												'00	260		8%			
Eriogonum heracleoides																		
Y	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	56	-	-	-	-	-	-	-	-	56	-	-	-	1120			56
M	95	242	-	-	28	-	-	-	-	-	270	-	-	-	5400	11	14	270
	00	252	-	-	-	-	-	10	-	-	262	-	-	-	5240	4	10	262
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%			+14%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	5440	Dec:	-			
												'00	6360		-			
Gutierrezia sarothrae																		
M	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	6	7	2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	40	Dec:	-			
												'00	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Purshia tridentata																		
M	95	-	-	-	-	-	1	-	-	-	1	-	-	-	20	15	42	1
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60	16	28	3
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			100%			00%			+67%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	20	Dec:	-			
												'00	60		-			
Symphoricarpos oreophilus																		
Y	95	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	20			1	
M	95	7	7	-	3	-	-	-	-	-	17	-	-	340	24	47	17	
	00	12	-	-	3	-	-	-	-	-	15	-	-	300	25	53	15	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		41%			00%			00%			- 6%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	340	Dec:	-			
												'00	320		-			

Trend Study 8B-10-00

Study site name: Sagebrush Ridge .

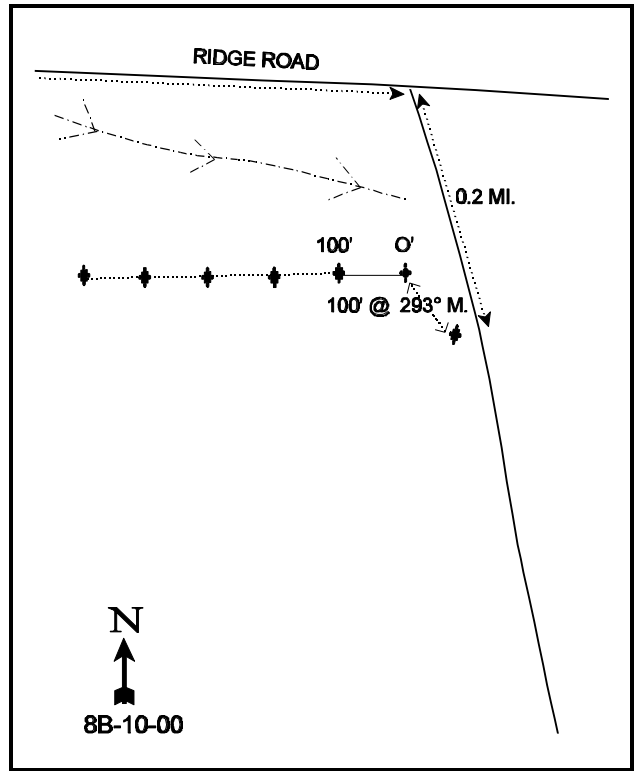
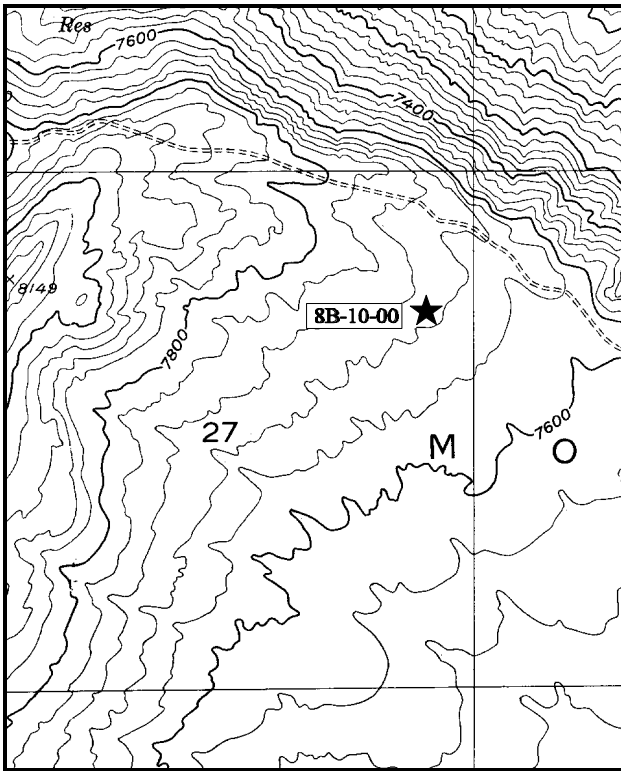
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 242°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

LOCATION DESCRIPTION

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191 for approximately 8 miles. Before the Wyoming border, turn east on the Antelope Flat Road towards Goslin Mountain. Go 2.8 miles and turn right towards Goslin Mountain. Bear right and drive 1.3 miles to a gate. Continue 4.5 miles to a fork. Bear right and drive 0.2 miles. There will be a witness post on the west side of the road. The 0' post is 100 ft away at 293/M. The site is marked with full high fence posts. The 0-foot post is marked with a browse tag # 33.



Map Name: Goslin Mtn.

Diagrammatic Sketch

Township 3N , Range 23E ,Section 27

UTM 4536922.294 N , 643044.360 E

DISCUSSION

Trend Study No. 8B-10 (9-21)

This trend study, Sagebrush Ridge, also samples a mountain big sagebrush-grass type at an elevation of 7,700 feet with an eastern aspect. Slope is moderate ranging from 5% to 10%. Cattle utilize this area in the summer when not concentrated in the relatively small wet meadows nearby. Deer also use the area in the summer. A few elk pellet-groups were noted yet none were encountered within the quadrats. A pellet group transect read parallel to the study site baseline in 2000 estimate 19 deer, 1 elk, and 1 cow days use/acre (47 ddu/ha, 3 edu/ha and 3 cdu/ha). All cattle pats encountered were from last fall. Livestock graze this area during the summer. They are currently allowed to graze for one month at 400 AUMs. Most of the cattle grazing in this area is concentrated on nearby meadows. Sage grouse also use the area and 10 adult birds, many with young, were seen near the site during the 2000 reading.

The soil is moderately shallow and rocky but rooting depth does not appear to be a limiting factor. Effective rooting depth is estimated at only 11 inches due to a calcified hardpan and bedrock in some areas. It has a sandy loam texture with a neutral pH. Phosphorus is limited at 7.8 ppm where values less than 10 ppm can limit normal plant growth and development. Percent bare ground is higher on this site than at West Goslin (8B-9), but it is still relatively low at 11% in 1995 and 12% in 2000. The abundant and well dispersed vegetation and litter cover adequately protect the soil from erosion.

The dominant browse on this site is mountain big sagebrush which provides about 75% of the total browse cover. In 1995, density was estimated at 3,580 plants/acre, 76% of which were mature. Use was moderate to heavy, but vigor was normal on most plants with percent decadence at only 18%. Dead plants were common. However, it appears that winter injury and snow mold is responsible for most of the decadence and some of the dead plants on the site. Several areas nearby, especially those with more northern aspects, contain pockets of dead sagebrush due to deep snow accumulation from the winter of 1992-93. During the 2000 reading, population density was estimated at 4,220 plants/acre. Use is mostly light but due to drought, vigor is poor on 22% of the plants sampled. In addition, percent decadence has increased to 28% with 23% of the decadent sagebrush classified as dying. On the positive side, young plants are numerous and represent 19% of the population.

Bitterbrush is another important browse species on the site. There was an estimated 760 plants/acre in 1995. Utilization was reported moderate to heavy with 53% of the shrubs displaying heavy use (>60% stems browsed). Even with this heavy use some bitterbrush were in flower. Vigor was good on most plants and percent decadence was low at 3%. During the 2000 reading, density was estimated at 680 plants/acre. Use is lighter with only 15% of the shrubs sampled being heavily browsed. Vigor remains good and percent decadence is low. Other less desirable browse encountered on the site include mountain low rabbitbrush, wyeth eriogonum, slenderbush eriogonum, and gray horsebrush.

The Herbaceous understory is abundant and diverse with a composition that is very similar to West Goslin (8B-9). Eleven perennial grasses and one sedge currently ('00) produce 26% cover which accounts for 40% of the total vegetation cover. Dominant species include: Carex, needle-and-thread, letterman needlegrass, mutton bluegrass and thickspike wheatgrass. Forbs are also abundant and diverse which include several preferred species including: pale agoseris, sulfur eriogonum, silvery lupine, bluebells, low penstemon and lambstongue. These forbs currently ('00) provide 65% of the forb cover and offer excellent spring forage for deer and elk.

1995 APPARENT TREND ASSESSMENT

Estimated cover for bare ground is only 11% with abundant vegetation and litter cover. This cover is also well dispersed, adequately protecting the soil from erosion. Trend for soil appears stable. The browse trend appears to be slightly down with a moderately high proportion of the decadent plants that are dying. The high number of dead plants encountered is evidence of a reduction in density in the past, either by unusually heavy snow cover during the 1992-93 and the 1994-95 winters, or winter injury coupled with drought. Currently the population appears healthy, utilization is mostly light to moderate with percent decadency moderately low at 17%. The herbaceous understory contains a large variety of grasses and forbs. Of the 12 species of grasses and one sedge encountered, most are desirable forage species. The forb component also contains several desirable species. The herbaceous understory appears in relatively good condition.

2000 TREND ASSESSMENT

Trend for soil is stable with abundant and well dispersed vegetation and litter cover. Trend for mountain big sagebrush is mixed. Use is lighter compared to 1995 but percent decadence has increased from 18% to 28% with 22% of the sampled sagebrush displaying poor vigor due to drought. In addition, 23% of the decadent sagebrush were classified as dying. On the positive side, young recruitment is improved with young plants accounting for 19% of the population. The less abundant but preferred bitterbrush, shows less heavy use. Vigor is good and percent decadence low at 6%. Taking all of these factors into consideration, trend for browse is considered stable. Drought conditions are obviously effecting the health of the sagebrush but a return to normal precipitation patterns will improve this. Trend for the herbaceous understory is down slightly. Sum of nested frequency of perennial grasses declined slightly while frequency of perennial forbs declined more substantially. Due to the dry conditions, nested frequency of annual forbs declined by 54%.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - down slightly (2) especially for forbs

HERBACEOUS TRENDS --
Herd unit 08B, Study no: 10

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
		G	Agropyron dasystachyum	186	*135	57	46
G	Carex spp.	177	185	58	68	5.86	7.49
G	Festuca ovina	43	58	14	20	1.47	1.39
G	Koeleria cristata	6	1	2	1	.01	.03
G	Melica bulbosa	13	10	4	3	.24	.06
G	Muhlenbergia richardsonis	5	-	2	-	.06	-
G	Poa compressa	96	*38	33	14	.64	.94
G	Poa fendleriana	2	*112	1	39	.03	2.22
G	Poa pratensis	8	6	3	2	.04	.15
G	Sitanion hystrix	57	36	24	16	.45	.31
G	Stipa columbiana	19	16	9	5	.42	.39
G	Stipa comata	188	145	60	42	3.63	5.78
G	Stipa lettermani	95	118	29	33	2.32	6.04
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		895	860	296	289	17.35	26.19
Total for Grasses		895	860	296	289	17.35	26.19
F	Agoseris glauca	181	*71	68	34	1.12	.78
F	Antennaria dimorpha	2	-	1	-	.03	-
F	Antennaria rosea	12	13	5	5	.07	.22
F	Arenaria congesta	6	10	2	4	.18	.31
F	Arabis drummondi	3	*17	2	7	.01	.06
F	Astragalus convallarius	26	19	13	9	.72	.39
F	Astragalus spp.	-	1	-	1	-	.03
F	Calochortus nuttallii	3	-	1	-	.00	-
F	Collomia linearis (a)	198	*1	75	1	1.58	.00
F	Collinsia parviflora (a)	193	*43	60	14	1.64	.07
F	Cryptantha spp.	8	2	3	2	.01	.01
F	Cymopterus longipes	48	*36	26	16	.40	.21
F	Delphinium nuttallianum	8	7	4	2	.02	.01
F	Erigeron eatonii	22	27	11	12	.28	.19
F	Eriogonum umbellatum	38	40	14	15	1.29	2.29
F	Gayophytum ramosissimum (a)	9	*-	3	-	.01	-
F	Lithospermum ruderales	29	36	12	14	.62	1.00
F	Lomatium triternatum	3	4	1	2	.00	.06
F	Lupinus argenteus	135	123	59	55	3.95	3.00
F	Mertensi fusiformis	56	50	25	22	.71	1.46

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
F	Penstemon humilis	42	*8	18	3	.29	.04
F	Phlox longifolia	172	154	62	58	.79	.91
F	Polygonum douglasii (a)	105	*30	40	11	.25	.05
F	Senecio integerrimus	6	8	6	4	.11	.09
F	Stellaria longipes	5	*-	3	-	.04	-
F	Taraxacum officinale	-	2	-	1	-	.00
F	Tragopogon dubius	9	1	3	1	.01	.00
F	Trifolium gymnocarpon	47	33	21	17	.28	.52
F	Unknown forb-annual (a)	1	-	1	-	.00	-
Total for Annual Forbs		506	74	179	26	3.50	0.12
Total for Perennial Forbs		861	662	360	284	10.99	11.62
Total for Forbs		1367	736	539	310	14.49	11.75

* Indicates significant difference at % = 0.10

BROWSE TRENDS --

Herd unit 08B, Study no: 10

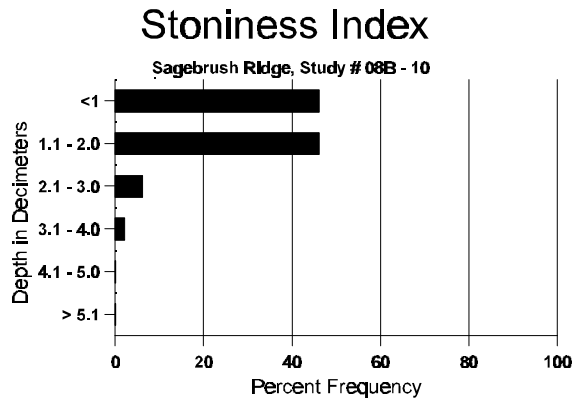
T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata vaseyana	85	82	17.29	20.70
B	Ceratoides lanata	1	0	.00	-
B	Chrysothamnus viscidiflorus viscidiflorus	2	3	.03	.03
B	Eriogonum heracleoides	28	30	1.86	1.55
B	Eriogonum microthecum	27	30	.97	.44
B	Purshia tridentata	29	30	2.84	5.14
B	Tetradymia canescens	0	1	-	.03
Total for Browse		172	176	23.01	27.90

BASIC COVER --
Herd unit 08B, Study no: 10

Cover Type	Nested Frequency		Average Cover %	
	'95	'00	'95	'00
Vegetation	469	463	50.19	63.35
Rock	105	28	.51	.25
Pavement	221	205	1.72	5.55
Litter	497	475	54.46	63.60
Cryptogams	2	4	.00	.18
Bare Ground	306	210	11.05	12.05

SOIL ANALYSIS DATA --
Herd Unit 8B, Study # 10, Study Name: Sagebrush Ridge

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
11.18	51.2 (13.07)	6.6	71.0	14.1	14.9	3.0	7.8	150.4	0.6



PELLET GROUP FREQUENCY --
Herd unit 08B, Study no: 10

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre	Days Use per Acre (ha)
Rabbit	2	-	96	N/A
Elk	-	-	17	1 (3)
Sage Grouse	-	1	78	N/A
Deer	6	1	252	19 (48)
Cattle	8	4	17	2 (4)

BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 10

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
S	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
Y	95	4	6	1	-	-	-	-	-	-	11	-	-	-	220		11	
	00	41	-	-	-	-	-	-	-	-	41	-	-	-	820		41	
M	95	45	86	5	-	-	-	-	-	-	136	-	-	-	2720	25	39	136
	00	86	10	-	14	-	-	-	-	-	86	-	24	-	2200	23	36	110
D	95	4	16	12	-	-	-	-	-	-	24	-	2	6	640		32	
	00	54	4	-	2	-	-	-	-	-	36	1	9	14	1200		60	
X	95	-	-	-	-	-	-	-	-	-	-	-	-	-	920		46	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	740		37	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		60%			10%			04%			+15%							
'00		07%			00%			22%										
Total Plants/Acre (excluding Dead & Seedlings)											'95	3580	Dec:	18%				
											'00	4220		28%				
<i>Ceratoides lanata</i>																		
M	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	6	9	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'95	20	Dec:	-				
											'00	0		-				
<i>Chrysothamnus viscidiflorus viscidiflorus</i>																		
M	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	12	17	2
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60	12	17	3
D	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%			+50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'95	40	Dec:	0%				
											'00	80		25%				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Eriogonum heracleoides																		
Y	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	13	-	-	-	-	-	-	-	-	13	-	-	-	260		13	
M	95	68	-	-	-	-	-	-	-	-	68	-	-	-	1360	11	19	68
	00	66	-	-	-	-	-	-	-	-	66	-	-	-	1320	4	10	66
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%			+14%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	1360	Dec:	-			
												'00	1580		-			
Eriogonum microthecum																		
S	95	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	95	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8	
	00	5	-	-	-	-	-	6	-	-	11	-	-	-	220		11	
M	95	49	-	-	5	2	-	-	-	-	56	-	-	-	1120	7	12	56
	00	33	-	-	8	-	-	-	-	-	39	1	1	-	820	6	7	41
D	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		03%			00%			00%			-17%							
'00		00%			00%			02%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	1280	Dec:	0%			
												'00	1060		2%			
Gutierrezia sarothrae																		
M	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	11	16	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	0	Dec:	-			
												'00	0		-			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Purshia tridentata</i>																		
S	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	4	-	-	1	-	-	-	-	-	5	-	-	-	100		5	
M	95	3	7	13	-	5	7	-	-	-	35	-	-	-	700	16	36	
	00	9	7	1	2	4	3	1	-	-	27	-	-	-	540	19	47	
D	95	-	1	-	-	-	-	-	-	-	-	-	-	1	20		1	
	00	1	-	1	-	-	-	-	-	-	2	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		34%			53%			03%			-11%							
'00		32%			15%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'95	760	Dec:	3%				
											'00	680		6%				
<i>Tetradymia canescens</i>																		
M	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	9	10	
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20	8	14	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'95	0	Dec:	-				
											'00	20		-				

Trend Study 8B-11-00

Study site name: Triangle Meadow .

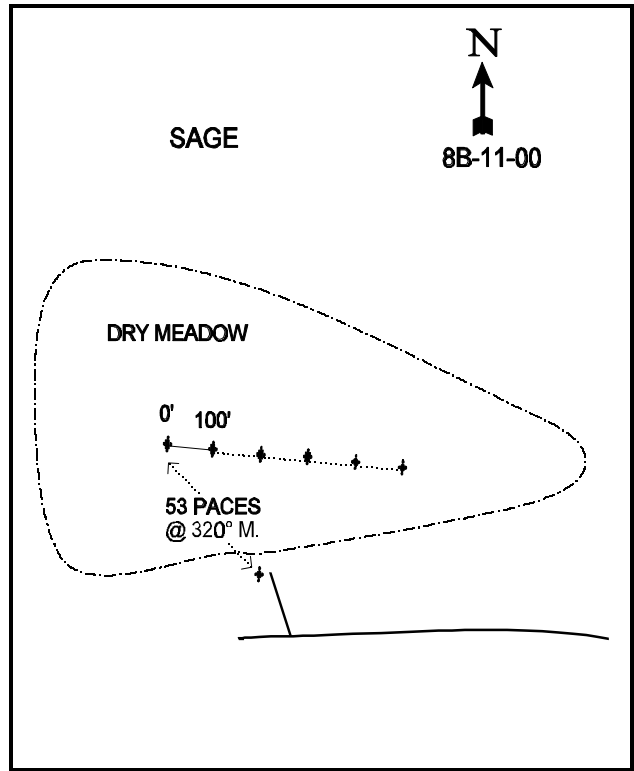
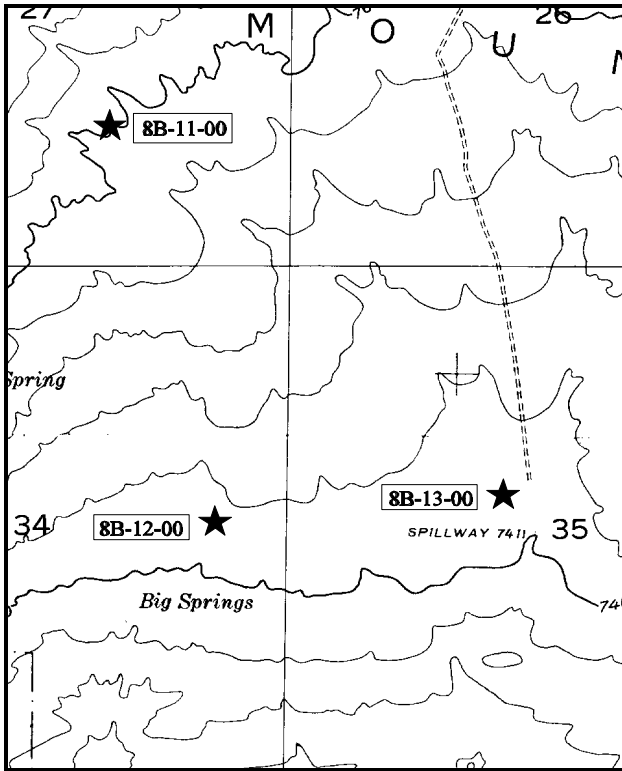
Range type: Dry Meadow .

Compass bearing: frequency baseline 95°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

LOCATION DESCRIPTION

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191 for approximately 8 miles. Before the Wyoming border, turn east on the Antelope Flat Road towards Goslin Mountain. Go 2.8 miles and turn right towards Goslin Mountain. Bear right and drive 1.3 miles to a gate. Continue 4.5 miles to a fork. Bear right and proceed 0.8 miles passing study 8B-10-00 to a four-way intersection. Turn right and drive 0.4 miles to a fork by a meadow. Turn right and continue 0.1 miles to a meadow with a witness post. The 0-foot baseline stake is located 53 paces away at 320/M.



Map Name: Goslin Mtn.

Diagrammatic Sketch

Township 3N , Range 23E ,Section 27

UTM 4536054.932 N , 642562.193 E

DISCUSSION

Trend Study No. 8B-11 (9-22)

This study site, Triangle Meadow, was placed in a meadow less than one-half of a mile south of study #10. This meadow, which is on DWR land, receives light to moderate use by elk and deer with heavy use during the summer by cattle. The study was established in early July of 1995 before livestock were allowed onto the allotment. Elk were seen on the site and appear to use the area mostly in the spring and fall. Cattle use was heavy during the summer of 1994 as evidenced by the high quadrat frequency of cow pats in 1995 (see pellet group table). Pellet group data taken along the study site baseline in 2000, estimates only light wildlife use. Cattle use from the previous season (1999) was estimated at 49 cow days use/acre (121 cdu/ha). Several spring antelope pellet groups were also encountered and an antelope fawn was on the meadow during the 2000 reading. In addition, a bull moose was seen near the site and several sage grouse were observed in the area.

Slope on the meadow is nearly level (2% to 5%) with drainage to the east. This meadow was partially flooded when the site was established in 1995. The meadow appears to be sub-irrigated most of the summer by springs originating from the hillside a short distance to the west. During the 2000 reading, the meadow was very dry. No water was visible and the soil profile was extremely dry and compact.

The soil appears to be deep and relatively rock free. However, due to the dry conditions of 2000, the soil was very dry and compacted. Effective rooting depth was estimated at only 7 inches due to a hard compacted clay horizon which was encountered at about 4 inches in depth. Soil texture is a sandy loam with a neutral soil reaction (pH of 6.6). Erosion is not a problem on these meadows due to the extensive ground cover of sod forming grasses.

Very few browse occur on these meadows. The only species encountered on this site was a seedling and one young mountain big sagebrush in 1995. The high water table during most of the spring prohibits sagebrush from becoming established.

The important aspect of these meadows is the herbaceous species, especially the grasses which provide forage for wildlife and livestock. The grasses produced a total of 39% cover in 1995, increasing to 66% in 2000. Kentucky bluegrass, an increaser, was the most numerous species in 1995, accounting for 74% of the grass cover. Baltic rush, a less desirable species, was also common producing 11% of the grass cover. In 2000, nested frequency of Baltic rush increased significantly and cover rose five-fold from 5% to 26%. Kentucky bluegrass declined significantly in nested frequency while cover declined slightly from 29% to 25%. The key forage species on this meadow is Nebraska sedge which provided 13% of the grass cover in 1995, increasing to 22% by 2000. This sedge is highly palatable and a good indicator species.

Forbs provided a total cover value of 6% in 1995, and only 1% in 2000. The most common species is dandelion, an invasive plant, which accounted for 78% of the forb cover in 1995 and 96% in 2000. Most of the other forbs are annuals or low growing perennials.

1995 APPARENT TREND ASSESSMENT

Soil trend appears stable and there is no threat of erosion on this site as long as the sod cover is not broken. There are very few shrubs on site, but the shrub component is not an important aspect here with regard to transition or summer range. The herbaceous composition is the important aspect of this meadow type. Since there is no previous data to determine trends, vegetative condition will have to be assessed by composition only. The grass component is dominated by Kentucky bluegrass, an increaser under moderate to heavy grazing pressure. The second most abundant species is Nebraska sedge which is a palatable and highly sought after

forage plant. This species decreases with moderate to heavy grazing pressure. Forbs are dominated by dandelion and other low growing perennial and annual species. Trend is not very feasible without at least two sampling periods. However, trend would be considered stable, but in fair to poor condition due to the present species composition.

2000 TREND ASSESSMENT

Trend for soil is stable with no exposed bare ground and excellent herbaceous vegetation and litter cover. There are no shrubs on this site and they are not an important component on this spring/fall range. Trend for the herbaceous understory is mixed. Sum of nested frequency of perennial grasses increased slightly while sum of nested frequency of perennial forbs declined. Perennial grass cover has nearly doubled since 1995. Nested frequency for Nebraska sedge, which is the key forage species on this site, increased significantly. In addition, cover of Nebraska sedge has nearly tripled. Nested frequency of the increaser, Kentucky bluegrass, declined significantly since 1995. One negative aspect of the herbaceous trend is that Baltic rush, a low value increaser, increased significantly in frequency with cover increasing five-fold since 1995. The only common forb is dandelion which declined significantly in nested frequency due to a combination of drought and competition with the vigorous perennial grasses. The herbaceous trend is considered stable with the improvement of Nebraska sedge offset by the increase in Baltic rush and decline in perennial forbs. Drought conditions have obviously given the deep rooted Baltic rush and Nebraska sedge a competitive advantage over other perennial species.

TREND ASSESSMENT

soil - stable (3)

browse - no browse on site (NA)

herbaceous understory - stable, but composition still dominated by increasers (3)

HERBACEOUS TRENDS --

Herd unit 08B, Study no: 11

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
G	Agropyron spp.	7	*-	3	-	.39	-
G	Carex nebraskensis	271	*309	79	82	5.09	14.48
G	Juncus balticus	215	*367	75	94	4.50	26.26
G	Muhlenbergia richardsonis	6	-	2	-	.15	-
G	Poa pratensis	487	*356	100	90	28.99	25.18
G	Sitanion hystrix	1	-	1	-	.03	-
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		987	1032	260	266	39.16	65.93
Total for Grasses		987	1032	260	266	39.16	65.93
F	Achillea millefolium	1	3	1	2	.00	.03
F	Aster spp.	11	*-	5	-	.24	-
F	Astragalus spp.	4	-	2	-	.01	-
F	Chorispora tenella (a)	16	*-	9	-	.07	-
F	Collinsia parviflora (a)	18	*-	7	-	.08	-
F	Descurainia pinnata (a)	2	-	1	-	.00	-
F	Draba spp. (a)	48	*-	18	-	.43	-
F	Gayophytum ramosissimum (a)	10	*-	3	-	.01	-

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
		F	Lappula occidentalis (a)	8	*-	3	-
F	Lepidium spp. (a)	2	-	1	-	.00	-
F	Myosotis alpestris	15	*-	6	-	.03	-
F	Polygonum douglasii (a)	4	-	2	-	.01	-
F	Ranunculus testiculatus (a)	1	-	1	-	.00	-
F	Taraxacum officinale	251	*53	88	21	4.67	.97
F	Tragopogon dubius	2	1	1	1	.03	.00
F	Unknown forb-annual (a)	3	-	1	-	.00	-
Total for Annual Forbs		112	0	46	0	1.02	0
Total for Perennial Forbs		284	57	103	24	4.99	1.01
Total for Forbs		396	57	149	24	6.02	1.01

* Indicates significant difference at % = 0.10

BROWSE TRENDS --

Herd unit 08B, Study no: 11

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
		B	Artemisia tridentata vaseyana	-	-
Total for Browse		-	-	0.00	0

BASIC COVER --

Herd unit 08B, Study no: 11

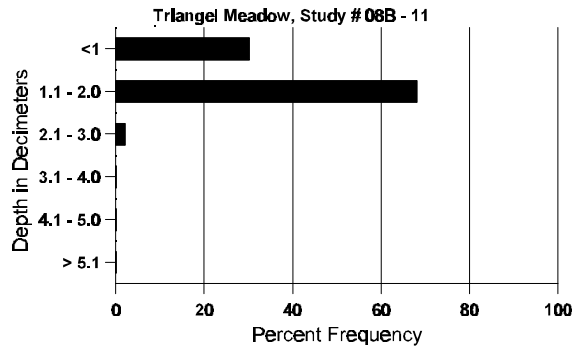
Cover Type	Nested Frequency		Average Cover %	
	'95	'00	'95	'00
	Vegetation	494	495	51.43
Rock	17	-	.05	0
Pavement	36	-	.06	0
Litter	500	499	79.47	89.40
Cryptogams	10	-	.02	0
Bare Ground	58	-	.43	0

SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 11, Study Name: Triangle Meadow

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
6.99	50.8 (7.17)	6.6	64.0	19.7	16.3	4.3	15.3	76.8	1.3

Stoniness Index



PELLET GROUP FREQUENCY --
Herd unit 08B, Study no: 11

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'95	'00	00	00
Rabbit	2	-	-	-
Elk	7	-	-	-
Deer	8	-	17	1 (3)
Cattle	48	6	583	49 (120)
Antelope	-	-	61	5 (12)

BROWSE CHARACTERISTICS --
Herd unit 8B, Study no: 11

A G R E	Y	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Artemisia tridentata vaseyana																	
S	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
Y	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'95		00%			00%			00%									
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'95	20	Dec:	-		
												'00	0		-		

Trend Study 8B-12-00

Study site name: Big Meadow.

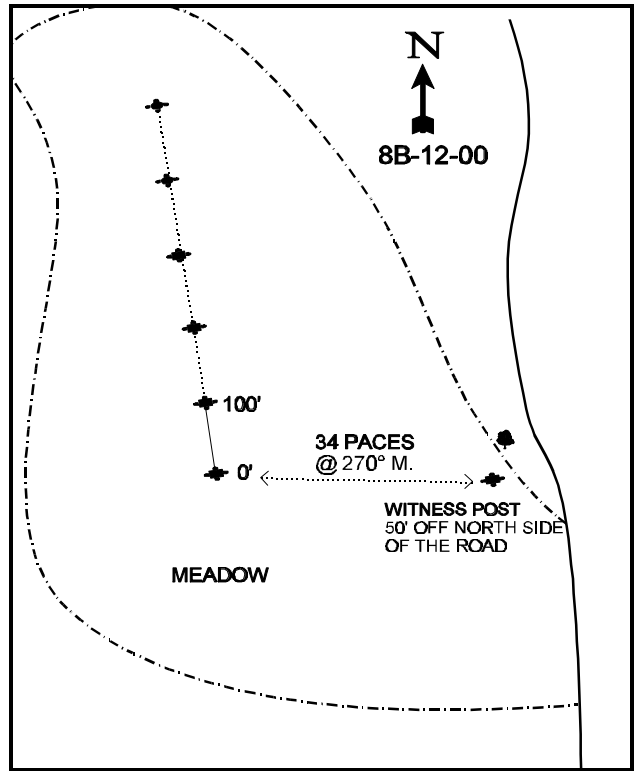
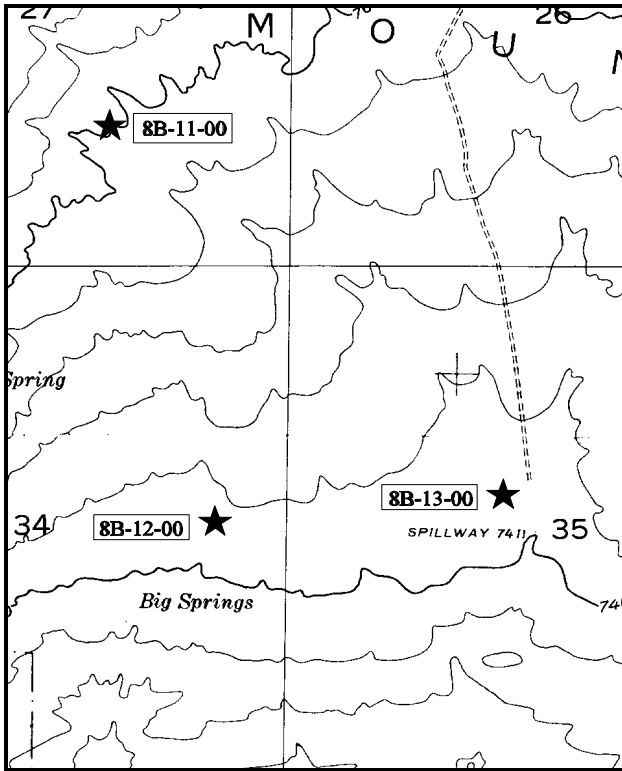
Range type: Wet Meadow.

Compass bearing: frequency baseline 322°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

LOCATION DESCRIPTION

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191 for approximately 8 miles. Before the Wyoming border, turn east on the Antelope Flat Road towards Goslin Mountain. Go 2.8 miles and turn right towards Goslin Mountain. Bear right and drive 1.3 miles to a gate. Continue 4.5 miles to a fork. Bear right and proceed 0.8 miles passing study 8B-10-00 to a four-way intersection. Continue straight west and drive 0.4 miles to a witness post. The witness post is located 50 feet off the north side of the road. From the witness post walk 34 paces at 270°/M. to the 0-foot baseline stake.



Map Name: Goslin Mtn.

Diagrammatic Sketch

Township 3N, Range 23E, Section 34

UTM 4534888.557 N, 643005.736 E

DISCUSSION

Trend Study No. 8B-12 (9-23)

The Big Meadow trend study is a another new study set up in the Goslin Mountain area to monitor concentrated use areas by wildlife and livestock on small meadows. This meadow is about one half of a mile south of site #11, just north of Big Springs at an elevation of 7,500 feet. The transect was placed on the north edge of the meadow. Slope is more gradual here than at site #11 resulting in wetter conditions. Drainage is to the east, south-east.

The soil is deep with an effective rooting depth >35 inches. There are no rocks on the surface or within the profile. Soil texture is a clay loam with a mildly alkaline soil reaction (pH of 7.4). Phosphorus is limited at only 5.5 ppm where values less than 10 ppm can limit normal plant growth and development. Vegetation and litter cover are abundant and prohibit any erosion. Water is found on the surface of the meadow until sometime in June or July depending on weather conditions. During study establishment, July 7th 1995, the ground was mostly dry although the water table appeared to be just under the surface in most places. Further to the south the meadow becomes increasingly wet with some shallow accumulations of water visible. Due to the wet conditions, deep hoof action by cattle has caused the surface to be uneven in places. There is no erosion occurring due to the abundant herbaceous cover.

Grasses and forbs are diverse and abundant on this site, however species composition could be better. In 1995, nearly 80% of the grass cover came from Baltic rush and Kentucky bluegrass. This increased to 95% by 2000. Both of these species are considered increasers under grazing pressure. The more desirable Nebraska sedge, tufted hair-grass, and slender wheatgrass made up only 13% of the grass cover in 1995 and 25% in 2000.

Dominant forbs include yarrow, Pacific aster, thistle, cinquefoil, balsam groundsel and dandelion. Many of these species are low growing increasers which establish under heavy grazing pressure. Increaser forbs made up 76% of the forb cover in 1995 and 66% in 2000.

1995 APPARENT TREND ASSESSMENT

Soil trend is considered stable due to the almost imperceptible slope and excellent vegetation and litter cover. No shrubs occur on the site so there is no data available for a browse trend. Composition of the herbaceous understory is diverse, but dominated by less desirable increaser species. The increaser grass-like and grass species are Baltic rush and Kentucky bluegrass. Forbs are diverse but are also dominated by low growing increasers. Dandelion is the most numerous forb with a quadrat frequency of 96%. Although this forb is found in many natural undisturbed communities, high densities are a good indication of overgrazing.

2000 TREND ASSESSMENT

Trend for soil is stable with abundant and well dispersed herbaceous cover and very little bare ground exposed. There are no shrubs on the site so there is no browse trend. Trend for the herbaceous understory is considered down slightly. Sum of nested frequency of perennial grasses has declined slightly with a significant decline in the frequency of Kentucky bluegrass, tufted hair-grass, Carex and slender wheatgrass. The key forage species, Nebraska sedge, increased significantly in frequency and cover rose from 3% in 1995 to 14% in 2000. However, the poor value increaser, Baltic rush, also increased significantly in nested frequency and cover doubled. It now provides 58% of the grass cover. Sum of nested frequency of perennial forbs declined by 56% with some of the most abundant species low valued increasers. The dominant species include: horsetail, cinquefoil, dandelion and hook violet.

TREND ASSESSMENT

soil - stable (3)

browse - no browse on site (NA)

herbaceous understory - down slightly (2) especially for forbs

HERBACEOUS TRENDS --

Herd unit 08B, Study no: 12

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
G	Agropyron trachycaulum	89	*29	30	11	.74	.15
G	Carex nebraskensis	233	*303	78	89	2.76	14.13
G	Carex spp.	146	*39	39	13	2.86	1.39
G	Deschampsia caespitosa	88	*47	30	18	1.85	.76
G	Hordeum brachyantherum	9	*31	3	12	.01	.31
G	Juncus balticus	410	*444	94	96	16.51	34.60
G	Muhlenbergia richardsonis	16	1	5	1	.07	.00
G	Phleum pratense	-	2	-	1	-	.03
G	Poa pratensis	440	*223	95	67	16.20	8.55
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		1431	1119	374	308	41.02	59.94
Total for Grasses		1431	1119	374	308	41.02	59.94
F	Achillea millefolium	48	*8	14	5	1.43	.10
F	Agoseris glauca	10	3	4	1	.05	.00
F	Antennaria rosea	26	*3	10	2	.91	.03
F	Arabis spp.	3	-	1	-	.00	-
F	Astragalus agrestis	37	*-	11	-	.08	-
F	Aster chilensis	146	*35	48	12	3.13	.91
F	Aster spp.	36	*-	11	-	.59	-
F	Cirsium spp.	95	*-	38	-	1.53	-
F	Equisetum spp.	72	*90	24	27	.33	1.66
F	Erigeron spp.	3	5	1	1	.00	.00
F	Myosotis alpestris	13	*52	4	19	.04	.77
F	Potentilla anersina	200	199	68	78	3.85	5.14
F	Potentilla gracilis	69	*25	32	11	1.56	.44
F	Ranunculus testiculatus (a)	11	*-	3	-	.18	-
F	Senecio pauperculus	97	*-	25	-	2.75	-
F	Sisyrinchium spp.	104	*-	39	-	1.24	-
F	Stellaria longipes	5	-	2	-	.01	.00
F	Taraxacum officinale	316	*30	96	15	8.56	.78
F	Viola adunca	124	171	39	59	2.32	3.75

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
Total for Annual Forbs		11	0	3	0	0.18	0
Total for Perennial Forbs		1404	621	467	230	28.44	13.61
Total for Forbs		1415	621	470	230	28.63	13.61

* Indicates significant difference at % = 0.10

BASIC COVER --

Herd unit 08B, Study no: 12

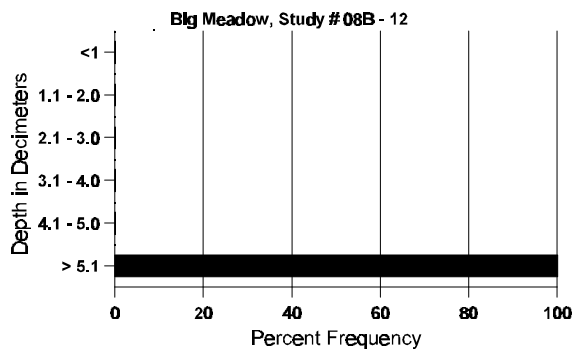
Cover Type	Nested Frequency		Average Cover %	
	'95	'00	'95	'00
Vegetation	499	492	69.33	70.35
Litter	499	497	76.84	86.00
Cryptogams	83	56	5.28	4.85
Bare Ground	-	8	0	.18

SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 12, Study Name: Big Meadow

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
35.43	50.0 (18.11)	7.4	34.0	33.7	32.3	6.1	5.5	256.0	1.2

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 12

Type	Quadrat Frequency	
	'95	'00
Elk	-	1
Deer	-	1
Cattle	21	2

Pellet Transect	
Pellet Groups per Acre 00	Days Use per Acre (ha) 00
-	-
-	-
131	11 (27)

Trend Study 8B-13-00

Study site name: Lower Big Meadow.

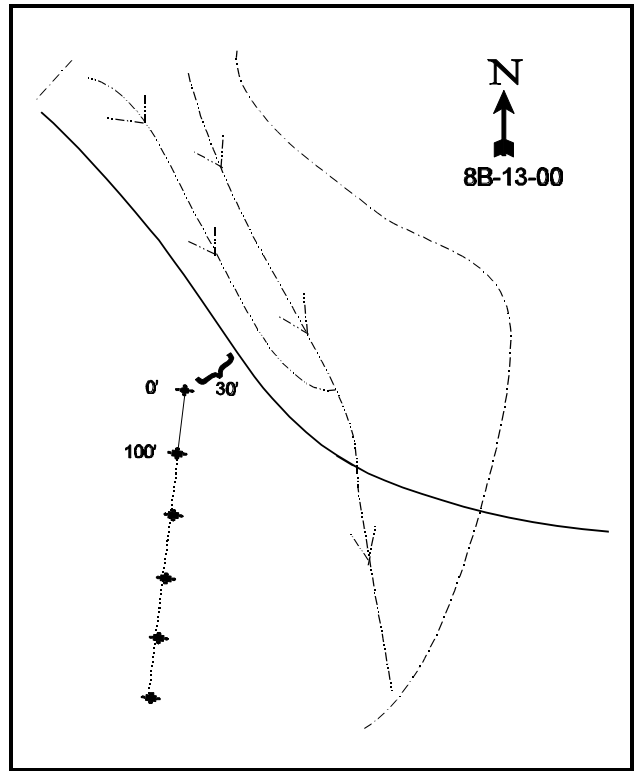
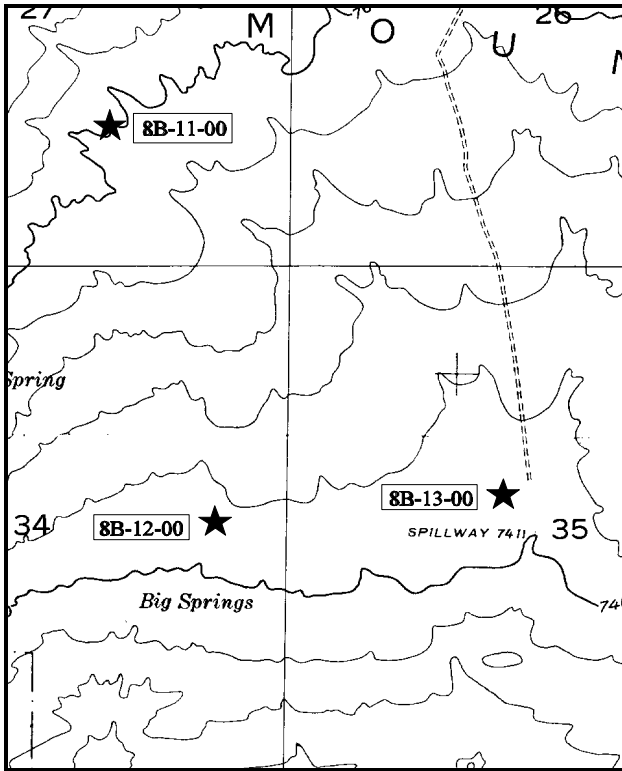
Range type: Wet Meadow.

Compass bearing: frequency baseline 165°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

LOCATION DESCRIPTION

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191 for approximately 8 miles. Before the Wyoming border, turn east on the Antelope Flat Road towards Goslin Mountain. Go 2.8 miles and turn right towards Goslin Mountain. Bear right and drive 1.3 miles to a gate. Continue 4.5 miles to a fork. Bear right and proceed 0.8 miles passing study 8B-10-00 to a four-way intersection. Bear left and drive 0.6 miles to a post in a meadow 30 feet south of the road. The road is faint as it crosses the large meadow. The 0-foot stake is marked with browse tag #37.



Map Name: Goslin Mtn.

Diagrammatic Sketch

Township 3N, Range 23E, Section 35

UTM 4534895.977 N, 643914.120 E

DISCUSSION

Trend Study No. 8B-13 (9-24)

This is a new study site established in 1995 to monitor wildlife and livestock impacts on meadows in the Goslin Mountain area. This study, Lower Big Meadow, was setup on a meadow about one-half of a mile east of study #12. It is a drier site than site #12, but has the same elevation, slope, and aspect. There is water flowing in a small stream to the north-west of the study site. Pellet group quadrat frequency data indicated moderate deer and heavy cattle use in 1995. Pellet group data taken along the study site baseline in 2000, estimate light wildlife use (<1 deer and 3.4 elk days use/acre or 8 edu/ha). Spring pronghorn antelope pellet groups were fairly abundant and some sage grouse scat was also encountered. Cattle were not on the allotment as of July 6th 2000, but use from the 1999 season is estimated at 52 days use/acre.

The soil is deep with an effective rooting depth estimated at nearly 20 inches. There is very little surface rock. Soil texture is a sandy clay loam to loam with a moderately alkaline soil reaction (pH of 8.0). Phosphorus is limited at only 2.4 ppm where values less than 10 ppm can limit normal plant growth and development. Vegetation and litter cover are abundant and prevent any erosion.

Due to the drier nature of this site, species composition is much more diverse than the other meadow sites. Ten to 12 grasses, two sedges, and one rush provided 32% cover in 1995 and 37% cover in 2000. The most common grasses include Canada and Kentucky bluegrass which account for about half of the grass cover. These species are very tolerant of grazing and often occur on disturbed sites. Grasses considered decreasers on this range type include: slender wheatgrass, thickspike wheatgrass, Nebraska sedge, prairie Junegrass and Sandberg bluegrass.

Forbs are more abundant on this site than on site #11 or #12. Combined, they provided a total of 39% cover in 1995 and 34% in 2000. Unfortunately, the most abundant forb is the mat forming rose pussytoes. Other abundant forbs include Pacific aster and dandelion.

1995 APPARENT TREND ASSESSMENT

The soil trend appears stable with abundant well dispersed vegetation and litter cover. There is no browse trend because no shrubs occur on the site. The herbaceous understory is very diverse and abundant. However, like the other meadows sampled, less desirable increaser species dominate the understory. Only 18% of the grass cover comes from decreaser species. Fifty-six percent of the forb cover comes from rose pussytoes, a mat forming species, which provides very little forage value. Most of the other forbs are low growing increasers whose dominance indicates over grazing. Overall, 74% of the total vegetative cover is contributed by increaser grasses and forbs.

2000 TREND ASSESSMENT

Trend for soil is stable with abundant protective ground cover and little bare ground exposed. There is no erosion occurring on the site. There are no shrubs on the site so there is no browse trend. Trend for the herbaceous understory is down slightly due to a slight decline in the sum of nested frequency for perennial grasses and a substantial decline in the sum of nested frequency of perennial forbs. The grass composition is dominated by the increaser, Kentucky bluegrass, which increased significantly in nested frequency and now accounts for 33% of the grass cover. A Carex and Canada bluegrass are also abundant and combine to produce 44% of the grass cover. Nested frequency of Carex, remained stable while Canada bluegrass declined significantly. Nebraska sedge is found on this site but at a much lower frequency compared to the other meadows. It increased significantly in nested frequency but it only has a quadrat frequency of 25% and a cover value less than 1%. The forb composition is still dominated by rose pussytoes which currently provides 59% of

the forb cover. Field milkvetch, thistle, horsetail, fleabane, and dandelion are also fairly abundant.

TREND ASSESSMENT

soil - stable (3)

browse - no shrubs on the site (NA)

herbaceous understory - down slightly (2) especially for forbs

HERBACEOUS TRENDS --

Herd unit 08B, Study no: 13

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
G	Agropyron dasystachyum	157	*84	46	24	1.55	.75
G	Agropyron trachycaulum	57	78	21	28	.45	1.19
G	Bromus carinatus	-	*35	-	13	-	.55
G	Carex nebraskensis	3	*64	1	21	.03	.80
G	Carex spp.	297	291	84	90	6.59	8.07
G	Hordeum brachyantherum	6	4	3	3	.04	.04
G	Juncus balticus	70	80	24	33	1.12	1.43
G	Koeleria cristata	87	*36	30	15	3.23	.66
G	Muhlenbergia richardsonis	91	49	25	18	2.37	1.97
G	Poa compressa	238	*145	68	42	9.39	8.10
G	Poa fendleriana	-	1	-	1	-	.03
G	Poa pratensis	94	*240	26	61	5.67	12.33
G	Poa secunda	31	12	9	7	.61	.16
G	Sporobolus cryptandrus	41	*-	13	-	.21	-
G	Stipa columbiana	-	*19	-	8	-	.45
G	Stipa lettermani	30	15	9	9	.64	.27
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		1202	1153	359	373	31.94	36.87
Total for Grasses		1202	1153	359	373	31.94	36.87
F	Achillea millefolium	22	36	9	13	.52	.66
F	Antennaria rosea	306	*253	79	71	21.67	19.97
F	Arabis spp.	5	-	2	-	.01	-
F	Astragalus agrestis	115	*135	40	49	1.58	3.70
F	Aster chilensis	177	*70	55	22	3.19	2.07
F	Astragalus spp.	-	*4	-	4	-	.02
F	Cirsium spp.	119	81	47	31	1.04	1.35
F	Convolvulus arvensis	-	1	-	1	-	.03
F	Cymopterus spp.	-	4	-	1	-	.00
F	Descurainia spp. (a)	3	-	1	-	.00	-
F	Draba spp. (a)	15	*-	5	-	.02	-
F	Equisetum spp.	113	141	44	59	.39	.90

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
F	Erigeron spp.	62	90	20	31	.41	1.06
F	Eriogonum spp.	3	8	1	2	.03	.06
F	Lithospermum spp.	-	1	-	1	-	.03
F	Potentilla anersina	56	49	21	16	.69	.80
F	Potentilla gracilis	15	14	4	6	.04	.22
F	Ranunculus testiculatus (a)	2	-	1	-	.00	-
F	Sedum lanceolatum	3	-	1	-	.00	-
F	Senecio pauperculus	4	-	1	-	.00	-
F	Sisyrinchium spp.	183	*-	61	-	2.05	-
F	Taraxacum officinale	189	*107	63	38	6.05	2.22
F	Viola spp.	33	18	10	8	.73	.55
F	Zigadenus venenosus	9	*-	3	-	.16	-
Total for Annual Forbs		48	0	16	0	0.46	0
Total for Perennial Forbs		1386	1012	452	353	38.20	33.70
Total for Forbs		1434	1012	468	353	38.67	33.70

* Indicates significant difference at % = 0.10

BASIC COVER --

Herd unit 08B, Study no: 13

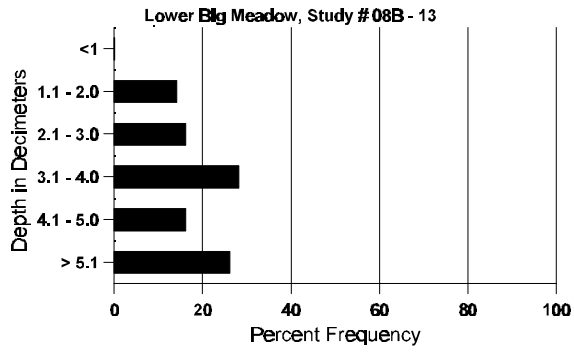
Cover Type	Nested Frequency		Average Cover %	
	'95	'00	'95	'00
Vegetation	499	499	68.32	78.12
Rock	9	-	.01	0
Pavement	-	2	0	.00
Litter	495	478	63.81	72.36
Cryptogams	38	7	.79	.04
Bare Ground	92	80	.52	1.74

SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 13, Study Name: Lower Big Meadow

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
19.91	52.4 (18.03)	8.0	49.0	27.7	23.3	3.5	2.4	444.8	1.9

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 13

Type	Quadrat Frequency	
	'95	'00
Rabbit	16	3
Antelope	-	1
Elk	2	-
Deer	12	4
Cattle	40	13
Sage Grouse	-	-

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
'00	'00
174	N/A
87	7 (17)
44	3 (8)
9	1 (2)
618	52 (127)
26	N/A

Trend Study 8B-14-00

Study site name: Clay Basin Bench .

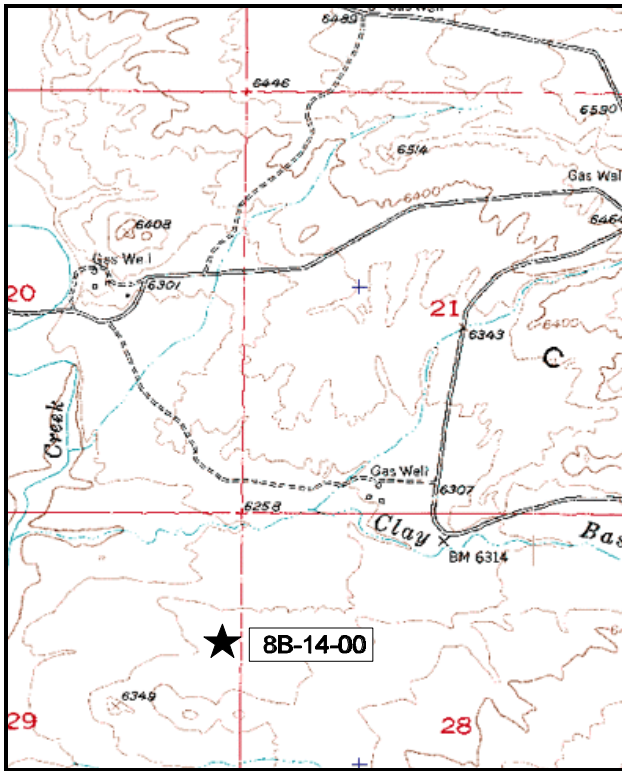
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 107°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

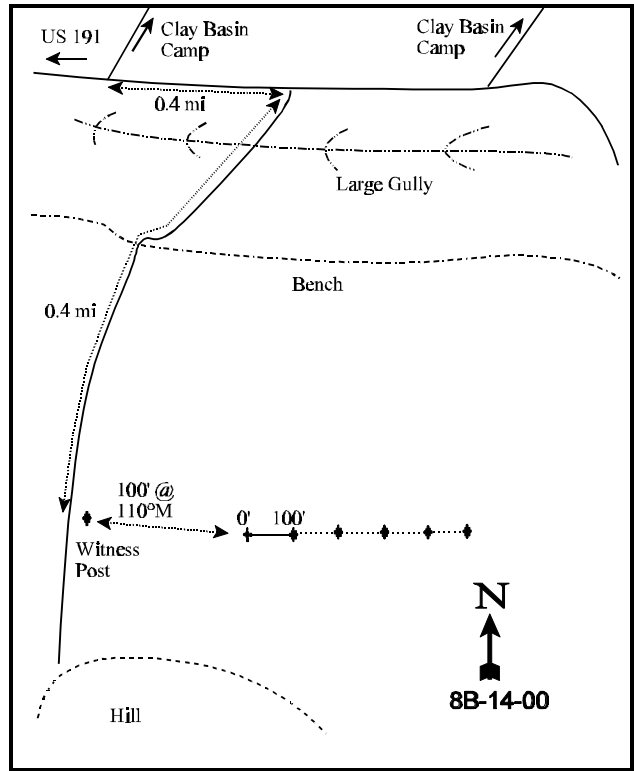
LOCATION DESCRIPTION

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191. Continue over the stateline into Wyoming and turn right just after Minnies Gap onto the Clay Basin road. Drive approximately 13 miles towards Clay Basin to the turn off to Clay Basin Camp. Turn right again and proceed 0.4 miles to another intersection. Turn right and go 0.4 miles going through the large gully and onto the bench. The witness post is on the left side of the road. The 0-foot stake is 100 feet away at a bearing of 110°M.



Map Name: Clay Basin

Township 3N, Range 24E, Section 29



Diagrammatic Sketch

UTM 4536844 N, 649503 E

DISCUSSION

Trend Study No. 8B-14

The Clay Basin Bench is a new trend study established in 2000 to monitor important big game winter range in Clay Basin. The site is placed on a bench about 1 mile to the south of Clay Basin Camp. It samples a Wyoming big sagebrush type with a gentle slope of 3% at an elevation of 6,300 feet. Aspect is to the west. Cattle graze this area in the summer which were in the area when the site was established. Deer and elk use the area primarily as winter range. Pellet group data taken along the study site baseline in 2000 estimate 56 deer, 5 elk, and 17 cow days use/acre (138 ddu/ha, 12 edu/ha and 42 cdu/ha).

Soil on the site is relatively deep and rock free but compacted with an effective rooting depth estimated at nearly 13 inches. It has a sandy loam texture with a neutral soil reaction (pH of 7.3). Phosphorus is marginal at 6.3 ppm where values less than 10 ppm can limit normal plant growth and development. There are some small active gullies on the site which appear to have originally been cattle trails. Herbaceous vegetation is lacking and percent bare ground is moderately high at 44%. An important stabilizing factor for the soil is the high cryptogamic cover (23%) which combined with vegetation and litter provide marginally sufficient protective ground cover.

The site supports an old stand of Wyoming big sagebrush with a density of 6,500 plants/acre. There is little reproduction in the form of seedlings and young. Seed production is poor this year and not much better last season considering the lack of old seed heads. Leader growth is currently poor averaging about 1 inch. This gives the sagebrush the appearance of being heavily hedged. Some heavy use appears to have taken place in the past, but current use is mostly moderate. Percent decadence is moderately high at 32% and approximately 44%, or 900 plants/acre, of the decadent plants are classified as dying.

Additional browse forage is provided by small numbers of winter fat, stickyleaf low rabbitbrush and slenderbush eriogonum. The most numerous shrub is broom snakeweed, an undesirable increaser. It currently has a density of 12,660 plants/acre which provides 18% of the browse cover. Ninety-three percent of the population was classified as mature. This would indicated a stable population where young plants make up only 2% of the population.

The herbaceous understory is lacking. Perennial grasses, consisting primarily of western wheatgrass, Indian ricegrass and needle-and-thread, produce only about 5% total cover. Forbs are also lacking and produce only 2% cover. Six species were encountered but hoods phlox, a low value, low growing species, dominates the composition by providing 98% of the forb cover.

2000 APPARENT TREND ASSESSMENT

The soil condition is poor due to a high percentage of bare ground combined with low cover of litter and vegetation. Even with the slight slope, some active erosion is occurring within the shrub interspaces. Condition of the key browse species, Wyoming big sagebrush, is also poor. The stand is overly mature with no seedlings evident and poor young recruitment at only 2%. Use is mostly moderate and percent decadence is fairly high at 32%. In addition, 44% of the decadent plants sampled are classified as dying and there are currently not enough young plants to replace those that are dead.

HERBACEOUS TRENDS --
Herd unit 08B, Study no: 14

T y p e	Species	Nested Frequency	Quadrat Frequency	Average Cover %
		'00	'00	'00
G	<i>Agropyron smithii</i>	134	50	1.30
G	<i>Bromus tectorum</i> (a)	18	6	.10
G	<i>Oryzopsis hymenoides</i>	71	27	1.12
G	<i>Poa fendleriana</i>	4	1	.00
G	<i>Poa secunda</i>	80	27	.36
G	<i>Sitanion hystrix</i>	14	6	.10
G	<i>Stipa comata</i>	132	51	2.43
Total for Annual Grasses		18	6	0.10
Total for Perennial Grasses		435	162	5.33
Total for Grasses		453	168	5.44
F	<i>Erigeron pumilus</i>	2	2	.01
F	<i>Hymenoxys richardsonii</i>	4	1	.00
F	<i>Penstemon</i> spp.	1	1	.00
F	<i>Phlox hoodii</i>	134	62	1.92
F	<i>Schoenrambe linifolia</i>	2	1	.00
F	<i>Townsendia incana</i>	4	2	.01
Total for Annual Forbs		0	0	0
Total for Perennial Forbs		147	69	1.95
Total for Forbs		147	69	1.95

BROWSE TRENDS --
Herd unit 08B, Study no: 14

T y p e	Species	Strip Frequency	Average Cover %
		'00	'00
B	<i>Artemisia tridentata</i> <i>wyomingensis</i>	97	15.67
B	<i>Ceratoides lanata</i>	10	.21
B	<i>Chrysothamnus viscidiflorus</i> <i>viscidiflorus</i>	5	.03
B	<i>Eriogonum microthecum</i>	6	.00
B	<i>Gutierrezia sarothrae</i>	82	3.92
B	<i>Opuntia</i> spp.	43	1.75
Total for Browse		243	21.60

BASIC COVER --

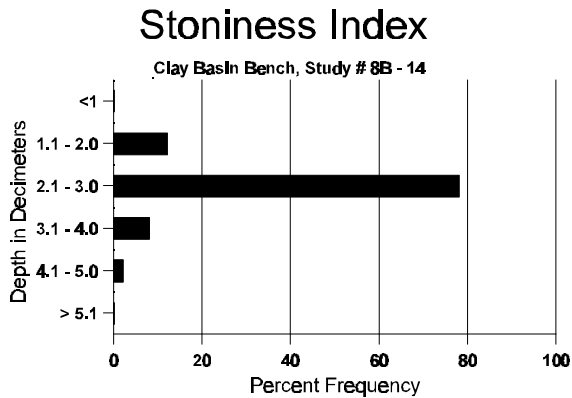
Herd unit 08B, Study no: 14

Cover Type	Nested Frequency	Average Cover %
	'00	'00
Vegetation	389	28.52
Rock	16	.20
Pavement	89	.60
Litter	425	29.68
Cryptogams	277	22.77
Bare Ground	378	43.54

SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 14, Study Name: Clay Basin Bench

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
12.87	56.0 (12.99)	7.3	65.6	17.1	17.3	1.2	6.3	89.6	0.5



PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 14

Type	Quadrat Frequency	Pellet Transect	
		Pellet Groups per Acre	Days Use per Acre (ha)
	'00	'00	'00
Rabbit	9	70	N/A
Elk	3	70	5 (13)
Deer	47	731	56 (139)
Cattle	4	209	17 (43)

BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 14

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Artemisia tridentata wyomingensis</i>																		
Y	'00	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7	
M	'00	87	107	20	1	-	-	-	-	-	215	-	-	-	4300	13	25	215
D	'00	35	60	7	1	-	-	-	-	-	58	-	-	45	2060		103	
X	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	680		34	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'00		51%			08%			14%										
Total Plants/Acre (excluding Dead & Seedlings)														'00	6500	Dec:	32%	
<i>Ceratoides lanata</i>																		
M	'00	2	7	4	-	-	-	-	-	-	13	-	-	-	260	3	6	13
D	'00	-	3	-	-	-	-	-	-	-	1	-	-	2	60		3	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'00		63%			25%			13%										
Total Plants/Acre (excluding Dead & Seedlings)														'00	320	Dec:	19%	
<i>Chrysothamnus viscidiflorus viscidiflorus</i>																		
M	'00	3	2	-	-	-	-	-	-	-	5	-	-	-	100	8	7	5
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'00		40%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'00	100	Dec:	-	
<i>Eriogonum microthecum</i>																		
M	'00	2	1	4	-	-	-	-	-	-	7	-	-	-	140	4	5	7
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'00		14%			57%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'00	140	Dec:	-	
<i>Gutierrezia sarothrae</i>																		
S	'00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
Y	'00	24	-	-	-	-	-	-	-	-	24	-	-	-	480		24	
M	'00	589	-	-	-	-	-	-	-	-	589	-	-	-	11780	4	7	589
D	'00	20	-	-	-	-	-	-	-	-	15	-	3	2	400		20	
X	'00	-	-	-	-	-	-	-	-	-	-	-	-	60		3		
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'00		00%			00%			.78%										
Total Plants/Acre (excluding Dead & Seedlings)														'00	12660	Dec:	3%	

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Opuntia spp.																		
Y	'00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	'00	51	-	-	1	-	-	-	-	-	52	-	-	-	1040	3	14	52
D	'00	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'00	1240	Dec:	13%			

SUMMARY

WILDLIFE MANAGEMENT UNIT 8B (9) - NORTH SLOPE, DAGGETT

A total of 13 study sites were read on unit 8B in 2000. Of these, 5 were rereads of sites established in 1982, two were rereads of studies established in 1988, five were rereads of sites established in the Goslin Mountain area in 1995 and the last site was a new trend study established in Clay Basin. One site, Cedar Springs (#1) was dropped. It is totally dominated by pinyon and juniper leaving little browse in the understory. It is no longer considered representative of big game winter range.

Of the 12 trend studies with 2000 trend assessments, 8 sites had stable soil trends. Two had improving trends and 2 trend studies (Bear Top Mtn. and Antelope Flat) had declining trends. Of the 9 trend studies where browse trends were determined, 5 had stable trends while 3 displayed slightly downward trends due to drought conditions (Bear Top Mtn, Bennett Ranch and Death Valley). One site, Bear Top Mountain, has a downward browse trend due to a fire which eliminated most of the shrubs. Herbaceous trends are stable on 4 sites and slightly down on 6 sites (Greendale, Bear Top Mtn, West Goslin, Sagebrush Ridge, Big Meadow and Lower Big Meadow). Two sites have slightly upward herbaceous trends. Drought conditions are obviously effecting these trends. Nested frequency of perennial forbs were down on 8 of the 12 sites. Half of the sites also showed a decline in the sum of nested frequency of perennial grasses but had an increase in cover. Trends for all of the trend study sites on unit 8B are listed below.

TREND SUMMARY

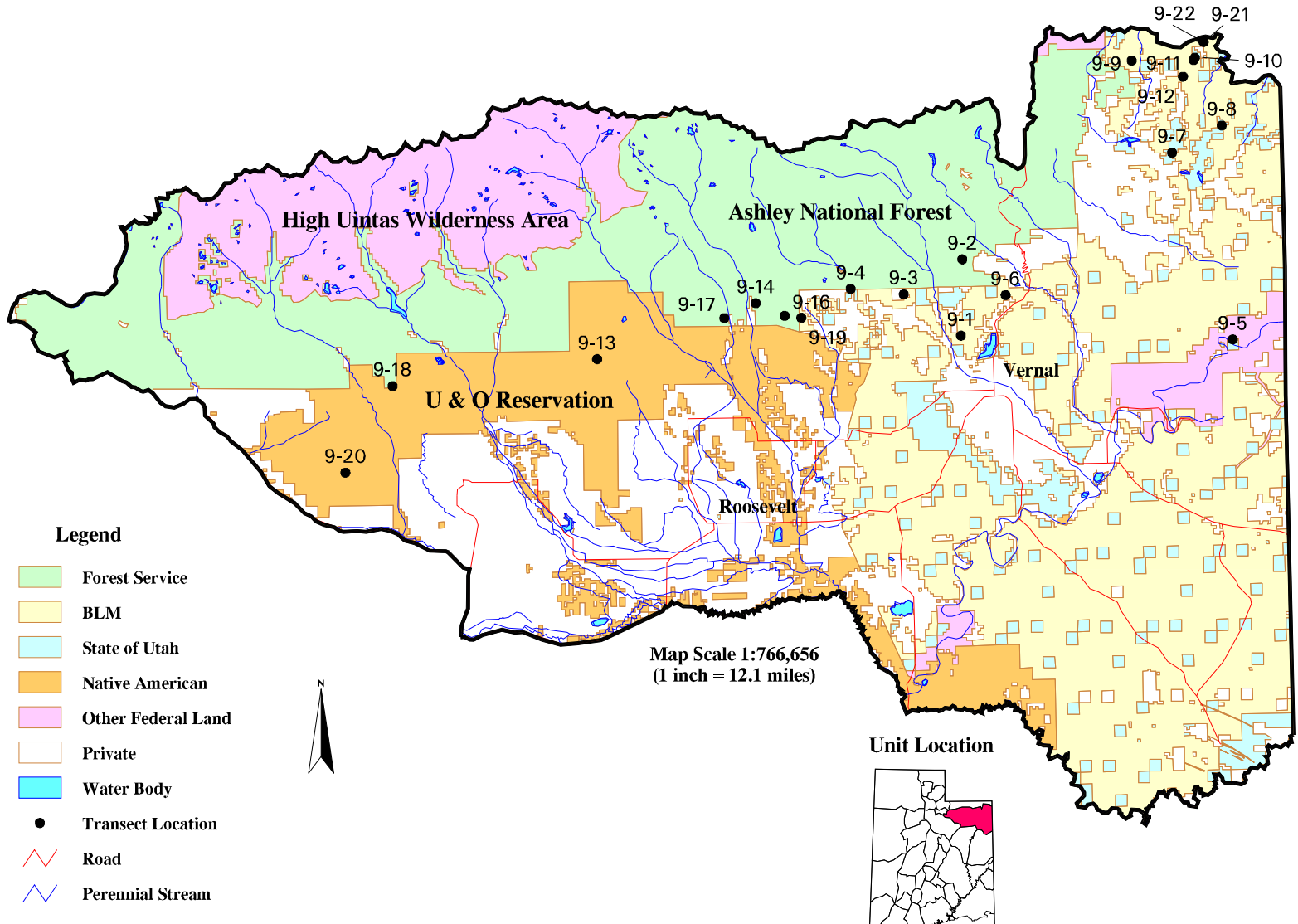
	Category	1988	1995	2000
8B-1 Cedar Springs	soil	3	4	NR
	browse	1	1	NR
	herbaceous understory	4	3	NR
8B-2 Goslin Mountain	soil	3	4	4
	browse	3	2	3
	herbaceous understory	5	4	4
8B-3 Bear Top Mountain	soil	4	3	1
	browse	5	3	1
	herbaceous understory	5	2	2
8B-4 Greendale	soil	4	5	5
	browse	5	5	3
	herbaceous understory	5	5	2
8B-5 Bennett Ranch	soil	4	3	3
	browse	5	4	2
	herbaceous understory	4	2	3

(1) = down, (2) = slightly down, (3) = stable, (4) = slightly up, (5) = up
est = site established, NA = data not available, NR = site not read

	Category	1988	1995	2000
8B-6 Death Valley	soil	5	3	3
	browse	5	3	2
	herbaceous understory	5	3	4
8B-7 Antelope Flat	soil	est	4	2
	browse	est	3	2
	herbaceous understory	est	2	3
8B-8 Phil Pico Mountain	soil	est	4	3
	browse	est	4	3
	herbaceous understory	est	1	3
	Category		1995	2000
8B-9 West Goslin	soil		est	3
	browse		est	3
	herbaceous understory		est	2
8B-10 Sagebrush Ridge	soil		est	3
	browse		est	3
	herbaceous understory		est	2
8B-11 Triangle Meadow	soil		est	3
	browse		est	NA
	herbaceous understory		est	3
8B-12 Big Meadow	soil		est	3
	browse		est	NA
	herbaceous understory		est	2
8B-13 Lower Big Meadow	soil		est	3
	browse		est	NA
	herbaceous understory		est	2
8B-14 Clay Basin Bench	soil			est
	browse			est
	herbaceous understory			est

(1) = down, (2) = slightly down, (3) = stable, (4) = slightly up, (5) = up
est = site established, NA = data not available, NR = site not read

Management Unit 9



WILDLIFE MANAGEMENT UNIT 9 - SOUTH SLOPE

Boundary Description

Wasatch, Summit, Daggett, Uintah, Duchesne counties -- Boundary begins at the junction of Highway US-40 and Highway SR-87 in Duchesne; then north on SR-87 to Highway SR-35; then northwest on SR-35 to the Provo River; north along the Provo River to the North Fork Provo River; north along the North Fork Provo River to Highway SR-150; northerly along SR-150 to the Summit/Duchesne county line (summit of the Uinta Mountains); east along the summit of the Uinta Mountains to Highway SR-191; north along SR-191 to Cart Creek; northeast along Cart Creek to Flaming Gorge Reservoir; east along Flaming Gorge Reservoir to the Green River; east along the Green River to the Utah-Colorado state line; south along the Utah-Colorado state line to the White River; west along the White River to the Green River; north along the Green River to the Duchesne River; northwest along the Duchesne River to US-40 at Myton; west along US-40 to SR-87 in Duchesne and beginning point; excludes Dinosaur National Monument and all Indian Tribal Lands.

Management Unit Description

This management unit encompasses the land area of two former deer herd units, the Vernal unit (11) and the South Slope unit (12). Currently, the South Slope unit contains an estimated 2.8 million acres of deer range with summer, year-long, and winter ranges making up 40%, 35%, and 25% of this area respectively. Of all the land area classified as deer range, 32% is managed by the U.S. Forest Service, 25% by the Bureau of Land Management, and 22% are privately owned lands. In addition, 13% are Native American trust lands, and 5% are State of Utah trust lands. The South Slope unit also contains about 1.7 million acres classified as elk range. Of this amount, 64% is classified as elk summer range, 32% elk winter range, and 4% year-long range. The U.S. Forest Service and Bureau of Land Management manage 53% and 13% of the acreage classified as elk range, with private and Native American trust lands each making up 15% of the area.

Winter range within the old Vernal deer herd unit (11) is comprised mainly of closely associated areas of pinyon-juniper woodlands on the south-facing slopes and foothill benches of Diamond, Blue, and Taylor Mountains. The upper limits generally follow the 8,500 foot contour. The lower limits are defined by agricultural lands and the desert below Vernal. Winter ranges within the old South Slope (12) unit are more limiting, and management is complicated in that a large portion of these lands are part of Uintah and Ouray Indian Reservations. Summer range within the new South Slope unit are plentiful, ranging from aspen and conifer communities, to mountain big sagebrush and mountain brush communities.

Key Areas

Key areas for winter range consist of the small sagebrush/grass parks found throughout the pinyon-juniper woodlands, especially on the Vernal side of the unit. The sparse pinyon-juniper type predominates the foothills where diversity and productivity of desirable browse is usually low. Areas with a sagebrush understory or sagebrush/grass associations are more productive. Therefore, these areas normally receive more use by big game and livestock. Key areas that sample this type are Red Mountain, Dry Fork Mountain, Island Park, and Brown's Park. Key areas at Steinaker Draw, Toliver Creek, and Brown's Park sample winter range in the pinyon-juniper type, including areas that have either been chained or burned. Higher winter ranges in the mountain brush and mountain big sagebrush zones also provide important winter range for big game in this unit, especially along the south slope of the Uinta Mountains. Key areas within these vegetation types include: Little Hole, John Starr Flat, Red Pine Canyon, Mosby Mountain, Gooseberry Spring and Seep Hollow. Key areas in transitional and summer ranges are sampled on Taylor, Mosby and Diamond Mountains.

Grazing Summary

Grazing on BLM managed lands occurs under several different allotments. They are generally grazed by cattle in spring and/or summer. The Red Mountain allotment is grazed under a deferred system in either spring or fall, but not both. Dry Fork Mountain is grazed from approximately June 1 to September 15 for 470 AUM's. Actual use averages 334 AUM's per year due to a lack of water. The BLM Spring Creek allotment below Taylor Mountain has been grazed by cows in the spring (May) and late fall (November 26 to December 15) for the last 12 years. The Little Hole allotment is grazed from June 1 to October 15 for 330 AUM's. The Warren Draw allotment is permitted for 376 AUM's from May 15 to October 31. Cows use the lower areas of Browns Park on the Taylor Flat allotment in spring. The intensive annual grazing from April 1 to May 31 is planned to reduce grass-shrub competition and to promote sagebrush vigor. However, better livestock distribution is needed. Furthermore, this will not work during drought because the cattle will heavily utilize sagebrush during this grazing period when grasses are not available. There have been 1,000 AUM's permitted since 1970. The land in the drainages above Brown's Park that were burned in the 1980's are grazed only one out of every three years.

Forest Service land on Taylor Mountain is managed in a six pasture rest-rotation system with grazing occurring from June 1 to September 15. The unit in which the trend study is located supports about 500 AUM's in non-rested years for a grazing intensity of 2.9 suitable acres/AUM. The Lake Mountain allotment is grazed by 276 cows/calves from June 21 to September 30, on a four unit rest-rotation system. The Mosby Mountain allotment consists of several grazing units and has been in a rest-rotation system since 1960. Currently, this allotment is permitted for 402 cattle from June 11 to September 30. The Red Pine Canyon area is in the Whiterocks Canyon allotment and is grazed by 50 cattle on a deferred rest system. The Farm Creek allotment has a four unit rest-rotation system permitted for 576 cattle with a season of use from June 11 to September 10. Gooseberry Spring falls in the Pigeon Water allotment which is grazed by 172 cattle on a rest-rotation system with a season of use from June 16 to September 25.

Big Game Herd Unit Management Objectives

Deer herd population management goals call for a wintering herd size of 25,000 animals, distributed in the following sub-populations: 12,000 animals in the Yellowstone sub-unit; and 13,000 animals in the Vernal, Bonanza and Diamond Mountain sub-units combined. The desired composition of the herd in all areas except Diamond Mountain is a post-season buck to doe ratio of 15:100 with 30% of the bucks being 3-point or better. The Diamond Mountain sub-unit will be managed for a post-season buck to doe ratio of 25:100 with the southern slope being managed as a limited entry unit.

Elk population management objectives call for a target population of 6,400 wintering animals distributed in the following sub-populations: 3,900 in the Yellowstone sub-unit; 1,300 in the Vernal/Bonanza sub-units combined; and 1,200 in the Diamond Mountain sub-unit. The desired herd composition is for a bull to cow ratio of 8:100, with at least half of the bulls being 2 ½ years of age or older. In the Diamond Mountain sub-unit (limited entry), a 5 ½ year old age class is to be maintained for harvest, with the rest of the unit being managed for general open bull hunting.

Study Site Description

Currently, this management unit contains 22 trend studies. Twelve of these existed in the old Vernal unit (11), 8 existed in the old South Slope unit (12) and 2 new studies were established in 2000. Fourteen studies were established in 1982, and 3 additional studies were established in both 1988 and 1995 in addition to the 2 new studies established in 2000 already mentioned. Depending upon when they were established, sites were re-read in 1988, 1995 and 2000. In 2000, the study at Toliver Creek in the untreated pinyon-juniper was not read

because it is in very poor condition and there was very little wildlife use. This study was originally established to compare with the adjacent Toliver Creek Chaining trend study. The study at Mud Springs Draw was also not read due to road closures and lack of access.

Trend Study 9-1-00

Study site name: Red Mountain Allotment .

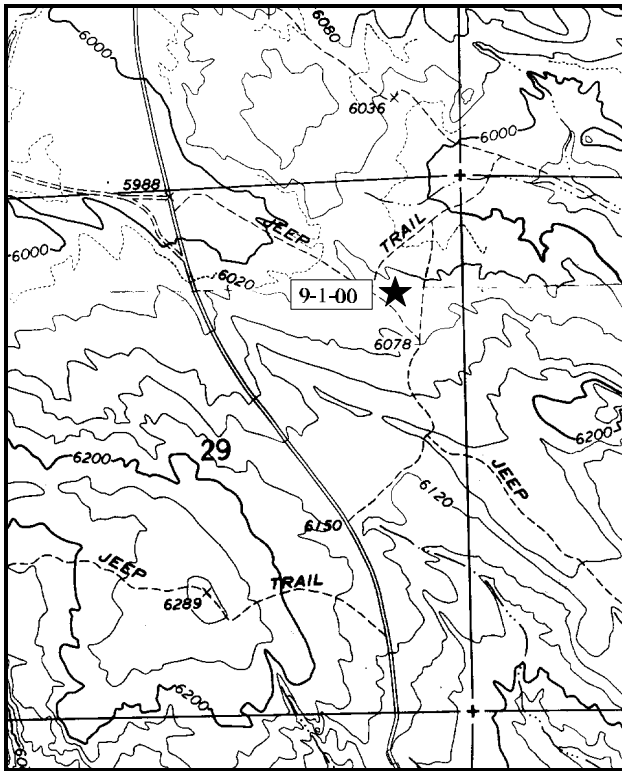
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 9°M, 105°M .

First frame Placement on frequency belts 5 feet. Frequency belt placement; line 1 (4ft), line 2 (28ft), line 3 (45ft), line 4 (77ft), line 5 (89ft).

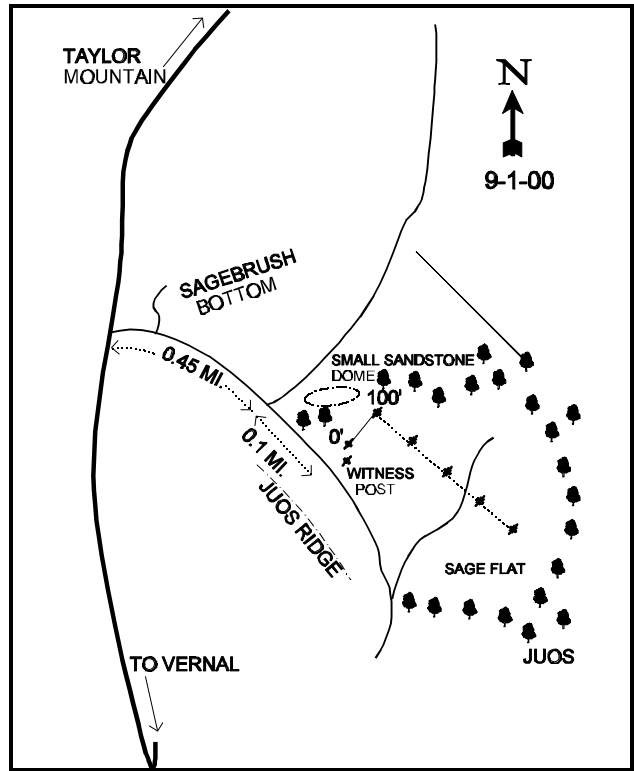
LOCATION DESCRIPTION

From Highway 121 (500 N) west of Vernal in Maeser, go north on 2500 West for 3.25 miles to the Ashley substation. From there, continue 2.0 miles to a dirt road to the right in the sagebrush bottom. Turn and go east for 0.45 miles to a fork. Stay right and proceed just less than 0.1 miles. The 0-foot baseline stake should be visible in the sagebrush along the left side of the road. The study can also be located by walking 75 paces bearing 167°M from the east end of the sandstone dome to the 0-foot baseline stake.



Map Name: Steinaker Reservoir

Township 3S , Range 21E , Section 29



Diagrammatic Sketch

UTM 4487661.851 N, 620389.985 E

DISCUSSION

Trend Study No. 9-1 (11-1)

The Red Mountain Allotment trend study is located on big game winter range above Vernal. The site supports a nearly pure stand of Wyoming big sagebrush surrounded by pinyon-juniper covered rocky ridges. The terrain at the study site slopes gently to the north (3-5%) with an elevation of just over 6,000 feet. Pellet group transect data taken along the study baseline in 2000 estimate moderate use by deer (47 deer days use/acre, 116 ddu/ha) and light use by cattle (1 cow day use/acre, 2 cdu/ha). This study is in the Red Mountain cattle allotment which is grazed in spring or fall on a deferred system.

Soils texture is a sandy loam which is moderately deep and somewhat excessively drained. Estimated effective rooting depth is over 16 inches with a relatively high average soil temperature of 70° F. Sites with high soil temperatures are more susceptible to invasion from weeds, primarily annual species. Soils are moderately alkaline (pH of 7.9) and low in organic matter. Although this site lacks continuous ground cover in the interspaces, runoff is low and the erosion hazard is slight due to the nearly flat terrain. Some pedestaling around shrubs is evident. Percent bare ground was moderately high in 1982 at 35%, but steadily declined to 21% in 1995. Due to drought in 2000, bare ground slightly increased to 25% with vegetation cover decreasing from 34% to 30%. Seventy-two percent of the vegetative cover comes from shrubs. Compared to herbaceous vegetation, shrubs are less effective at protecting against soil erosion from high intensity summer storms. An extensive cover of cryptogams (18%) provides added soil protection which is important at this site due to low herbaceous cover.

Wyoming big sagebrush is the dominant browse species, comprising 84% of the browse cover in 1995 and 90% in 2000. Sagebrush cover averages around 20%. Sagebrush density is currently estimated at 5,440 plants/acre with a relatively high rate of decadency at 65%. The current level of decadency is a dramatic increase from 15% in 1995. Although, percent decadency was nearly as high in 1988 at 53%. Percent decadency has been highly variable between sampling years since the establishment of this site in 1982. It is apparent however, that sharp fluctuations in decadency are mostly weather related as use of the sagebrush since 1988 has been mostly light to moderate. With numerous drought years since the late 1980's, sagebrush has undoubtedly been affected by the dry conditions. Currently ('00), 37% of the decadent plants are classified as dying which represents about 1,300 plants/acre that could be lost from the population. Young recruitment is currently very low (60 plants/acre) and not adequate to replace the decadent, dying plants in the population. Coupled with high decadency in 2000, the proportion of the sagebrush population in poor vigor also increased from 6% in 1995 to 25%. The increase in poor vigor is most likely drought related as well, which has been documented on other trend studies in this unit in 2000. A return to normal precipitation would improve these downward trends on sagebrush.

All other browse species present on the site are infrequent and include: stickyleaf low rabbitbrush, prickly pear cactus, Stansbury cliffrose and prickly phlox.

Herbaceous vegetation occurs mainly under the canopy of sagebrush, leaving large bare interspaces between individual shrubs. Annual species dominate both the grass and forb components. The dominant grasses are annual cheatgrass and sixweeks fescue that account for over 80% of the grass cover in both 1995 and 2000. Sixweeks fescue sharply declined in nested frequency in 2000, while cheatgrass significantly increased. This increase in cheatgrass frequency is somewhat surprising with the dry conditions in 2000. Perennial grasses are in low abundance with 5 species being sampled in 1995 and 2000. Muttongrass and Sandberg bluegrass are the most abundant, with needle-and-thread, thickspike wheatgrass and bottlebrush squirreltail also being sampled, but occurring in low numbers. Perennial grasses decreased in sum of nested frequency in 2000 and only provide 4% of the total vegetative cover at this site. Forbs have been sparse on this site during all sampling periods.

Annual forbs were fairly abundant in 1995 with the wet spring of that year, but were infrequent in 2000 with drought. Perennial forbs are nearly non-existent with 3 species being sampled in 2000 totaling less than 1/10 of one percent average cover.

1982 APPARENT TREND ASSESSMENT

Apparent vegetative trend on this site appears stable. Plant composition is less than desirable however. The key species, Wyoming big sagebrush, shows evidence of high utilization which could eventually depress vigor and plant abundance. Soil trend appears to be declining. Of the seven applicable soil trend parameters on the evaluation checklist, five were judged as indicating a declining trend.

1988 TREND ASSESSMENT

Slight changes in ground cover measurements detected in 1988 are probably not significant. The possible exception is the increase in the cover of cryptogamic crusts. Bare soil still constitutes 30% of the ground surface, but that is an improvement from 1982 when percent bare ground was estimated at 35%. There is considerable areas of unprotected bare soil in the shrub interspaces, but serious erosion does not appear to be a significant problem on the site due to the level terrain. Trend for soil is slightly up, but in poor condition. Trend for the key browse species, Wyoming big sagebrush, is mixed. Population density has increased greatly but entirely from an increase in the decadent age class which rose from 400 plants/acre in 1982 to 5,133 by 1988. Use is currently more moderate, yet vigor has declined with 14% (733 plants/acre) of the decadent shrubs classified as dying. The data for shrub density suggests that the population has increased considerably since 1982, most likely caused by the extremely wet years of 1983 and 1984. However, sagebrush is likely poised to decline dramatically in the future if current drought conditions persist. Trend for browse is slightly down due to the high numbers of decadent individuals even though the mature population currently appears stable. The herbaceous trend is slightly up due to an increase in quadrat frequency of grasses. Forbs have remained stable.

TREND ASSESSMENT

soil - slightly up but in poor condition (4)

browse - slightly down and poised to decline due to abundant decadent sagebrush (2)

herbaceous understory - slightly up but in poor condition due to annuals (4)

1995 TREND ASSESSMENT

Ground cover characteristics have improved since 1988 with percent bare ground decreasing from almost 30% to 21%. Cryptogamic cover has also increased providing added soil protection. Even with this improvement, condition is still poor with large areas of bare ground in the shrub interspaces. Trend for browse is improved slightly. Overall density has declined considerably but the result is a smaller, healthier population. Heavy use has declined, vigor has improved, and percent decadency has declined from 53% to 15%. Recruitment is fairly good with 120 seedlings and 360 young plants/acre. Trend for the herbaceous understory is slightly down with sum of nested frequency of perennial grasses declining for three of the five species encountered. Condition of the understory is poor due to the dominance of annual grasses and forbs. Cheatgrass and sixweeks fescue make up 82% of the grass cover while 8 annual forbs contribute 99% of the forb cover. These annual grasses and forbs were not included in the 1982 and 1988 samples so no comparisons can be made.

TREND ASSESSMENT

soil - slightly up but remains in poor condition (4)

browse - slightly up (4)

herbaceous understory - slightly down, and in poor condition due to annuals (2)

2000 TREND ASSESSMENT

Trend for soil is down slightly. Percent bare ground slightly increased, but not excessively. Vegetation cover has declined slightly and sum of nested frequency of herbaceous vegetation has fallen due to drought. In addition, the ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil has also declined slightly. Very little protective ground cover is present in the interspaces between sagebrush plants, but erosion remains minimal due to the level terrain. Trend for browse is slightly down as Wyoming big sagebrush has several downward parameters. Percent decadency increased from 15% to 65% and poor vigor increased from 6% to 25% since 1995. The proportion of decadent, dying plants is moderate at 37%, representing about 1,300 plants/acre. Recruitment is low and not adequate to replace the decadent, dying portion of the population. These downward parameters are most likely the result of drought which could improve if precipitation returns to a normal level. Trend for the herbaceous understory is down and remains in poor condition. Sum of nested frequency of perennial species, which are already infrequent, decreased by half in 2000. Annual species dominate the understory at this site.

TREND ASSESSMENT

soil - slightly down (2)

browse - slightly down (2)

herbaceous understory - down (1)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 1

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	_b 71	_b 53	_a 15	14	25	17	7	.33	.12
G	Bromus tectorum (a)	-	_a 251	_b 290	-	-	84	92	5.64	6.90
G	Oryzopsis hymenoides	2	-	-	-	1	-	-	-	-
G	Poa fendleriana	_b 111	_a 51	_a 45	10	52	23	20	.66	.35
G	Poa secunda	_a -	_b 17	_c 47	-	-	8	20	.40	.61
G	Sitanion hystrix	_c 50	_b 25	_a 4	13	27	13	2	.23	.03
G	Stipa comata	3	3	2	1	1	2	2	.06	.03
G	Vulpia octoflora (a)	-	_b 252	_a 31	-	-	84	13	1.82	.09
Total for Annual Grasses		0	503	321	0	0	168	105	7.47	6.99
Total for Perennial Grasses		237	149	113	38	106	63	51	1.69	1.15
Total for Grasses		237	652	434	38	106	231	156	9.17	8.14
F	Allium spp.	_B 12	_b 11	_a -	2	5	5	-	.02	-
F	Androsace septentrionalis (a)	-	4	-	-	-	2	-	.01	-
F	Calochortus nuttallii	1	2	-	4	1	2	-	.01	-
F	Chaenactis spp.	-	2	-	-	-	1	-	.00	-
F	Chenopodium leptophyllum (a)	-	_b 16	_a -	-	-	9	-	.04	-
F	Collinsia parviflora (a)	-	3	-	-	-	1	-	.00	-
F	Cryptantha spp.	_A 2	_b 18	_a -	17	2	9	-	.07	-

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Descurainia pinnata (a)	-	_b 92	_a -	-	-	40	-	.25	-
F	Eriogonum cernuum (a)	-	2	-	-	-	1	-	.00	-
F	Erigeron pumilus	_a -	_b 8	_{ab} 2	-	-	4	1	.02	.00
F	Gilia spp. (a)	-	16	7	-	-	7	3	.03	.01
F	Lappula occidentalis (a)	-	3	3	-	-	1	2	.00	.03
F	Lepidium montanum	12	13	12	1	6	8	5	.06	.07
F	Machaeranthera canescens	_b 6	_c 16	_a -	1	3	9	-	.04	-
F	Oenothera pallida	-	1	-	-	-	1	-	.00	-
F	Orobanche fasciculata	3	-	-	-	1	-	-	-	-
F	Phlox longifolia	3	11	-	-	1	5	-	.05	-
F	Plantago patagonica (a)	-	_b 207	_a 94	-	-	73	39	1.23	.27
F	Polygonum douglasii (a)	-	2	-	-	-	1	-	.00	-
F	Schoenocrambe linifolia	_a -	_b 5	_{ab} 6	-	-	3	2	.04	.01
F	Senecio multilobatus	-	-	-	-	-	-	-	-	.00
F	Unknown forb-perennial	1	-	-	-	1	-	-	-	-
Total for Annual Forbs		0	345	104	0	0	135	44	1.59	0.32
Total for Perennial Forbs		40	87	20	25	20	47	8	0.33	0.09
Total for Forbs		40	432	124	25	20	182	52	1.93	0.41

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

BROWSE TRENDS --

Herd unit 09 , Study no: 1

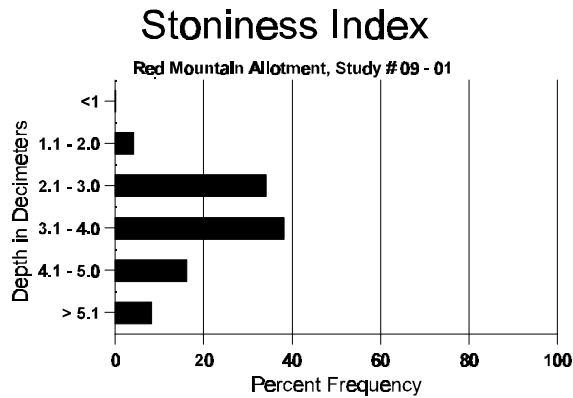
T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata wyomingensis	90	96	21.34	20.20
B	Chrysothamnus viscidiflorus viscidiflorus	40	34	4.00	2.15
B	Leptodactylon pungens	1	0	.15	-
B	Opuntia spp.	2	3	-	-
Total for Browse		133	133	25.50	22.36

BASIC COVER --
Herd unit 09 , Study no: 1

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	351	323	4.0	3.25	34.27	30.36
Rock	12	-	9.50	0	.02	0
Pavement	7	21	1.25	0	.01	.06
Litter	398	360	68.75	55.50	43.87	43.37
Cryptogams	259	293	4.25	11.75	15.97	18.43
Bare Ground	281	298	35.25	29.50	21.13	25.96

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 1, Study Name: Red Mountain Allotment

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
16.39	70.0 (17.56)	7.9	77.0	12.7	10.3	0.6	6.3	64.0	0.6



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 1

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre	Days Use per Acre (ha)
Rabbit	14	65	400	N/A
Elk	2	1	-	-
Deer	47	30	609	47 (116)
Cattle	-	1	9	1 (2)

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 1

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Artemisia tridentata wyomingensis</i>																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200		3	
	95	5	-	-	1	-	-	-	-	-	6	-	-	-	120		6	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	88	1	1	-	2	-	-	-	-	-	4	-	-	-	266		4	
	95	17	1	-	-	-	-	-	-	-	18	-	-	-	360		18	
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
M	82	10	25	35	-	-	-	-	-	-	65	3	2	-	4666	23 26	70	
	88	26	27	11	-	-	-	-	-	-	58	2	4	-	4266	24 21	64	
	95	73	68	5	-	8	8	6	-	-	168	-	-	-	3360	33 42	168	
	00	61	26	3	2	-	-	-	-	-	91	-	1	-	1840	29 31	92	
D	82	-	1	5	-	-	-	-	-	-	-	4	1	1	400		6	
	88	30	32	14	1	-	-	-	-	-	52	1	13	11	5133		77	
	95	15	7	5	1	1	-	3	-	-	20	-	-	12	640		32	
	00	116	49	4	7	-	-	1	-	-	111	-	-	66	3540		177	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	980		49	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	1380		69	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		34%			52%			05%			+47%							
'88		41%			17%			19%			-55%							
'95		39%			08%			06%			+20%							
'00		28%			03%			25%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	5132	Dec:	8%			
												'88	9665		53%			
												'95	4360		15%			
												'00	5440		65%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4							
<i>Chrysothamnus viscidiflorus viscidiflorus</i>												
S	82	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	0	-	0	
	00	1	-	-	-	-	-	-	20	-	1	
Y	82	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	0	-	0	
	95	3	-	-	-	-	-	-	60	-	3	
	00	4	-	-	-	-	-	-	80	-	4	
M	82	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	0	-	0	
	95	41	-	-	2	-	-	-	860	23	32	43
	00	29	-	-	2	-	-	2	660	18	22	33
D	82	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	0	-	0	
	95	3	-	-	1	-	-	-	80	-	4	
	00	10	-	-	3	-	-	1	280	-	14	
X	82	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	60	-	3	
	00	-	-	-	-	-	-	-	20	-	1	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%						
'88		00%		00%		00%						
'95		00%		00%		02%		+ 2%				
'00		00%		00%		12%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	0%			
						'88	0		0%			
						'95	1000		8%			
						'00	1020		27%			
<i>Cowania mexicana stansburiana</i>												
M	82	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	0	-	0	
	00	-	-	-	-	-	-	-	0	30	41	0
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%						
'88		00%		00%		00%						
'95		00%		00%		00%						
'00		00%		00%		00%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	-			
						'88	0		-			
						'95	0		-			
						'00	0		-			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Gutierrezia sarothrae</i>																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	12	23	0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	0		-			
<i>Juniperus osteosperma</i>																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	'82	-	1	-	-	-	-	-	-	-	1	-	-	-	66	36	15	1
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		100%			00%			00%			+ 0%							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	66	Dec:	-			
												'88	66		-			
												'95	0		-			
												'00	0		-			
<i>Leptodactylon pungens</i>																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	5	19	3
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	60		-			
												'00	0		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4		1	2									
Opuntia spp.																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	1	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	1	-	-	-	-	-	-	-	1	-	-	-	66	4	16	1
	88	3	-	-	2	-	-	-	-	5	-	-	-	333	3	6	5
	95	2	-	-	-	-	-	-	-	2	-	-	-	40	4	13	2
	00	3	-	-	-	-	-	-	-	3	-	-	-	60	3	7	3
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	1	-	-	-	-	2	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		00%			00%			00%			+83%						
'88		00%			00%			00%			-90%						
'95		00%			00%			00%			+60%						
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	66	Dec:	0%				
										'88	399		0%				
										'95	40		0%				
										'00	100		40%				

Trend Study 9-2-00

Study site name: Taylor Mountain .

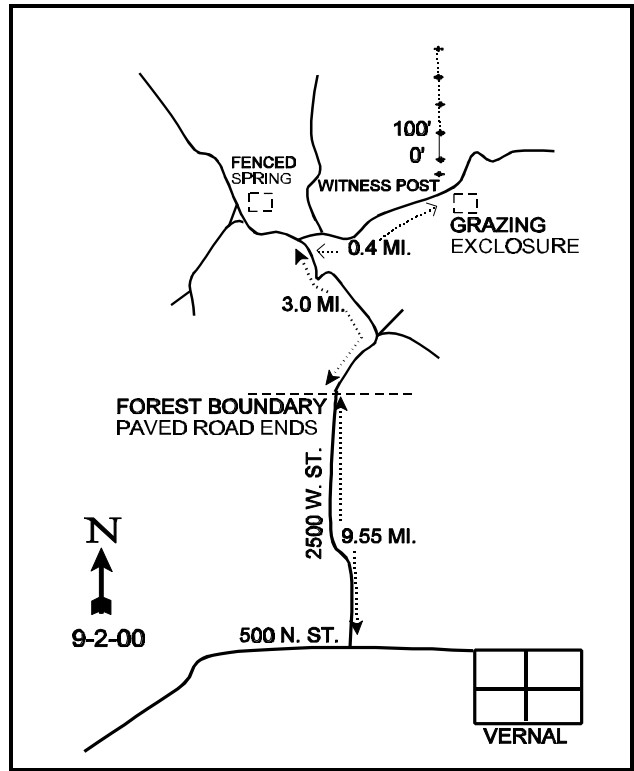
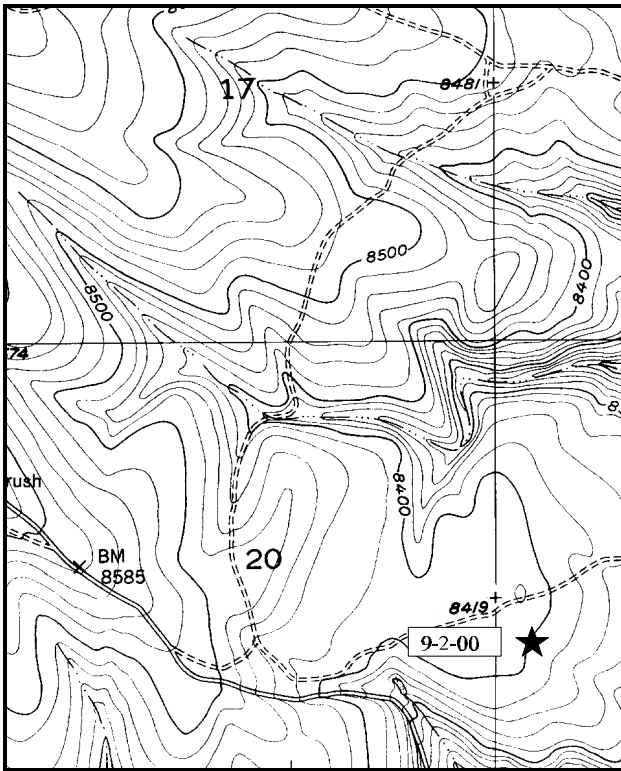
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 0°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (14 & 82ft), line 2 (28ft), line 3 (59ft), line 4 (77ft).

LOCATION DESCRIPTION

From Vernal, travel west on 500 North Street to 2500 West. Turn right on 2500 West and drive north 9.55 miles to the National Forest boundary. Continue north 3 miles to a fork. Turn right and go 0.4 miles towards the Taylor Mountain Exclosure. From the sign on the west side of the exclosure, walk 54 paces north to the 0-foot end of the baseline. There is also a witness post 4 feet south of the 0-foot stake. It is marked by an 18 inch tall fencepost with browse tag #7091 attached.



Map Name: Dyer Mountain

Diagrammatic Sketch

Township 2S, Range 21E, Section 20

UTM 4498233.176 N, 620580.650 E

DISCUSSION

Trend Study No. 9-2 (11-2)

The Taylor Mountain trend study is adjacent to the Taylor Mountain Exclosure which was built in 1962. This site can best be classified as spring-fall range. Elevation on the broad open ridge top is 8,400 feet with a gentle east facing slope of 1% to 5%. The Forest Service land on Taylor Mountain is managed in a 6-pasture rest-rotation system with grazing occurring from June 1 to September 15. The grazing unit in which the trend study is located supports about 500 AUM's during years of non-rest. A pellet group transect read along the study site baseline in 2000 estimates only 4 cow days use/acre (9 cdu/ha). Wildlife use is moderate for deer at 38 deer days use/acre (94 ddu/ha) and light for elk at 13 elk days use/acre (31 edu/ha).

Soils are a dark clay loam to loam and are moderately shallow in depth with an estimated effective rooting depth of just over 9 inches. A profile stoniness index estimated from penetrometer readings shows nearly 90% of the rocks occur within the top 8 inches of soil. Phosphorus is low at 4.5 ppm as 10 ppm may limit normal plant growth and development. Active erosion is slight due to the level terrain. Vegetation and litter cover are also excellent being estimated at 62% and 71% in 2000 respectively. Percent bare ground is relatively low at 8%.

Browse is not as critical on this site as it is not true winter range, but a dense stand of mountain big sagebrush and antelope bitterbrush are present. These species provide 64% and 28% of the browse cover respectively in 2000. Sagebrush cover is currently estimated at 26%, with an estimated density of 5,120 plants/acre. Utilization was estimated much lower in 2000 with only 10% of the population displaying moderate use and no heavy use identified. This was a significant decrease from 72% moderate use and 12% heavy use in 1995. Percent decadency increased from 4% in 1995 to 22% in 2000. However, in the past it has been as high as 19%. The proportion of decadent, dying individuals is moderate at 21% (240 plants/acre), but recruitment is currently good at 220 plants/acre. This should be adequate to replace individuals that may be lost to die-off. Vigor has been generally good in all sampling years, and even with drought in 2000, poor vigor remains low at 5%. Average leader growth is just under 5 inches in 2000, with good seed production on mature plants.

Antelope bitterbrush is also an important forage species on this site with an estimated density of 2,620 plants/acre in 1995 and 2,500 plants/acre in 2000. The population has a prostrate growth form that measures only 16 inches in height. The population has generally been vigorous and healthy in the past, with utilization being determined as moderate most years. In 2000, poor vigor increased from 2% to 12%, while percent decadency increased from 3% to 30% since 1995. Recruitment is currently good at 9% (220 plants/acre). With the level of use on bitterbrush at this site (52% heavy use in 2000), it would be easy to attribute the increases in decadency and poor vigor solely on use. However, with extended drought and low annual leader growth, heavy use may have been overestimated in 2000. Drought most likely plays a major role in the current increases in decadency and poor vigor of bitterbrush. Also, the dense stand of sagebrush causes strong competition between the species, this may further increase percent decadency and poor vigor with any further drought. Use of bitterbrush was also intensified in 2000 due to the droughts effect to the herbaceous understory.

Other browse encountered on the site includes: mountain low rabbitbrush, snowberry, serviceberry and true mountain mahogany. Both serviceberry and mahogany are heavily utilized and in low abundance. Serviceberry, bitterbrush and mahogany are all more abundant inside the exclosure compared to outside. Seed production for these species appeared to be similar whether inside or outside of the exclosure. However, plant stature was much better inside the exclosure.

The herbaceous understory is diverse and moderately abundant with grasses producing over 12% cover and forbs contributing 17% cover in 2000. The dominant grasses are thickspike wheatgrass, muttongrass and bottlebrush squirreltail. Thickspike was previously not sampled, but picked up with the much larger sample

used in 1995. Forbs are exceptionally diverse with over 40 species being sampled in 1995 and 2000. Perennial forbs are dominant and include: rose pussytoes, ballhead sandwort, tapertip hawksbeard, silver lupine and rock goldenrod. Sum of nested frequency of both perennial grasses and forbs decreased slightly in 2000, mostly due to drought. However, the dense stand of mountain big sagebrush providing 26% cover is also suppressing the understory somewhat. As this is not critical winter range, some type of treatment, most likely a prescribed burn to decrease sagebrush density and cover should be considered in the future. This would help improve the abundance of herbaceous species in the understory. Grasses appeared to be more abundant and more robust inside the enclosure compared to the transect located outside the enclosure.

1982 APPARENT TREND ASSESSMENT

Both vegetative and soil trends appear stable or improving. Utilization of the key browse species is not excessive and there appears to be adequate replacement of decadent or dead plants. Herbaceous understory composition and production is fair, but there is need for improvement.

1988 TREND ASSESSMENT

An increase in percent litter cover was noted, resulting in more than 88% total ground cover in 1988. The dense vegetative cover on the site provides excellent soil protection. The slight soil movement is not significant and there is little net loss of soil. Trend for soil is up. Trend for the key browse species, mountain big sagebrush and bitterbrush, is up due to increasing population densities, good numbers of young plants, and low decadency rates. Trend for the herbaceous understory is also up due to increased quadrat frequency of grasses and forbs.

TREND ASSESSMENT

soil - up (5)

browse - up (5)

herbaceous understory - up (5)

1995 TREND ASSESSMENT

Soil conditions continue to improve on the site. Bare ground declined from 12% to 7%. Litter cover declined from 77% to 65%, but this trend is common during the statewide extended drought. The browse trend is stable overall, being stable for sagebrush and slightly improved for bitterbrush. Sagebrush density has declined since 1988, but the number of mature plants is relatively stable, percent decadency is low and vigor is good. The number of dead plants is relatively low (300), indicating that the change in density is partly due to the much larger sample used in 1995. Recruitment of young is moderate at 8%. The only negative aspect of the sagebrush population is the higher use reported in 1995. Antelope bitterbrush is also more heavily utilized but has increased in density, has a lower decadency rate, and has an adequate number of young plants. The herbaceous understory has remained stable since the last reading. Grasses declined slightly in sum of nested frequency, while forbs have increased slightly.

TREND ASSESSMENT

soil - slightly up (4)

browse - stable overall (3)

herbaceous understory - stable (3)

2000 TREND ASSESSMENT

Trend for soil is stable. Bare ground remains relatively low. Protective ground cover from vegetation and litter are abundant and well distributed. Trend for browse is stable although sagebrush and bitterbrush display increased poor vigor and decadence in 2000. Drought and competition, more than any other factors, likely

combined to cause increases in decadency and poor vigor for these species. Even with reduced health, these species remain at relatively stable densities. Some type of treatment such as a prescribed burn to decrease the dense stand of sagebrush and increase perennial herbaceous species should be considered in the future. The herbaceous understory slightly decreased in perennial sum of nested frequency in 2000, but has a stable trend as the most abundant perennial species remained at stable frequencies.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 2

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	a ⁻	b ¹⁵⁷	b ¹⁷¹	-	-	62	63	1.12	2.01
G	Agropyron spicatum	a ⁻	a ²	b ⁷	-	-	1	3	.03	.09
G	Bouteloua gracilis	-	3	-	-	-	1	-	.00	-
G	Bromus anomalus	a ⁻	a ⁻	b ¹⁵	-	-	-	6	-	.52
G	Bromus tectorum (a)	-	3	-	-	-	1	-	.00	-
G	Carex spp.	a ⁻	b ⁷	b ²⁰	-	-	4	9	.02	.41
G	Festuca ovina	3	19	15	5	2	9	9	.09	.17
G	Koeleria cristata	b ⁴⁶	a ¹⁸	a ⁵	33	18	6	2	.08	.06
G	Poa fendleriana	ab ¹⁷³	a ¹⁵⁴	b ²⁰⁶	29	65	54	75	1.96	7.09
G	Poa pratensis	b ²²	a ⁵⁰	a ¹²	1	8	20	5	.99	.27
G	Poa secunda	b ⁷⁷	a ¹	a ²⁰	48	34	1	10	.00	.24
G	Sitanion hystrix	c ¹⁷⁷	b ¹⁰⁶	a ³⁹	25	71	41	15	1.57	.66
G	Stipa comata	b ⁹⁰	a ⁴⁶	a ³⁰	9	38	15	11	.30	.62
G	Stipa lettermani	b ⁷⁶	ab ⁵⁶	a ²⁸	41	34	24	12	.39	.55
Total for Annual Grasses		0	3	0	0	0	1	0	0.00	0
Total for Perennial Grasses		664	619	568	191	270	238	220	6.58	12.74
Total for Grasses		664	622	568	191	270	239	220	6.59	12.74
F	Agoseris glauca	a ⁻	ab ⁴	b ⁹	-	-	2	6	.01	.10
F	Antennaria rosea	b ¹⁰⁷	a ⁵⁹	a ⁵⁴	14	41	25	23	1.67	.99
F	Androsace septentrionalis (a)	-	b ²⁰	a ²	1	-	9	1	.04	.00
F	Arabis spp.	b ⁴⁵	a ¹⁶	a ⁹	4	23	7	4	.06	.02
F	Arenaria congesta	a ¹¹²	b ²¹⁶	b ²⁰⁸	22	42	69	73	2.62	5.02
F	Aster chilensis	a ⁻	b ¹⁶	b ¹⁵	-	-	8	6	.04	.10
F	Astragalus convallarius	15	5	3	7	7	3	2	.04	.18
F	Astragalus tenellus	-	6	1	-	-	2	1	.06	.03

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Astragalus spp.	-	2	5	1	-	1	2	.00	.01
F	Balsamorhiza hookeri	72	72	87	54	35	37	46	.73	1.38
F	Castilleja flava	-	2	4	-	-	1	2	.00	.01
F	Castilleja linariaefolia	15	14	5	2	9	6	3	.03	.06
F	Cirsium spp.	-	3	-	-	-	1	-	.00	-
F	Collomia linearis (a)	-	_b 69	_a 12	-	-	34	6	.17	.10
F	Comandra pallida	3	4	9	5	3	2	3	.03	.01
F	Collinsia parviflora (a)	-	_b 78	_a 25	-	-	31	14	.15	.09
F	Crepis acuminata	_a -	_b 17	_b 11	-	-	7	5	1.06	.08
F	Cryptantha spp.	-	2	-	-	-	2	-	.01	-
F	Draba spp. (a)	-	1	4	7	-	1	2	.00	.01
F	Eriogonum alatum	-	1	-	-	-	1	-	.00	-
F	Erigeron eatonii	_a -	_a -	_b 50	-	-	-	24	-	.22
F	Erigeron flagellaris	_c 100	_b 42	_a 1	38	48	21	1	.13	.00
F	Erigeron pumilus	-	-	5	-	-	-	2	-	.01
F	Eriogonum racemosum	-	-	3	-	-	-	1	-	.03
F	Eriogonum umbellatum	58	63	39	23	23	28	19	.83	.75
F	Gayophytum ramosissimum (a)	-	3	-	-	-	1	-	.00	-
F	Hymenoxys acaulis	-	3	-	-	-	1	-	.03	-
F	Ipomopsis aggregata	5	4	-	-	2	2	-	.01	-
F	Lesquerella spp.	-	5	5	-	-	2	3	.01	.01
F	Lithospermum spp.	-	1	-	-	-	1	-	.00	-
F	Lomatium spp.	_a -	_b 19	_b 17	1	-	9	9	.09	.09
F	Lupinus argenteus	_a 18	_b 80	_b 82	12	10	35	37	1.79	2.37
F	Lychnis drummondii	-	-	-	2	-	-	-	-	-
F	Mertensia spp.	_a -	_b 8	_a -	-	-	4	-	.02	-
F	Penstemon humilis	_a -	_b 40	_b 14	-	-	19	7	.12	.08
F	Penstemon spp.	_c 100	_b 10	_a -	39	49	5	-	.02	-
F	Petroradia pumila	_b 94	_{ab} 59	_a 37	29	40	29	19	1.12	1.08
F	Phlox austromontana	_b 93	_a 23	_a 40	47	39	12	21	.10	1.22
F	Phlox longifolia	50	60	79	-	25	25	33	.32	1.31
F	Polygonum douglasii (a)	-	_b 165	_a 3	-	-	58	1	.36	.00
F	Potentilla gracilis	_a 12	_b 28	_{ab} 23	14	6	16	13	.10	.11
F	Senecio debilis	_b 101	_a 33	_a 20	7	47	17	12	.08	.21
F	Sedum lanceolatum	_a -	_c 51	_b 17	31	-	21	9	.25	.11
F	Senecio multilobatus	-	2	4	-	-	1	3	.00	.01
F	Streptanthus cordatus	-	4	-	-	-	1	-	.00	-
F	Taraxacum officinale	_a -	_c 33	_b 15	-	-	14	6	.15	.05

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Trifolium gymnocarpon	_a 14	_b 131	_b 109	19	5	49	45	.54	1.13
F	Unknown forb-annual (a)	-	_b 8	_a -	-	-	3	-	.01	-
F	Unknown forb-perennial	_b 11	_a -	_a -	-	5	-	-	-	-
F	Zigadenus elegans	_a -	_b 14	_b 11	-	-	8	5	.05	.19
Total for Annual Forbs		0	344	46	8	0	137	24	0.75	0.21
Total for Perennial Forbs		1025	1152	991	371	459	494	445	12.23	17.09
Total for Forbs		1025	1496	1037	379	459	631	469	12.99	17.31

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

BROWSE TRENDS --

Herd unit 09 , Study no: 2

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	1	1	.00	.15
B	Artemisia tridentata vaseyana	91	94	22.71	26.12
B	Cercocarpus montanus	2	2	.15	.38
B	Chrysothamnus viscidiflorus lanceolatus	24	18	.60	1.22
B	Purshia tridentata	75	70	14.75	11.55
B	Symphoricarpos oreophilus	11	14	.56	1.50
Total for Browse		204	199	38.78	40.95

BASIC COVER --

Herd unit 09 , Study no: 2

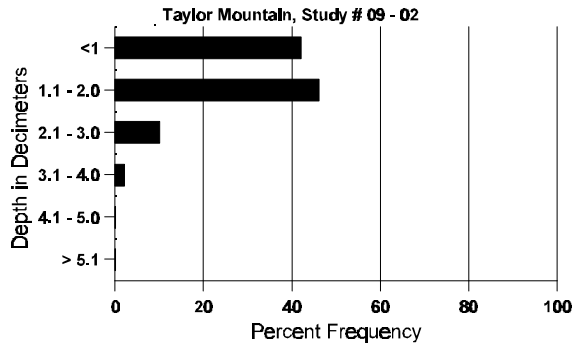
Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	381	360	11.00	7.25	50.54	61.97
Rock	53	21	.50	.75	.58	.13
Pavement	123	102	4.25	3.25	2.70	1.94
Litter	399	387	63.75	77.25	65.15	71.75
Cryptogams	48	47	0	0	1.87	1.22
Bare Ground	122	149	21.00	11.50	6.45	7.75

SOIL ANALYSIS DATA --

Herd Unit 09, Study # 2, Study Name: Taylor Mountain

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	%OM	PPM P	PPM K	dS/m
9.53	55.0 (11.81)	7.2	37.4	36.0	26.6	5.0	4.5	153.6	1.3

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 09 , Study no: 2

Type	Quadrat Frequency	
	'95	'00
Rabbit	2	6
Elk	8	3
Deer	21	20
Cattle	3	-

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
'00	'00
104	N/A
165	13 (31)
505	39 (96)
44	5 (9)

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 2

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Amelanchier alnifolia</i>																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	1	-	-	-	-	1	-	-	-	20	31	43	1
	'00	-	-	-	-	-	1	-	-	-	1	-	-	-	20	30	28	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
		'82 00%			'82 00%			'82 00%										
		'88 00%			'88 00%			'88 00%										
		'95 100%			'95 00%			'95 00%			+ 0%							
		'00 00%			'00 100%			'00 00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	20		-			
												'00	20		-			
<i>Artemisia tridentata vaseyana</i>																		
S	'82	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	8	-	-	1	-	-	-	-	-	9	-	-	-	180			9
	'00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	'82	18	-	-	-	-	-	-	-	-	18	-	-	-	1200			18
	'88	14	1	-	-	-	-	-	-	-	15	-	-	-	1000			15
	'95	14	5	-	-	-	-	-	-	-	19	-	-	-	380			19
	'00	11	-	-	-	-	-	-	-	-	11	-	-	-	220			11
M	'82	31	8	-	-	-	-	-	-	-	39	-	-	-	2600	23	29	39
	'88	60	9	1	-	-	-	-	-	-	70	-	-	-	4666	23	26	70
	'95	22	156	24	-	-	-	-	-	-	202	-	-	-	4040	24	39	202
	'00	163	15	-	9	2	-	-	-	-	187	2	-	-	3780	27	37	189
D	'82	13	-	-	-	-	-	-	-	-	10	3	-	-	866			13
	'88	11	2	-	-	-	-	-	-	-	13	-	-	-	866			13
	'95	-	6	4	-	-	-	-	-	-	9	-	-	1	200			10
	'00	43	9	-	3	-	-	1	-	-	44	-	-	12	1120			56
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	300			15
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	300			15
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
		'82 11%			'82 00%			'82 00%			+29%							
		'88 12%			'88 01%			'88 00%			-29%							
		'95 72%			'95 12%			'95 .43%			+10%							
		'00 10%			'00 00%			'00 05%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	4666	Dec:	19%			
												'88	6532		13%			
												'95	4620		4%			
												'00	5120		22%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cercocarpus montanus																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	2	-	-	-	-	-	-	2	-	-	-	40	32	41	2
	'00	-	-	-	-	-	2	-	-	-	2	-	-	-	40	27	34	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			100%			00%			+ 0%							
'00		00%			100%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	0	Dec:	-				
											'88	0		-				
											'95	40		-				
											'00	40		-				
Chrysothamnus viscidiflorus lanceolatus																		
Y	'82	9	-	-	-	-	-	-	-	-	9	-	-	-	600			9
	'88	16	-	-	-	-	-	-	-	-	16	-	-	-	1066			16
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	'82	14	-	-	-	-	-	-	-	-	14	-	-	-	933	17	14	14
	'88	21	1	-	1	-	-	-	-	-	23	-	-	-	1533	10	11	23
	'95	28	-	-	2	-	-	-	-	-	30	-	-	-	600	11	13	30
	'00	28	-	1	-	-	-	-	-	-	29	-	-	-	580	15	15	29
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%			+41%							
'88		03%			00%			00%			-77%							
'95		00%			00%			00%			- 3%							
'00		00%			03%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	1533	Dec:	-				
											'88	2599		-				
											'95	600		-				
											'00	580		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Purshia tridentata																	
S	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
Y	82	4	-	-	-	-	-	-	-	-	4	-	-	-	266		4
	88	4	-	-	-	1	-	-	-	-	5	-	-	-	333		5
	95	6	6	-	-	3	-	-	-	-	15	-	-	-	300		15
	00	5	1	1	-	3	-	1	-	-	10	-	1	-	220		11
M	82	7	13	6	-	-	-	-	-	-	26	-	-	-	1733	13 27	26
	88	-	18	4	1	-	1	-	-	-	24	-	-	-	1600	16 24	24
	95	2	34	47	-	29	-	-	-	-	112	-	-	-	2240	16 42	112
	00	4	3	17	3	9	27	13	-	-	75	1	-	-	1520	16 37	76
D	82	-	1	-	-	-	-	-	-	-	-	1	-	-	66		1
	88	1	4	-	-	-	-	-	-	-	5	-	-	-	333		5
	95	1	3	-	-	-	-	-	-	-	1	-	-	3	80		4
	00	-	2	8	2	11	12	3	-	-	23	1	1	13	760		38
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	60		3
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'82		45%			19%			00%			+ 9%						
'88		68%			15%			00%			+14%						
'95		57%			36%			02%			- 5%						
'00		23%			52%			12%									
Total Plants/Acre (excluding Dead & Seedlings)											'82	2065	Dec:	3%			
											'88	2266		15%			
											'95	2620		3%			
											'00	2500		30%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total									
		1	2	3	4		5	6		7	8	9						
Symphoricarpos oreophilus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	3	-	-	-	-	-	4	-	-	-	80		4	
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	95	1	-	-	1	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	1	-	-	1	-	-	-	20		1	
M	82	4	-	-	-	-	-	-	-	-	4	-	-	-	266	19	11	4
	88	3	-	-	2	-	-	-	-	-	4	-	1	-	333	14	16	5
	95	3	-	-	14	-	-	-	-	-	17	-	-	-	340	14	37	17
	00	7	-	-	4	1	-	2	-	-	14	-	-	-	280	16	39	14
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	1	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+50%							
'88		00%			00%			13%			-29%							
'95		00%			00%			00%			-16%							
'00		13%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)										'82	266	Dec:	0%					
										'88	532		12%					
										'95	380		0%					
										'00	320		6%					

Trend Study 9-3-00

Study site name: Dry Fork Mountain.

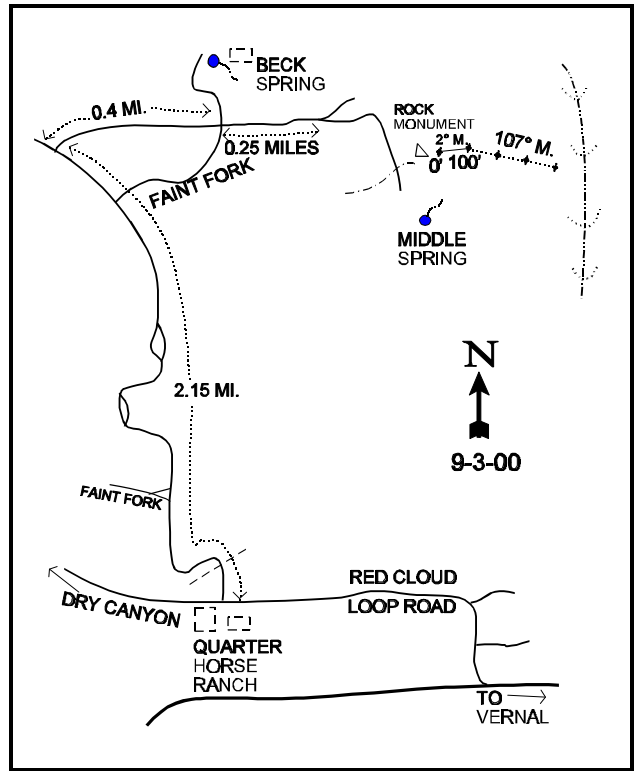
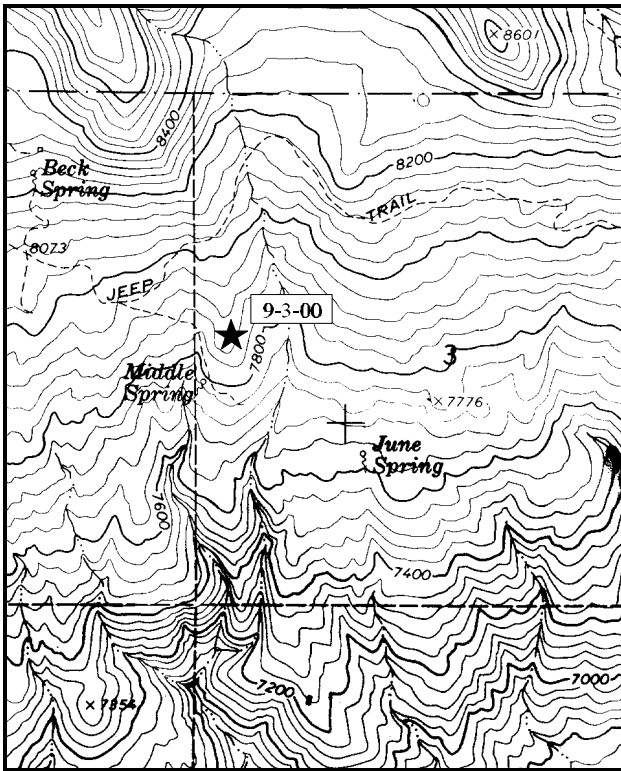
Range type: Big Sagebrush-Grass.

Compass bearing: frequency baseline 83°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (18 & 81ft), line 2 (33ft), line 3 (66ft), line 4 (79ft).

LOCATION DESCRIPTION

From Vernal, proceed west on 500 North to 3500 West. Turn right and go up Dry Fork 8.5 miles to the Red Cloud Loop Road. Bear right onto this road and continue up Dry Fork Canyon 1.7 miles to a horse ranch on the left. North across the road from the ranch is a dirt road. Turn right onto this road, go through the gate and go 2.15 miles to a fork. Bear right and proceed 0.4 miles to an intersection. Continue straight for 0.25 miles to a faint turnoff on the right. Turn right and drive across the meadow toward Middle Spring. Go 0.2 miles to the base of the hill just before Middle Spring. Walk to the highest point on the hill. There is a rock monument on top. From the monument, the 0-foot baseline stake is 12 paces away bearing 90°M.



Map Name: Dry Fork

Diagrammatic Sketch

Township 3S, Range 20E, Section 3

UTM 4493391.447 N, 612469.698 E

DISCUSSION

Trend Study No. 9-3 (11-4)

The Dry Fork Mountain study is on Dry Fork Mountain near Middle Spring at an elevation of 7,800 feet. The area is a sagebrush-grass type and is administered by the BLM. The site has an average slope of 13% and a southeast aspect. The sagebrush slopes on the south face of Dry Fork Mountain provide important big game winter range. This area is grazed from June 1 to September 15 (470 AUM's). A pellet group transect read along the baseline in 2000 estimates moderate use of the site by deer with 68 deer days use/acre (167 ddu/ha). Use by elk is light with 3 elk days use/acre (8 edu/ha). Cattle use was also light with 7 cow days use/acre (16 cdu/ha) estimated when the site was read in mid-July 2000.

The soil is a coarse sandy loam that is shallow, rocky, and well drained. Estimated effective rooting depth is just over 7 inches and average soil temperature is moderately high for this elevation at nearly 72° F. A stoniness profile index shows nearly 80% of the penetrometer readings to be within the upper 4 inches of the soil profile. Soil reactivity is slightly acidic (pH of 6.1). Erosion and soil movement are minimal due to the excellent and well dispersed vegetation and litter cover.

Key browse for the site are mountain big sagebrush and antelope bitterbrush. Sagebrush accounted for 61% and 56% of the total browse cover in 1995 and 2000 respectively, while bitterbrush made up 29% and 31% of the browse cover for the same years. Sagebrush cover is currently ('00) estimated at about 22% with an estimated density of 2,720 plants/acre. Vigor is currently good and use is light to moderate. Percent decadency slightly increased from 11% in 1995 to 18% in 2000. This level is still much lower than the 42% estimated in 1988. The current level of decadence is not excessive for sagebrush especially during a period of extended drought. Recruitment is currently ('00) moderate at 7% (200 plants/acre) and fairly steady over the past three readings. Sagebrush on the site is vigorous with good leader growth and seed production.

Antelope bitterbrush is not as abundant as sagebrush, but is more preferred and shows heavier use. Bitterbrush density was estimated at 1,399 plants/acre in 1988, increasing to 1,960 in 1995, and 1,880 in 2000. During the 1988 reading, all bitterbrush sampled displayed heavy hedging. Heavy use has declined somewhat since then to 58% and 62% respectively in 1995 and 2000. Even with this heavy use, vigor remains good over all years. Percent decadency increased from 4% in 1995 to 14% in 2000. Bitterbrush on the site display a prostrate growth form, averaging only 20 inches in height. Recruitment from young plants is currently good at 14%. Annual growth on bitterbrush is minimal in 2000 averaging less than 1 inch throughout the site.

Other browse encountered on the site include: pricklypear cactus, mountain low rabbitbrush, broom snakeweed, Oregon grape, wax current and snowberry. Pricklypear is increasing over the site and is currently estimated at 6,060 plants/acre. This represents the largest negative factor facing the browse component on Dry Fork Mountain.

The herbaceous understory is dominated by perennial grasses which accounted for 28% of the total vegetation cover in 1995, increasing to 39% in 2000. Sum of nested frequency of perennial grasses remained the same between 1995 and 2000. The relatively high sagebrush cover at this site does not appear to be suppressing the understory as of yet. Needle-and-thread is by far the most abundant grass, followed by two wheatgrass species, thickspike and bluebunch. Annual cheatgrass was fairly common in 1995, being sampled in 49% of the quadrats. However, with the dry conditions in 2000, cheatgrass occurred in only 1 quadrat. Forbs are diverse but were dominated by annuals in 1995. Annual forbs were nearly non-existent in 2000 with drought. Perennial forb species decreased in sum of nested frequency. The most abundant perennial forbs are scarlet globemallow and redroot eriogonum.

1982 APPARENT TREND ASSESSMENT

Soil trend appears stable with adequate ground cover and little soil movement. Vegetative trend appears stable to declining. The preferred species, antelope bitterbrush, occurs in less than optimum numbers and does not appear to be increasing. The key species, Mountain big sagebrush, currently dominates the site. The most obvious indicator of declining trend is the apparent increase of prickly pear. Grasses are in fair to good condition, although a moderately palatable increaser (i.e. needle-and-thread) is quite abundant. Forbs are much less important and composition consists largely of scarlet globemallow.

1988 TREND ASSESSMENT

A small increase was noted in the percentage of vegetative basal cover found in 1988, but the significant changes in ground cover occurred in the loss of cryptogams, increase of rock on the soil surface, and a decline in percent bare ground. The loose soil is well protected by the dense shrub overstory and runoff is localized. Trend for soil is up slightly. The browse trend is slightly up for bitterbrush, but heavy use of this shrub should be watched closely. Mountain big sagebrush densities have also increased but so has percent decadence now at 42%. Trend for sagebrush is stable. One negative aspect of the browse trend is the large increase in pricklypear cactus. Age class analysis indicates 68% of the population consists of young plants. Trend for the herbaceous understory is up for grasses and stable for forbs.

TREND ASSESSMENT

soil - slightly up (4)

browse - stable for sagebrush and slightly up for bitterbrush (3)

herbaceous understory - up (5)

1995 TREND ASSESSMENT

Ground cover characteristics have improved since 1988 with percent rock cover declining to near 1982 levels, along with a further decline in bare ground now at only 2%. Trend for soil is slightly up. The preferred browse species, bitterbrush, displays an upward trend with an increase in density and decline in the proportion of shrubs being heavily browsed. Percent decadence has remained low at 4%. The key browse species, mountain big sagebrush, also shows an improving trend with a decline in percent decadence and an increase in density. An additional improvement in the browse composition is the decline in prickly pear cactus. Trend for the herbaceous understory is slightly up with an increase in sum of nested frequency of perennial grasses and forbs. It appears that thickspike wheatgrass (*Agropyron dasystachyum*) was misidentified and combined with bluebunch wheatgrass in 1988.

TREND ASSESSMENT

soil - slightly up and in excellent condition (4)

browse - slightly up (4)

herbaceous understory - slightly up (4)

2000 TREND ASSESSMENT

Trend for soil is stable. Bare ground remains low and protective ground cover from vegetation and litter are abundant and well dispersed. Erosion is minimal as a result. Trend for browse is stable. Bitterbrush increased in decadency, but vigor remains good while use has remained about the same as the 1995 level. Recruitment is also good at 14%. Mountain big sagebrush also increased in decadency (11% to 18%), but this level is not excessive for sagebrush. Vigor remains mostly good and use is mostly light. Annual leader growth and seed production are both good for sagebrush and recruitment is adequate at 7%. The increase in pricklypear cactus is

the main negative factor for the browse component at this site. Trend for the herbaceous understory is stable. Sum of nested frequency for perennial grasses stayed the same, while perennial forbs slightly decreased due to drought. However, the forbs only contribute to about 1% total cover.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 3

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	a-	b73	b97	57	-	26	36	1.35	2.73
G	Agropyron spicatum	c212	b86	a36	2	72	29	15	3.33	1.73
G	Bromus tectorum (a)	-	b138	a1	-	-	49	1	2.91	.00
G	Carex spp.	6	17	16	3	3	7	6	.37	.48
G	Oryzopsis hymenoides	1	5	-	-	1	2	-	.06	-
G	Poa fendleriana	ab9	a8	b30	1	5	3	12	.16	.43
G	Poa pratensis	a-	b7	c60	-	-	4	17	.31	5.63
G	Sitanion hystrix	b55	ab36	a22	5	24	16	8	.21	.34
G	Stipa comata	a121	b234	b207	54	47	78	67	11.03	14.64
G	Stipa lettermani	-	6	4	-	-	2	1	.06	.15
G	Unknown grass - perennial	b10	a-	a-	-	3	-	-	-	-
Total for Annual Grasses		0	138	1	0	0	49	1	2.91	0.00
Total for Perennial Grasses		414	472	472	122	155	167	162	16.90	26.15
Total for Grasses		414	610	473	122	155	216	163	19.81	26.15
F	Antennaria rosea	-	-	-	1	-	-	-	-	-
F	Arabis spp.	-	3	-	-	-	2	-	.01	-
F	Arenaria congesta	-	-	-	1	-	-	-	-	-
F	Astragalus convallarius	a-	b9	b7	-	-	4	3	.02	.06
F	Calochortus nuttallii	b8	b9	a-	1	4	4	-	.02	-
F	Collomia linearis (a)	-	b152	a5	-	-	57	3	1.64	.01
F	Collinsia parviflora (a)	-	b58	a6	-	-	27	3	.33	.01
F	Cryptantha spp.	3	9	2	-	2	4	1	.07	.03
F	Cymopterus longipes	-	7	11	-	-	3	5	.01	.12
F	Descurainia pinnata (a)	-	1	-	-	-	1	-	.00	-
F	Eriogonum racemosum	a2	b13	ab12	1	1	6	6	.10	.15
F	Heterotheca villosa	1	-	5	2	1	-	2	-	.01

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	<i>Hymenoxys acaulis</i>	-	1	3	-	-	1	1	.00	.15
F	<i>Lactuca serriola</i>	-	3	-	-	-	1	-	.00	-
F	<i>Lepidium</i> spp. (a)	-	2	-	-	-	2	-	.01	-
F	<i>Lithospermum</i> spp.	a-	b6	a-	-	-	3	-	.16	.03
F	<i>Lupinus argenteus</i>	a-	b7	b6	-	-	4	4	.12	.24
F	<i>Machaeranthera canescens</i>	-	3	-	-	-	2	-	.01	-
F	<i>Orobanche fasciculata</i>	a-	ab2	b5	-	-	1	4	.00	.07
F	<i>Penstemon humilis</i>	2	3	3	2	1	1	1	.03	.03
F	<i>Phlox longifolia</i>	-	-	1	-	-	-	1	-	.00
F	<i>Polygonum douglasii</i> (a)	-	b28	a2	-	-	13	1	.06	.00
F	<i>Sphaeralcea coccinea</i>	a6	b31	a15	16	3	13	7	.36	.13
F	<i>Tragopogon dubius</i>	-	6	7	-	-	3	4	.04	.04
F	<i>Zigadenus elegans</i>	-	14	6	-	-	5	3	.03	.09
Total for Annual Forbs		0	241	13	0	0	100	7	2.05	0.03
Total for Perennial Forbs		22	126	83	14	12	57	42	1.02	1.18
Total for Forbs		22	367	96	14	12	157	49	3.08	1.21

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

BROWSE TRENDS --

Herd unit 09 , Study no: 3

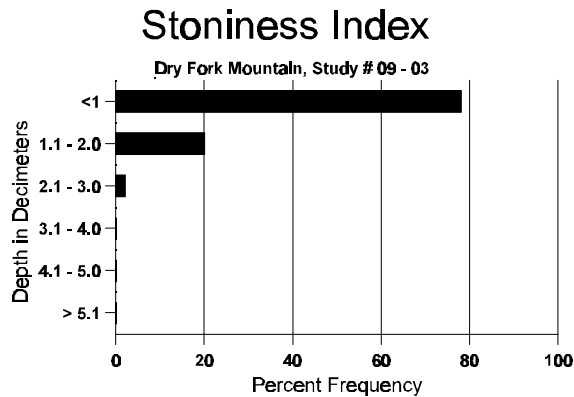
T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	<i>Artemisia tridentata vaseyana</i>	76	70	22.85	21.93
B	<i>Chrysothamnus viscidiflorus lanceolatus</i>	4	2	.06	.15
B	<i>Gutierrezia sarothrae</i>	4	1	.00	-
B	<i>Mahonia repens</i>	1	2	-	-
B	<i>Opuntia fragilis</i>	77	82	2.83	4.13
B	<i>Pediocactus simpsonii</i>	1	0	-	-
B	<i>Purshia tridentata</i>	65	71	10.91	12.03
B	<i>Symphoricarpos oreophilus</i>	3	3	.56	.91
Total for Browse		231	231	37.22	39.16

BASIC COVER --
Herd unit 09 , Study no: 3

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	353	347	4.00	6.50	58.21	64.25
Rock	211	179	9.50	17.00	9.85	13.81
Pavement	43	62	1.25	.50	.33	1.34
Litter	396	390	68.75	69.75	67.73	66.24
Cryptogams	7	10	4.25	0	.04	.22
Bare Ground	67	78	12.25	6.25	2.08	4.22

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 3, Study Name: Dry Fork Mountain

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
7.18	71.6 (8.27)	6.1	64.6	15.8	16.6	5.3	29.9	124.8	0.5



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 3

Type	Quadrat Frequency	
	'95	'00
Rabbit	9	5
Elk	6	-
Deer	30	17
Cattle	2	-

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
'00	'00
792	N/A
44	3 (8)
879	68 (167)
78	7 (16)

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 3

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4							
<i>Amelanchier alnifolia</i>												
M	82	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	0	14	59	0
	00	-	-	-	-	-	-	-	0	15	29	0
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%						
'88		00%		00%		00%						
'95		00%		00%		00%						
'00		00%		00%		00%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	-			
						'88	0		-			
						'95	0		-			
						'00	0		-			
<i>Artemisia tridentata vaseyana</i>												
S	82	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	0		0	
	00	8	-	-	-	-	-	-	160		8	
Y	82	1	-	-	-	-	-	-	66		1	
	88	2	1	-	-	-	-	-	200		3	
	95	6	4	-	-	-	-	-	200		10	
	00	10	-	-	-	-	-	-	200		10	
M	82	21	-	-	-	-	-	-	1400	27	40	21
	88	12	7	-	-	-	-	-	1266	26	31	19
	95	59	46	11	-	2	-	-	2360	30	48	118
	00	90	7	-	4	-	-	-	2020	31	44	101
D	82	4	-	-	-	-	-	-	266			4
	88	14	2	-	-	-	-	-	1066			16
	95	7	6	3	-	-	-	-	320			16
	00	17	8	-	-	-	-	-	500			25
X	82	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	500			25
	00	-	-	-	-	-	-	-	280			14
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%		+32%				
'88		26%		00%		00%		+12%				
'95		39%		11%		07%		- 6%				
'00		11%		00%		03%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	1732	Dec:	15%			
						'88	2532		42%			
						'95	2880		11%			
						'00	2720		18%			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus viscidiflorus lanceolatus																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	1	-	-	-	-	-	-	-	-	-	-	-	20			1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
M	82	1	-	-	-	-	-	-	-	-	-	-	-	66	16	20	1	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	2	-	-	1	-	-	-	-	-	-	-	-	60	12	24	3	
	00	2	-	-	-	-	-	-	-	-	-	-	-	40	8	7	2	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	88	-	-	2	-	-	-	-	-	-	-	-	-	133			2	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+50%							
'88		00%			100%			00%			-40%							
'95		00%			00%			00%			-50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	66	Dec:	0%			
												'88	133		100%			
												'95	80		0%			
												'00	40		0%			
Eriogonum heracleoides																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0	2	6	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'95	5	-	-	-	-	-	-	-	-	5	-	-	-	100	8	7	
	'00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	8	5	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			-20%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	100		-			
												'00	80		-			
Mahonia repens																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	4	9	
	'00	4	-	-	-	-	-	-	-	-	4	-	-	-	80	4	4	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			+50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	40		-			
												'00	80		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Opuntia fragilis</i>																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
Y	82	15	-	-	-	-	-	-	-	-	15	-	-	-	1000		15	
	88	61	-	-	3	-	-	1	-	-	65	-	-	-	4333		65	
	95	12	-	-	-	-	-	-	-	-	12	-	-	-	240		12	
	00	12	-	-	-	-	-	1	-	-	13	-	-	-	260		13	
M	82	39	-	-	-	-	-	-	-	-	39	-	-	-	2600	4 10	39	
	88	28	-	-	1	-	-	1	-	-	30	-	-	-	2000	5 12	30	
	95	207	-	-	14	-	-	-	-	-	215	-	6	-	4420	5 15	221	
	00	279	-	-	2	-	-	3	-	-	284	-	-	-	5680	4 11	284	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	-	-	1	-	20		1	
	00	5	-	-	-	-	-	1	-	-	4	-	-	2	120		6	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	120		6	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+43%							
'88		00%			00%			00%			-26%							
'95		00%			00%			03%			+23%							
'00		00%			00%			.66%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	3600	Dec:	0%			
												'88	6333		0%			
												'95	4680		0%			
												'00	6060		2%			
<i>Pediocactus simpsonii</i>																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	4 4	1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	20		-			
												'00	0		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total										
		1	2	3	4		1	2											
Purshia tridentata																			
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0			
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0			
	95	2	5	1	-	4	1	-	-	13	-	-	-	260		13			
	00	9	2	-	-	-	-	2	-	13	-	-	-	260		13			
M	82	12	-	-	-	-	-	-	-	8	4	-	-	800	20 36	12			
	88	-	-	19	-	-	1	-	-	20	-	-	-	1333	15 25	20			
	95	7	18	33	1	3	19	-	-	81	-	-	-	1620	18 46	81			
	00	9	2	15	-	7	28	1	-	66	2	-	-	1360	20 50	68			
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0			
	88	-	-	1	-	-	-	-	-	1	-	-	-	66		1			
	95	-	-	2	-	1	1	-	-	3	-	-	1	80		4			
	00	1	-	3	-	2	4	1	-	11	-	-	2	260		13			
X	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0			
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0			
	95	-	-	-	-	-	-	-	-	-	-	-	-	60		3			
	00	-	-	-	-	-	-	-	-	-	-	-	-	80		4			
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>											
'82		00%		00%		00%		+43%											
'88		00%		100%		00%		+29%											
'95		32%		58%		01%		- 4%											
'00		14%		62%		02%													
Total Plants/Acre (excluding Dead & Seedlings)										'82	800	Dec:	0%						
										'88	1399		5%						
										'95	1960		4%						
										'00	1880		14%						
Ribes cereum cereum																			
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0		
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0		
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	45 67	0			
	00	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0		
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>											
'82		00%		00%		00%													
'88		00%		00%		00%													
'95		00%		00%		00%													
'00		00%		00%		00%													
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-						
										'88	0		-						
										'95	0		-						
										'00	0		-						

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	'88	-	1	-	-	-	-	-	-	-	-	-	-	66	13	9	1	
	'95	3	-	-	-	-	-	-	-	-	-	-	-	60	14	27	3	
	'00	4	-	-	-	-	-	-	-	-	-	-	-	80	12	31	4	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		00%			00%			00%										
		100%			00%			00%			- 9%							
		00%			00%			00%			+25%							
		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	66		-			
												'95	60		-			
												'00	80		-			

Trend Study 9-4-00

Study site name: Sawtooth-Flat Spring .

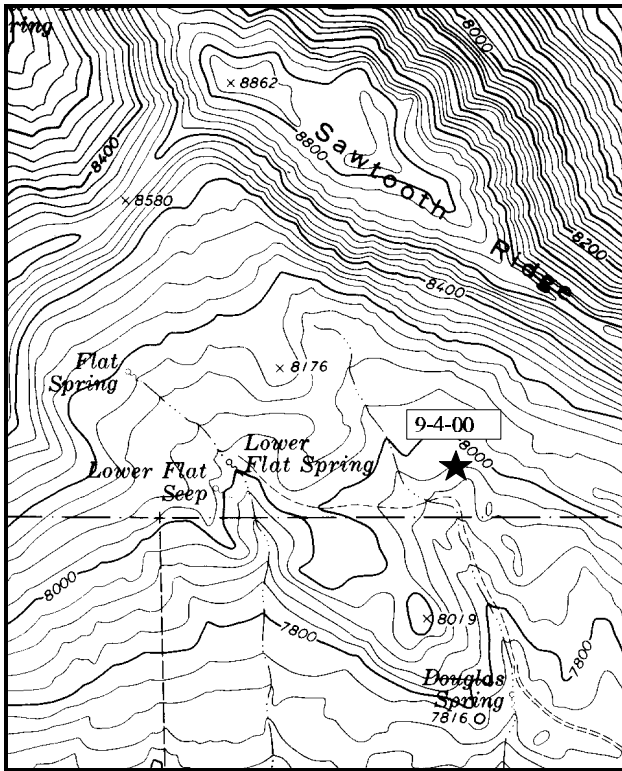
Range type: Sagebrush-Bitterbrush .

Compass bearing: frequency baseline 359°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (13 & 92ft), line 2 (40ft), line 3 (52ft), line 4 (71ft).

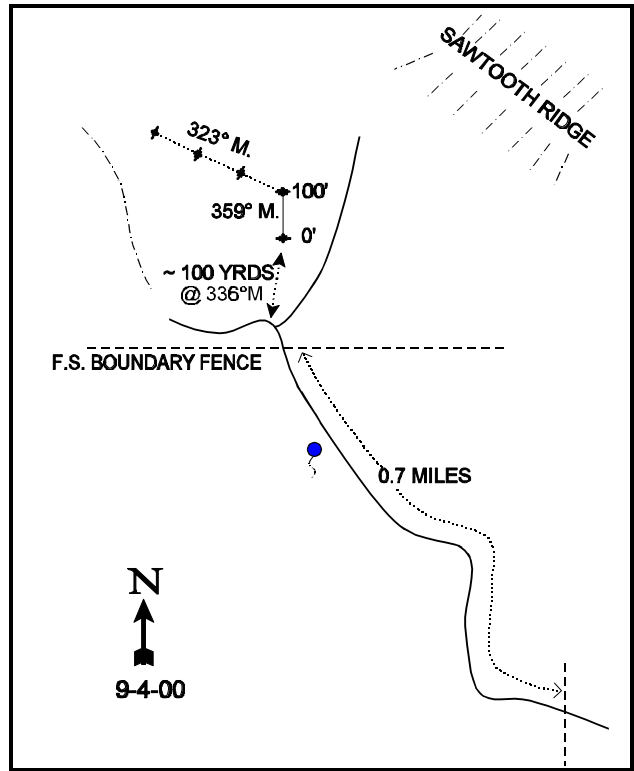
LOCATION DESCRIPTION

From Lapoint, drive east then turn north just before the bridge over Deep Creek. Proceed north for 6.85 miles to a fork. Bear right towards Deep Creek Ranch. Stay on this road for 9.8 miles to a dirt road on the left heading north up Pine Ridge. This road can also be reached by driving 3 miles west from Dry Fork. The gate may be locked. Turn left and drive 1.65 miles to a cattle guard. Continue 1.1 miles to a gate. Go through the gate and 0.7 miles to the fence on the FS boundary. Go through the gate and stop. From the yellow fencepost near the gate, walk 63 paces north bearing 336°M to the 0-foot baseline stake.



Map Name: Lake Mountain

Township 2S , Range 19E , Section 35



Diagrammatic Sketch

UTM 4494140.237 N, 605104.509 E

DISCUSSION

Trend Study No. 9-4 (11-5)

The Sawtooth-Flat Spring trend study is located on the south side of Sawtooth Ridge, east of Lows Flat Spring. Elevation is 7,960 feet with a southeast aspect and 16% slope. The study site is just outside the 1978-79 Flat Springs prescribed burn. The study samples a mountain big sagebrush/grass type with an important bitterbrush component. Quadrat frequency of deer pellet groups was moderately high in 1995 at 32%, while elk were only 6%. Rabbit pellet group quadrat frequency was quite high at 45%. A pellet group transect was read along the study baseline in 2000 estimates 75 deer days use/acre (185 ddu/ha), 25 elk days use/acre (63 edu/ha), and 16 cow days use/acre (40 cdu/ha). This study is in the Lake Mountain allotment which is grazed from June 21 to September 30 by 276 cows and calves on a 4-unit rest-rotation system.

Soils are sandy loam in texture and very rocky. Estimated effective rooting depth is just over 9 inches, while penetrometer readings show the majority of rock to be in the upper 8 inches of the profile. However, the presence of mountain big sagebrush suggests that the soil is deeper and effective soil depth measurements are limited by the rocky nature of the soil profile. The soil is slightly acidic (pH of 6.1) and relatively high in organic matter (4.3%). Vegetation and litter cover are high and well dispersed, preventing most soil erosion problems.

Key browse on the site consist of antelope bitterbrush and mountain big sagebrush. Sagebrush is more numerous and currently ('00) provides 78% of the browse cover. It has an estimated density of 2,740 plants/acre in 2000. Vigor has generally been good on sagebrush with 8% of the population displaying poor vigor in 2000. In 1995, 56% of the population was classified as being moderately browsed. In 2000, use was mostly light, with less than 5% of the population showing moderate or heavy use. Percent decadency has varied with each reading, with the highest level occurring in 1988 at 37%. Percent decadency is currently ('00) at 23%, a slight increase from 14% in 1995. Young recruitment is currently good at 9% and biotic potential (number of seedlings) is high at 22%. In 2000, seed production was noted as being high for the past few years. Annual growth averaged about 3 inches.

Antelope bitterbrush is the most preferred browse species on the site. Bitterbrush currently ('00) provides 16% of the browse cover and has an estimated density of 1,520 plants/acre. Density has varied slightly in each sampling year. However, the number of mature plants has remained relatively stable. Use has been classified as moderate to heavy during all readings. In 1982, thirty-eight percent of the mature plants displayed heavy hedging, increasing to 79% by 1988. Heavy use decreased in 1995 to 48% of the population, then slightly increasing to 62% in 2000. Vigor is mostly good with only 8% of the population showing poor vigor in 2000. Percent decadency steadily increased between 1982 and 1995 from 0% to 22%. Currently ('00), percent decadency is 11% and recruitment from young plants is moderately high at 14% (220 plants/acre). The bitterbrush population displays a prostrate growth form. Mature plants averaged only 14 inches in height with a 32 inch crown in 2000. Annual growth averages about 5 inches in 2000, with low seed production being noted.

Other browse are infrequent, but include: snowberry, mountain low rabbitbrush and a few scattered serviceberry.

Grasses and forbs are diverse, dense, and provide over 70% of the total vegetative cover in both 1995 and 2000. At the time of the 1988 reading, grass utilization was light, but cattle had just come onto the site. Due to recent seed head removal that year, species identification was difficult for some grasses. Currently ('00), needle-and-thread and the increaser, Kentucky bluegrass, are the most abundant species in both cover and nested frequency. Muttongrass was also abundant in 1995 and 2000. As a group, perennial grasses decreased in sum of nested frequency by 13% in 2000. This decrease is most likely due to drought. This condition should improve with a

return to normal precipitation. In 2000, grasses had not been utilized when the site was read in July. There are numerous valuable forb species found on the site, especially arrowleaf balsamroot and silver lupine which accounted for 74% of the forb cover in 1995 and 90% in 2000. Forbs were far less abundant in 2000 due to drought, with perennial sum of nested frequency decreasing by 35%. Annual forbs, which were moderately abundant in 1995, were almost non-existent with the drought in 2000. As with grasses, perennial forbs should increase with a return to normal precipitation in the future.

1982 APPARENT TREND ASSESSMENT

Range condition is good and overall trend appears stable. There is little compelling evidence for either extensive soil loss or vegetational change. The area appears capable of supporting more big game animals if livestock use remains at the current level.

1988 TREND ASSESSMENT

Due to the dense herbaceous understory, ground cover is excellent. Basal vegetative cover increased significantly. Percent bare ground declined slightly and there was very little detectable soil movement. Trend for soil is slightly up. The browse trend is up for mountain big sagebrush due to a large increase in density, adequate reproductive potential, a good number of young plants, good vigor, and light to moderate use. Trend for the more preferred antelope bitterbrush is also slightly up. Vigor is good and there are an adequate number of young plants. Density of mature plants increased slightly but heavy use increased to 79% of the plants sampled. Percent decadency rose from 0% to 18%, but the population appears to be in good condition in spite of the increases in use and decadency. Quadrat frequency of grasses and forbs increased since 1982, indicating a slightly upward trend for the herbaceous understory.

TREND ASSESSMENT

soil - slightly up (4)

browse - slightly up; up for sagebrush and slightly up for bitterbrush (4)

herbaceous understory - slightly up (4)

1995 TREND ASSESSMENT

Percent bare ground has declined by 48% since 1988, indicating a continued improvement in the soil trend. Litter also declined 14%, a common occurrence during this continuing drought. However, nested frequency of litter is very high indicating well dispersed protective cover. Herbaceous vegetation is also abundant accounting for 73% of the vegetative cover on the site, effectively limiting erosion. Trend for soil is slightly up. Trend for browse is stable. Mountain big sagebrush declined in density, but most of this is probably due to the increased sample size giving a better estimate of the actual population size. Reproductive potential is low, but stable, and recruitment from young plants is good at 10%. Percent decadency declined from 37% to 14%, and the young age class appears adequate to replace the decadent, dying individuals in the population. Bitterbrush continues to be heavily used yet appears to be stable. Currently, 48% of the shrubs are heavily hedged (>60% of twigs browsed). Percent decadence has increased to 22%, with 42% (160 plants/acre) of these decadent shrubs classified as dying. Average height measurements of mature plants have declined somewhat since 1982. Recruitment from young bitterbrush plants is good at 10%. Bitterbrush can withstand heavy use for long periods of time, but future trends should be watched closely with the continued drought. Trend for grasses and forbs is stable. Some of the fluctuations in the nested frequency numbers of the *Poa* grasses is the result of identification problems in 1988 and not necessarily actual changes in composition.

TREND ASSESSMENT

soil - slightly up (4)

browse - stable (3)

herbaceous understory - stable (3)

2000 TREND ASSESSMENT

Trend for soil is stable. Erosion remains minimal as vegetation and litter cover remain high and well disbursed over the site. Bare ground remains low and even with drought, only increased to 7%. Trend for browse is stable for both mountain big sagebrush and bitterbrush. Sagebrush shows increased density and lighter use compared to 1995 estimates. Currently, recruitment is adequate even with an increase in decadency from 14% to 23%. Bitterbrush remains at a stable density, has good recruitment, and vigor remains mostly good even with increased heavy use and drought in 2000. Percent decadency also decreased from 22% to 11%. Trend for the herbaceous understory is slightly down due to drought. Perennial grass sum of nested frequency decreased by 13%, with perennial forb sum of nested frequency decreasing by 35%. Normal precipitation patterns in the future should reverse this decline.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 4

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	a ⁵⁹	b ¹¹⁶	a ⁷⁰	14	32	45	30	1.42	.69
G	Carex spp.	b ⁸⁵	a ²²	a ⁴⁹	15	38	10	18	.24	2.16
G	Koeleria cristata	b ²³	a ⁻	a ⁵	33	9	-	2	.00	.06
G	Poa fendleriana	b ³¹⁵	a ¹³¹	a ¹³⁵	61	97	50	54	3.02	4.46
G	Poa pratensis	a ⁸¹	b ¹³⁸	b ¹⁶⁵	4	30	44	49	7.83	9.85
G	Poa secunda	b ²⁹	a ¹⁴	a ³	9	11	4	1	.09	.00
G	Sitanion hystrix	b ¹⁰	ab ⁵	a ¹	-	6	2	1	.03	.03
G	Stipa comata	a ⁴⁵	b ¹⁶⁸	c ¹⁹³	29	24	60	66	5.97	12.59
G	Stipa lettermani	b ⁸³	ab ¹⁴⁰	a ¹⁴	37	36	48	6	4.17	.49
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		730	734	635	202	283	263	227	22.81	30.35
Total for Grasses		730	734	635	202	283	263	227	22.81	30.35
F	Agoseris glauca	3	7	11	-	3	4	4	.02	.07
F	Allium spp.	a ²	ab ¹¹⁸	b ²⁸	28	1	52	12	.36	.19
F	Antennaria rosea	5	13	1	2	2	6	1	.30	.03
F	Arabis spp.	b ⁵¹	a ⁶	a ⁷	1	23	3	3	.01	.04

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	<i>Artemisia ludoviciana</i>	-	-	4	-	-	-	1	-	.03
F	<i>Astragalus</i> spp.	_b 4	_b 6	_a -	-	3	2	-	.01	-
F	<i>Balsamorhiza sagittata</i>	152	160	148	50	70	68	63	14.00	15.28
F	<i>Castilleja linariaefolia</i>	-	4	2	-	-	2	2	.01	.03
F	<i>Calochortus nuttallii</i>	-	2	-	5	-	2	-	.01	-
F	<i>Chenopodium</i> spp. (a)	-	_b 15	_a -	-	-	7	-	.03	-
F	<i>Collomia linearis</i> (a)	-	_b 264	_a 24	-	-	93	12	2.08	.08
F	<i>Comandra pallida</i>	_a -	_{ab} 3	_b 7	-	-	2	4	.01	.09
F	<i>Collinsia parviflora</i> (a)	-	_b 173	_a 18	-	-	65	10	1.33	.05
F	<i>Crepis acuminata</i>	_a 2	_b 21	_a 1	3	1	9	1	.45	.00
F	<i>Cryptantha</i> spp.	-	2	-	-	-	1	-	.00	-
F	<i>Descurainia pinnata</i> (a)	-	_b 13	_a -	-	-	5	-	.07	-
F	<i>Eriogonum alatum</i>	4	-	-	-	2	-	-	-	-
F	<i>Erigeron eatonii</i>	_b 6	_a -	_b 4	5	3	-	3	-	.01
F	<i>Erigeron flagellaris</i>	8	1	5	6	3	1	2	.00	.06
F	<i>Eriogonum racemosum</i>	9	7	16	8	7	3	7	.09	.28
F	<i>Eriogonum umbellatum</i>	_a 1	_b 14	_b 13	3	1	7	8	.30	.14
F	<i>Heterotheca villosa</i>	-	-	2	-	-	-	1	-	.03
F	<i>Lomatium</i> spp.	18	11	5	3	7	6	3	.03	.06
F	<i>Lupinus argenteus</i>	_a 55	_b 91	_{ab} 77	36	30	44	41	3.35	2.72
F	<i>Lychnis drummondii</i>	_{ab} 6	_b 13	_a 1	15	3	8	1	.09	.00
F	<i>Orobanche fasciculata</i>	_a -	_b 8	_{ab} 3	-	-	4	2	.02	.03
F	<i>Penstemon humilis</i>	52	34	20	13	24	15	12	.17	.31
F	<i>Phlox longifolia</i>	_b 96	_a 43	_a 20	1	48	20	9	.20	.07
F	<i>Polygonum douglasii</i> (a)	-	_b 76	_a 11	8	-	35	4	.22	.02
F	<i>Potentilla gracilis</i>	-	3	3	-	-	2	1	.03	.00
F	<i>Senecio integerrimus</i>	-	2	2	-	-	1	2	.15	.03
F	<i>Sedum lanceolatum</i>	-	1	-	-	-	1	-	.00	-
F	<i>Senecio multilobatus</i>	1	2	1	3	1	1	1	.03	.00
F	<i>Tragopogon dubius</i>	_b 7	_b 7	_a -	-	3	3	-	.01	-
F	Unknown forb-perennial	_b 5	_a -	_a -	-	3	-	-	-	-
F	<i>Zigadenus elegans</i>	-	4	1	3	-	2	1	.01	.03
Total for Annual Forbs		0	541	53	8	0	205	26	3.76	0.15
Total for Perennial Forbs		487	583	382	185	238	269	185	19.71	19.58
Total for Forbs		487	1124	435	193	238	474	211	23.47	19.73

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

BROWSE TRENDS --
Herd unit 09 , Study no: 4

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	0	1	-	-
B	Artemisia tridentata vaseyana	72	78	12.34	15.40
B	Chrysothamnus viscidiflorus lanceolatus	5	4	.30	.36
B	Eriogonum heracleoides	3	7	.06	.30
B	Mahonia repens	2	2	.00	.03
B	Opuntia fragilis	3	2	.01	.00
B	Pediocactus simpsonii	1	0	.03	-
B	Purshia tridentata	52	54	3.87	3.12
B	Symphoricarpos oreophilus	11	12	.30	.52
Total for Browse		149	160	16.93	19.73

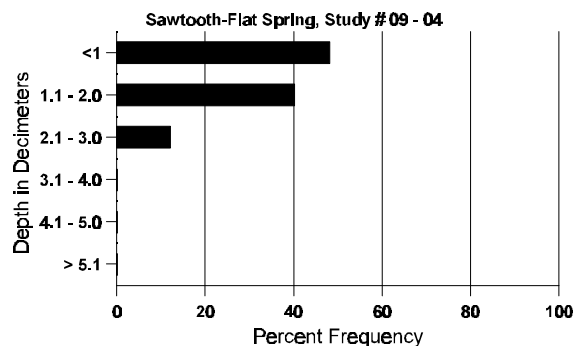
BASIC COVER --
Herd unit 09 , Study no: 4

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	375	368	7.25	12.50	61.72	64.45
Rock	111	65	1.75	1.50	2.08	1.64
Pavement	84	112	0	2.00	1.07	1.77
Litter	392	394	67.75	73.25	63.34	65.68
Cryptogams	-	18	.75	0	0	.42
Bare Ground	157	146	22.50	10.75	5.61	7.58

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 4, Study Name: Sawtooth-Flat Spring

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
9.24	58.2 (10.71)	6.1	67.4	18.4	14.3	4.3	28.2	236.8	0.7

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 09 , Study no: 4

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre	Days Use per Acre (ha)
			'00	'00
Rabbit	5	4	209	N/A
Elk	5	8	331	25 (63)
Deer	31	30	974	75 (185)
Cattle	9	1	191	16 (39)

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 4

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier alnifolia																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'00	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>% Change</u>				
		'82				00%				00%				00%				
		'88				00%				00%				00%				
		'95				00%				00%				00%				
		'00				00%				00%				00%				
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	20		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
S	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	1	-	1	-	-	-	-	-	2	-	-	-	133		2	
	'95	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
	'00	28	-	-	-	-	-	2	-	-	30	-	-	-	600		30	
Y	'82	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	'88	5	4	-	-	-	-	-	-	-	9	-	-	-	600		9	
	'95	10	-	-	-	-	-	-	-	-	10	-	-	-	200		10	
	'00	10	-	-	-	-	-	3	-	-	13	-	-	-	260		13	
M	'82	18	-	-	-	-	-	-	-	-	18	-	-	-	1200	26 30	18	
	'88	21	7	-	-	-	-	-	-	-	28	-	-	-	1866	22 20	28	
	'95	30	46	2	-	-	-	-	-	-	78	-	-	-	1560	27 43	78	
	'00	85	1	1	5	-	-	-	-	-	91	-	1	-	1840	28 39	92	
D	'82	3	-	-	-	-	-	-	-	-	1	2	-	-	200		3	
	'88	9	9	3	1	-	-	-	-	-	21	-	1	-	1466		22	
	'95	1	11	2	-	-	-	-	-	-	10	-	-	4	280		14	
	'00	22	4	-	6	-	-	-	-	-	22	-	-	10	640		32	
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	380		19	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	240		12	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%			+63%							
'88		34%			05%			02%			-48%							
'95		56%			04%			04%			+26%							
'00		04%			.72%			08%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	1466	Dec:	14%			
												'88	3932		37%			
												'95	2040		14%			
												'00	2740		23%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus viscidiflorus lanceolatus																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	6	-	-	-	-	-	-	-	-	6	-	-	-	120	14	28	6
	'00	6	-	-	-	-	-	-	-	-	6	-	-	-	120	15	24	6
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			+ 0%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	120		-			
												'00	120		-			
Eriogonum heracleoides																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	10	13	3
	'00	8	-	-	1	-	-	2	-	-	11	-	-	-	220	4	6	11
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			+45%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	120		-			
												'00	220		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Mahonia repens																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
	00	1	-	-	-	-	-	2	-	-	3	-	-	-	60		3	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	5	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	2	4	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			-25%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	80		-			
												'00	60		-			
Opuntia fragilis																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	4	-	-	1	-	-	1	-	-	5	-	1	-	400		6	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	1	-	-	-	-	-	1	-	-	-	66	5	4	
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	2	5	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80	2	5	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	3	-	-	1	-	-	-	-	-	3	-	1	-	266		4	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			18%			-89%							
'95		00%			00%			00%			+ 0%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	732		36%			
												'95	80		0%			
												'00	80		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Pediocactus simpsonii</i>																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	3	4	1
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
		'82 00%			'82 00%			'82 00%										
		'88 00%			'88 00%			'88 00%										
		'95 00%			'95 00%			'95 00%										
		'00 00%			'00 00%			'00 00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	20		-			
												'00	0		-			
<i>Purshia tridentata</i>																		
S	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	4	-	-	-	-	-	-	-	4	-	-	-	266			4
	'95	6	1	1	1	-	-	-	-	-	9	-	-	-	180			9
	'00	6	4	-	1	-	-	-	-	-	11	-	-	-	220			11
M	'82	3	7	6	-	-	-	-	-	-	10	6	-	-	1066	19	28	16
	'88	-	-	18	-	1	-	-	-	-	19	-	-	-	1266	17	28	19
	'95	3	19	7	3	4	22	-	-	-	58	-	-	-	1160	13	32	58
	'00	8	4	9	2	-	28	1	-	5	57	-	-	-	1140	14	32	57
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	1	4	-	-	-	-	-	-	5	-	-	-	333			5
	'95	-	4	5	1	-	6	3	-	-	11	-	-	8	380			19
	'00	1	-	1	-	2	4	-	-	-	2	-	-	6	160			8
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
		'82 44%			'82 38%			'82 00%			'82 +43%							
		'88 21%			'88 79%			'88 00%			'88 - 8%							
		'95 33%			'95 48%			'95 09%			'95 -12%							
		'00 13%			'00 62%			'00 08%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	1066	Dec:	0%			
												'88	1865		18%			
												'95	1720		22%			
												'00	1520		11%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total							
		1	2	3	4										
Symphoricarpos oreophilus															
S	82	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	0		0	
	95	2	-	-	-	-	-	-	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	4	-	-	-	-	-	-	-	-	-	266		4	
	88	-	1	-	-	-	-	-	-	-	-	66		1	
	95	6	-	-	-	-	-	-	-	-	-	120		6	
	00	1	-	-	-	-	-	-	-	-	-	20		1	
M	82	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	2	1	-	1	-	-	-	-	-	-	266	18	18	4
	95	3	10	-	4	-	-	-	-	-	-	340	19	38	17
	00	8	-	-	2	-	-	-	-	-	-	200	19	50	10
D	82	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	1	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>				
'82		00%			00%			00%			+20%				
'88		40%			00%			00%			+28%				
'95		43%			00%			00%			-43%				
'00		00%			00%			08%							
Total Plants/Acre (excluding Dead & Seedlings)										'82	266	Dec:	0%		
										'88	332		0%		
										'95	460		0%		
										'00	260		15%		

Trend Study 9-5-00

Study site name: Island Park.

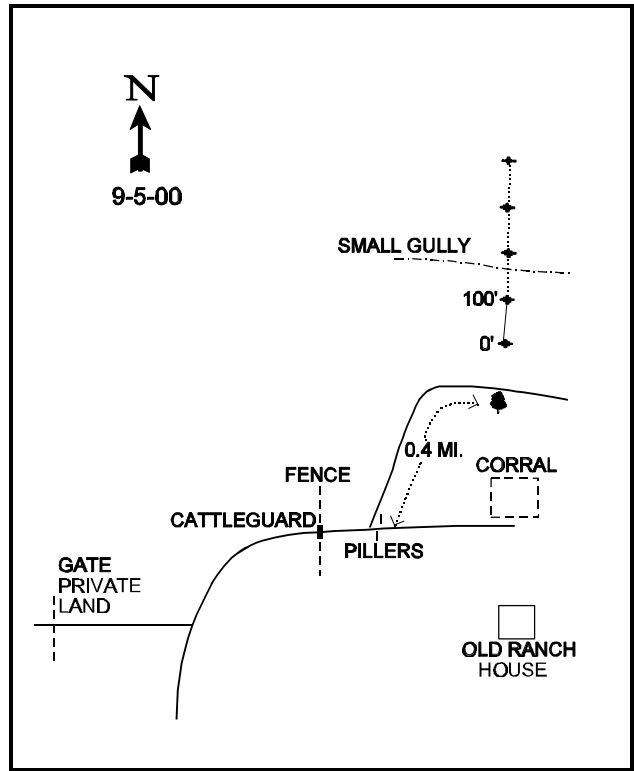
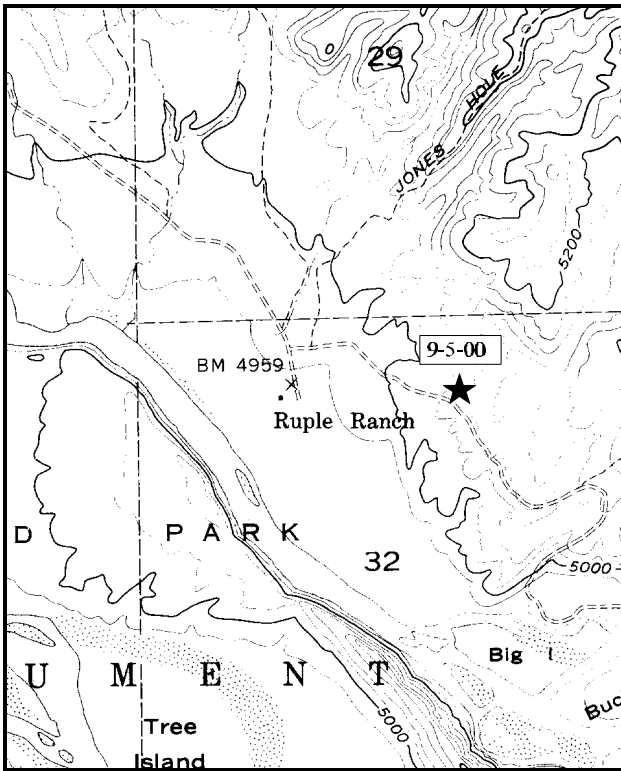
Range type: Big Sagebrush-Grass.

Compass bearing: frequency baseline 12°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (9 & 88ft), line 2 (26ft), line 3 (48ft), line 4 (73ft).

LOCATION DESCRIPTION

From the Diamond Mountain Road, take the Island Park turnoff to the right. Proceed east for 2.1 miles to a fork. Stay to the left and go 17.7 miles. Just past the Jones Hole trailhead and before Ruple Ranch, there is a turnoff to the left. The road may be closed. Go left and proceed up the ridge for 0.4 miles to a juniper next to the road on the right. From the juniper, the 0-foot baseline stake is 20 paces away at a bearing of 28°M.



Map Name: Island Park

Diagrammatic Sketch

Township 3S, Range 25E, Section 32

UTM 4487260 N, 658118 E

DISCUSSION

Trend Study No. 9-5 (11-6)

The Island Park study is located on a sagebrush-grass slope one-half mile above the Green River in Dinosaur National Monument. This site is on deer winter range at an elevation of approximately 5,000 feet and a slope of about 25%. Aspect is south, southwest. Deer and rabbit pellets had high quadrat frequencies in 1995, while elk were low. Quadrat frequency decreased for deer and rabbit pellets in 2000, but increased for elk. A pellet group transect read along the baseline in 2000 estimates 47 deer days use/acre (116 ddu/ha) and 57 elk days use/acre (141 edu/ha). Livestock grazing is no longer permitted as this site is found within the national monument.

Soils are a sandy loam with little surface rock. Estimated effective rooting depth is nearly 13 inches and average soil temperature is relatively high at over 73°F. Soil temperatures this high often indicate the potential for annual weed invasion, primarily from winter annuals such as cheatgrass. Soil movement is noticeable, which is currently ('00) described as being moderate. Interspaces between shrubs are generally devoid of vegetation except for the small annual grasses, sixweeks fescue and cheatgrass. Cryptogamic crusts have slowly increased since 1982 with no grazing. They provide added protection to the soil. With drought in 2000, bare ground increased from 31% to nearly 45%.

In 1982, the key browse species was identified as Wyoming big sagebrush. At that time it was in fair to poor condition and moderately hedged. Thirty percent of the stand displayed poor vigor and percent decadency was relatively high for a Wyoming big sagebrush site at 44%. The 1988 survey found a more decadent stand of sagebrush (29% mature, 51% decadent) with moderate to heavy hedging, poor growth, and low seed production. In 1995, percent decadency declined to 39%, with 71% (920 plants/acre) of these decadent plants being classified as dying. Also, nearly 80% of the population displayed moderate or heavy hedging. Those classified with poor vigor increased to 29% of the population. The number of dead plants/acre in 1995, indicated that 1 of almost every 3 plants (1,520 plants/acre) were dead. In 2000, the condition of sagebrush continued to decline. Percent decadency has drastically increased to 82%, half of the population is classified with poor vigor, while use remains at a moderate to high level. Sixty-one percent of the decadent plants were classified as dying in 2000, representing 1,390 plants/acre that could be lost from the population if conditions persist. Young recruitment is low (80 plants/acre) and not adequate to replace individuals lost to a die-off. Extended drought, inter and intraspecific competition appear to be the most negatively influencing factors to this sagebrush stand. Leader growth on sagebrush is currently ('00) poor, averaging 1-2 inches. It appears that the sagebrush on this site has some characteristics of both basin big sagebrush (*Artemisia tridentata tridentata*) and Wyoming big sagebrush (*A. tridentata wyomingensis*), indicating hybridization between the two subspecies.

Another sign of possible declining range condition, first noted in 1982, was the abundance of broom snakeweed which appeared to have an expanding population. In 1995, snakeweed was estimated at 3,580 plants/acre with high recruitment (36%) and mostly good vigor. In 2000, snakeweed has increased exponentially to an estimated 30,120 plants/acre. Snakeweed often declines with drought, but with this large of a population, the drought conditions in 2000 appear to have not yet negatively impacted this species. The population appears stable with 92% of the population being mature. Other shrubs encountered on the site include: slenderbush eriogonum, pricklypear cactus and small numbers of prickly phlox.

The understory is dominated by needle-and-thread grass which made up 68% of the herbaceous cover in both 1995 and 2000. It currently ('00) provides 28% of the total vegetation cover. Thickspike wheatgrass is the only other perennial grass that is somewhat abundant. It was sampled in 19 quadrats (19% quadrat frequency) in 2000. Two annual grasses, sixweeks fescue and cheatgrass, are present on the site. Sixweeks fescue was more abundant of the two in 1995, but due to drought in 2000, was much less abundant compared to 1995 estimates.

Cheatgrass increased in nested frequency in 2000. It is presently found in about one-third of the quadrats. Forbs are depleted and dominated by annuals and provide little useful forage. All forbs, both annual and perennial species, drastically decreased in sum of nested frequency in 2000. Although, even at its best, the forbs together only provided just over 1% cover. This site is now best described as a decadent Wyoming big sagebrush community with a depleted understory.

1982 APPARENT TREND ASSESSMENT

Soil trend appears stable to declining. The estimates for ground cover show approximately 51% bare ground and less than 3% basal vegetative cover. There is active sheet and gully erosion underway and considerable quantities of soil and litter have piled up against small obstructions. Vegetative trend appears to be declining. The best evidence would appear to be an aggressive and expanding population of snakeweed and the fair to poor condition of the key browse species, Wyoming big sagebrush. In addition, understory composition is less than desirable and produces little quality forage. Furthermore, grass and forb density is inadequate to prevent or seriously impede soil movement.

1988 TREND ASSESSMENT

Percent litter cover has declined resulting in an increase in the amount of exposed bare soil, from 50% to 60%. Consequently, there is evidence of some soil loss and sedimentation. Trend for soil is slightly down. Trend for the key browse, Wyoming big sagebrush is also slightly down. Even though total population increased, the number of mature plants declined from 2,000 plants/acre to 1,666. The increase in population came primarily from the increase in decadent plants (1,666 to 2,866) which account for 51% of the population. Heavy use was also higher with 34% of the sagebrush displaying heavy hedging. Another negative factor is the abundance of broom snakeweed which increased since 1982. The herbaceous trend is up especially for grasses. Quadrat frequency of grasses doubled since 1982. Composition is dominated by needle-and-thread grass. Forbs are depleted and provide little useful forage.

TREND ASSESSMENT

soil - slightly down and poor condition (2)

browse - slightly down due to heavy use and increased decadence (2)

herbaceous understory - up for grasses, but forbs are scarce (5)

1995 TREND ASSESSMENT

Trend for soil is slightly up due to a large increase in cryptogamic crusts (5% to 11%) and an obvious increase in vegetation cover noted in the data and photos. Aerial cover instead of basal cover was estimated in 1995. Percent bare ground decreased from nearly 60% to 31%. Vegetation and litter also have high nested frequencies values indicating well dispersed cover. The spring of 1995 was unusually wet and may be partly responsible for the dramatic change in some of these ground cover values. Browse trend continues to decline due to continued moderate to heavy use, high decadence, poor vigor, declining population density, and continuing drought. The herbaceous trend is slightly up with increases in sum of nested frequency of perennial grasses and forbs.

TREND ASSESSMENT

soil - slightly up, still poor condition (4)

browse - continues down (1)

herbaceous understory - slightly up, but still poor for forbs (4)

2000 TREND ASSESSMENT

Trend for soil is slightly down. Bare ground increased and erosion is considered moderate at this time. The abundance of herbaceous vegetation, especially perennial species, decreased in 2000 due to continuing drought. Herbaceous vegetation is key to holding soils in place. Trend for browse is down. Wyoming big sagebrush increased in decadency from 39% to 82%. Half of the sagebrush population is classified with poor vigor. Recruitment is currently low (80 plants/acre) and not adequate to replace the decadent individuals classified as dying (1,380 plants/acre). Over the past 18 years, young plants have averaged 11% of the population, while dead plants account for 31% of the population. Thus in the long term, the dead within the population are not being replaced. Furthermore, broom snakeweed exploded in density from 3,580 plants/acre to an estimated 30,120 plants/acre. Trend for the herbaceous understory is down. Sum of nested frequency of perennial grasses and forbs declined by nearly half due to continuing drought.

TREND ASSESSMENT

soil - slightly down (2)

browse - down (1)

herbaceous understory - down (1)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 5

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	62	38	43	-	26	16	19	.10	1.42
G	Agropyron spicatum	-	4	4	-	-	1	2	.03	.18
G	Bromus tectorum (a)	-	_a 40	_b 97	-	-	22	35	.16	1.48
G	Hilaria jamesii	25	43	21	17	11	17	8	.50	.24
G	Oryzopsis hymenoides	12	6	11	5	6	3	4	.39	.62
G	Poa fendleriana	_a -	_b 5	_a -	-	-	3	-	.06	-
G	Poa secunda	2	4	7	2	1	2	3	.01	.01
G	Sitanion hystrix	_b 31	_b 36	_a 4	8	17	18	1	.24	.15
G	Stipa comata	_a 213	_b 285	_a 217	44	88	96	84	12.38	9.53
G	Vulpia octoflora (a)	-	_b 324	_a 5	-	-	98	3	2.97	.06
Total for Annual Grasses		0	364	102	0	0	120	38	3.13	1.55
Total for Perennial Grasses		345	421	307	76	149	156	121	13.73	12.16
Total for Grasses		345	785	409	76	149	276	159	16.86	13.71
F	Allium spp.	_a 9	_b 130	_a 1	9	6	64	1	.42	.00
F	Astragalus convallarius	8	18	5	3	6	8	2	.12	.01
F	Astragalus purshii	_a -	_b 3	_a -	-	-	3	-	.01	-
F	Castilleja chromosa	-	3	4	-	-	1	2	.03	.03
F	Calochortus nuttallii	_a -	_{ab} 3	_b 6	1	-	2	3	.01	.01
F	Chenopodium leptophyllum (a)	-	1	-	-	-	1	-	.00	-
F	Descurainia pinnata (a)	_a 1	_b 57	_a -	-	1	25	-	.12	-
F	Draba spp. (a)	-	_b 35	_a -	-	-	12	-	.06	-
F	Erigeron spp.	-	3	5	-	-	1	2	.00	.01

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Euphorbia robusta	-	3	-	-	-	1	-	.03	-
F	Ipomopsis congesta	a-	b8	a-	-	-	4	-	.02	-
F	Lepidium spp. (a)	-	b24	a-	-	-	13	-	.09	-
F	Lesquerella spp.	1	1	-	-	1	1	-	.00	-
F	Lygodesmia spp.	-	3	-	-	-	2	-	.01	-
F	Machaeranthera grindelioides	3	-	-	-	1	-	-	-	-
F	Phlox longifolia	b72	a23	a22	-	35	11	10	.05	.15
F	Plantago patagonica (a)	-	b16	a-	-	-	6	-	.05	-
F	Polygonum douglasii (a)	-	3	4	-	-	1	2	.00	.01
F	Sisymbrium altissimum (a)	-	3	2	-	-	1	1	.15	.03
F	Sphaeralcea coccinea	a3	b18	a7	1	1	10	3	.13	.01
F	Taraxacum officinale	-	3	1	-	-	1	1	.00	.00
F	Unknown forb-perennial	b7	a-	a-	-	3	-	-	-	-
Total for Annual Forbs		1	139	6	0	1	59	3	0.49	0.04
Total for Perennial Forbs		103	219	51	14	53	109	24	0.86	0.24
Total for Forbs		104	358	57	14	54	168	27	1.35	0.29

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

BROWSE TRENDS --

Herd unit 09 , Study no: 5

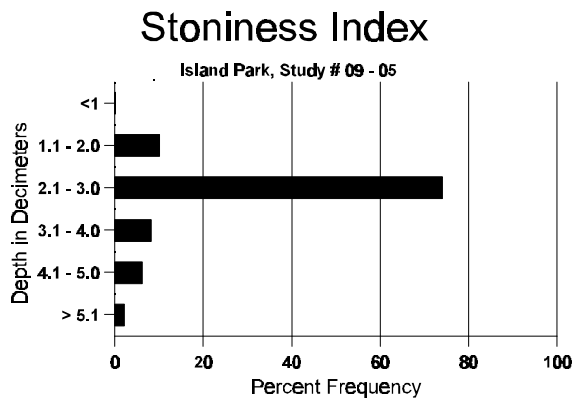
T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata wyomingensis	79	78	7.76	5.69
B	Eriogonum microthecum	30	15	.19	.16
B	Gutierrezia sarothrae	76	100	.98	12.44
B	Leptodactylon pungens	2	2	.03	.15
B	Opuntia spp.	20	16	.07	.36
Total for Browse		207	211	9.06	18.83

BASIC COVER --
Herd unit 09 , Study no: 5

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	369	323	2.75	4.75	31.06	35.34
Rock	-	-	0	0	0	0
Pavement	2	3	0	0	.01	.15
Litter	397	370	45.50	31.00	32.54	35.04
Cryptogams	245	208	1.00	4.50	10.82	12.38
Bare Ground	320	337	50.75	59.75	31.40	44.68

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 5, Study Name: Island Park

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
12.94	73.4 (14.33)	7.3	57.4	26.7	15.9	0.6	4.0	112.0	0.6



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 5

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre	Days Use per Acre (ha)
Rabbit	45	10	679	N/A
Elk	6	25	740	57 (141)
Deer	32	21	609	47 (116)

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 5

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Artemisia tridentata wyomingensis																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2
	95	9	-	-	-	-	-	-	-	-	9	-	-	-	180		9
	00	-	-	-	-	-	-	1	-	-	1	-	-	-	20		1
Y	82	-	2	-	-	-	-	-	-	-	-	2	-	-	133		2
	88	14	3	-	-	-	-	-	-	-	17	-	-	-	1133		17
	95	11	11	5	1	-	-	-	-	-	28	-	-	-	560		28
	00	3	1	-	-	-	-	-	-	-	4	-	-	-	80		4
M	82	12	18	-	-	-	-	-	-	-	13	17	-	-	2000	17 23	30
	88	1	13	11	-	-	-	-	-	-	22	1	2	-	1666	20 21	25
	95	13	42	17	-	-	-	-	-	-	70	-	2	-	1440	16 25	72
	00	-	3	10	2	4	1	1	-	-	20	-	1	-	420	16 25	21
D	82	6	11	8	-	-	-	-	-	-	4	4	17	-	1666		25
	88	5	20	18	-	-	-	-	-	-	32	1	5	5	2866		43
	95	10	28	26	-	1	-	-	-	-	19	-	-	46	1300		65
	00	18	49	28	3	16	-	-	-	-	45	-	-	69	2280		114
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	1520		76
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	1140		57
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'82		54%			14%			30%			+33%						
'88		42%			34%			14%			-42%						
'95		50%			29%			29%			-16%						
'00		53%			28%			50%									
Total Plants/Acre (excluding Dead & Seedlings)											'82	3799	Dec:	44%			
											'88	5665		51%			
											'95	3300		39%			
											'00	2780		82%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total					
		1	2	3	4								
Eriogonum microthecum													
S	82	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	0		0
	95	1	-	-	-	-	-	-	-	-	20		1
	00	-	-	-	-	-	-	-	-	-	0		0
Y	82	-	-	-	-	-	-	-	-	-	0		0
	88	3	-	-	-	-	-	-	-	-	200		3
	95	3	-	-	-	-	-	-	-	-	60		3
	00	-	-	-	-	-	-	-	-	-	0		0
M	82	3	-	-	-	-	-	-	-	-	200	13 6	3
	88	8	-	-	-	-	-	-	-	-	533	9 5	8
	95	39	2	2	-	-	-	-	-	-	860	10 10	43
	00	14	3	3	4	-	-	-	-	-	480	5 6	24
D	82	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	0		0
	95	5	-	-	-	-	-	-	-	-	100		5
	00	-	-	-	1	-	-	-	-	-	20		1
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>				<u>%Change</u>			
'82		00%		00%		00%				+73%			
'88		00%		00%		00%				+28%			
'95		04%		04%		00%				-51%			
'00		12%		12%		04%							
Total Plants/Acre (excluding Dead & Seedlings)										'82	200	Dec:	0%
										'88	733		0%
										'95	1020		10%
										'00	500		4%

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	88	1	-	-	-	-	-	-	-	-	-	-	-	66			1	
	95	1327	-	-	1	-	-	-	-	-	-	-	-	26560			1328	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
Y	82	12	-	-	-	-	-	-	-	-	-	-	-	800			12	
	88	46	-	-	-	-	-	-	-	-	-	-	-	3066			46	
	95	65	-	-	-	-	-	-	-	-	-	-	-	1300			65	
	00	17	-	-	-	-	-	-	-	-	-	-	-	340			17	
M	82	100	-	-	-	-	-	-	-	-	-	-	-	6666	12	10	100	
	88	368	-	-	1	-	-	-	-	-	-	-	-	24600	8	6	369	
	95	108	5	-	-	-	-	-	-	-	-	-	-	2260	12	13	113	
	00	1386	-	-	-	-	-	-	-	-	-	-	-	27720	8	9	1386	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	88	40	-	-	-	-	-	-	-	-	-	-	-	2666			40	
	95	1	-	-	-	-	-	-	-	-	-	-	-	20			1	
	00	103	-	-	-	-	-	-	-	-	-	-	-	2060			103	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	100			5	
	00	-	-	-	-	-	-	-	-	-	-	-	-	320			16	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+75%							
'88		00%			00%			01%			-88%							
'95		03%			00%			00%			+88%							
'00		00%			00%			03%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	7466	Dec:	0%			
												'88	30332		9%			
												'95	3580		1%			
												'00	30120		7%			
Leptodactylon pungens																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	00	1	-	-	-	-	-	-	-	-	-	-	-	20			1	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	3	-	-	-	-	-	-	-	-	-	-	-	60	4	8	3	
	00	5	-	-	-	-	-	-	-	-	-	-	-	100	4	8	5	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			+50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	60		-			
												'00	120		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Opuntia spp.																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	2	1	-	-	-	-	1	-	-	4	-	-	-	266			4
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	'82	2	-	-	-	-	-	-	-	-	-	2	-	-	133	3	5	2
	'88	5	-	-	-	-	-	-	-	-	5	-	-	-	333	4	8	5
	'95	21	-	-	-	-	-	-	-	-	21	-	-	-	420	4	16	21
	'00	16	-	-	-	-	-	-	-	-	16	-	-	-	320	4	12	16
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	'00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+78%							
'88		11%			00%			00%			-27%							
'95		00%			00%			00%			-14%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	133	Dec:	0%			
												'88	599		0%			
												'95	440		5%			
												'00	380		11%			

Trend Study 9-6-00

Study site name: Above Steinaker Draw .

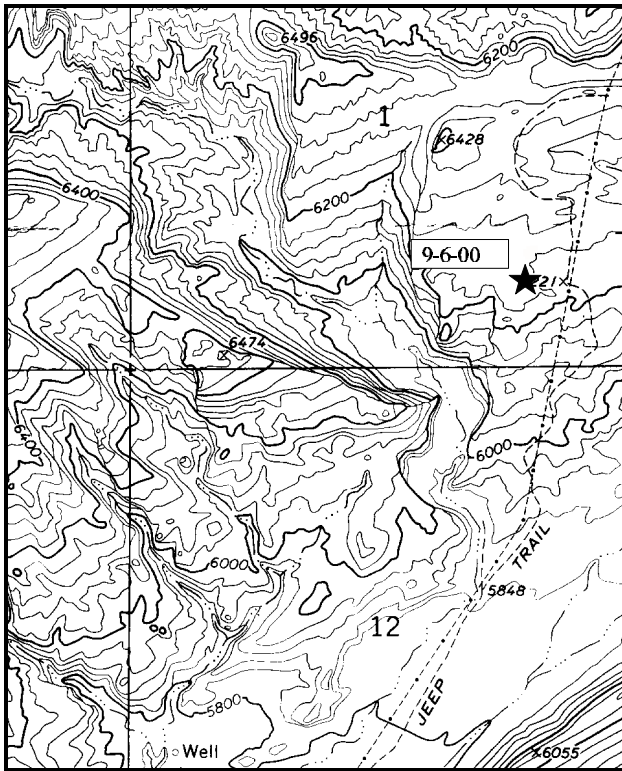
Range type: Pinyon-Juniper .

Compass bearing: frequency baseline 143°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

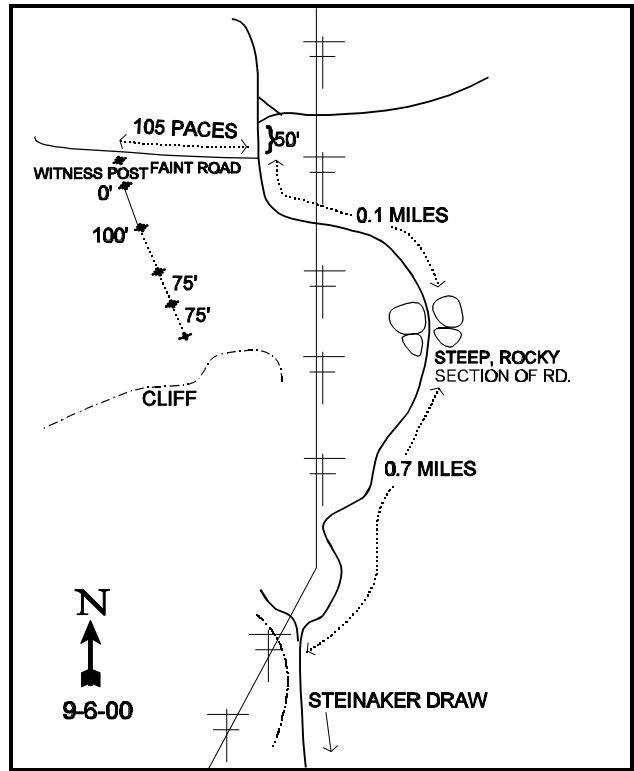
LOCATION DESCRIPTION

One mile north of Steinaker Reservoir, turn left off highway US 191. Staying to the right, go northeast on the dirt road for approximately 1.85 miles. Just after crossing under the power lines, there is a fork. Bear left at this fork, going 0.4 miles to a fork at the base of the hill. Proceed up the right fork, following the power lines, going approximately 0.85 miles to the top of a rough, sandy 4-WD road. Just after you come up a very steep, rocky section, you top out and the road bends to the right beneath the power lines. Beyond the bend is a faint road leading off to the east. Walk along this trail about 150 yards to a witness post on the left side of the old road. The study site is in the juniper/sage on the south side of the road. The 0-foot baseline stake is 50 feet south of the witness post.



Map Name: Steinaker Reservoir

Township 3S, Range 21E, Section 1



Diagrammatic Sketch

UTM 4493282.769 N, 626581.283 E

DISCUSSION

Trend Study No. 9-6 (11-7)

The Above Steinaker Draw study was established in 1988. It is located in an open juniper stand with an understory of Wyoming big sagebrush. This study was added to replace an old study, Steinaker Draw, which was established in 1982 and sampled a little-used desert shrub range type. The study site lies in a small basin that has a gentle slope in the bottom, but gets steeper on the short slopes which run up to sandstone ridges. The general aspect is to the northeast. The area does not receive much snow, where annual precipitation ranges from 9 to 12 inches. The elevation at the site is 6,250 feet. Old sign of wintering deer and elk are abundant at this site, although with several mild winters recently, fresh sign was scarce in 2000. A pellet group transect read along the baseline in 2000 estimates 6 deer days use/acre (15 ddu/ha) and 9 elk days use/acre (22 edu/ha). No cattle pats were sampled in 2000. Cattle graze the area in spring or fall as part of a deferred system. It may be that they have not yet come onto the area when the site was read in 2000.

The soil is a loamy sand in the LaMarsh-Rock Outcrop complex. Estimated effective rooting depth is just over 16 inches and penetrometer readings show rock to be evenly distributed throughout the upper 20 inches of the soil profile. There are areas where soils are more shallow resulting in exposed bedrock. Soils are often without plant cover and tend to support well-developed cryptogams. Cryptogamic crust cover has been high in all years, and is currently ('00) estimated at 23%. Phosphorus is low at 6.2 ppm, where 10 ppm has been shown to be necessary for normal plant growth and development. Although permeability is rapid, surface runoff is moderate and erosion potential is high. The soil is most vulnerable during high intensity summer thunderstorms. At most other times, erosion is localized and not severe. Moderate pedestaling occurs around the stems of sagebrush and the trunks of juniper trees.

The mature juniper overstory is open with an estimated point-center quarter density of 65 juniper trees/acre with an average diameter of 11.8 inches. Overhead canopy cover is currently ('00) estimated at 10%. Due to low average precipitation, this site is marginal for pinyon as evidenced by an estimated density of only 6 pinyon trees/acre. Average trunk diameter of pinyon trees is 3 inches.

Openings in the juniper woodland allow for a moderately low density stands of Wyoming big sagebrush to persist throughout this area. On the site itself, Wyoming sagebrush has an estimated density of about 2,600 plants/acre in both 1995 and 2000. Sagebrush cover was estimated at 12% in 1995, and 10% in 2000. Vigor has generally been good with fair growth and seed production in both 1988 and 1995. In 2000, poor vigor slightly increased to 9%, while percent decadency increased a moderate amount from 11% in 1995 to 32%. Increases in poor vigor and percent decadency are most likely due to drought as most use remains at a light level, with few plants showing moderate use. This level of use has been observed in both 1995 and 2000. Recruitment was good in both 1988 and 1995, but at the present time ('00), recruitment from young plants is only fair (100 plants/acre). Decreased recruitment provides additional evidence that drought is playing a role in the depressed condition of sagebrush on this site. Currently ('00), annual growth averages only about 2 inches. Spiny hopsage has an estimated density of just under 200 plants/acre for all sampling periods. This species is very palatable and shows moderate utilization. On average, it contributes only about 10% of the browse cover. This small population exhibits several downward population parameters in 2000. Poor vigor increased from 13% to 56%, percent decadency increased from 13% to 78%, and no young plants are being recruited into the population. Other palatable browse on the site include: a low density of moderately utilized green ephedra, scattered black sagebrush and an occasional true mountain mahogany plant. Less desirable browse include a fairly dense population of pricklypear cactus estimated at 2,580 plants/acre in 2000. A few broom snakeweed are also scattered throughout the area.

The herbaceous understory is dominated by annuals. Grass distribution is extremely variable over the site. Some places support a dense stand of cheatgrass, while perennial species are clumped in others. Thickspike wheatgrass, needle-and-thread grass, Sandberg bluegrass and galleta are the most common perennial grasses found on the site. As a group, perennial grasses provide only 3% average cover in 2000. They had a quadrat frequency of only 66%. Both of these are decreases from 1995 data, due most likely to continuing drought. Two annual species, cheatgrass and sixweeks fescue, are normally abundant. Cheatgrass increased in nested frequency, quadrat frequency and average cover in 2000 even with drought. Sixweeks fescue was fairly abundant in 1995, but infrequent in 2000. Forbs are rare, especially so in 2000 with the drought. Twelve perennial species and 8 annual species were sampled in 1995, decreasing to 7 perennial and 5 annual species being sampled in 2000. Currently ('00), lobeleaf groundsel is the most abundant forb. Sum of nested frequency of perennial grasses and forbs decreased by 37% in 2000.

1988 APPARENT TREND ASSESSMENT

The percentage of basal vegetative cover is low (5%), but litter cover is higher than expected (55%). Cryptogams provide a substantial amount of ground cover (21%), thereby reducing the amount of bare soil to 18%, which is low for this type of site. Trend for soil appears stable. Wyoming big sagebrush appears to be slightly down due to its moderately high decadency rate. Apparent trend for the herbaceous understory is stable.

1995 TREND ASSESSMENT

Bare ground slightly increased from 18% to 20%, while cryptogamic cover and litter decreased. Due to the variable ground cover on the site, the much larger sampling design may be responsible for some of the changes in ground cover. Sum of nested frequency of vegetation and litter are high indicating well dispersed cover for these cover classes. Additionally, grasses and forbs account for 43% of the total vegetation cover. Sum of nested frequency of perennial grasses and forbs have also increased since 1988. Taking these factors into consideration, trend for soil is considered stable. Trend for Wyoming big sagebrush is slightly up. Percent decadence has declined from 57% to 11% and heavy use has also declined. The herbaceous understory trend is stable. Sum of nested frequency of perennial grasses decreased, but the most abundant perennial grass, thickspike wheatgrass, remained stable in nested frequency. Sum of nested frequency for perennial forbs increased from 13 to 168.

TREND ASSESSMENT

soil - stable (3)

browse - slightly up (4)

herbaceous understory - stable (3)

2000 TREND ASSESSMENT

Trend for soil is stable. Cover from cryptogams doubled, and bare ground decreased to 17% which is low for this type of community. The ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil is relatively high at over 4:1 which indicates well disbursed cover over the site. Trend for browse is slightly down. The key species, Wyoming big sagebrush shows increases percent decadency from 11% to 32%, a decrease in recruitment from 16% to 4%, and a slight increase in poor vigor from 2% to 9%. Drought is the principle factor driving these downward trends. With a return to normal precipitation in the future, these parameters should improve. Trend for the herbaceous understory is slightly down. Sum of nested frequency of perennial grasses and forbs decreased by 37% in 2000 due to drought. Composition is poor as annual species make up a significant portion of the understory at this site.

TREND ASSESSMENT

soil - stable (3)

browse - slightly down (2)

herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 6

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	_b 136	_b 141	_a 60	51	48	24	4.41	.73
G	Bromus tectorum (a)	-	212	249	-	67	83	5.16	5.40
G	Hilaria jamesii	_b 113	_a 13	_a 23	41	7	10	.13	.34
G	Oryzopsis hymenoides	_b 17	_a 4	_a -	7	2	-	.04	-
G	Poa fendleriana	_c 23	_b 6	_a -	13	4	-	.04	-
G	Poa secunda	41	40	28	21	16	14	.30	.55
G	Sitanion hystrix	3	-	-	1	-	-	-	-
G	Sporobolus cryptandrus	-	3	-	-	1	-	.38	-
G	Stipa comata	52	33	40	25	13	18	.70	1.36
G	Vulpia octoflora (a)	-	_b 208	_a 21	-	74	9	1.04	.04
Total for Annual Grasses		0	420	270	0	141	92	6.21	5.44
Total for Perennial Grasses		385	240	151	159	91	66	6.02	2.99
Total for Grasses		385	660	421	159	232	158	12.23	8.43
F	Arabis spp.	1	6	-	1	2	-	.01	-
F	Calochortus nuttallii	5	1	-	2	1	-	.00	-
F	Chaenactis douglasii	-	1	-	-	1	-	.00	-
F	Chenopodium leptophyllum (a)	-	_b 34	_a -	-	18	-	.09	-
F	Collinsia parviflora (a)	-	_b 40	_a 2	-	17	1	.08	.00
F	Cryptantha spp.	_a 1	_b 52	_a -	1	20	-	.22	-
F	Delphinium nuttallianum	-	-	2	-	-	1	-	.00
F	Descurainia pinnata (a)	_b 4	_c 51	_a -	3	22	-	.21	-
F	Draba spp. (a)	-	_b 53	_a -	-	20	-	.14	-
F	Eriogonum cernuum (a)	-	_b 16	_a -	-	7	-	.03	-
F	Erigeron spp.	_a -	_b 9	_{ab} 3	-	5	2	.02	.01
F	Eriogonum spp.	-	5	1	-	2	1	.03	.00
F	Gilia spp. (a)	-	_b 64	_a -	-	27	-	.21	-
F	Hymenoxys acaulis	_a -	_a -	_b 7	-	-	3	-	.01
F	Ipomopsis aggregata	_a -	_b 8	_a -	-	3	-	.04	-
F	Lappula occidentalis (a)	-	_b 78	_a 16	-	30	7	.28	.17
F	Lactuca serriola	-	3	-	-	1	-	.01	-

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
F	Lepidium densiflorum (a)	-	-	2	-	-	1	-	.00
F	Lepidium spp. (a)	_b 9	_c 74	_a -	4	30	-	.27	-
F	Lomatium spp.	_a -	_{ab} 3	_b 4	-	2	3	.03	.06
F	Lupinus argenteus	-	-	-	-	-	-	-	.03
F	Oenothera spp.	-	4	-	-	2	-	.01	-
F	Polygonum douglasii (a)	-	_b 25	_a 2	-	12	1	.06	.00
F	Senecio multilobatus	_a 5	_b 70	_b 80	4	31	31	.15	2.24
F	Sphaeralcea coccinea	1	-	-	1	-	-	-	-
F	Townsendia incana	_a -	_b 6	_b 8	-	3	4	.04	.02
Total for Annual Forbs		13	435	22	7	183	10	1.39	0.18
Total for Perennial Forbs		13	168	105	9	73	45	0.59	2.38
Total for Forbs		26	603	127	16	256	55	1.98	2.57

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

BROWSE TRENDS --

Herd unit 09 , Study no: 6

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia nova	0	3	.38	.91
B	Artemisia tridentata wyomingensis	61	62	11.60	10.16
B	Chrysothamnus nauseosus	0	2	-	.06
B	Chrysothamnus viscidiflorus viscidiflorus	14	10	1.64	1.20
B	Ephedra viridis	3	3	.15	.15
B	Grayia spinosa	8	9	1.52	2.36
B	Gutierrezia sarothrae	4	2	.03	-
B	Juniperus osteosperma	0	4	2.20	3.99
B	Opuntia spp.	36	31	1.50	1.01
Total for Browse		126	126	19.03	19.85

CANOPY COVER --

Herd unit 09 , Study no: 6

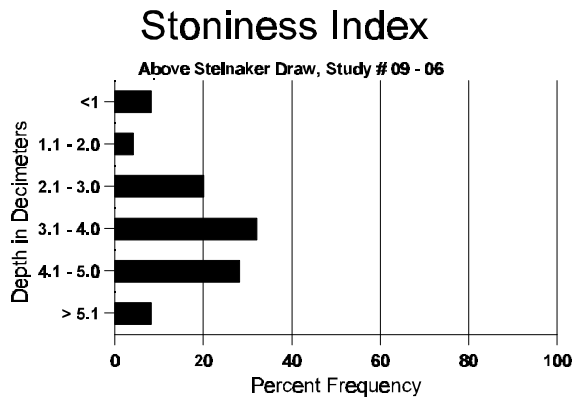
Species	Percent cover	
	'95	'00
Juniperus osteosperma	-	10

BASIC COVER --
Herd unit 09 , Study no: 6

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	355	312	4.75	35.26	31.51
Rock	7	3	.25	.41	.15
Pavement	3	-	0	.00	0
Litter	390	365	55.50	48.90	46.34
Cryptogams	242	305	21.25	11.38	23.07
Bare Ground	237	215	18.25	20.29	17.57

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 6, Study Name: Above Steinaker Draw

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
16.38	35.6 (17.87)	7.0	82.4	7.7	9.9	0.5	6.2	48.0	0.4



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 6

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre	Days Use per Acre (ha)
Rabbit	28	67	270	N/A
Elk	29	32	122	9 (23)
Deer	39	18	78	6 (15)
Cattle	1	-	-	-

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 6

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia nova																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	7	17	0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	18	25	2
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			33%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	0%			
												'95	0		0%			
												'00	60		33%			
Artemisia tridentata wyomingensis																		
S	88	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	6	1	-	1	-	-	-	-	-	7	-	1	-	266			8
	95	21	-	-	-	-	-	-	-	-	21	-	-	-	420			21
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
M	88	7	10	3	-	-	-	-	-	-	20	-	-	-	666	30	24	20
	95	75	18	1	-	-	-	-	-	-	94	-	-	-	1880	26	38	94
	00	59	23	-	2	-	-	-	-	-	84	-	-	-	1680	29	39	84
D	88	12	18	6	1	-	-	-	-	-	36	-	1	-	1233			37
	95	10	-	-	1	-	-	3	-	-	11	-	-	3	280			14
	00	25	10	1	4	-	-	2	-	-	29	1	-	12	840			42
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	380			19
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	660			33
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		45%			14%			03%			+16%							
'95		14%			.77%			02%			+ 2%							
'00		25%			.76%			09%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	2165	Dec:	57%			
												'95	2580		11%			
												'00	2620		32%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cercocarpus montanus																		
M	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	38	60	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	0		-			
												'00	0		-			
Chrysothamnus nauseosus																		
Y	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	28	24	1
X	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	0		-			
												'00	40		-			
Chrysothamnus viscidiflorus viscidiflorus																		
Y	'88	1	-	-	-	-	-	-	-	-	-	-	-	1	33			1
	'95	2	1	-	-	-	-	-	-	-	3	-	-	-	60			3
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	'88	1	-	-	-	-	-	-	-	-	-	-	-	1	33	18	20	1
	'95	5	6	-	1	-	-	-	-	-	12	-	-	-	240	19	21	12
	'00	9	-	-	1	-	-	-	-	-	10	-	-	-	200	13	13	10
D	'88	1	-	-	-	-	-	-	-	-	-	-	-	1	33			1
	'95	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
	'00	-	-	-	1	-	-	-	-	-	-	-	-	1	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			100%			+69%							
'95		44%			00%			00%			-31%							
'00		00%			00%			09%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	99	Dec:	33%			
												'95	320		6%			
												'00	220		9%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Ephedra viridis</i>																		
Y	88	-	1	-	1	-	-	-	-	-	2	-	-	-	66		2	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	88	-	-	1	-	-	-	-	-	-	1	-	-	-	33	15	14	1
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	21	24	2
	00	1	2	-	-	-	-	-	-	-	3	-	-	-	60	20	23	3
D	88	-	-	1	-	-	-	-	-	-	1	-	-	-	33			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		25%			50%			00%			-55%							
'95		00%			00%			00%			+ 0%							
'00		67%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	132	Dec:	25%			
												'95	60		0%			
												'00	60		0%			
<i>Grayia spinosa</i>																		
M	88	1	1	-	-	-	-	-	-	-	2	-	-	-	66	22	23	2
	95	4	2	-	1	-	-	-	-	-	7	-	-	-	140	27	45	7
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	32	47	2
D	88	1	1	1	-	-	-	-	-	-	3	-	-	-	100			3
	95	-	-	1	-	-	-	-	-	-	-	-	-	1	20			1
	00	3	-	-	2	2	-	-	-	-	2	-	-	5	140			7
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		40%			20%			00%			- 4%							
'95		25%			13%			13%			+11%							
'00		22%			00%			56%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	166	Dec:	60%			
												'95	160		13%			
												'00	180		78%			
<i>Gutierrezia sarothrae</i>																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	6	15	-	-	-	-	-	-	-	21	-	-	-	420	12	12	21
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	7	9	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		71%			00%			00%			-90%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	420		-			
												'00	40		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Juniperus osteosperma																		
Y	88	1	-	-	2	-	-	-	-	-	3	-	-	-	100		3	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	88	-	-	-	1	-	-	-	-	-	1	-	-	-	33	72	57	1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	1	-	-	-	-	-	2	-	-	3	-	-	-	60	-	-	3
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	1	-	-	1	-	-	1	-	-	1	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			20%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	133	Dec:	0%			
												'95	0		0%			
												'00	100		40%			
Opuntia spp.																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
Y	88	5	-	-	-	-	-	-	-	-	5	-	-	-	166		5	
	95	15	-	-	-	-	-	-	-	-	15	-	-	-	300		15	
	00	2	-	-	1	-	-	-	-	-	3	-	-	-	60		3	
M	88	29	-	-	-	-	-	-	-	-	29	-	-	-	966	3	11	29
	95	161	-	-	-	-	-	-	-	-	161	-	-	-	3220	3	11	161
	00	110	-	-	4	-	-	-	-	-	114	-	-	-	2280	3	12	114
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	11	-	-	1	-	-	-	-	-	3	-	-	9	240		12	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	140		7	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			00%			+68%							
'95		00%			00%			00%			-27%							
'00		00%			00%			07%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	1132	Dec:	0%			
												'95	3520		0%			
												'00	2580		9%			

Trend Study 9-7-00

Study site name: Warren Draw .

Range type: Big Sagebrush-Grass .

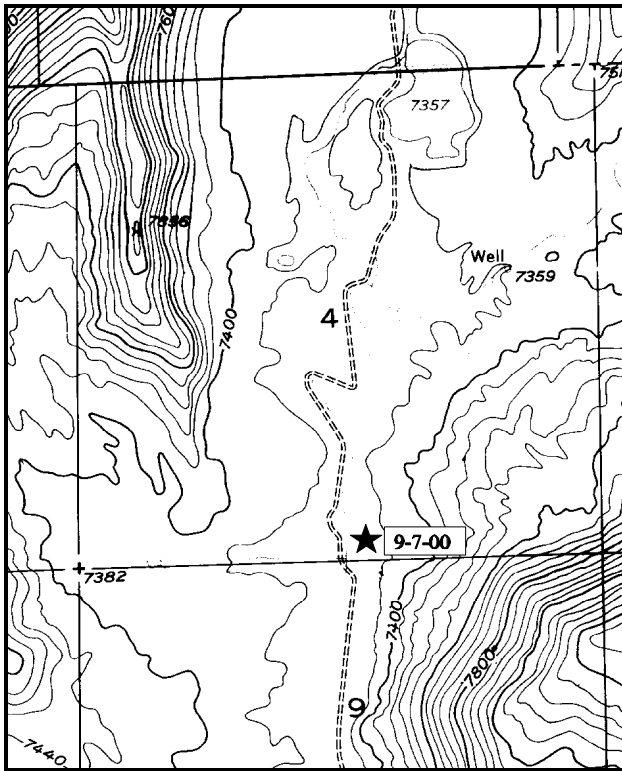
Compass bearing: frequency baseline 2°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

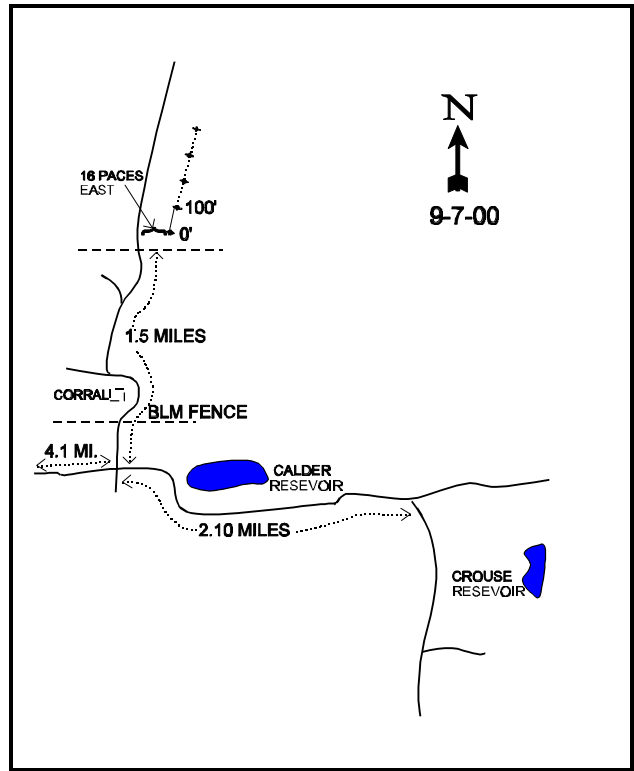
From the junction between Crouse and Calder reservoirs proceed west 2.1 miles to an intersection. Turn right (north) and go 1.5 miles, past a fence and 2 forks. On the other side of the second fence, a boundary between BLM and DWR land, stop and walk 16 paces east to the 0-foot baseline stake. The frequency baseline is marked with green steel fenceposts approximately 18 inches in height.

Alternative route: From the Diamond Mountain turnoff off US 191 travel east to an intersection just south of Matt Warner reservoir. Turn right towards Calder reservoir and proceed 4.1 miles to a fork. Turn left (north) at this fork and travel 1.5 miles passing through one fence and coming to another. On the other side of the second fence, a boundary between BLM and DWR land, stop and walk 16 paces east to the 0-foot baseline stake. The frequency baseline is marked with green steel fenceposts approximately 18 inches in height.



Map Name: Warren Draw

Township 1S, Range 24E, Section 4



Diagrammatic Sketch

UTM 4513014.101 N, 649642.413 E

DISCUSSION

Trend Study No. 9-7 (11-8)

The Warren Draw trend study is located just north of the DWR boundary fence in Warren Draw. The site is on a gentle (10%) west facing slope at an elevation of approximately 7,400 feet. The area is used year-round by deer and elk. There is an abundance of sage grouse sign. Water is readily available in most years with several stock ponds being found within a mile of the site. In 1995, pellet group quadrat frequency data suggested moderately low use by elk and deer. Pellet group quadrat frequency increased for both deer and elk in 2000. A pellet group transect read along the study site baseline in 2000 estimates 22 deer days use/acre (54 ddu/ha) and 8 elk days use/acre (20 edu/ha). One cattle pat was sampled in the transect in 2000.

Soil conditions are good with abundant protective ground cover from vegetation and litter and low amounts of bare soil. Soil texture is a sandy clay loam with a neutral pH. Soil depth is moderate with an estimated effective rooting depth of nearly 13 inches. Some areas close to the site contain black sagebrush indicating localized rooting depth restrictions. Rock and pavement are scarce both on the surface and within the profile. Penetrometer readings used to estimate a profile stoniness index are more indicative of soil compaction in the profile than the presence of rocks. Erosion is slight, but some pedestaling is noted around the older sagebrush stems.

The key browse species on this site is mountain big sagebrush. This sagebrush stand has on average (1995 and 2000) an estimated cover of about 19%. It has a fairly dense population with an estimated 8,940 plants/acre in 2000. Age class analysis indicates the population to be composed of 57% mature plants, 37% decadent plants, with a moderate level of recruitment from young plants at 12% in 2000. Percent decadency has varied over all sampling years. In 1982, decadency was low at 7%, increasing to a high of 51% in 1988. Decadency decreased in 1995 to 20%, but again increased in 2000 to 37%. The proportion of the population showing poor vigor also increased from 1% in 1995 to 11% in 2000. Increases in poor vigor and decadency in 2000 are primarily attributed to drought as several plants were classified with poor vigor due to a chlorotic state and/or loss of leaves. In addition, several sagebrush plants were covered with ants in 2000. Use has varied somewhat between readings. Use is currently ('00) light to moderate with moderate seed production. Recruitment has remained stable over the past three readings at 12-13%. This reproductive effort currently appears adequate to replace the decadent, dying individuals in the population. Annual growth is fairly low in 2000 averaging about 4 inches over the site.

The only other browse species sampled are slenderbush eriogonum and fringed sagebrush. Snowberry is also scattered around the area in even lower numbers. It was not picked up in the shrub density strips, but was measured for height/crown in 1995.

Even with a high density and cover of sagebrush, the herbaceous understory is abundant on this site. Grasses combined to produce nearly 15% cover in 1995 and 2000, while forbs combined for 24% cover in 1995. Ten perennial grasses were sampled in 2000, with thickspike wheatgrass, mutton bluegrass, and pinewoods needlegrass being the most abundant. These 3 species combine to produce 82% of the grass cover on the site in 2000, with light use being noted on thickspike wheatgrass. Other species include: bottlebrush squirreltail, needle-and-thread, Sandberg bluegrass, prairie junegrass, Kentucky bluegrass and a *Carex*. Perennial grasses slightly decreased in sum of nested frequency in 2000 due to drought. Forbs are diverse and abundant with 22 perennial species encountered in 1995, and 18 species in 2000. Currently ('00), forbs have decreased in cover to 15% due to drought. The dominant species are mostly mat forming and include: rose pussytoes, desert phlox and clover. Perennial forbs decreased in sum of nested frequency by nearly 30% in 2000 with the dry conditions. Annual forbs were fairly abundant in 1995, especially Douglas knotweed, but were far less abundant in 2000, again with the drought conditions.

1982 APPARENT TREND ASSESSMENT

Soil trend appears stable to improving. All nine categories on the apparent trend evaluation form had favorable ratings. Vegetative trend appears stable but is perhaps more precarious at least with respect to the key browse species. Mountain big sagebrush appears to be sustaining itself at the present time, but age, form and vigor class distributions tend to be borderline. Reproduction may be a problem. All of these will be important parameters to monitor in the future.

1988 TREND ASSESSMENT

Soil conditions have improved in some areas but declined in others. Basal vegetative cover has increased from 18% to 23%. Percent litter cover declined slightly while percent bare ground increased. The site is in good condition and the soil trend is considered stable. The key browse species, mountain big sagebrush, displays a slightly improving trend. Even though population density increased dramatically, the proportion of decadent plants also dramatically increased from 7% to 51%. Biotic potential (number of seedlings) is currently high at 28% and the proportion of young plants is good at 13%. The number of mature plants has also increased slightly. The current population could decline in the future if drought conditions persist and cause the high number of decadent sagebrush to die-off. The herbaceous trend is up due to a large increase in the quadrat frequency of grasses and forbs since 1982.

TREND ASSESSMENT

soil - stable (3)

browse - slightly up, but with increased decadency (4)

herbaceous understory - up (5)

1995 TREND ASSESSMENT

Ground cover characteristics have improved in most categories since 1988. Currently, 53% of the ground surface is covered by vegetation, 65% of which consists of herbaceous plants. Percent litter has declined due to the prolonged drought, but cryptogamic cover has increased and percent bare ground has declined from 16% to 14%. Trend for soil is stable. The browse trend is slightly up for mountain big sagebrush. The number of mature plants increased, while the number of decadent shrubs declined from 51% to 20%. The only negative aspect of the browse trend is the moderate and heavy use of the sagebrush. Thirty-four percent of the plants were heavily hedged, up from 9% in 1988. Trend for the herbaceous understory is up due to a large increase in the sum of nested frequency of grasses and forbs. Three species sampled in 1988 increased significantly in nested frequency while three others declined significantly. The main difference in composition is the appearance of thickspike wheatgrass. If identification is accurate in the past, it appears that thickspike is coming into the site and squirreltail is going out.

TREND ASSESSMENT

soil - stable (3)

browse - slightly up (4)

herbaceous understory - up (5)

2000 TREND ASSESSMENT

Trend for soil is stable. Vegetation and litter cover are abundant with the proportion of bare ground remaining about the same. Erosion is minimal as a result. Trend for browse is stable. Mountain big sagebrush shows increases in poor vigor and decadency, but these increases can be attributed to drought and should improve with normal precipitation in the future. Recruitment remains good at 12%, and the number of young plants is adequate to replace the decadent-dying individuals in the population if any should be lost to die-off. Use also decreased to a more moderate level compared to that in 1995. Trend for the herbaceous understory is slightly down due to drought. Sum of nested frequency slightly decreased for perennial grasses, and moderately decreased for perennial forbs.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 7

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	a ⁻	b ²⁶⁵	b ²⁷⁹	-	-	93	91	2.48	3.87
G	Agropyron intermedium	-	-	4	-	-	-	1	-	.15
G	Carex spp.	26	29	18	28	11	13	6	.14	.30
G	Festuca ovina	b ²⁰	c ³⁰	a ⁻	7	6	15	-	.29	-
G	Koeleria cristata	b ⁵¹	a ⁹	a ¹¹	2	21	4	5	.04	.05
G	Poa fendleriana	a ⁴¹	a ⁷⁹	b ¹⁵³	-	15	27	59	1.52	5.07
G	Poa pratensis	a ⁻	b ²⁷	b ¹⁰	-	-	8	3	.43	.21
G	Poa secunda	89	108	79	-	33	46	31	1.08	.98
G	Sitanion hystrix	c ²⁷⁸	b ⁵²	a ¹³	-	93	25	6	2.23	.25
G	Stipa comata	b ⁵⁷	ab ⁶⁵	a ³⁴	-	24	30	13	1.72	.67
G	Stipa pinetorum	188	177	136	5	73	69	55	4.61	3.60
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		750	841	737	42	276	330	270	14.58	15.18
Total for Grasses		750	841	737	42	276	330	270	14.58	15.18
F	Achillea millefolium	34	33	42	13	15	12	16	.34	.71
F	Agoseris glauca	a ⁻	a ⁻	b ⁵	-	-	-	3	-	.01
F	Allium spp.	-	2	2	-	-	2	2	.01	.03
F	Antennaria rosea	191	189	196	41	75	71	76	5.49	6.70
F	Androsace septentrionalis (a)	-	b ³⁶	a ¹⁸	6	-	18	9	.09	.04
F	Arabis drummondi	24	7	4	1	8	5	3	.03	.01
F	Artemisia ludoviciana	1	-	-	1	1	-	-	-	-
F	Astragalus aretioides	1	1	-	-	1	1	-	.00	-
F	Aster spp.	15	24	23	1	5	9	10	.09	.17
F	Chenopodium leptophyllum (a)	-	b ⁶	a ⁻	-	-	3	-	.01	-

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	<i>Collinsia parviflora</i> (a)	-	_b 43	_a 7	-	-	18	3	.26	.01
F	<i>Cryptantha</i> spp.	-	1	-	-	-	1	-	.00	-
F	<i>Delphinium nuttallianum</i>	-	6	-	-	-	2	-	.03	-
F	<i>Descurainia pinnata</i> (a)	1	1	-	-	1	1	-	.00	-
F	<i>Draba</i> spp. (a)	-	-	3	-	-	-	2	-	.01
F	<i>Erigeron eatonii</i>	_b 136	_b 157	_a 65	52	62	64	34	.62	.37
F	<i>Erigeron flagellaris</i>	_a -	_a -	_b 11	-	-	-	7	-	.11
F	<i>Gayophytum ramosissimum</i> (a)	-	_b 18	_a -	-	-	8	-	.09	-
F	<i>Heterotheca villosa</i>	-	2	-	-	-	1	-	.00	-
F	<i>Hymenoxys richardsonii</i>	3	3	3	2	1	1	1	.03	.03
F	<i>Lupinus argenteus</i>	24	44	17	21	10	25	9	1.44	.56
F	<i>Lychnis drummondii</i>	_a -	_b 5	_a -	5	-	3	-	.06	-
F	<i>Microsteris gracilis</i> (a)	-	6	2	-	-	4	1	.02	.00
F	<i>Navarretia</i> spp.	_a -	_b 14	_a -	-	-	6	-	.08	-
F	<i>Orthocarpus luteus</i> (a)	-	_b 109	_a 30	-	-	42	16	3.04	.16
F	<i>Orobanche</i> spp.	-	2	-	-	-	1	-	.00	-
F	<i>Penstemon</i> spp.	_b 13	_a 1	_{ab} 6	-	7	1	3	.00	.09
F	<i>Phlox austromontana</i>	_b 234	_a 172	_a 161	48	84	55	61	10.77	5.90
F	<i>Phlox longifolia</i>	_a 52	_b 81	_a 39	4	26	39	14	.34	.07
F	<i>Polygonum douglasii</i> (a)	-	_b 161	_a 12	-	-	60	6	.59	.03
F	<i>Potentilla gracilis</i>	-	2	6	2	-	1	2	.03	.01
F	<i>Taraxacum officinale</i>	_{ab} 18	_b 38	_a 16	-	9	17	8	.13	.21
F	<i>Tragopogon dubius</i>	-	-	3	-	-	-	2	-	.01
F	<i>Trifolium gymnocarpon</i>	_a -	_c 113	_b 41	37	-	49	17	.27	.23
F	Unknown forb-annual (a)	-	3	-	-	-	1	-	.00	-
F	Unknown forb-perennial	_b 11	_a -	_a -	3	6	-	-	-	-
F	<i>Zigadenus elegans</i>	_a -	_{ab} 3	_b 12	-	-	1	5	.00	.12
Total for Annual Forbs		1	383	72	0	1	155	37	4.12	0.26
Total for Perennial Forbs		757	900	652	237	310	367	273	19.82	15.39
Total for Forbs		758	1283	724	237	311	522	310	23.94	15.65

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

BROWSE TRENDS --
Herd unit 09 , Study no: 7

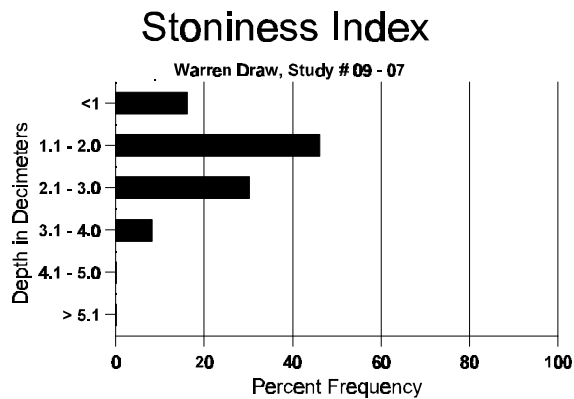
Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia frigida	0	1	-	-
B	Artemisia tridentata vaseyana	99	97	20.41	18.76
B	Eriogonum microthecum	3	3	.03	.01
Total for Browse		102	101	20.45	18.77

BASIC COVER --
Herd unit 09 , Study no: 7

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	379	369	18.25	23.00	53.39	57.93
Rock	28	8	1.25	1.50	.16	.08
Pavement	14	24	0	0	.07	.09
Litter	394	388	65.50	59.00	50.50	66.19
Cryptogams	90	77	.25	.50	1.31	1.22
Bare Ground	264	214	14.75	16.00	13.86	13.88

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 7, Study Name: Warren Draw

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
12.93	60.0 (13.46)	6.6	63.4	16.7	19.9	2.1	20.4	265.6	0.8



PELLET GROUP FREQUENCY --

Herd unit 09 , Study no: 7

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'95	'00	'00	'00
Rabbit	3	13	218	N/A
Elk	14	21	104	8 (20)
Deer	10	24	287	22 (55)
Cattle	2	1	9	1 (2)
Moose	-	-	35	2 (5)
Antelope	-	-	18	1 (2)

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 7

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4	5	6	7	8	9	1	2	3	4							
Artemisia frigida																					
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0			
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0			
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0			
	'00	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	20	4	5	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>				<u>% Change</u>									
	'82	00%			00%			00%													
	'88	00%			00%			00%													
	'95	00%			00%			00%													
	'00	00%			00%			00%													
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-						
												'88	0		-						
												'95	0		-						
												'00	20		-						

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4		1	2									
<i>Artemisia tridentata vaseyana</i>																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	40	-	1	4	-	-	-	-	43	-	1	1	3000		45	
	95	7	-	-	-	-	-	-	-	7	-	-	-	140		7	
	00	4	-	-	-	-	-	-	-	4	-	-	-	80		4	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	14	5	-	2	-	-	-	-	19	2	-	-	1400		21	
	95	27	11	9	-	-	-	-	-	47	-	-	-	940		47	
	00	43	5	-	5	-	-	-	-	52	-	1	-	1060		53	
M	82	25	15	13	-	-	-	-	-	53	-	-	-	3533	18	31	53
	88	8	41	8	1	-	-	-	-	53	1	4	-	3866	21	25	58
	95	83	75	83	6	-	-	-	-	247	-	-	-	4940	16	29	247
	00	154	61	14	-	-	-	-	-	228	1	-	-	4580	17	29	229
D	82	-	2	2	-	-	-	-	-	-	-	4	-	266		4	
	88	21	55	6	-	-	-	-	-	71	1	6	4	5466		82	
	95	15	24	32	-	1	-	-	-	67	-	-	5	1440		72	
	00	108	43	8	2	4	-	-	-	111	4	-	50	3300		165	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	840		42	
	00	-	-	-	-	-	-	-	-	-	-	-	-	1120		56	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>									
'82		30%		26%		07%		+65%									
'88		63%		09%		09%		-32%									
'95		30%		34%		01%		+18%									
'00		25%		05%		11%											
Total Plants/Acre (excluding Dead & Seedlings)										'82	3799	Dec:	7%				
										'88	10732		51%				
										'95	7320		20%				
										'00	8940		37%				
<i>Eriogonum microthecum</i>																	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	5	-	-	-	-	-	-	-	5	-	-	-	100	4	15	5
	00	3	-	-	-	-	-	-	-	1	-	2	-	60	6	9	3
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>									
'82		00%		00%		00%											
'88		00%		00%		00%											
'95		00%		00%		00%		-40%									
'00		00%		00%		67%											
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-				
										'88	0		-				
										'95	100		-				
										'00	60		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	13	11	0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
	'82	00%			00%			00%										
	'88	00%			00%			00%										
	'95	00%			00%			00%										
	'00	00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	0		-			

Trend Study 9-8-00

Study site name: Rye Grass .

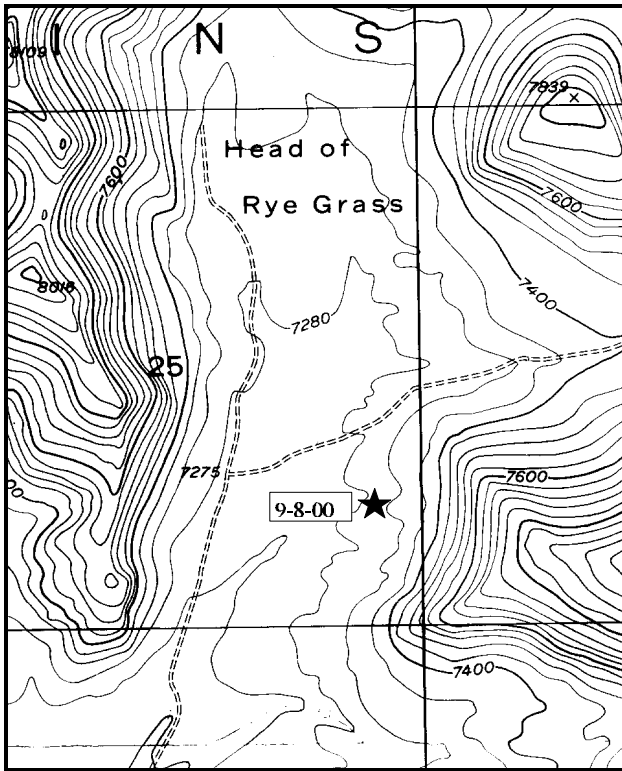
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 232°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

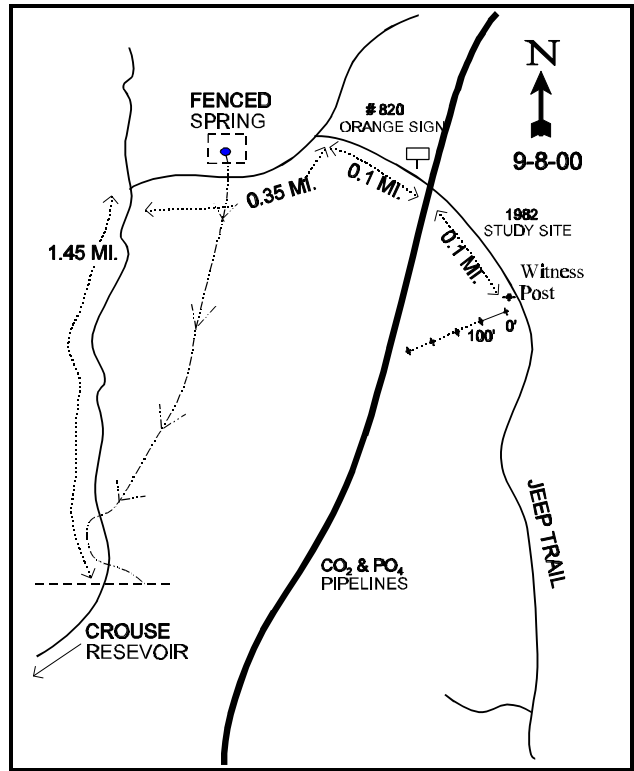
LOCATION DESCRIPTION

From Crouse Reservoir, proceed north up Mail Draw for 4 miles. Turn right and proceed towards the Head of Rye Grass valley. Go 0.4 miles to a fence. Continue 1.45 miles to a fork. Turn right and proceed 0.35 miles, crossing the wash, then turn right towards the pipeline. Go 0.1 miles to the pipeline. Cross the pipeline and head back south 0.1 miles to the study on the right side of the road. This study site is adjacent to the 1982 study area, which was destroyed by pipeline construction. The 0-foot baseline stake is about 10 feet west of the road. All study stakes are short green fenceposts.



Map Name: Warren Draw

Township 1N, Range 24E, Section 25



Diagrammatic Sketch

UTM 4516781.432 N, 656532.518 E

DISCUSSION

Trend Study No. 9-8 (11-9)

The Rye Grass study samples winter range in Rye Grass Draw on Diamond Mountain. The study was placed on Division owned property because it was used by a substantial number of deer and elk in most years. There was evidence of year-round use; antler drops, recent deer pellet groups, a winter-killed fawn, elk pellet groups, and the remains of a newborn calf in 1988. This important area was originally sampled with a trend study further up the slope in a mixed sagebrush and mountain mahogany type. The old trend study, #25-8-82, was disturbed by underground gas pipeline construction and was relocated 175 yards to the south in a more open sagebrush-grass flat, typical of the valley location. Data from the 1982 reading was left in the report and some changes in cover measurements and shrub densities are due mostly to the relocation, but general trends can still be determined. A pellet group transect read along the baseline in 2000 estimates light use by wildlife with 9 deer days use/acre (22 ddu/ha) and 7 elk days use/acre (17 edu/ha) on the site. Several successive mild winters most likely account for the current light level of use by big game on this site.

The study site is on an 8% slope with a southwest exposure at an elevation of 7,300 feet. Soils are a sandy clay loam texture and are neutral in reactivity (pH of 6.6). Estimated effective rooting depth over the entire site is nearly 15 inches, but soil depth is variable as indicated by the mixture of black sagebrush and mountain big sagebrush. Phosphorus is low at 7.6 ppm as values less than 10 ppm may limit normal plant growth and development. Shrub interspaces contain a lot of exposed bare soil, but erosion is minimal. Bare ground moderately increased in 2000, while litter cover slightly decreased.

The valley floor in Rye Grass Draw is dominated by mountain big sagebrush with a significant component of black sagebrush, grasses, and forbs. Mountain big sagebrush averaged 11% cover in 1988 with a density of 4,199 plants/acre. Fifty-four percent of the population consisted of large decadent plants and 24% were mature. Reproductive potential (percent of seedlings to the population) was high at 33%, with 22% of the population classified as young. Use was light to moderate with 13% of the shrubs displaying heavy hedging. With the much larger sample utilized in 1995, mountain big sagebrush averaged 16% cover with an estimated 4,900 plants/acre. The number of decadent plants declined to only 16%, while mature plants increased to 73% of the population. It appeared that many of the decadent plants sampled in 1988 had recovered. Use was light to moderate and vigor good on all but 2% of the population. In 2000, mountain big sagebrush is estimated at 5,460 plants/acre and 19% cover. Percent decadency slightly increased to 27%, with poor vigor increasing to 15%. Heavy use increased to an estimated 21% of the population. However, with apparent light use from wildlife, heavy use may have been overestimated in 2000 due to many plants having a hedged appearance due to a very low annual growth. It was noted in 2000 that some mountain big sagebrush plants had a lot of leader growth while others had virtually none. As with other sites in this unit, increases in decadency and poor vigor and low annual growth are most likely drought related. These parameters should improve with a return to normal precipitation patterns. Currently ('00), recruitment is fair with an estimated 340 young plants/acre. However, there is twice as many decadent, dying plants (780 plants/acre) as young ones which could result in some population loss in the future.

Black sagebrush is numerous, but only accounted for 6% of the browse cover in 2000. Mature plants are relatively small (8" x 15") and normally occur in small, dense patches. It was reported in the 1988 that nearly all of the black sagebrush counted that year occurred in one of the three density plots. This inflated the actual density which was reported at 7,866 plants/acre with 75% of the population being classified as decadent. Use was moderate to heavy with good vigor on all but 15% of the decadent plants. Seedlings were extremely numerous. The much larger, better distributed sample taken in 1995 more accurately estimates black sagebrush density. The black sagebrush density is much more consistent with the larger sampling design, where its density has been about 2,700 plants/acre in both 1995 and 2000. Percent decadency is currently ('00) 14%, an increase

from 4% in 1995. Use is estimated at a moderate to heavy level in 2000, but as with mountain big sagebrush at this site, this may be overestimated due to low annual growth.

Slenderbush eriogonum is abundant throughout the site and lightly hedged. Only one small, dying serviceberry was found on the study site in 1988. Serviceberry and curlleaf mountain mahogany are more common on the surrounding slopes than in the valley bottom. Other shrubs sampled include: mountain low rabbitbrush, broom snakeweed and gray horsebrush.

Herbaceous vegetation is diverse on the site with grasses and forbs each producing 8% to 10% average cover in 1995 and 2000. Herbaceous cover actually declined from 1995 estimates due to drought. Nine grass species, all perennials, were identified in 1995 and 2000. Thickspike wheatgrass, bluebunch wheatgrass, mutton bluegrass, Sandberg bluegrass and needle-and-thread were the most abundant. Nearly all of these species, except for thickspike, significantly decreased in nested frequency in 2000. Twenty-eight species of perennial forbs were identified in 1995, where only 24 species were identified in 2000. Rose pussytoes, timber poisonvetch, hairy goldaster, rock goldenrod and Hood's phlox are the most abundant. Sum of nested frequency for forbs slightly decreased in 2000 with drought.

1982 APPARENT TREND ASSESSMENT

Both soil and vegetative trends appear stable to improving. This site is in generally good condition. A possible increase of broom snakeweed is a potential problem, but from an overall standpoint, current management seems adequate.

1988 TREND ASSESSMENT

Even with a moderately dense sagebrush population and an abundant and diverse understory, there is a higher than expected estimate for bare soil on this site (38%). Basal vegetative cover is adequate at 13%, but the site is deficient in litter cover. However, bare spots are not continuous and do not encourage serious erosion. Trend for soil appears stable. Due to the extremely dry conditions, both key browse species on the site have very high decadency rates. Biotic potential (# of seedlings) is excellent for both species and young plants are also adequate. Trend for both black sagebrush and mountain big sagebrush is slightly down. The herbaceous understory is diverse, but not particularly abundant. Herbaceous trend is up compared to the data from the original site.

TREND ASSESSMENT

soil - stable (3)

browse - slightly down (2)

herbaceous understory - up (5)

1995 TREND ASSESSMENT

Ground cover conditions have improved somewhat since the last reading. Percent litter has declined slightly but percent bare ground has also declined from 38% to 27%. Nested frequency of grasses and forbs have declined, yet herbaceous vegetation produces 50% of the vegetative cover and nested frequency for vegetation and litter are high indicating well dispersed cover. Trend for soil is slightly up. Trend for browse is slightly up for both mountain big sagebrush and black sagebrush. The high number of decadent black sagebrush sampled in 1988 were not encountered in 1995. This transect was read in mid-September of 1988 which was a very dry year. According to weather data from Flaming Gorge Dam, normal annual precipitation averages about 16 inches. From 1987 through 1989, conditions were unusually dry with only 10.2", 9.5" and 9.6" of precipitation measured respectively. Due to the lack of many dead plants (20 plants/acre), it is evident that no large die-off

has occurred. Plants had likely dropped many of their leaves by September of 1988 and were mistakenly classified as decadent. Mature black sagebrush have increased from 1,600 plants/acre to 2,000. Decadency of mountain big sagebrush has also improved from 54% to 16%. The number of mature plants increased along with average height and crown measurements. Trend for the herbaceous understory is down due to a large decline in the sum of nested frequency of grasses and forbs. All grass species except bluebunch wheatgrass declined in nested frequency. Three species significantly declined.

TREND ASSESSMENT

soil - slightly up (4)

browse - slightly up for black sagebrush and mountain big sagebrush (4)

herbaceous understory - downward (1)

2000 TREND ASSESSMENT

Although bare ground increased in 2000, trend for soil is still considered stable. Erosion remains minimal as nested frequency of vegetation and litter are high indicating well disbursed protective cover. Trend for browse is stable. The mountain big sagebrush and black sagebrush populations both increased in decadency, but in a drought year these increases are not severe. Current decadency levels are much lower than those of the drought year in 1988. Use is estimated at higher levels for both species in 2000. However due to drought, annual growth is low and many sagebrush plants have a more hedged appearance than normally observed. As a result, use may have been overestimated on both species. Normal precipitation in the future will likely result in decreased decadency and better annual growth on sagebrush. Trend for the herbaceous understory is slightly down overall. Perennial grasses moderately decreased in sum of nested frequency and perennial forbs slightly decreased in sum of nested frequency due to the dry conditions in 2000.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 8

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	b208	a140	ab186	60	78	51	68	1.38	1.62
G	Agropyron spicatum	a68	b138	a84	58	32	50	33	1.74	1.75
G	Carex spp.	9	5	8	10	7	2	4	.53	.44
G	Elymus cinereus	4	-	-	-	2	-	-	-	-
G	Koeleria cristata	c111	b46	a26	35	56	24	9	.32	.43
G	Oryzopsis hymenoides	-	-	-	2	-	-	-	-	-
G	Poa fendleriana	156	93	112	24	63	37	44	.92	2.46
G	Poa secunda	b185	b138	a56	93	76	55	20	1.14	.37
G	Sitanion hystrix	2	3	2	38	1	1	1	.00	.00
G	Stipa comata	c190	b153	a30	62	78	59	11	3.41	.40
G	Stipa lettermani	ab36	b41	a13	10	15	16	5	.91	.12
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		969	757	517	392	408	295	195	10.38	7.62
Total for Grasses		969	757	517	392	408	295	195	10.38	7.62
F	Allium spp.	-	-	-	4	-	-	-	-	-
F	Antennaria rosea	b128	a56	b101	-	50	23	36	1.21	2.29
F	Arabis spp.	b19	a3	a-	-	12	2	-	.01	-
F	Astragalus argophyllus	-	3	2	-	-	1	1	.00	.03
F	Astragalus convallarius	b127	a86	a80	16	63	45	41	2.30	1.27
F	Aster spp.	-	-	1	-	-	-	1	-	.00
F	Balsamorhiza hookeri	b69	a36	a35	-	32	20	21	.27	.33
F	Calochortus nuttallii	a-	b9	a-	-	-	5	-	.02	-
F	Chaenactis douglasii	7	10	8	1	5	4	4	.02	.04
F	Comandra pallida	b33	a16	a19	-	17	9	8	.05	.06
F	Collinsia parviflora (a)	-	3	1	-	-	1	1	.00	.00
F	Crepis acuminata	-	1	-	-	-	1	-	.00	-
F	Erigeron eatonii	a-	b17	b15	-	-	9	7	.07	.06
F	Erigeron flagellaris	b67	a16	a4	2	34	6	2	.05	.03
F	Eriogonum umbellatum	b14	a-	c28	1	5	-	14	-	.24
F	Gayophytum ramosissimum (a)	-	b114	a5	-	-	45	2	.42	.01
F	Gilia spp	-	-	-	5	-	-	-	-	-
F	Heterotheca villosa	a8	a14	b30	28	3	6	10	.49	.58
F	Hymenoxys richardsonii	11	10	21	-	4	5	8	.10	.16
F	Ipomopsis aggregata	a3	ab11	b1	-	2	5	1	.02	.00
F	Lappula occidentalis (a)	-	1	-	-	-	1	-	.00	-
F	Lactuca serriola	a-	b5	ab3	-	-	4	1	.02	.00

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Lithospermum spp.	2	-	2	-	1	-	1	-	.00
F	Lomatium spp.	5	4	4	-	4	2	2	.01	.01
F	Lupinus argenteus	a ⁻	ab ²	b ⁸	20	-	1	4	.00	.21
F	Machaeranthera grindelioides	3	2	-	-	2	1	-	.00	-
F	Microsteris gracilis (a)	-	b ⁷	a ⁻	-	-	4	-	.02	-
F	Orthocarpus luteus (a)	-	26	43	6	-	11	21	.47	.38
F	Pedicularis centruruthera	-	-	-	12	-	-	-	-	-
F	Penstemon humilis	c ⁹²	b ⁶⁹	a ²²	3	44	29	10	.62	.12
F	Petradoria pumila	b ³⁰	ab ²⁸	a ¹⁵	-	15	11	8	2.60	.39
F	Phlox hoodii	b ¹¹⁸	a ⁷¹	a ⁶⁷	-	46	31	29	1.16	.91
F	Phlox longifolia	b ⁸	a ⁻	ab ²	-	4	-	2	-	.01
F	Polygonum douglasii (a)	-	20	14	-	-	9	6	.04	.03
F	Sedum lanceolatum	-	-	-	2	-	-	-	-	-
F	Senecio multilobatus	b ⁶	b ⁷	a ⁻	6	4	3	-	.01	-
F	Sphaeralcea coccinea	b ⁶²	ab ³⁸	a ²⁴	-	25	16	10	.25	.12
F	Taraxacum officinale	a ³	b ¹⁷	ab ¹³	-	1	9	6	.04	.08
F	Tragopogon dubius	-	3	-	-	-	1	-	.00	-
F	Trifolium gymnocarpon	a ⁴	b ⁵²	a ¹⁰	4	2	23	5	.21	.02
F	Valeriana edulis	4	-	-	-	2	-	-	-	-
Total for Annual Forbs		0	171	63	0	0	71	30	0.97	0.42
Total for Perennial Forbs		823	586	515	110	377	272	232	9.62	7.05
Total for Forbs		823	757	578	110	377	343	262	10.59	7.48

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

BROWSE TRENDS --
Herd unit 09 , Study no: 8

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	0	1	-	-
B	Artemisia nova	29	20	2.40	1.41
B	Artemisia tridentata vaseyana	94	93	16.35	19.31
B	Ceratoides lanata	1	2	-	-
B	Chrysothamnus viscidiflorus lanceolatus	17	5	.04	.03
B	Eriogonum microthecum	61	44	1.53	.55
B	Gutierrezia sarothrae	34	23	.84	.80
B	Pediocactus simpsonii	4	4	.03	.03
B	Tetradymia canescens	6	0	-	-
Total for Browse		246	192	21.21	22.15

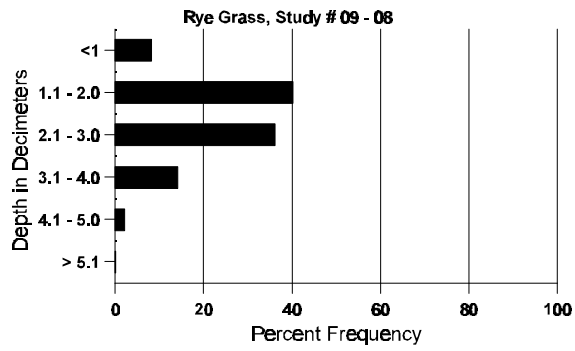
BASIC COVER --
Herd unit 09 , Study no: 8

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	366	342	7.25	13.00	37.97	37.80
Rock	66	29	1.75	1.00	.99	.91
Pavement	206	135	0	4.50	2.83	2.35
Litter	395	373	67.75	43.25	40.59	37.79
Cryptogams	35	33	.75	.50	.32	.42
Bare Ground	330	322	22.50	37.75	26.97	44.37

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 8, Study Name: Rye Grass

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
14.83	64.2 (15.20)	6.6	64.3	12.2	20.6	1.5	7.6	92.8	0.8

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 09 , Study no: 8

Type	Quadrat Frequency	
	'95	'00
Sheep	-	2
Rabbit	23	32
Moose	-	1
Elk	24	9
Deer	25	9
Cattle	6	2

Pellet Transect	
Pellet Groups per Acre '00	Days Use per Acre (ha) '00
-	-
609	N/A
17	1 (2)
96	7 (18)
113	9 (22)
-	-

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 8

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Amelanchier alnifolia																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	-	-	-	-	-	-	1	-	-	1	-	-	-	20		1
M	82	-	1	-	-	-	-	-	-	-	-	1	-	-	66	10 12	1
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	1	-	-	-	-	-	-	-	-	-	-	1	-	66		1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		100%			00%			00%			+ 0%						
'88		00%			00%			100%									
'95		00%			00%			00%									
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'82	66	Dec:	0%		
												'88	66		100%		
												'95	0		0%		
												'00	20		0%		

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Artemisia nova																	
S	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'88	83	-	1	-	-	-	-	-	-	84	-	-	-	5600		84
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
Y	'82	7	-	-	-	-	-	-	-	-	7	-	-	-	466		7
	'88	1	3	1	-	-	-	-	-	-	5	-	-	-	333		5
	'95	29	-	-	-	-	-	-	-	-	29	-	-	-	580		29
	'00	-	2	-	-	-	-	-	-	-	2	-	-	-	40		2
M	'82	17	2	-	-	-	-	-	-	-	19	-	-	-	1266	8 20	19
	'88	7	11	5	-	-	1	-	-	-	24	-	-	-	1600	5 10	24
	'95	79	20	1	-	-	-	-	-	-	100	-	-	-	2000	5 16	100
	'00	12	34	69	-	-	-	-	-	-	115	-	-	-	2300	8 15	115
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'88	13	35	41	-	-	-	-	-	-	76	-	13	-	5933		89
	'95	1	3	1	-	-	-	-	-	-	4	-	-	1	100		5
	'00	1	13	5	-	-	-	-	-	-	13	-	-	6	380		19
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'82		08%			00%			00%			+78%						
'88		42%			41%			11%			-66%						
'95		17%			01%			.74%			+ 1%						
'00		36%			54%			04%									
Total Plants/Acre (excluding Dead & Seedlings)												'82	1732	Dec:	0%		
												'88	7866		75%		
												'95	2680		4%		
												'00	2720		14%		

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4		1	2									
<i>Artemisia tridentata vaseyana</i>																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	18	2	-	1	-	-	-	-	21	-	-	-	1400		21	
	95	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	8	-	-	-	-	-	-	-	8	-	-	-	160		8	
Y	82	6	-	-	-	-	-	-	-	6	-	-	-	400		6	
	88	12	1	1	-	-	-	-	-	14	-	-	-	933		14	
	95	19	7	-	-	-	-	-	-	26	-	-	-	520		26	
	00	14	3	-	-	-	-	-	-	17	-	-	-	340		17	
M	82	13	-	-	-	-	-	-	-	13	-	-	-	866	23 39	13	
	88	5	9	1	-	-	-	-	-	14	1	-	-	1000	14 20	15	
	95	76	98	6	-	-	-	-	-	180	-	-	-	3600	17 32	180	
	00	76	58	47	1	-	-	-	-	181	-	1	-	3640	18 29	182	
D	82	2	-	-	-	-	-	-	-	1	1	-	-	133		2	
	88	9	19	6	-	-	-	-	-	30	-	2	2	2266		34	
	95	6	26	7	-	-	-	-	-	33	-	-	6	780		39	
	00	39	13	10	2	4	1	5	-	34	-	1	39	1480		74	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	640		32	
	00	-	-	-	-	-	-	-	-	-	-	-	-	640		32	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>									
'82		00%		00%		00%		+67%									
'88		46%		13%		06%		+14%									
'95		53%		05%		02%		+10%									
'00		29%		21%		15%											
Total Plants/Acre (excluding Dead & Seedlings)										'82	1399	Dec:	10%				
										'88	4199		54%				
										'95	4900		16%				
										'00	5460		27%				
<i>Ceratoides lanata</i>																	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	1	-	-	-	20	8 16	1	
	00	2	-	-	-	-	-	-	-	2	-	-	-	40	11 9	2	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>									
'82		00%		00%		00%											
'88		00%		00%		00%											
'95		00%		00%		00%		+50%									
'00		00%		00%		00%											
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-				
										'88	0		-				
										'95	20		-				
										'00	40		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cercocarpus ledifolius																		
Y	82	5	-	-	-	-	-	-	-	-	5	-	-	-	333		5	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	10	-	-	-	-	-	-	-	-	10	-	-	-	666	13 16	10	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	999	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	0		-			
Chrysothamnus viscidiflorus lanceolatus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	3	1	-	-	-	-	-	-	-	3	-	1	-	266		4	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	2	2	-	2	-	-	-	-	-	6	-	-	-	400		6	
	95	6	-	-	1	-	-	-	-	-	7	-	-	-	140		7	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0	
	88	1	-	-	1	-	-	-	-	-	2	-	-	-	133	5 7	2	
	95	9	1	1	2	-	-	-	-	-	13	-	-	-	260	7 9	13	
	00	3	-	-	1	-	-	1	-	-	5	-	-	-	100	11 13	5	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	1	-	-	-	-	-	2	-	-	-	133		2	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		20%			00%			00%			-37%							
'95		05%			05%			00%			-67%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	666		20%			
												'95	420		5%			
												'00	140		14%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4		1	2									
Eriogonum microthecum																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	3	-	-	-	-	-	-	-	3	-	-	-	200		3	
	88	10	-	-	-	-	-	-	-	10	-	-	-	666		10	
	95	23	-	-	1	-	-	-	-	24	-	-	-	480		24	
	00	4	-	-	-	-	-	-	-	4	-	-	-	80		4	
M	82	20	-	-	-	-	-	-	-	20	-	-	-	1333	9	5	20
	88	4	2	-	2	-	-	-	-	8	-	-	-	533	5	5	8
	95	125	-	-	23	-	-	-	-	148	-	-	-	2960	5	7	148
	00	51	-	-	15	-	-	10	-	74	-	2	-	1520	5	5	76
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	1	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	5	-	-	5	-	-	-	-	6	-	-	4	200		10	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>				<u>%Change</u>							
'82		00%		00%		00%				-17%							
'88		11%		05%		00%				+63%							
'95		00%		00%		00%				-48%							
'00		00%		00%		07%											
Total Plants/Acre (excluding Dead & Seedlings)										'82	1533	Dec:	0%				
										'88	1265		5%				
										'95	3440		0%				
										'00	1800		11%				
Gutierrezia sarothrae																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	18	-	-	-	-	-	-	-	18	-	-	-	1200		18	
	95	3	-	-	-	-	-	-	-	3	-	-	-	60		3	
	00	7	-	-	-	-	-	-	-	7	-	-	-	140		7	
Y	82	10	-	-	-	-	-	-	-	10	-	-	-	666		10	
	88	14	-	-	-	-	-	-	-	14	-	-	-	933		14	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	53	-	-	-	-	-	-	-	53	-	-	-	1060		53	
M	82	30	-	-	-	-	-	-	-	30	-	-	-	2000	5	6	30
	88	25	-	-	-	-	-	-	-	24	1	-	-	1666	5	6	25
	95	79	-	-	2	-	-	-	-	81	-	-	-	1620	8	10	81
	00	112	-	-	-	-	-	-	-	112	-	-	-	2240	5	5	112
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>				<u>%Change</u>							
'82		00%		00%		00%				- 3%							
'88		00%		00%		00%				-38%							
'95		00%		00%		00%				+51%							
'00		00%		00%		00%											
Total Plants/Acre (excluding Dead & Seedlings)										'82	2666	Dec:	-				
										'88	2599		-				
										'95	1620		-				
										'00	3300		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Opuntia spp.																		
M	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66	4	21	1
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'82			'88			'95			'00							
		00%			00%			00%			00%							
		00%			00%			00%			00%							
		00%			00%			00%			00%							
		00%			00%			00%			00%							
Total Plants/Acre (excluding Dead & Seedlings)												'82	66	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	0		-			
Pediocactus simpsonii																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	4	-	-	-	-	-	-	-	4	-	-	-	80	4	5	4	
	00	3	-	-	-	-	-	-	-	3	-	-	-	60	2	3	3	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	20			1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'82			'88			'95			'00							
		00%			00%			00%			00%							
		00%			00%			00%			00%							
		00%			00%			00%			+ 0%							
		00%			00%			00%			00%							
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	80		-			
												'00	80		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Purshia tridentata																		
S	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20	52	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	22	74	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	0		-			
Tetradymia canescens																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'88	1	1	-	-	-	-	-	-	-	2	-	-	-	133	5	5	
	'95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	6	8	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		50%			00%			00%			-10%							
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	133		-			
												'95	120		-			
												'00	0		-			

Trend Study 9-9-00

Study site name: Little Hole .

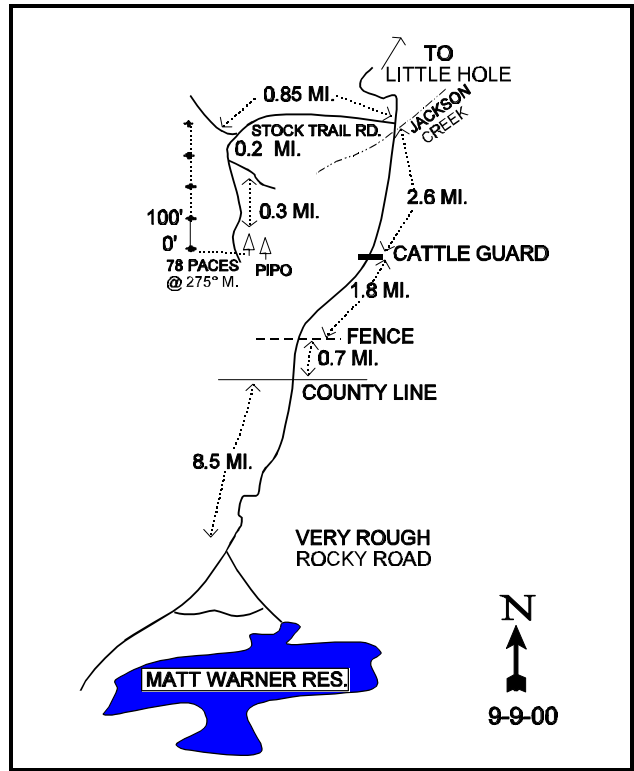
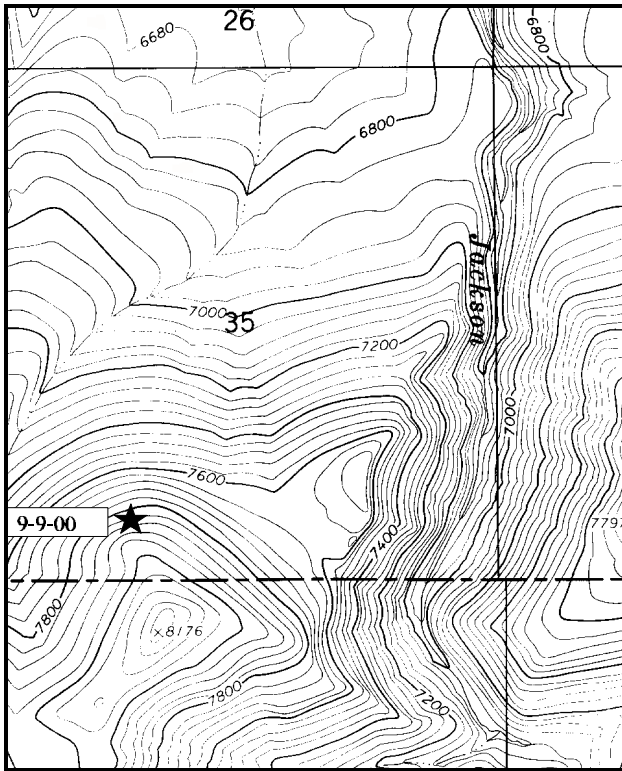
Range type: Mixed Mountain Brush .

Compass bearing: frequency baseline 345°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the intersection of Highway U.S. 191 and the Diamond Mountain Road, take the Diamond Mountain Road to the north to a fork with a sign indicating Browns Park Road 10 miles and Vernal 36 miles. Turn left (north) towards Jackson Draw and proceed down Jackson Draw towards Little Hole. Just past where you cross Jackson Creek, about 4 miles before the end of the road at the Green River, make a left turn and proceed 0.85 miles to an intersection. Bear left, drive about 0.5 miles and stop. From the 2 large ponderosa pines near the road, walk SW (275°M) for 78 paces to a large rock outcropping just below another large ponderosa. From this tree, the 0-foot baseline stake is 21 paces at 206°M. The frequency baseline is marked by 18 inch green fenceposts.



Map Name: Jackson Draw

Diagrammatic Sketch

Township 2N ,Range 23E , Section 35

UTM 4525760 N, 643991 E

DISCUSSION

Trend Study No. 9-9 (11-10)

The Little Hole study is on a north facing, 20% slope overlooking the Green River at Little Hole. It is considered an important winter range for deer and elk. The study samples a mixed mountain brush type with scattered pinyon-juniper, Ponderosa pine, and Douglas fir. Elevation is 7,800 feet. This area is managed by the BLM which is grazed by cattle during the summer season from June 1 to October 15. Pellet group transect data taken along the baseline in 2000 estimates light use by livestock at 9 cow days use/acre (22 cdu/ha). Cattle pats sampled appeared to be from the fall of 1999. Wildlife use was also light with an estimated 28 deer days use/acre (69 ddu/ha) and 6 elk days use/acre (15 edu/ha) in 2000.

Soils are derived from igneous parent material and have a sandy clay loam texture. Soil depth characteristically varies as the transect runs downslope. Estimated effective rooting depth is over 12 inches. Penetrometer readings used to estimate a stoniness profile index shows a lot of rock between the surface down to 12 inches. Phosphorus is low at just 6.4 ppm, which is lower than the 10 ppm thought necessary for normal plant growth and development. The soil is slightly acidic in reactivity (pH of 6.2). Erosion potential is moderate on this 20% slope, but due to a somewhat abundant understory, erosion appears to be minimal for the most part. Evidence of past soil movement can be seen by a build-up of soil on the uphill side of shrub and tree stems.

Mountain big sagebrush and antelope bitterbrush are the key browse species and together make up over 75% of the total browse cover. In 2000, cover for sagebrush and bitterbrush was estimated at 17% and 9% respectively. Density of big sagebrush has varied between readings due mostly to the increased sample size used following the 1988 reading. Currently ('00), big sagebrush is estimated at 3,320 plants/acre with about half of the population being mature plants and the other half being decadent. Percent decadency was estimated at 19% in 1995, more than doubling in 2000 to 47%. This increase in decadency has occurred in the majority of other big sagebrush sites in the region and is primarily attributed to drought. Although the level of decadency is high in 2000, it is still well below the high of 74% in the drought year of 1988. Recruitment from young plants is estimated at 160 plants/acre in 2000, which is nearly the amount of decadent plants classified as dying in the population. Use is currently ('00) light on mountain big sagebrush. Annual growth is moderately high, averaging 6 inches over the site.

The population of bitterbrush is estimated at 1,540 plants/acre in 2000 with percent decadency being relatively low at 12%. Recruitment is moderately low at 80 plants/acre, but with low decadency and 83% of the population being mature plants, this population appears to be stable. Use increased somewhat in 2000 with heavy use being estimated on 26% of the population, an increase from 1% in 1995. Vigor is good and average leader growth is low in 2000 at about 3 inches.

A small number of true mountain mahogany and serviceberry occur on the site. Mahogany are moderate to heavily hedged in 2000, with poor vigor being estimated on 21% of the population. Density is estimated at 280 plants/acre and decadency is low at 7%. Annual average leader growth on mahogany is 4 inches in 2000. Serviceberry has an estimated density of 120 plants/acre in 2000. Use is moderate to heavy, with no decadent plants and high young recruitment at 33%. The proportion of the population in poor vigor decreased from 33% in 1995 to 17% in 2000.

Other browse found on the site include: mountain low rabbitbrush, slenderbush eriogonum, broom snakeweed, Oregon grape and snowberry. Point-center quarter data in 2000 estimates 42 pinyon trees/acre, 7 juniper trees/acre, 8 ponderosa pine trees/acre, and 5 Douglas fir trees/acre.

The herbaceous understory is diverse, especially the grass component. Perennial grasses provide 36% of the total vegetative cover of the site in 2000, an increase from 24% in 1995. Ten perennial species were sampled in 2000, of which Kentucky bluegrass was by far the most abundant. Kentucky bluegrass increased from 3% average cover in 1995 to 14% in 2000. It now provides 69% of the grass cover on the site. This species has significantly increased in nested frequency since 1995. Thickspike wheatgrass is also moderately abundant on the site. Other species include: oniongrass, bluebunch wheatgrass, mutton bluegrass, Sandberg bluegrass, needle-and-thread, Letterman needlegrass and bottlebrush squirreltail. Grasses had been utilized when the site was read in July 2000. As a group, sum of nested frequency for perennial grasses slightly decreased in 2000 with drought. Individually, 6 of the 10 species sampled significantly decreased in nested frequency in 2000.

Forbs have been diverse in number, but not particularly abundant during any reading. Twenty-two perennial forb species were encountered in 1995, with only hairy goldaster contributing more than 1% cover. Due to drought, only 15 perennial species were sampled in 2000, with sum of nested frequency significantly decreasing. Annual forbs were abundant in 1995, but nearly non-existent in 2000 due to the dry conditions.

1982 APPARENT TREND ASSESSMENT

Overall range trend appears stable to perhaps slightly improving. An apparent increase in antelope bitterbrush is encouraging. A concurrent decline in mountain big sagebrush is less so. If the community is in a state of flux, it will be important to prevent any increase in broom snakeweed or pricklypear. Soil trend appears stable.

1988 TREND ASSESSMENT

Ground cover data show an increase in vegetative cover which is consistent with frequency and density data, although the percentage of rock cover doubled to almost 13%. Percent bare ground declined from 16% to 9%. Soil trend is up. Trend for mountain big sagebrush is slightly down due to an increase in percent decadency. This condition is caused by the unusually dry conditions present this year and will improve with normal precipitation patterns. Trend for antelope bitterbrush is up due to a large increase in seedling and young plants indicating an increasing population. Overall, the browse trend is considered stable. The herbaceous understory trend is up with increased quadrat frequency for both grasses and forbs.

TREND ASSESSMENT

soil - up (5)

browse - stable overall; down for sagebrush and up for bitterbrush (3)

herbaceous understory - up (5)

1995 TREND ASSESSMENT

Soil trend is up slightly due to a decrease in percent bare ground from 9% to 4%. Percent rock cover has declined and litter cover has remained fairly stable. The herbaceous understory makes up only 38% of the vegetative cover, but sum of nested frequency of vegetation and litter cover is high, indicating well dispersed protective cover. Trend for sagebrush is up due to a major decrease in decadency. It appears that most of the decadent shrubs are now normal, mature plants with good vigor. This site was read in mid-September of 1988 and decadency numbers were likely inflated due to sagebrush dropping leaves in response to the dry conditions of that year. Trend for bitterbrush is slightly up due to an increase in the number of mature plants. Reproductive potential and percent young declined since 1988, but there are still sufficient seedlings and young to maintain the population. Average height and crown has also increased significantly. Overall browse trend is slightly up. The herbaceous understory trend is stable. Three of the five most numerous perennial grass species increased significantly, but the overall sum of nested frequency for perennial grasses declined slightly. Sum of nested frequency for perennial forbs increased significantly.

TREND ASSESSMENT

soil - slightly up (4)

browse - slightly up overall; up for mountain big sagebrush and slightly up for bitterbrush (4)

herbaceous understory - stable (3)

2000 TREND ASSESSMENT

Trend for soil is stable. Bare ground doubled from 4% to 8%, but this is still comparatively low. Vegetation and litter cover remain high and are well disbursed over the site. Erosion remains minimal on this moderately steep site. Trend for browse is slightly down for mountain big sagebrush and stable for bitterbrush. Trend for mountain big sagebrush is slightly down due to the large increase in percent decadency from 19% to 47%. This increase is due to drought and should improve with better precipitation in the future. Although decadency increased, the proportion of the decadent plants classified as dying is low, and recruitment is currently adequate to replace this class of plants if any die-off occurs. Bitterbrush remains in mostly good vigor, decadency is low at 12% and use is not extreme. Trend for the herbaceous understory is slightly down overall. Although Kentucky bluegrass is the most abundant grass and increased in both cover and nested frequency in 2000, six other perennial grasses significantly decreased in nested frequency. Perennial forbs, while less abundant than grasses, declined in sum of nested frequency by nearly half.

TREND ASSESSMENT

soil - stable (3)

browse - stable overall; slightly down for mountain big sagebrush, stable for bitterbrush (3)

herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 9

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	_a 53	_b 92	115	35	24	39	45	1.24	1.89
G	Agropyron spicatum	_b 97	_{ab} 70	_a 41	-	36	30	18	.84	1.12
G	Bromus tectorum (a)	-	_b 50	_a 3	-	-	18	1	.45	.00
G	Carex spp.	2	9	7	3	2	4	3	.17	.18
G	Koeleria cristata	_c 61	_b 5	_a -	8	26	4	-	.02	-
G	Melica bulbosa	_a 27	_b 98	_a 43	7	10	40	16	1.87	.69
G	Poa fendleriana	_a 28	_b 92	_a 35	-	12	31	13	1.38	.92
G	Poa pratensis	_a 90	_a 140	_b 206	1	34	46	66	3.18	14.19
G	Poa secunda	_c 150	_b 75	_a 27	50	59	30	11	1.00	.22
G	Sitanion hystrix	_b 113	_a 33	_a 12	20	50	17	7	.35	.22
G	Stipa comata	_c 144	_b 57	_a 20	56	61	28	8	1.03	.80
G	Stipa lettermani	8	8	16	6	5	4	5	.21	.39
Total for Annual Grasses		0	50	3	0	0	18	1	0.45	0.00
Total for Perennial Grasses		773	679	522	168	319	273	192	11.33	20.68
Total for Grasses		773	729	525	168	319	291	193	11.79	20.68
F	Agoseris glauca	_a -	_b 15	_a 3	-	-	6	1	.06	.00
F	Antennaria rosea	15	8	16	2	8	4	5	.48	.86
F	Arabis spp.	3	3	-	1	1	1	-	.00	-
F	Astragalus convallarius	1	11	12	-	1	4	5	.09	.39
F	Astragalus spp.	1	-	-	-	1	-	-	-	-
F	Castilleja linariaefolia	-	1	-	-	-	1	-	.06	-
F	Calochortus nuttallii	-	3	-	-	-	2	-	.01	-
F	Chaenactis douglasii	_b 13	_a -	_a 1	-	6	-	1	-	.00
F	Collomia linearis (a)	-	_b 109	_a -	-	-	43	-	.33	-
F	Comandra pallida	_a -	_b 29	_b 25	-	-	14	12	.26	.18
F	Collinsia parviflora (a)	-	_b 252	_a 10	-	-	85	5	2.74	.02
F	Crepis acuminata	_b 8	_b 7	_a -	-	5	3	-	.04	-
F	Cystopteris fragilis	4	-	-	-	2	-	-	-	-
F	Delphinium nuttallianum	-	6	-	-	-	2	-	.01	-
F	Descurainia pinnata (a)	-	2	-	-	-	1	-	.00	-
F	Erigeron eatonii	15	1	7	-	6	1	3	.00	.01
F	Eriogonum umbellatum	2	-	2	-	1	-	1	-	.00
F	Gayophytum ramosissimum (a)	-	3	-	-	-	1	-	.00	-

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Gilia spp.	-	-	-	1	-	-	-	-	-
F	Heterotheca villosa	_b 84	_a 51	_a 40	12	37	22	19	1.01	.73
F	Ipomopsis aggregata	3	6	5	-	2	4	3	.02	.06
F	Lepidium densiflorum (a)	-	_b 7	_a -	-	-	4	-	.02	-
F	Linum lewisii	-	3	-	-	-	1	-	.00	-
F	Lithospermum ruderales	4	1	1	-	2	1	1	.03	.00
F	Lomatium spp.	_a -	_b 7	_a -	-	-	3	-	.02	-
F	Lupinus argenteus	_a -	_c 38	_b 11	-	-	19	6	.69	.10
F	Microsteris gracilis (a)	-	4	2	-	-	3	1	.01	.00
F	Orobancha spp.	-	5	-	-	-	2	-	.03	-
F	Penstemon spp.	3	-	-	-	2	-	-	-	-
F	Petrorhiza pumila	_b 7	_a -	_a -	-	4	-	-	-	-
F	Phlox hoodii	-	2	3	-	-	1	1	.00	.15
F	Polygonum douglasii (a)	-	_b 19	_a 8	-	-	12	4	.06	.02
F	Sphaeralcea coccinea	24	17	13	-	13	8	6	.09	.20
F	Taraxacum officinale	_b 17	_b 16	_a -	-	9	8	-	.07	-
F	Tragopogon dubius	_b 9	_a -	_a -	3	5	-	-	-	-
F	Trifolium gymnocarpon	_a -	_c 29	_b 6	-	-	13	3	.06	.04
F	Zigadenus paniculatus	-	2	4	-	-	1	2	.00	.06
Total for Annual Forbs		0	396	20	0	0	149	10	3.18	0.05
Total for Perennial Forbs		213	261	149	19	105	121	69	3.09	2.82
Total for Forbs		213	657	169	19	105	270	79	6.27	2.87

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

BROWSE TRENDS --

Herd unit 09 , Study no: 9

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	6	4	.03	.41
B	Artemisia tridentata vaseyana	91	82	15.07	16.77
B	Cercocarpus montanus	16	13	1.31	1.69
B	Chrysothamnus viscidiflorus lanceolatus	4	4	.18	.06
B	Eriogonum heracleoides	2	1	.18	-
B	Eriogonum microthecum	32	24	1.07	1.12

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Gutierrezia sarothrae	6	0	-	-
B	Mahonia repens	2	0	-	-
B	Pinus edulis	0	4	1.74	2.24
B	Pinus ponderosa	0	0	.38	-
B	Purshia tridentata	51	56	7.84	9.34
B	Symphoricarpos oreophilus	16	15	1.53	2.60
B	Tetradymia canescens	0	1	-	-
Total for Browse		226	204	29.36	34.25

CANOPY COVER --
Herd unit 09 , Study no: 9

Species	Percent Cover	
	'95	'00
Pinus edulis	-	2

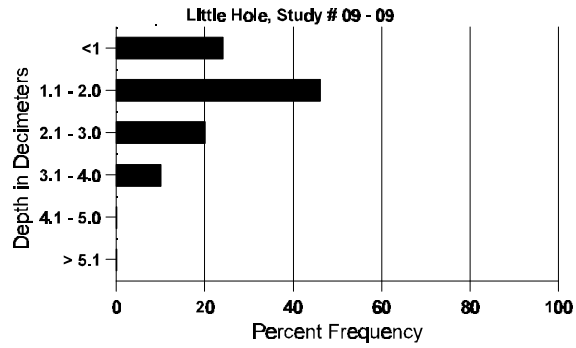
BASIC COVER --
Herd unit 09 , Study no: 9

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	357	337	8.75	12.25	52.22	56.11
Rock	112	89	6.00	12.50	8.00	5.73
Pavement	25	25	.25	.75	.20	.90
Litter	392	385	64.50	61.50	64.56	66.65
Cryptogams	91	63	5.00	4.25	1.27	1.97
Bare Ground	113	136	15.50	8.75	3.90	8.44

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 9, Study Name: Little Hole

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	%OM	PPM P	PPM K	dS/m
12.52	59.6 (12.83)	6.2	64.4	18.0	20.6	2.6	6.4	153.6	0.5

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 09 , Study no: 9

Type	Quadrat Frequency	
	'95	'00
Rabbit	4	13
Moose	1	1
Elk	4	3
Deer	15	12
Cattle	6	7

Pellet Transect	
Pellet Groups per Acre '00	Days Use per Acre (ha) '00
278	N/A
26	2 (5)
78	6 (15)
365	28 (69)
113	9 (22)

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 9

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier alnifolia																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	33		1	
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	'00	2	-	-	-	-	-	-	-	-	-	1	1	-	40		2	
M	'82	-	1	-	-	-	-	-	-	-	1	-	-	-	33	27	22	1
	'88	-	-	-	1	-	-	-	-	-	1	-	-	-	33	26	20	1
	'95	3	2	-	-	-	-	-	-	-	2	1	2	-	100	29	38	5
	'00	1	1	1	1	-	-	-	-	-	3	1	-	-	80	35	44	4
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		100%			00%			00%			+50%							
'88		00%			00%			00%			+45%							
'95		33%			00%			33%			+ 0%							
'00		17%			17%			17%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	33	Dec:	-			
												'88	66		-			
												'95	120		-			
												'00	120		-			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7	
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	33		1	
	88	6	1	-	4	-	-	1	-	-	12	-	-	-	400		12	
	95	13	1	-	-	-	-	-	-	-	14	-	-	-	280		14	
	00	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8	
M	82	24	24	-	-	-	-	-	-	-	46	2	-	-	1600	17	23	48
	88	6	7	2	1	-	-	-	-	-	15	1	-	-	533	16	20	16
	95	74	76	1	6	-	-	-	-	-	157	-	-	-	3140	23	34	157
	00	72	1	-	7	-	-	-	-	-	80	-	-	-	1600	25	32	80
D	82	-	10	1	-	-	-	-	-	-	7	2	1	1	366		11	
	88	40	37	1	1	-	-	-	-	-	75	-	-	4	2633		79	
	95	16	19	4	1	-	-	-	-	-	32	-	-	8	800		40	
	00	69	1	-	8	-	-	-	-	-	70	-	-	8	1560		78	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	600		30	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	500		25	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		57%			02%			03%			+44%							
'88		42%			03%			04%			+15%							
'95		45%			02%			04%			-21%							
'00		01%			00%			05%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	1999	Dec:	18%			
												'88	3566		74%			
												'95	4220		19%			
												'00	3320		47%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cercocarpus montanus																		
S	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	3	-	-	-	-	-	-	-	-	3	-	-	-	100		3	
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	1	-	-	-	-	-	-	-	1	-	-	-	33		1	
	'95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	'00	2	-	-	1	-	-	-	-	-	3	-	-	-	60		3	
M	'82	-	1	-	-	-	-	-	-	-	1	-	-	-	33	28 31	1	
	'88	-	-	1	-	-	-	-	-	-	1	-	-	-	33	22 31	1	
	'95	9	4	2	2	-	-	-	-	-	15	2	-	-	340	37 50	17	
	'00	3	-	1	1	4	1	-	-	-	7	-	3	-	200	35 49	10	
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	-	-	-	-	-	1	-	-	-	1	-	-	-	20		1	
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		100%			00%			00%			+50%							
'88		50%			50%			00%			+83%							
'95		21%			11%			00%			-26%							
'00		29%			21%			21%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	33	Dec:	0%			
												'88	66		0%			
												'95	380		0%			
												'00	280		7%			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Chrysothamnus viscidiflorus lanceolatus</i>																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	11	-	-	-	-	-	-	-	-	11	-	-	-	220	16	19	
	00	6	-	-	-	-	-	1	-	-	7	-	-	-	140	14	10	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			-18%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	220		-			
												'00	180		-			
<i>Eriogonum heracleoides</i>																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	1	-	-	1	-	-	-	-	-	2	-	-	-	40	7	19	
	00	-	-	-	2	-	-	-	-	-	2	-	-	-	40	-	2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			+ 0%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	40		-			
												'00	40		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total		
		1	2	3	4		1	2			
<i>Eriogonum microthecum</i>											
S	82	-	-	-	-	-	-	-	0		0
	88	1	-	-	-	-	-	-	33		1
	95	-	-	-	-	-	-	-	0		0
	00	2	-	-	-	-	-	-	40		2
Y	82	-	-	-	-	-	-	-	0		0
	88	7	-	-	1	-	-	-	266		8
	95	3	-	-	-	-	-	-	60		3
	00	3	-	-	2	-	-	-	100		5
M	82	6	-	-	-	-	-	-	200	9 8	6
	88	7	-	-	4	-	-	-	366	7 6	11
	95	95	-	-	-	-	-	-	1900	11 16	95
	00	30	1	-	10	-	-	8	980	9 11	49
D	82	-	-	-	-	-	-	-	0		0
	88	3	-	-	-	-	-	-	100		3
	95	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	20		1
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>			<u>%Change</u>				
'82		00%	00%	17%			+73%				
'88		00%	00%	09%			+63%				
'95		00%	00%	00%			-44%				
'00		02%	00%	00%							
Total Plants/Acre (excluding Dead & Seedlings)					'82	200	Dec:	0%			
					'88	732		14%			
					'95	1960		0%			
					'00	1100		2%			
<i>Gutierrezia sarothrae</i>											
M	82	8	-	-	-	-	-	-	266	9 6	8
	88	5	-	-	-	-	-	-	166	7 6	5
	95	8	-	-	-	-	-	-	160	10 10	8
	00	-	-	-	-	-	-	-	0	-	0
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>			<u>%Change</u>				
'82		00%	00%	00%			-38%				
'88		00%	00%	00%			- 4%				
'95		00%	00%	00%							
'00		00%	00%	00%							
Total Plants/Acre (excluding Dead & Seedlings)					'82	266	Dec:	-			
					'88	166		-			
					'95	160		-			
					'00	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Mahonia repens																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	5	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	40		-			
												'00	0		-			
Opuntia spp.																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	5	-	-	1	-	-	-	-	-	5	-	1	-	200		6	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	7	-	-	-	-	-	-	-	-	7	-	-	-	233	6	9	
	88	3	-	-	-	-	-	-	-	-	1	-	2	-	100	4	6	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	7	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	7	22	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	33		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+30%							
'88		00%			00%			30%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	233	Dec:	0%			
												'88	333		10%			
												'95	0		0%			
												'00	0		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Pinus edulis																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	1	-	-	1	-	-	2	-	-	-	66		2	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	33		1	
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	33		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	00	-	-	-	1	-	-	-	1	-	2	-	-	-	40	-	2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+ 0%							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	33	Dec:	-			
												'88	33		-			
												'95	0		-			
												'00	80		-			
Pinus ponderosa																		
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	33		1	
	88	2	-	-	2	-	-	-	-	-	4	-	-	-	133		4	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	1	-	-	-	-	-	-	-	-	1	-	-	-	33	41	69	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+50%							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	66	Dec:	-			
												'88	133		-			
												'95	0		-			
												'00	0		-			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Purshia tridentata																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	7	-	-	1	-	-	4	-	-	12	-	-	-	400		12	
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	2	-	-	-	-	-	-	-	-	2	-	-	-	66		2	
	88	26	5	-	5	-	-	3	-	-	38	-	1	-	1300		39	
	95	5	6	-	4	-	-	-	-	-	15	-	-	-	300		15	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
M	82	6	4	-	-	-	-	-	-	-	10	-	-	-	333	22 32	10	
	88	4	8	3	-	-	-	-	-	-	14	-	1	-	500	17 24	15	
	95	30	37	-	5	1	-	-	-	-	73	-	-	-	1460	22 50	73	
	00	24	4	3	19	1	13	-	-	-	62	-	2	-	1280	25 49	64	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	1	1	-	-	-	-	-	-	2	-	-	-	66		2	
	95	-	-	1	-	-	-	-	-	-	1	-	-	-	20		1	
	00	2	-	1	3	-	3	-	-	-	8	-	1	-	180		9	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		33%			00%			00%			+79%							
'88		25%			07%			04%			- 5%							
'95		49%			01%			00%			-13%							
'00		06%			26%			04%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	399	Dec:	0%			
												'88	1866		4%			
												'95	1780		1%			
												'00	1540		12%			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	7	-	-	1	-	-	-	-	-	8	-	-	-	160		8	
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	15	-	-	-	-	-	-	-	-	15	-	-	-	300	20	43	
	00	14	-	-	8	-	-	1	-	-	23	-	-	-	460	12	28	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			+12%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	460		-			
												'00	520		-			
Tetradymia canescens																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	13	22	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	17	24	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	0		0%			
												'95	0		0%			
												'00	40		50%			

Trend Study 9-10-00

Study site name: Toliver Creek Chaining.

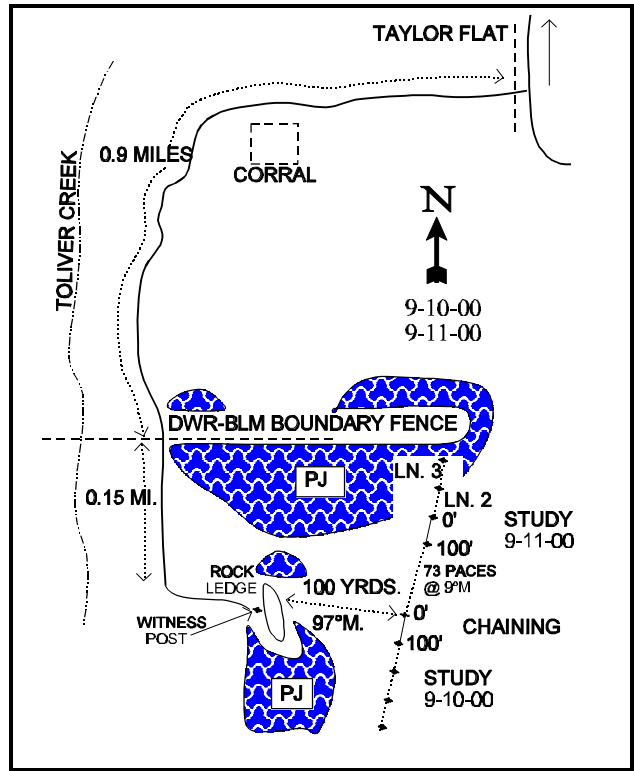
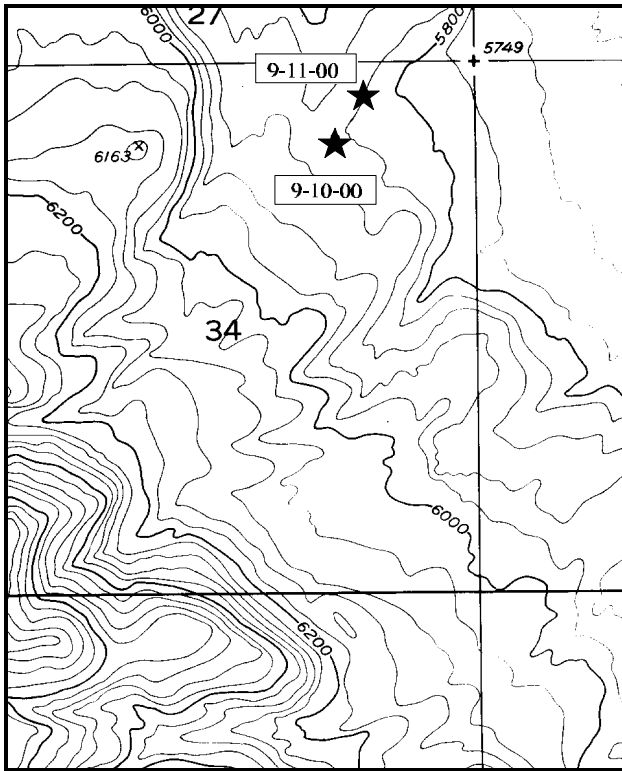
Range type: Chained, Seeded P-J.

Compass bearing: frequency baseline 189°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft.), line 4 (71ft).

LOCATION DESCRIPTION

From the north side of the Green River at the Taylor Flat bridge, go south across the river 1.75 miles. Turn right and go through a gate. Go 0.2 miles to a gate by a corral. Continue south and west 0.7 miles to the DWR-BLM boundary fence. Go through the gate and continue 0.15 miles to the end of the road. There is a P-J covered, rocky ledge about 75 feet east. From the ledge, walk 60 paces SE into the chaining to a short green fencepost tagged #909 which marks the start of the frequency baseline.



Map Name: Warren Draw

Diagrammatic Sketch

Township 2N, Range 24E, Section 34

UTM 4525857.827 N, 652611.654 E

DISCUSSION

Trend Study No. 9-10 (11-11)

The Toliver Creek Chaining study was established in 1988 to monitor a large pinyon-juniper chaining completed during the fall of 1986. It was two-way chained and seeded with grasses, forbs, and shrubs. This area is managed by the BLM and as with all of the Browns Park area, is considered critical deer winter range. Another study was established in the adjacent undisturbed pinyon-juniper stand to provide comparative baseline data for species composition and trend assessment. The study site is located in the foothills above Taylor Flat. The study site has a northern aspect with a slope of 3-4% and lies at an elevation of 5,900 feet. Animal use of the site appears light, although quadrat frequency of elk and deer pellets increased between 1995 and 2000. Pellet group transect data taken along the baseline in 2000 estimate 25 deer days use/acre (62 ddu/ha) and 7 elk days use/acre (17 edu/ha). Livestock use appears light as well with an estimated 2 cow days use/acre (5 cdu/ha) in 2000. This area is in the Taylor Flat allotment which is usually grazed in the spring from April 1 to May 31 for 1,000 AUM's.

The sandy loam soils are fairly shallow and extremely rocky. Estimated effective rooting depth is just over 7 inches, while penetrometer readings used to estimate a profile stoniness index showed nearly all probes hit rocks within the first 5 inches of the soil surface. Rock cover on the surface is high at 22%. Although rocky, this soil does support mountain big sagebrush suggesting that the rock here is of a cobbly nature and does not prohibit root penetration. Vegetation and litter cover have been adequate to prevent serious erosion, although both decreased in 2000 while bare ground increased. These changes in ground cover characteristics are due to drought. This should improve with better precipitation in the future.

Due to the shallow, rocky nature of the site, the control of pinyon and juniper by chaining was close to 100%. Few seedlings were observed and none were sampled in the density plots of 1988. Point-center quarter data from 2000 estimate 38 juniper and 12 pinyon trees/acre. Average diameter of juniper is 2.4 inches, while that of pinyon is only 1.5 inches. Fifteen percent of the juniper and 5% of the pinyon trees sampled consisted of live mature tipped trees which were not eradicated by the chaining treatment.

Browse are not abundant on the site with all species combining to contribute to just over 3% average cover in 2000. Mountain big sagebrush, fourwing saltbush, and rubber rabbitbrush do provide some forage. Currently, mountain big sagebrush density is estimated at 520 plants/acre, an increase from 380 plants/acre in 1995. Currently ('00), big sagebrush has good vigor, low decadency, and good recruitment from young plants at 12%. Use is light and average annual leader growth is 5 inches in 2000. Fourwing saltbush is estimated at 120 plants/acre in 2000 with the population consisting solely of mature plants. Use is light to moderate, vigor normal, with no decadent plants. Leader growth on fourwing averages 5 inches in 2000. Currently ('00), white-stemmed rubber rabbitbrush is estimated at 260 plants/acre, an increase from 60 plants/acre in 1995. Although this species is not always an important forage source, it is palatable to browsing animals and may be more important at this site due to the lack of a well developed shrub component. Use on rubber rabbitbrush is light, vigor good, and decadency is low at 8%.

Increaser species, including prickly pear and broom snakeweed, are present but only snakeweed has increased in abundance since 1988.

The herbaceous understory is limited. Cheatgrass is well established and was the dominant understory species in 1995. With drought conditions in 2000, cheatgrass is still abundant, but significantly decreased in nested and quadrat frequencies. Cheatgrass also has greatly reduced stature in 2000, resulting in a large decrease in average cover from 22% in 1995 to 4% in 2000. A good mix of seeded and native perennial grasses are present on the site, but most remain infrequent. Crested wheatgrass significantly increased in nested frequency between

1995 and 2000, and is currently ('00) the dominant grass. Crested wheatgrass was mostly dried up when the site was read in July of 2000. It exhibited moderate to heavy use. Average cover for crested wheatgrass, even with use, is presently estimated at nearly 10%. Other perennial grasses that have been sampled include: bluebunch wheatgrass, intermediate wheatgrass, orchard grass, needle-and-thread and Sandberg bluegrass. As a group, perennial grasses increased in sum of nested frequency in 2000 due mostly to the increase in crested wheatgrass. Forbs are scarce, especially in 2000 with drought. All forbs combined provide less than 1% average cover in 2000, a decrease from 4% in 1995. Annual forbs were nearly non-existent in 2000, while perennial forbs decreased in sum of nested frequency by 75%. Eighteen species of forbs were sampled in 1995, decreasing to only 6 in 2000.

1988 APPARENT TREND ASSESSMENT

Large rocks are prominent on the surface and account for 23% of the ground cover. Debris from the chaining provides a substantial amount of surface litter cover (54%). Percent bare ground is moderately high at 28%. Trend for soil appears stable at this time. There are low densities of shrubs on the site, but fourwing saltbush and mountain big sagebrush should increase in time. The herbaceous understory contains a good variety of seeded and native grasses although annual cheatgrass is currently the most abundant grass. Trend for grasses and forbs is improved from pre-chained conditions, however the abundance of annual grasses and forbs is a concern.

1995 TREND ASSESSMENT

Ground cover characteristics have improved since the chaining. Currently, there is only 5% bare soil and litter cover has remained moderately high at 54%. Trend for soil is up. The browse trend is improved for sagebrush and fourwing saltbush. One negative aspect is the increase of broom snakeweed which has increased 90% since 1988. However, the population appears to be stabilizing with a mostly mature plants and a much lower biotic potential (percent of seedlings to mature population). The herbaceous trend is down due to the dominance of annual grasses and forbs. Cheatgrass makes up 80% of the grass cover and 62% of the total vegetative cover. Annual forbs account for 39% of the forb cover. Drought conditions since 1987 have intensified this condition. Two perennial seeded grasses, crested and intermediate wheatgrass, did increase significantly in nested frequency since the last reading. These and other perennial grasses should eventually gain dominance of this site.

TREND ASSESSMENT

soil - up (5)

browse - improved but still in small numbers (4)

herbaceous understory - down due to the over dominance of annuals (1)

2000 TREND ASSESSMENT

Trend for soil is slightly down. Bare ground increased from 5% to 22% and vegetation and litter cover both decreased. These changes in ground cover are due to drought and should reverse in the future with normal precipitation. Trend for browse is slightly up as mountain big sagebrush slightly increased in density, has good vigor and low decadency. Recruitment from young sagebrush plants is also good at 12%. Fourwing saltbush remains stable, even though no young plants were sampled in 2000. However, drought conditions make it difficult for young shrubs to establish and persist. Normal precipitation in the future will hopefully increase the number of young sagebrush and fourwing plants at this site, resulting in population increases. Trend for the herbaceous understory is slightly up as crested wheatgrass significantly increased in nested frequency, while cheatgrass significantly decreased in nested frequency. The understory is still limited and forbs are scarce.

TREND ASSESSMENT

soil - slightly down (2)

browse - slightly up (4)

herbaceous understory - slightly up (4)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 10

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	Agropyron cristatum	a ₈₄	b ₁₆₅	c ₂₄₈	42	66	82	4.30	9.80
G	Agropyron intermedium	3	25	21	2	8	8	.55	.38
G	Agropyron spicatum	a ⁻	a ₄	b ₂₅	-	2	9	.03	.17
G	Aristida purpurea	-	-	-	-	-	-	.03	-
G	Bromus tectorum (a)	b ₂₁₀	c ₃₆₃	a ₁₄₇	80	100	57	22.82	4.74
G	Dactylis glomerata	b ₇₃	a ₁₆	a ₂₂	33	8	13	.16	.71
G	Oryzopsis hymenoides	b ₁₇	a ⁻	a ₂	8	-	1	-	.03
G	Poa secunda	11	1	6	5	1	2	.00	.01
G	Sitanion hystrix	b ₃₃	a ⁻	a ⁻	15	-	-	.00	-
G	Sporobolus cryptandrus	2	6	1	1	2	1	.01	.00
G	Stipa comata	a ⁻	b ₂₀	b ₁₁	-	7	5	.69	.11
G	Unknown grass - perennial	b ₃₉	a ⁻	a ⁻	16	-	-	-	-
G	Vulpia octoflora (a)	-	b ₂₂	a ₄	-	8	2	.06	.01
Total for Annual Grasses		210	385	151	80	108	59	22.89	4.75
Total for Perennial Grasses		262	237	336	122	94	121	5.79	11.23
Total for Grasses		472	622	487	202	202	180	28.68	15.98
F	Calochortus nuttallii	a ⁻	b ₅	a ⁻	-	3	-	.01	-
F	Chenopodium album (a)	b ₇	a ⁻	a ⁻	5	-	-	-	-
F	Chenopodium spp. (a)	b ₂₂	a ⁻	a ⁻	11	-	-	-	-
F	Cymopterus longipes	a ⁻	b ₃	ab ₄	-	3	2	.01	.01
F	Descurainia pinnata (a)	b ₁₉	b ₂₀	a ⁻	11	8	-	.44	-
F	Draba reptans (a)	b ₇	c ₈₃	a ⁻	4	31	-	.23	-
F	Erodium cicutarium (a)	-	b ₂₆	a ₆	-	9	2	.41	.01
F	Gilia spp. (a)	-	b ₁₈	a ⁻	-	11	-	.05	-
F	Lappula occidentalis (a)	-	1	-	-	1	-	.00	-
F	Lactuca serriola	a ⁻	b ₇₀	a ⁻	-	35	-	.30	-
F	Lepidium densiflorum (a)	-	b ₇	a ⁻	-	3	-	.01	-
F	Leucelene ericoides	37	40	24	19	19	11	.73	.18
F	Machaeranthera canescens	-	4	-	-	2	-	.01	-
F	Melilotus officinalis	-	7	-	-	2	-	.21	-

T y p e	Species	Nestled Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
F	<i>Medicago sativa</i>	_c 24	_b 9	_a -	13	3	-	.34	-
F	<i>Phlox hoodii</i>	-	6	1	-	2	1	.06	.00
F	<i>Sanguisorba minor</i>	_b 5	_a -	_a -	3	-	-	-	-
F	<i>Sisymbrium altissimum</i> (a)	-	_b 50	_a 2	-	22	1	.48	.00
F	<i>Sphaeralcea coccinea</i>	_a -	_b 23	_b 13	-	10	6	.71	.05
F	<i>Tragopogon dubius</i>	_a -	_b 6	_a -	-	3	-	.04	-
F	Unknown forb-annual (a)	_b 7	_a -	_a -	3	-	-	-	-
F	Unknown forb-perennial	_b 9	_{ab} 3	_a -	4	1	-	.15	-
Total for Annual Forbs		62	205	8	34	85	3	1.64	0.01
Total for Perennial Forbs		75	176	42	39	83	20	2.59	0.24
Total for Forbs		137	381	50	73	168	23	4.24	0.26

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

BROWSE TRENDS --

Herd unit 09 , Study no: 10

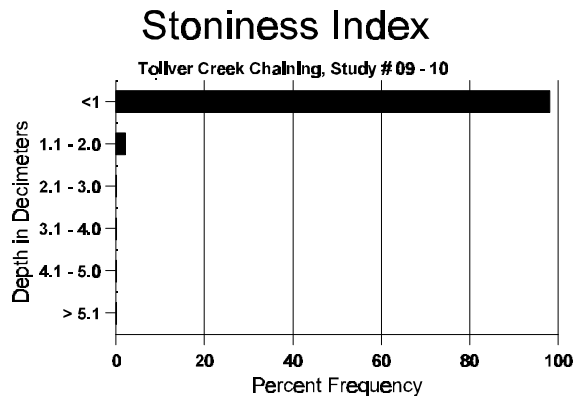
T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	<i>Artemisia tridentata vaseyana</i>	6	8	.33	.98
B	<i>Atriplex canescens</i>	5	5	.15	.66
B	<i>Chrysothamnus depressus</i>	0	3	-	.15
B	<i>Chrysothamnus nauseosus hololeucus</i>	3	5	.41	-
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	0	1	-	-
B	<i>Echinocereus</i> spp.	0	1	-	-
B	<i>Gutierrezia sarothrae</i>	35	32	1.61	.38
B	<i>Juniperus osteosperma</i>	0	5	.96	.73
B	<i>Opuntia</i> spp.	21	27	.57	.25
B	<i>Pinus edulis</i>	0	1	-	-
Total for Browse		70	88	4.03	3.16

BASIC COVER --
Herd unit 09 , Study no: 10

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	376	320	3.00	38.45	21.76
Rock	268	270	12.25	22.84	22.35
Pavement	94	146	1.50	.37	1.22
Litter	392	353	54.75	54.20	42.52
Cryptogams	24	96	0	.09	1.69
Bare Ground	157	255	28.50	5.06	22.23

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 10, Study Name: Toliver Creek Chaining

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
7.39	68.8 (8.35)	7.3	69.4	17.0	13.6	4.5	14.3	288.0	0.9



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 10

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre	Days Use per Acre (ha)
Rabbit	18	35	244	N/A
Elk	7	23	87	7 (17)
Deer	12	13	339	26 (65)
Cattle	3	5	26	2 (5)

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 10

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Artemisia tridentata vaseyana</i>																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	6	-	-	-	-	-	6	-	-	-	120		6	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	1	-	-	-	-	-	-	-	-	-	1	-	-	33		1	
	95	4	-	-	10	-	-	-	-	-	14	-	-	-	280		14	
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	3	2	-	-	-	-	-	-	-	5	-	-	-	100	13	16	
	00	22	-	-	-	-	-	-	-	-	22	-	-	-	440	14	18	
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			+91%							
'95		11%			00%			00%			+27%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	33	Dec:	0%			
												'95	380		0%			
												'00	520		4%			
<i>Atriplex canescens</i>																		
S	88	4	-	-	-	-	-	-	-	-	4	-	-	-	133		4	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	4	-	-	-	-	-	-	-	-	4	-	-	-	133		4	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	6	-	-	-	-	-	-	-	-	6	-	-	-	120	27	36	
	00	3	1	-	2	-	-	-	-	-	6	-	-	-	120	28	37	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			+17%							
'95		00%			00%			00%			-25%							
'00		17%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	133	Dec:	-			
												'95	160		-			
												'00	120		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus depressus																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	2 8	2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	0		-			
												'00	60		-			
Chrysothamnus nauseosus hololeucus																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	9	-	-	-	-	-	-	-	-	9	-	-	-	180		9	
M	88	1	-	-	-	-	-	-	-	-	1	-	-	-	33	11 8	1	
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	28 31	3	
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60	34 44	3	
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			+45%							
'95		00%			00%			00%			+77%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	33	Dec:	0%			
												'95	60		0%			
												'00	260		8%			
Chrysothamnus viscidiflorus viscidiflorus																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	0		-			
												'00	20		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Echinocereus spp.																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	2	3	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	3	6	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	0		-			
												'00	20		-			
Gutierrezia sarothrae																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	88	6	-	-	-	-	-	-	-	-	6	-	-	-	200	4	6	
	95	91	-	-	-	-	-	-	-	-	91	-	-	-	1820	11	17	
	00	95	-	-	-	-	-	-	-	-	50	2	43	-	1900	4	7	
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	10	-	-	-	-	-	-	-	-	-	-	1	9	200		10	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	200		10	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			+90%							
'95		00%			00%			00%			+ 9%							
'00		00%			00%			50%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	200	Dec:	0%			
												'95	1920		0%			
												'00	2120		9%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Juniperus osteosperma																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	-				
											'95	0		-				
											'00	120		-				
Opuntia spp.																		
S	88	2	-	-	-	-	-	-	-	-	2	-	-	-	66		2	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	16	-	-	-	-	-	-	-	-	16	-	-	-	533		16	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	88	10	-	-	1	-	-	-	-	-	11	-	-	-	366	4	12	11
	95	27	-	-	-	-	-	-	-	-	27	-	-	-	540	3	12	27
	00	32	-	-	1	-	-	-	-	-	30	3	-	-	660	3	8	33
D	88	5	-	-	-	-	-	-	-	-	1	-	4	-	166		5	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			13%			-47%							
'95		00%			00%			00%			+22%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	1065	Dec:	16%				
											'95	560		0%				
											'00	720		3%				
Pinus edulis																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	-				
											'95	0		-				
											'00	20		-				

Trend Study 9-11-00

Study site name: Toliver Creek P-J .

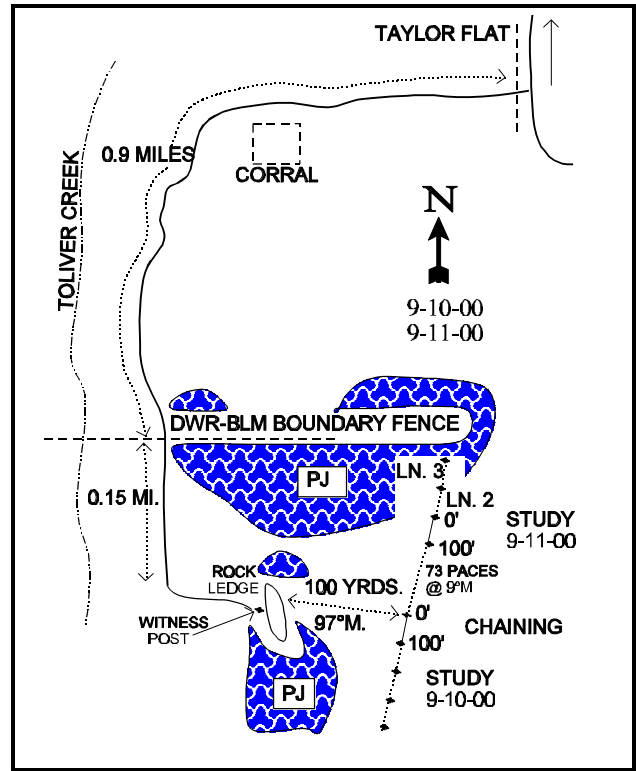
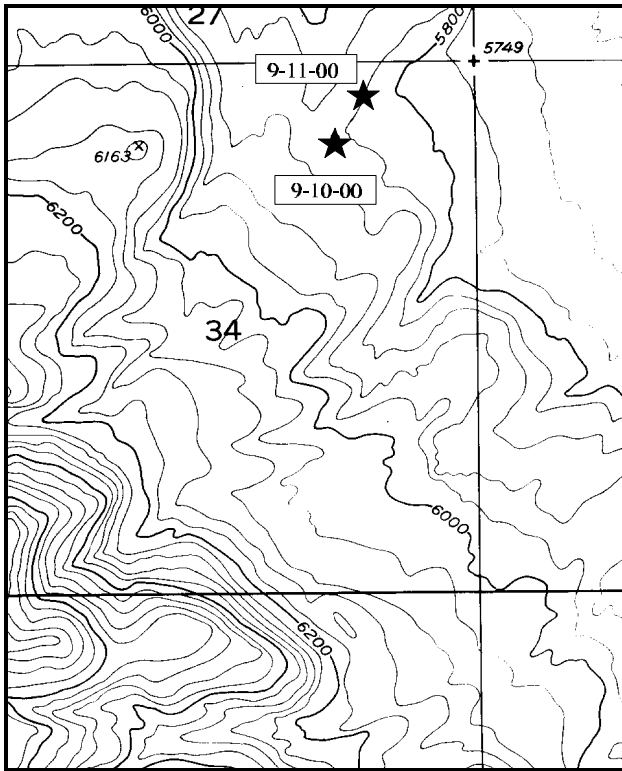
Range type: Pinyon-Juniper .

Compass bearing: frequency baseline 190°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft.), line 4 (71ft).

LOCATION DESCRIPTION

From the trend study in the Toliver Creek chaining, study #9-10-00, walk 73 paces north (9°M) into the unchained patch of juniper and pinyon. The first stake encountered should be the 100-foot baseline stake. The start of the frequency baseline is 100 feet north (9°M).



Map Name: Warren Draw

Diagrammatic Sketch

Township 2N , Range 24E , Section 34

DISCUSSION

Trend Study No. 9-11 (11-12)

*** This site was not read in 2000, but text from the 1995 report is included. Refer to the 1995 "Utah Big Game Range Trend Studies" report for maps and data tables for this site.

The Toliver Creek Pinyon-Juniper trend study is located in a mature pinyon-juniper stand adjacent to the chaining treatment sampled by trend study 9-10. This site represents the situation on the chained site before treatment. This type provides necessary escape and thermal cover, but forage is very limited.

The study is on a west-facing, 5% slope at an elevation of 5,900. The land is managed by the BLM. The soil, being shallow and sandy, is similar to that found on the adjacent study site. One apparent difference is the prevalence of exposed sandstone slabs, as opposed to the smaller, rounded rocks on the chained site. There is considerable runoff due to the lack of understory and light litter cover.

Using line intercept to estimate tree canopy cover, the juniper and pinyon overstory covers approximately 41% of the ground surface. Tree density was estimated at 298 juniper trees/acre and 108 pinyon trees/acre using the point-centered quarter method. Average diameter of juniper is 12 inches while that of pinyon is 4.3 inches. Most of the junipers have been high-lined. The only other browse sampled was pricklypear cactus and broom snakeweed.

Annual grasses and forbs were not included in the 1988 sample. No perennial forbs were observed on the study site that year and the only perennial grass encountered was a few bottlebrush squirreltail. Data from 1995 show that this depleted understory totals to only 6% cover. It is dominated by annuals which account for 89% of the grass cover and 99% of the forb cover.

1988 APPARENT TREND ASSESSMENT

Due to the lack of understory, there is very little vegetative ground cover. The litter cover associated with the mature juniper and pinyon is insubstantial and does not provide much soil protection. Rock cover is a significant percentage of the total cover at 27%, with percent bare ground at 24%. This site is in poor condition but the soil trend appears stable. The site does not support any useful browse except pinyon and juniper, which are most useful as thermal and escape cover. The herbaceous understory is in poor condition and depleted.

1995 TREND ASSESSMENT

Conditions are still poor but have improved, likely due to the unusually wet spring this year. Percent bare ground has declined to only about 8%, while cover for cryptogams has increased to almost 7%. Trend for soil is slightly up but still in poor condition. The only browse which occurs on the site consists of cactus and broom snakeweed, both are useless as forage. The herbaceous understory is in poor condition and dominated by annuals but has improved slightly since the last reading.

TREND ASSESSMENT

soil - slightly up, but still in poor condition (4)

browse - no useful species present (1)

herbaceous understory - slightly improved, but in very poor condition with a poor composition (4)

Trend Study 9-12-00

Study site name: Browns Park Burn & P-J

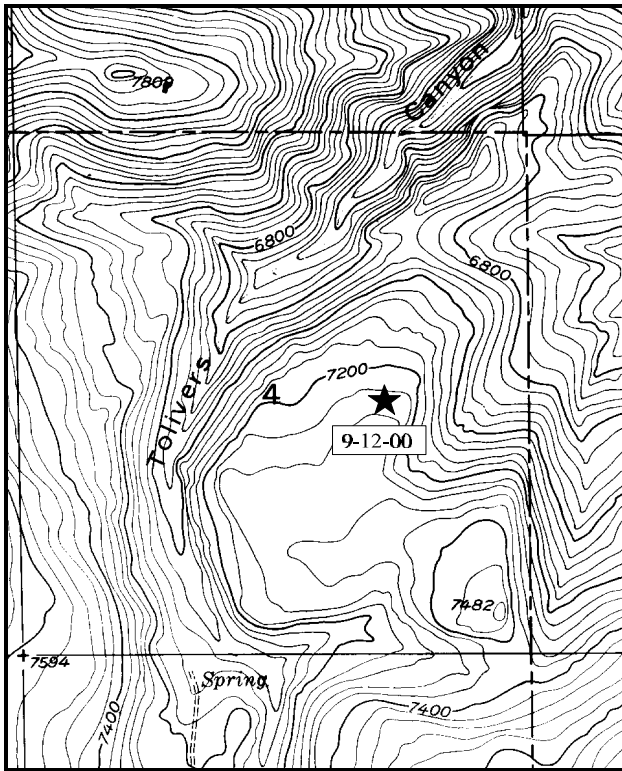
Range type: Pinyon-Juniper

Compass bearing: frequency baseline 358°M

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft.), line 4 (71ft).

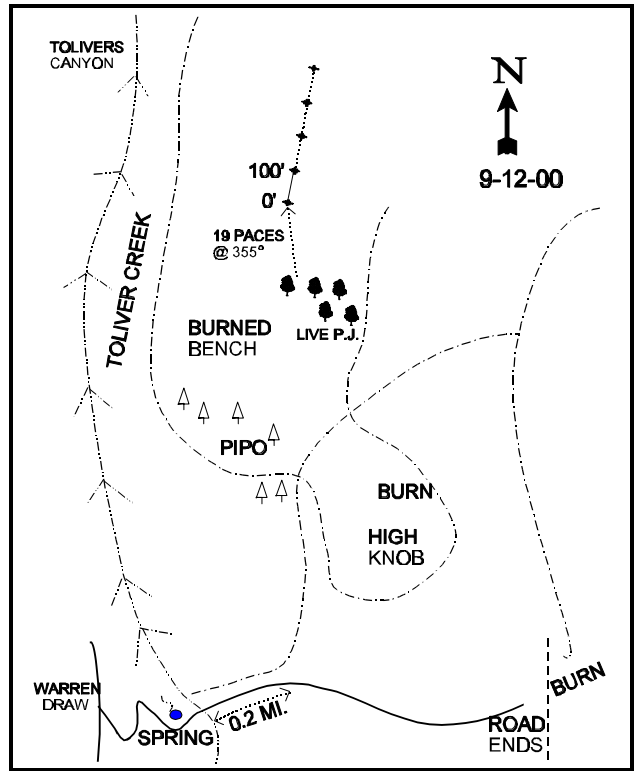
LOCATION DESCRIPTION

From the Warren Draw trend study, #9-7-00, proceed north 3.2 miles to a locked gate onto private land. Talk to the biologist for the key. Continue 1.9 miles to a fork by a stockpond, stay left. Go 0.45 miles to a fork, stay right. Continue another 0.45 miles, again bear right. Continue 0.4 miles down to the creek bottom. Proceed up the road for 0.2 miles, to a low point beneath the bench to the north. It is probably easiest to hike up to the bench from the low pass. Hike north, about ½ mile, over the top and down the burned bench. From the level ponderosa pine bench, continue north down the increasing slope where you will find the short green fencepost marking the burned P-J portion of the study.



Map Name: Warren Draw

Township 1N, Range 24E, Section 4



Diagrammatic Sketch

UTM 4523534.738 N, 651162.408 E

DISCUSSION

Trend Study No. 9-12 (11-13)

The Brown's Park P-J and Burn study samples a prescribed burn treatment that was conducted by the BLM in the upper Toliver Creek drainage in 1986. The treatment burned approximately 420 acres, containing several different range types; mixed mountain brush, Ponderosa pine, pinyon-juniper and curlleaf mountain mahogany. The trend study was established in the more prevalent pinyon-juniper/curlleaf mountain mahogany type. The study site is on a north facing slope of about 10-15% at an elevation of 7,200 feet. Abundant thermal and escape cover exists on areas surrounding the burn. Pellet group transect data taken along the baseline in 2000 show big game use to be light at the present time. Deer use is estimated at 5 days use/acre (12 ddu/ha) and elk use is estimated at 17 days use/acre (42 edu/ha). Livestock also graze the area with use being estimated at 12 cow days use/acre (30 cdu/ha) in 2000. According to BLM personnel, this area is grazed in conjunction with the Taylor Flat allotment, but the burned areas are only grazed 1 out of every 3 years.

The soil on this particular slope is moderately shallow with large rocks and boulders being prevalent on the surface. The soil itself is a coarse textured sandy loam with an estimated effective rooting depth of just over 10 inches. Nearly 80% of the penetrometer readings used to estimate a profile stoniness index hit rock within the upper 5 inches of the soil surface. The shallowness of penetrometer readings is the result of abundant bedrock being present over the site with a shallow layer of soil on top. Since the fire and the 1988 reading, there had been significant erosion due to the loss of duff and understory vegetation. Nearby unburned areas also showed serious erosion and soil loss due to the naturally sparse understory and runoff from surrounding bare areas. Initially, loss of the already shallow soil resulted in exposed plant roots and more rock. Erosion was not noted in 1995 due to the excellent protective ground cover from an improving understory. Rock cover has remained high at 27% in 1995 and 32% in 2000. Bare ground was estimated at 63% in 1988 declining to only 10% by 1995, and 12% in 2000. Litter cover increased from 7% to 47% by 1995, but slightly decreased to 42% in 2000. Vegetation cover has steadily increased with each reading as seeded grasses continue to increase on the site. Vegetation cover is currently ('00) estimated at 36%.

Unburned areas are dominated by an overstory of pinyon and juniper. Scattered curlleaf mountain mahogany, true mountain mahogany and snowberry occur in the understory. Tree species within the burn were completely killed by the fire, however many standing snags remain. Pre-burn pinyon density was estimated to be 467 trees/acre. The only browse encountered on the burn site in 1988 was sprouting mountain lover which numbered 333 plants/acre measuring only 4 x 3 inches. Currant and elderberry were also resprouting but were not encountered in the density plots. During the 1995 reading, several additional browse species were encountered including: serviceberry, manzanita, mountain big sagebrush, curlleaf mountain mahogany, true mountain mahogany, rubber rabbitbrush and snowberry. In 1995, all species were estimated at densities of 40 plants/acre or less, except for white-stemmed rubber rabbitbrush and snowberry which were estimated at 100 plants/acre and 80 plants/acre respectively. All species showed good vigor and light use in 1995. Browse continues to be low in abundance in 2000 with only rubber rabbitbrush, mountain lover and mahogany slightly increasing in density. Currently ('00), use remains light and vigor is good on all browse species.

Herbaceous vegetation was scarce in 1988 with few grasses and forbs appearing in the quadrats. No vegetation was hit with the points of the quadrats so there was no vegetation data estimated in 1988. Only annuals, mainly coyote tobacco (*Nicotiana attenuata*), were present. During the 1995 reading, 8 species of perennial grass and one sedge were encountered which combined to produce 16% cover. The site supports several native grasses including muttongrass, bluebunch wheatgrass, squirreltail, fescue, and a sedge. Seeded species including crested and intermediate wheatgrass, smooth brome, and orchard grass were also sampled. Crested wheatgrass is the dominate grass producing nearly 12% cover in 1995, increasing to 18% in 2000. Smooth brome is the second most numerous perennial grass which significantly increased in nested frequency in 2000. Quadrat frequency of

smooth brome also increased from 38 in 1995 to 71 in 2000, while cover increased from 2% to 9%. Both of these species have good vigor and provide good ground cover on this shallow soiled site. Cheatgrass was sampled in 1995 and was fairly abundant, contributing to over 3% cover and having a quadrat frequency of 49%. In 2000, cheatgrass was not sampled at all due to the extremely dry conditions. Forbs are infrequent especially in 2000 with drought. In 1995, ten species of perennial and 8 species of annual forbs were sampled. The number forbs sampled in 2000 decreased to 6 perennial and 3 annual species, with all species combining to provide just over 1% average cover. Sum of nested frequency for perennial grasses increased in 2000, while sum of nested frequency for perennial forbs slightly decreased from an already very low level.

1988 APPARENT TREND ASSESSMENT

With such a low density of living plants on the burn, no vegetative cover was sampled. The majority of the ground surface (63%) was bare soil. Rock and pavement cover was almost 30%. Litter was reduced by the fire, but it should recover to significant soil protection levels. Trend appears stable but in poor condition. Browse are lacking on the site but this should change over time. The herbaceous understory is sparse and needs time to become established.

1995 TREND ASSESSMENT

Ground cover characteristics have improved dramatically since 1988. Percent litter cover has increased from 7% to 47% while percent bare ground has declined from 63% to only 10%. Herbaceous vegetation has also increased significantly adding needed protective cover. Trend for soil is up. Browse are still lacking on the site but more species are coming in. Trend is up. The herbaceous understory has increased dramatically in sum of nested frequency. An additional 8 perennial species were encountered in 1995 with seeded crested wheatgrass and smooth brome being the most numerous. Sum of nested frequency of forbs also increased significantly. Trend for herbaceous understory is up.

TREND ASSESSMENT

soil - up (5)

browse - up but still not abundant (5)

herbaceous understory - up (5)

2000 TREND ASSESSMENT

Trend for soil is slightly up even though bare soil has increased from 10 to 12%. Vegetation cover increased significantly with the increase in crested wheatgrass and smooth brome. Cryptogamic cover also significantly increased from less than 1% in 1995 to over 8%. This provides additional important protective ground cover on this site which has shallow soils to begin with. The ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil increased from 3.2:1 to 5.5:1. Trend for browse is stable. Browse remains at low, but stable densities on the site. Use is light, and vigor is good on all species. Several years of normal or above normal precipitation is needed to provide favorable conditions for young shrubs to establish and be able to persist. Trend for the herbaceous understory is slightly up. The seeded grasses, crested wheatgrass and smooth brome, continue to increase in frequency. Both species have increased cover values which provide needed soil protection.

TREND ASSESSMENT

soil - slightly up (4)

browse - stable (3)

herbaceous understory - slightly up (4)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 12

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	<i>Agropyron cristatum</i>	_a 13	_b 269	_b 274	8	92	88	11.86	18.31
G	<i>Agropyron intermedium</i>	_a -	_b 23	_b 32	-	8	12	.64	.28
G	<i>Agropyron spicatum</i>	-	3	-	-	1	-	.15	-
G	<i>Bromus inermis</i>	_a -	_b 86	_c 207	-	38	71	2.09	9.42
G	<i>Bromus tectorum</i> (a)	-	_b 130	_a -	-	49	-	3.29	-
G	<i>Carex</i> spp.	_a -	_b 10	_b 6	-	4	3	.33	.09
G	<i>Dactylis glomerata</i>	_a -	_b 10	_b 14	-	6	6	.49	.25
G	<i>Festuca ovina</i>	-	1	-	-	1	-	.03	-
G	<i>Oryzopsis hymenoides</i>	4	-	-	2	-	-	-	-
G	<i>Poa fendleriana</i>	_a -	_b 17	_b 22	-	7	10	.11	.29
G	<i>Sitanion hystrix</i>	_a -	_b 20	_a 4	-	8	2	.41	.03
Total for Annual Grasses		0	130	0	0	49	0	3.29	0
Total for Perennial Grasses		17	439	559	10	165	192	16.13	28.69
Total for Grasses		17	569	559	10	214	192	19.43	28.69
F	<i>Agoseris glauca</i>	-	-	1	-	-	1	-	.00
F	<i>Allium</i> spp.	_a -	_b 18	_a -	-	7	-	.04	-
F	<i>Arabis</i> spp.	_a -	_b 14	_c 33	-	6	16	.03	.08
F	<i>Balsamorhiza hookeri</i>	-	3	-	-	2	-	.19	.00
F	<i>Chenopodium album</i> (a)	1	-	-	1	-	-	-	-
F	<i>Collomia linearis</i> (a)	-	4	-	-	2	-	.01	-
F	<i>Collinsia parviflora</i> (a)	-	12	-	-	8	-	.04	-
F	<i>Crepis acuminata</i>	_a -	_b 7	_a -	-	3	-	.21	-
F	<i>Cymopterus longipes</i>	_a -	_b 11	_b 3	-	5	3	.05	.01
F	<i>Descurainia pinnata</i> (a)	_a 3	_b 105	_a 5	1	50	2	.30	.01
F	<i>Erigeron</i> spp.	_a -	_a 5	_b -	-	3	-	.05	-
F	<i>Gayophytum ramosissimum</i> (a)	-	_b 16	_a -	-	8	-	.04	-
F	<i>Heterotheca villosa</i>	_a -	_a 5	_b 17	-	2	6	.41	.89
F	<i>Lappula occidentalis</i> (a)	-	_b 6	_a -	-	3	-	.01	-
F	<i>Lactuca serriola</i>	_a -	_b 19	_a -	-	8	-	.04	-
F	<i>Melilotus officinalis</i>	3	-	-	1	-	-	-	-
F	<i>Microsteris gracilis</i> (a)	-	_b 42	_a 3	-	16	1	.27	.00
F	<i>Polygonum douglasii</i> (a)	-	_b 9	_a -	-	4	-	.02	-
F	<i>Sisymbrium altissimum</i> (a)	-	5	-	-	2	-	.01	-

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
F	Taraxacum officinale	-	6	3	-	2	2	.03	.01
F	Tragopogon dubius	_a -	_a 2	_b 12	-	2	7	.04	.08
Total for Annual Forbs		4	199	8	2	93	3	0.71	0.01
Total for Perennial Forbs		3	90	69	1	40	35	1.10	1.10
Total for Forbs		7	289	77	3	133	38	1.81	1.12

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

BROWSE TRENDS --

Herd unit 09 , Study no: 12

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Arctostaphylos uva-ursi	1	0	-	-
B	Cercocarpus ledifolius	2	2	.38	.88
B	Cercocarpus montanus	0	1	-	-
B	Chrysothamnus nauseosus hololeucus	5	6	.66	.66
B	Chrysothamnus viscidiflorus viscidiflorus	1	0	.00	-
B	Pachistima myrsinites	2	3	-	.03
B	Pinus edulis	0	2	-	-
B	Sambucus cerulea	1	1	.56	.03
B	Symphoricarpos oreophilus	3	2	.03	.53
Total for Browse		15	17	1.63	2.13

BASIC COVER --

Herd unit 09 , Study no: 12

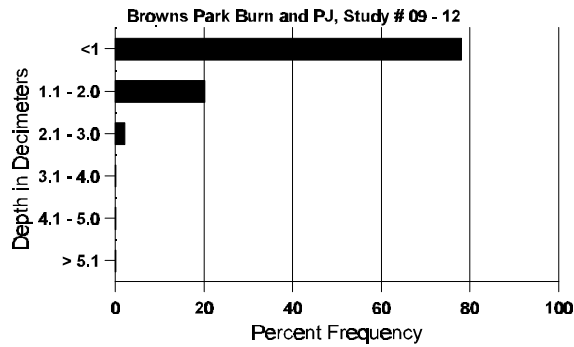
Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	331	349	0	23.90	36.50
Rock	310	297	28.00	27.12	32.09
Pavement	138	157	1.75	.41	2.28
Litter	390	362	7.00	46.50	41.93
Cryptogams	41	188	0	.36	8.36
Bare Ground	237	164	63.25	9.69	11.98

SOIL ANALYSIS DATA --

Herd Unit 09, Study # 12, Study Name: Browns Park Burn and PJ

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	%OM	PPM P	PPM K	dS/m
9.67	58.8 (32.8)	7.1	59.6	23.1	17.3	5.9	8.7	147.2	0.6

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 09 , Study no: 12

Type	Quadrat Frequency	
	'95	'00
Rabbit	10	17
Elk	4	9
Deer	12	5
Cattle	2	1

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
'00	'00
148	N/A
226	17 (43)
70	5 (13)
148	12 (30)

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 12

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Amelanchier alnifolia</i>																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	32	36	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	0		-			
												'00	0		-			
<i>Artemisia tridentata vaseyana</i>																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	18	34	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	0		-			
												'00	0		-			
<i>Arctostaphylos uva-ursi</i>																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	13	50	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	20		-			
												'00	0		-			
<i>Cercocarpus ledifolius</i>																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	23	34	2
	00	1	2	-	-	-	-	-	-	-	3	-	-	-	60	34	46	3
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%			+33%							
'00		67%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	40		-			
												'00	60		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4		5	6		7	8	9	1	2	3	4	
Cercocarpus montanus																	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	41	50	0
	00	-	-	1	-	-	-	-	-	1	-	-	-	20	52	54	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'88		00%			00%			00%									
'95		00%			00%			00%									
'00		00%			100%			00%									
Total Plants/Acre (excluding Dead & Seedlings)										'88	0	Dec:	-				
										'95	0		-				
										'00	20		-				
Chrysothamnus nauseosus hololeucus																	
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	3	-	-	-	-	-	-	-	3	-	-	-	60	32	45	3
	00	8	-	-	-	-	-	-	-	8	-	-	-	160	31	41	8
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'88		00%			00%			00%									
'95		00%			00%			00%			+38%						
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)										'88	0	Dec:	-				
										'95	100		-				
										'00	160		-				
Chrysothamnus viscidiflorus viscidiflorus																	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	1	-	-	-	20	11	16	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'88		00%			00%			00%									
'95		00%			00%			00%									
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)										'88	0	Dec:	-				
										'95	20		-				
										'00	0		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Juniperus osteosperma																		
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	-				
											'95	0		-				
											'00	0		-				
Mahonia repens																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	7	11	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	-				
											'95	0		-				
											'00	0		-				
Pachistima myrsinites																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	88	4	-	-	-	-	-	-	-	-	4	-	-	-	133		4	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5	
M	88	6	-	-	-	-	-	-	-	-	6	-	-	-	200	4	3	6
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	6	22	2
	00	7	-	-	-	-	-	-	-	-	7	-	-	-	140	5	13	7
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			-88%							
'95		00%			00%			00%			+83%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	333	Dec:	-				
											'95	40		-				
											'00	240		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Pinus edulis																		
Y	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	-				
											'95	0		-				
											'00	40		-				
Ribes cereum cereum																		
M	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	29	48	0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	35	37	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	-				
											'95	0		-				
											'00	0		-				
Sambucus cerulea																		
M	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	82	99	1
	'00	-	-	-	-	-	-	1	-	-	1	-	-	-	20	95	106	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%			+ 0%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	-				
											'95	20		-				
											'00	20		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
Y	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	'95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	16	52	
	'00	4	-	-	-	-	-	-	-	-	4	-	-	-	80	13	56	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%			+ 0%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	80		-			
												'00	80		-			

Trend Study 9-13-00

Study site name: John Starr Flat .

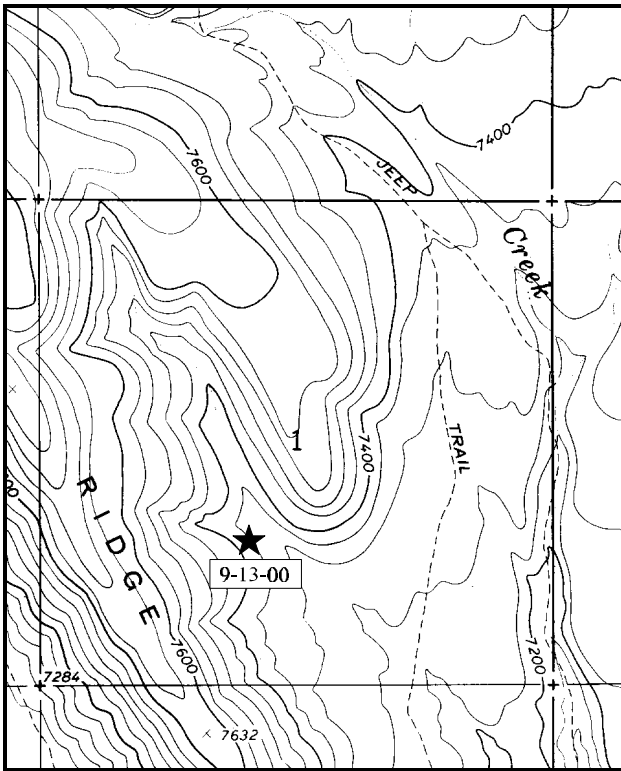
Range type: Mixed Mountain Brush .

Compass bearing: frequency baseline 355°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

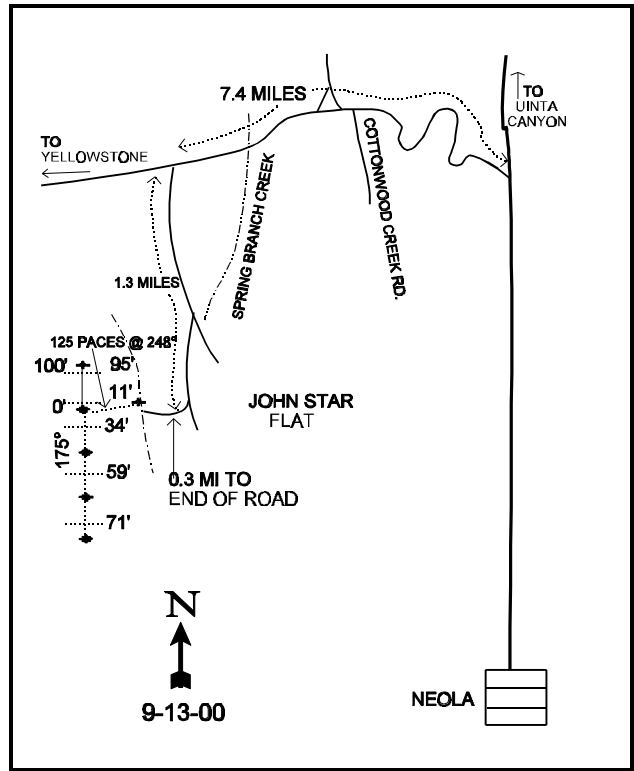
LOCATION DESCRIPTION

From Neola, drive north to a major fork. Turn left, west, (right fork goes to Uinta Canyon) and travel towards Yellowstone for 7.4 miles on the main road. At this point, turn left (south). Go 0.15 miles to a small fork and stay left. Continue 0.1 miles to another fork and bear right. Proceed 1.1 miles to a major fork and continue on the right fork for 0.7 miles. At the next fork turn right towards the hills to the west. Proceed 0.3 miles to the end of the road near a gully. From the end of the road, the 0-foot baseline stake is located 145 paces away at an azimuth of 245°M. The frequency baseline stakes are marked by green steel fenceposts approximately 18" in height. Browse tag #7020 is on the first baseline stake.



Map Name: Heller Lake

Township 1 N , Range 3W , Section 1



Diagrammatic Sketch

UTM 4484405.637 N, 569978.882 E

DISCUSSION

Trend Study No. 9-13 (12-1)

The John Starr Flat trend study is located at the northwest edge of John Starr Flat near the base of Tower Ridge. The area is within the Ute Indian Reservation and the study was established with assistance of a tribal biologist. The study site is on critical winter range for both deer and elk. Domestic livestock graze during the remainder of the year. The range type is mixed mountain brush on a northeasterly aspect with a 10% slope. Elevation is 7,400 feet. Pellet group data taken along the baseline in 2000 estimate moderate deer use at 46 days use/acre (114 ddu/ha) and light elk use at 20 days use/acre (50 edu/ha). No cattle pats were sampled.

These sandy loam soils are very rocky, but deep enough to support a dense mountain brush type. Effective rooting depth is estimated at a moderately shallow 7 inches, but with deep rooted shrub species on the site, the roots are obviously able to penetrate through the rocky profile. Phosphorus is low at 4.1 ppm as values less than 10 ppm may limit normal plant growth and development. Vegetation and litter cover are abundant enough to prevent severe erosion. Bare ground is moderate at an estimated 17% cover in 2000.

The key preferred browse species is true mountain mahogany which provided just over 10% average cover in 1995 and 2000. Estimated density was 2,866 plants/acre in 1982, increasing to 5,000 plants/acre in 1988, then declining to 3,580 in 1995. Large fluctuations in mahogany density are due to the change in sample size used after the 1988 reading which better estimates shrub population densities. Currently ('00), true mountain mahogany is estimated at 3,260 plants/acre. Use is moderate to heavy in both 1995 and 2000, however percent decadency has been low at 1% and 6% during these years. Heavy use has increased with each reading and is currently ('00) estimated at 64%. Heavy use may have been overestimated in 2000 as some plants displayed a hedged appearance due to low annual leader growth with the dry conditions. Mahogany vigor was normal in both 1982 and 1995, but declined somewhat in 1988 and 2000, both drought years. Twenty percent of the population had poor vigor in 1988, and 16% in 2000. Due to drought, many plants had a chlorotic appearance in 2000 and some had already begun to drop leaves. As a result, many were classified as having poor vigor. Recruitment has remained very good over all readings and is currently ('00) estimated at 21%. Leader growth is low in 2000 averaging only 2 inches over the site.

Other key browse include: serviceberry, black sagebrush, mountain big sagebrush, bitterbrush and snowberry. The serviceberry population is estimated at 1,060 plants/acre in 2000. It shows an increase in decadency (0% to 11%) and poor vigor (0% to 17%). Heavy use also increased from 13% in 1995 to 45% in 2000. As with mahogany, use was difficult to determine due to low annual growth in 2000 due to drought. This can result in plants taking on a hedged appearance without necessarily experiencing a lot of use. Recruitment decreased from 28% to 15% in 2000, but this is still quite high. Serviceberry appear to be growing in close proximity to mahogany plants, which may provide some protection from browsing. Increases in decadency and poor vigor are likely drought related, and as with mahogany, some plants displayed a chlorotic appearance and were dropping leaves when the site was read in June of 2000.

Mountain big sagebrush is estimated at 1,520 plants/acre. It has moderately high decadency of 30%. Poor vigor has been estimated at 13% in both 1995 and 2000. Use is mostly light to moderate on sagebrush and recruitment is high at 18%. Mature plants were noted as being robust, vigorous and producing abundant seed in 2000. Black sagebrush is moderately abundant at an estimated 2,260 plants/acre in 2000. Use is light, decadency is moderate at 16% and poor vigor slightly increased in 2000. Pricklypear cactus is abundant on this site, currently estimated at 6,620 plants/acre.

The herbaceous understory accounts for 40% and 46% of the total vegetative cover in 1995 and 2000 respectively. Grasses are dominated by perennials including: needle-and-thread, bluebunch wheatgrass, a

Carex, Sandberg bluegrass and Indian ricegrass. Average cover contributed by grasses increased from 5% in 1995 to 14% in 2000. Sum of nested frequency of perennials increased in 2000 due mostly to the significant increase in needle-and-thread. Although cheatgrass is present, it is not abundant. In 2000, grasses are described as being robust and vigorous with little use. Forbs are especially diverse with 29 and 26 perennial species being sampled in 1995 and 2000 respectively. Perennial forb sum of nested frequency decreased in 2000 due to drought, but this decrease should turn around with normal precipitation in the future. Annual forbs were very abundant in 1995 with the wet spring of that year, but they were almost non-existent in 2000 with drought.

1982 APPARENT TREND ASSESSMENT

Range trend, both for soil and vegetation, appears stable to improving. Soil movement and loss are negligible. Vegetative and litter cover provide adequate soil protection. Vegetatively, the browse component appears healthy, although rather heavily utilized. However, stand maintenance and productivity seem assured under current levels of animal use. Grasses are vigorous, diverse and productive. No apparent problems are evident. Forb composition and productivity is somewhat deficient, but not seriously so.

1988 TREND ASSESSMENT

Soil trend appears stable with continued adequate protective ground cover. The browse trend is slightly up for the key preferred species true mountain mahogany. The number of mature plants declined slightly, but the number of seedlings and young increased dramatically. Percent decadence is still low at 8%, yet more shrubs display heavy use and poor vigor. Trend for the herbaceous understory is stable to slightly improving. Quadrat frequency of bluebunch wheatgrass, Sandberg bluegrass, and needle-and-thread increased while frequency of squirreltail, Indian ricegrass, and prairie Junegrass declined.

TREND ASSESSMENT

soil - stable (3)

browse - slightly up for key species (4)

herbaceous understory - stable (3)

1995 TREND ASSESSMENT

Soil conditions are still stable with adequate protective ground cover. Trend for browse is slightly up for mahogany. Although total density declined from 5,000 plants/acre to 3,580, the number of mature plants increased. It should also be noted that 60% of the population in 1988 was classified as young plants and with the accompanying drought, many would have been lost. The much increased sample size would also account for some of the change in density. Percent decadency declined from 8% to 1% and vigor has improved. The only negative aspect is the increased heavy use (23% to 30%). A few bitterbrush were picked up in the larger sample used in 1995. Fifty percent of the mature plants were heavily hedged. Snowberry also showed more moderate to heavy use in 1995. Trend for the herbaceous understory is down for grasses and slightly up for forbs. Overall the trend is slightly down.

TREND ASSESSMENT

soil - stable (3)

browse - slightly up for key species (4)

herbaceous understory - slightly down (2)

2000 TREND ASSESSMENT

Trend for soil is slightly down. Bare ground slightly increased and the ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil decreased from 3.2:1 to 2.7:1. Erosion remains slight however. Trend for browse is stable. Poor vigor increased in the mahogany population, but this is due to drought and should improve with better precipitation in the future. Percent decadency is low (6%) and recruitment is high at 21%. The increase in heavy use may be overestimated due to low annual leader growth caused by drought in 2000. Serviceberry and mountain big sagebrush both show increased decadency and poor vigor, but as with mahogany, these increases are most likely drought related and should improve with normal precipitation. Recruitment is high for both of these species as well. Trend for the herbaceous understory is stable overall. Sum of nested frequency increased for perennial grasses, but decreased for perennial forbs. The loss of forb frequency is due to drought and will improve with normal precipitation.

TREND ASSESSMENT

soil - slightly down (2)

browse - stable (3)

herbaceous understory - stable overall; slightly up for grasses, slightly down for forbs (3)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 13

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron scribneri	-	-	-	4	-	-	-	-	-
G	Agropyron dasystachyum	-	-	-	4	-	-	-	-	-
G	Agropyron spicatum	_b 125	_a 67	_a 73	29	53	29	30	.66	2.08
G	Bouteloua gracilis	12	4	9	1	6	2	5	.03	.33
G	Bromus tectorum (a)	-	_b 61	_a 14	-	-	21	7	1.28	.06
G	Carex spp.	93	110	94	30	43	45	37	1.67	3.58
G	Koeleria cristata	5	-	5	25	3	-	2	-	.30
G	Oryzopsis hymenoides	_a 7	_{ab} 21	_b 24	20	3	7	13	.36	.78
G	Poa fendleriana	-	-	2	2	-	-	1	-	.00
G	Poa secunda	_c 171	_a 3	_b 29	34	65	1	14	.00	.51
G	Sitanion hystrix	_b 59	_a 22	_a 17	30	23	9	9	.18	.31
G	Stipa comata	_b 175	_a 76	_b 132	47	70	36	54	.85	6.64
Total for Annual Grasses		0	61	14	0	0	21	7	1.28	0.06
Total for Perennial Grasses		647	303	385	226	266	129	165	3.77	14.57
Total for Grasses		647	364	399	226	266	150	172	5.05	14.64
F	Antennaria rosea	_b 8	_a -	_a -	-	5	-	-	-	-
F	Arabis spp.	_a 3	_b 45	_a 1	23	1	17	1	.16	.00
F	Arenaria congesta	-	-	1	8	-	-	1	-	.00
F	Artemisia ludoviciana	6	21	17	3	3	9	7	.15	.28
F	Astragalus convallarius	7	6	1	-	4	2	1	.04	.01
F	Astragalus spatulatus	2	1	-	1	1	1	-	.03	-
F	Balsamorhiza hookeri	155	123	117	45	69	56	58	1.11	2.79

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Castilleja linariaefolia	a ⁻	b ²⁶	a ²	-	-	12	1	.13	.03
F	Calochortus nuttallii	6	3	3	8	4	1	1	.00	.00
F	Chenopodium leptophyllum (a)	b ⁻	a ²²	7	-	-	10	4	.05	.02
F	Collomia linearis (a)	-	b ¹³³	a ¹	-	-	61	1	.80	.00
F	Comandra pallida	b ⁴³	a ¹³	b ³⁴	10	18	8	17	.14	.32
F	Crepis acuminata	-	4	1	-	-	2	1	.03	.00
F	Cryptantha spp.	a ¹⁵	b ³⁷	a ³	33	8	20	1	.27	.03
F	Cymopterus longipes	7	6	9	1	5	4	4	.02	.09
F	Descurainia pinnata (a)	-	b ¹⁹	a ⁻	-	-	8	-	.04	-
F	Draba spp. (a)	-	b ⁵⁸	a ⁻	-	-	22	-	.11	-
F	Erigeron flagellaris	b ²¹	ab ¹⁴	a ⁴	-	11	5	1	.02	.03
F	Erigeron pumilus	2	12	17	3	2	6	8	.03	.19
F	Eriogonum umbellatum	5	13	9	3	4	7	5	.08	.10
F	Helianthella microcephala	58	76	76	33	28	33	36	1.40	1.12
F	Heuchera parvifolia	4	5	-	-	1	3	-	.01	-
F	Hymenoxys acaulis	-	1	-	5	-	1	-	.00	-
F	Lappula occidentalis (a)	-	b ¹⁰⁴	a ²	-	-	43	1	.51	.00
F	Lepidium densiflorum (a)	-	b ¹⁷⁴	a ⁻	-	-	65	-	1.28	-
F	Linum lewisii	-	5	-	-	-	2	-	.01	-
F	Lithospermum ruderales	b ¹⁵	a ³	a ¹	4	7	2	1	.04	.03
F	Lychnis drummondii	3	3	-	-	1	1	-	.03	-
F	Machaeranthera grindelioides	14	18	24	-	8	7	12	.39	.73
F	Orobanche spp.	-	3	-	-	-	1	-	.00	-
F	Penstemon caespitosus	b ¹²	a ⁻	a ¹	-	5	-	1	-	.00
F	Penstemon humilis	35	14	-	38	18	9	-	.09	-
F	Petroradia pumila	46	60	57	18	20	21	22	1.45	3.11
F	Phlox longifolia	b ⁷²	ab ⁵¹	a ³⁰	13	33	23	17	.19	.18
F	Polygonum douglasii (a)	-	b ⁷⁹	a ¹	-	-	35	1	.35	.00
F	Schoenocrambe linifolia	a ⁻	c ⁵⁷	b ⁷	-	-	26	3	.43	.01
F	Sedum lanceolatum	b ⁵⁵	a ²²	a ¹⁴	14	22	13	6	.16	.05
F	Senecio multilobatus	8	3	2	-	5	1	1	.63	.00
F	Sphaeralcea coccinea	12	21	10	5	7	11	5	.19	.39
F	Tragopogon dubius	4	-	3	-	2	-	1	-	.00
F	Zigadenus elegans	a ⁻	b ¹²	b ¹⁰	-	-	5	6	.02	.05
Total for Annual Forbs		0	589	11	0	0	244	7	3.15	0.03
Total for Perennial Forbs		618	678	454	268	292	309	218	7.33	9.62
Total for Forbs		618	1267	465	268	292	553	225	10.48	9.66

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

BROWSE TRENDS --
Herd unit 09 , Study no: 13

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier utahensis	20	35	1.33	5.81
B	Artemisia frigida	0	8	-	.06
B	Artemisia nova	38	40	1.24	2.92
B	Artemisia tridentata vaseyana	38	41	5.35	3.95
B	Cercocarpus montanus	85	80	10.75	10.21
B	Chrysothamnus depressus	3	2	.06	.03
B	Chrysothamnus nauseosus graveolens	0	1	-	-
B	Chrysothamnus viscidiflorus lanceolatus	12	12	.68	.39
B	Eriogonum corymbosum	1	0	-	.00
B	Gutierrezia sarothrae	12	8	.56	.40
B	Juniperus osteosperma	0	2	.85	1.00
B	Opuntia fragilis	72	68	1.28	1.51
B	Pediocactus simpsonii	2	9	-	.00
B	Pinus edulis	0	1	.00	-
B	Purshia tridentata	9	5	.49	.36
B	Symphoricarpos oreophilus	9	15	.45	1.88
B	Tetradymia canescens	5	2	-	.03
Total for Browse		306	329	23.08	28.61

CANOPY COVER --
Herd unit 09 , Study no: 13

Species	Percent Cover '00
Juniperus osteosperma	2

BASIC COVER --
Herd unit 09 , Study no: 13

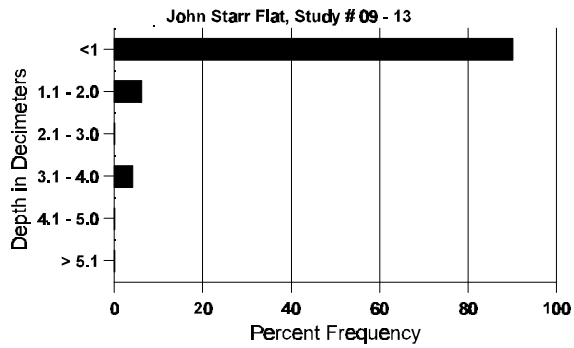
Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	351	323	12.50	7.50	41.08	48.65
Rock	214	193	2.00	4.75	9.96	12.08
Pavement	137	202	2.50	2.50	1.25	4.17
Litter	393	373	69.50	68.75	46.87	46.81
Cryptogams	15	28	.75	.75	.23	.21
Bare Ground	239	273	12.75	15.75	13.88	17.58

SOIL ANALYSIS DATA --

Herd Unit 09, Study # 13, Study Name: John Starr Flat

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	%OM	PPM P	PPM K	dS/m
7.64	60.4 (9.13)	6.7	67.4	16.0	16.6	3.8	4.1	134.4	0.8

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 09 , Study no: 13

Type	Quadrat Frequency	
	'95	'00
Rabbit	8	21
Elk	10	15
Deer	23	19

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
'00	'00
287	N/A
261	20 (50)
600	46 (114)

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 13

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4		1	2									
Amelanchier utahensis																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	3	-	-	-	-	-	-	-	3	-	-	-	60		3	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	2	-	2	-	-	-	-	5	-	-	-	333		5	
	95	8	-	-	1	-	-	-	-	9	-	-	-	180		9	
	00	7	1	-	-	-	-	-	-	3	5	-	-	160		8	
M	82	-	5	-	-	-	-	-	-	2	3	-	-	333	24	24	5
	88	-	2	1	-	-	-	-	-	2	1	-	-	200	26	25	3
	95	-	4	3	6	9	1	-	-	23	-	-	-	460	24	32	23
	00	1	4	6	2	7	15	4	-	29	3	7	-	780	32	37	39
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	3	3	-	-	-	-	-	3	1	-	2	120		6	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>% Change</u>									
'82		100%		00%		00%		+38%									
'88		50%		13%		00%		+17%									
'95		41%		13%		00%		+40%									
'00		28%		45%		17%											
Total Plants/Acre (excluding Dead & Seedlings)										'82	333	Dec:	0%				
										'88	533		0%				
										'95	640		0%				
										'00	1060		11%				
Artemisia frigida																	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	11	-	-	-	-	-	-	-	11	-	-	-	220	9	11	11
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>% Change</u>									
'82		00%		00%		00%											
'88		00%		00%		00%											
'95		00%		00%		00%											
'00		00%		00%		00%											
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-				
										'88	0		-				
										'95	0		-				
										'00	220		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Artemisia nova																	
S	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1
	88	3	-	-	1	-	-	-	-	-	4	-	-	-	266		4
	95	1	-	-	1	-	-	-	-	-	2	-	-	-	40		2
	00	13	-	-	-	-	-	-	-	-	13	-	-	-	260		13
Y	82	3	2	-	-	-	-	-	-	-	5	-	-	-	333		5
	88	14	1	1	2	-	-	-	-	-	17	-	1	-	1200		18
	95	6	7	-	-	-	-	-	-	-	13	-	-	-	260		13
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5
M	82	12	14	-	-	-	-	-	-	-	13	13	-	-	1733	12 17	26
	88	19	5	-	1	-	-	-	-	-	22	2	1	-	1666	14 15	25
	95	18	30	10	1	3	-	-	-	-	62	-	-	-	1240	9 15	62
	00	79	5	4	1	1	-	-	-	-	90	-	-	-	1800	9 15	90
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	13	5	-	1	-	-	-	-	-	16	-	2	1	1266		19
	95	1	-	2	-	-	-	-	-	-	2	-	-	1	60		3
	00	17	-	-	1	-	-	-	-	-	9	-	-	9	360		18
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'82		52%			00%			00%			+50%						
'88		18%			02%			08%			-62%						
'95		51%			15%			01%			+31%						
'00		05%			04%			08%									
Total Plants/Acre (excluding Dead & Seedlings)											'82	2066	Dec:	0%			
											'88	4132		31%			
											'95	1560		4%			
											'00	2260		16%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Artemisia tridentata vaseyana																	
S	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'88	1	-	-	1	-	-	-	-	-	2	-	-	-	133		2
	'95	15	-	-	-	-	-	-	-	-	15	-	-	-	300		15
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'88	3	-	-	-	-	-	-	-	-	3	-	-	-	200		3
	'95	9	5	1	-	-	-	-	-	-	14	-	-	1	300		15
	'00	14	-	-	-	-	-	-	-	-	14	-	-	-	280		14
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-
	'95	8	22	7	2	1	-	-	-	-	40	-	-	-	800	21	33
	'00	21	14	2	1	1	-	-	-	-	39	-	-	-	780	26	29
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1
	'95	4	6	4	-	-	-	-	-	-	6	-	-	8	280		14
	'00	16	5	2	-	-	-	-	-	-	13	-	3	7	460		23
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	180		9
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	60		3
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		00%			00%			00%									
'88		00%			00%			00%			+81%						
'95		49%			17%			13%			+ 9%						
'00		26%			05%			13%									
Total Plants/Acre (excluding Dead & Seedlings)											'82	0	Dec:	0%			
											'88	266		25%			
											'95	1380		20%			
											'00	1520		30%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Cercocarpus montanus																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	8	1	-	1	-	-	2	-	-	11	-	1	-	800		12
	95	9	-	-	-	-	-	-	-	-	9	-	-	-	180		9
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
Y	82	6	3	-	-	-	-	-	-	-	9	-	-	-	600		9
	88	23	17	4	1	-	-	-	-	-	39	-	6	-	3000		45
	95	11	22	4	-	2	-	-	-	-	39	-	-	-	780		39
	00	16	14	5	-	-	-	-	-	-	34	1	-	-	700		35
M	82	6	23	3	-	-	-	-	-	-	27	5	-	-	2133	21 27	32
	88	2	11	10	-	-	1	-	-	-	17	-	7	-	1600	30 36	24
	95	6	28	41	2	55	6	-	-	-	138	-	-	-	2760	27 38	138
	00	3	11	24	1	10	70	-	-	-	92	5	22	-	2380	27 39	119
D	82	-	2	-	-	-	-	-	-	-	-	2	-	-	133		2
	88	-	4	2	-	-	-	-	-	-	4	-	2	-	400		6
	95	-	-	2	-	-	-	-	-	-	2	-	-	-	40		2
	00	-	3	4	-	-	2	-	-	-	5	-	2	2	180		9
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'82		65%			07%			00%			+43%						
'88		43%			23%			20%			-28%						
'95		60%			30%			00%			- 9%						
'00		23%			64%			16%									
Total Plants/Acre (excluding Dead & Seedlings)											'82	2866	Dec:	5%			
											'88	5000		8%			
											'95	3580		1%			
											'00	3260		6%			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus depressus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	88	3	-	-	1	-	-	-	-	-	4	-	-	-	266	4	6	
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	7	13	
	00	1	-	2	-	-	-	-	-	-	3	-	-	-	60	7	13	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%			-82%							
'95		00%			00%			00%			+ 0%							
'00		00%			67%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	332		20%			
												'95	60		0%			
												'00	60		0%			
Chrysothamnus nauseosus graveolens																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	00	-	-	-	-	-	3	-	-	-	3	-	-	-	60	-	3	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			100%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	60		-			

A G R E	Y R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus viscidiflorus lanceolatus																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	1	-	-	-	-	-	-	-	-	-	-	-	20			1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	16	-	1	2	-	-	-	-	-	-	-	-	380	14	17	19	
	00	15	1	-	-	-	-	-	-	-	-	-	-	320	14	21	16	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	20			1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			05%			00%			-20%							
'00		06%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	400		-			
												'00	320		-			
Eriogonum corymbosum																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	1	-	-	-	-	-	-	-	-	-	-	-	20	-	-	1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	20		-			
												'00	0		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4		1	2				
<i>Gutierrezia sarothrae</i>												
S	82	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	0		0	
	95	3	-	-	-	-	-	-	60		3	
	00	-	-	-	-	-	-	-	0		0	
M	82	1	-	-	-	-	-	-	66	9	9	1
	88	10	-	-	-	-	1	-	733	8	6	11
	95	19	-	-	-	-	-	-	380	10	11	19
	00	42	-	-	-	-	-	-	840	6	8	42
D	82	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	66			1
	95	1	-	-	-	-	-	-	20			1
	00	2	-	-	-	-	-	-	40			2
X	82	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>			<u>%Change</u>					
'82		00%	00%	00%			+92%					
'88		00%	00%	08%			-50%					
'95		00%	00%	00%			+55%					
'00		00%	00%	00%								
Total Plants/Acre (excluding Dead & Seedlings)					'82	66	Dec:	0%				
					'88	799		8%				
					'95	400		5%				
					'00	880		5%				
<i>Juniperus osteosperma</i>												
Y	82	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	20			1
M	82	1	-	-	-	-	-	-	66	47	39	1
	88	1	-	-	-	-	-	-	66	53	55	1
	95	-	-	-	-	-	-	-	0	-	-	0
	00	1	-	-	-	-	-	-	20	-	-	1
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>			<u>%Change</u>					
'82		00%	00%	00%			+ 0%					
'88		00%	00%	00%								
'95		00%	00%	00%								
'00		00%	00%	00%								
Total Plants/Acre (excluding Dead & Seedlings)					'82	66	Dec:	-				
					'88	66		-				
					'95	0		-				
					'00	40		-				

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total							
		1	2	3	4		1	2								
<i>Opuntia fragilis</i>																
S	82	-	-	-	-	-	-	-	0		0					
	88	21	-	-	1	-	-	1	-	23	-	-	1533		23	
	95	3	-	-	-	-	-	-	-	3	-	-	60		3	
	00	10	-	-	-	-	-	-	-	10	-	-	200		10	
Y	82	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	50	-	-	1	-	-	12	-	63	-	-	4200		63	
	95	29	-	-	-	-	-	-	-	29	-	-	580		29	
	00	14	-	-	-	-	-	-	-	14	-	-	280		14	
M	82	35	-	-	-	-	-	-	-	35	-	-	2333	2	7	35
	88	83	-	-	1	-	-	6	-	83	-	6	6000	2	6	90
	95	243	-	-	-	-	-	-	-	243	-	-	4860	3	8	243
	00	308	1	-	-	-	-	-	-	309	-	-	6180	2	6	309
D	82	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	29	-	-	-	-	-	-	-	18	-	5	1933		29	
	95	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	8	-	-	-	-	-	-	-	6	-	-	160		8	
X	82	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	100		5	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>% Change</u>								
'82		00%		00%		00%		+81%								
'88		00%		00%		10%		-55%								
'95		00%		00%		00%		+18%								
'00		.30%		00%		.60%										
Total Plants/Acre (excluding Dead & Seedlings)										'82	2333	Dec:	0%			
										'88	12133		16%			
										'95	5440		0%			
										'00	6620		2%			
<i>Pediocactus simpsonii</i>																
M	82	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	2	-	-	-	-	-	-	-	2	-	-	40	2	3	2
	00	15	-	-	-	-	-	-	-	15	-	-	300	2	3	15
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>% Change</u>								
'82		00%		00%		00%										
'88		00%		00%		00%										
'95		00%		00%		00%		+87%								
'00		00%		00%		00%										
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-			
										'88	0		-			
										'95	40		-			
										'00	300		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
<i>Pinus edulis</i>																	
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
	'82	00%			00%			00%									
	'88	00%			00%			00%									
	'95	00%			00%			00%									
	'00	00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)											'82	0	Dec:	-			
											'88	66		-			
											'95	0		-			
											'00	20		-			
<i>Purshia tridentata</i>																	
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'95	-	2	-	-	-	-	-	-	-	2	-	-	-	40		2
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-
	'95	1	3	6	2	-	-	-	-	-	12	-	-	-	240	17	31
	'00	1	2	2	-	-	4	-	-	-	9	-	-	-	180	17	40
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
	'82	00%			00%			00%									
	'88	00%			00%			00%									
	'95	36%			43%			00%			-36%						
	'00	22%			67%			00%									
Total Plants/Acre (excluding Dead & Seedlings)											'82	0	Dec:	-			
											'88	0		-			
											'95	280		-			
											'00	180		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4		1	2									
Symphoricarpos oreophilus																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	2	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	15	-	-	-	-	-	-	-	15	-	-	-	1000		15	
	88	11	-	-	1	-	-	1	-	9	-	4	-	866		13	
	95	1	2	-	-	-	-	-	-	3	-	-	-	60		3	
	00	5	1	-	-	-	-	-	-	6	-	-	-	120		6	
M	82	6	-	-	-	-	-	-	-	6	-	-	-	400	7	4	6
	88	1	-	-	1	-	-	2	-	3	-	1	-	266	9	14	4
	95	5	1	2	5	-	-	-	-	13	-	-	-	260	13	26	13
	00	34	-	-	-	-	-	3	-	37	-	-	-	740	8	16	37
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'82		00%			00%			00%			-19%						
'88		00%			00%			29%			-72%						
'95		19%			13%			00%			+63%						
'00		02%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	1400	Dec:	-				
										'88	1132		-				
										'95	320		-				
										'00	860		-				
Tetradymia canescens																	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	1	-	-	-	-	1	-	2	-	-	-	133		2	
	95	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	-	3	1	-	-	-	-	-	1	2	1	-	266	13	14	4
	88	1	-	-	-	-	-	-	-	1	-	-	-	66	7	10	1
	95	-	4	1	1	-	-	-	-	6	-	-	-	120	9	13	6
	00	-	-	-	-	-	-	-	-	-	-	-	-	0	16	17	0
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	1	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	1	1	-	-	-	-	-	2	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'82		75%			25%			25%			-25%						
'88		33%			00%			00%			-20%						
'95		63%			25%			00%			-75%						
'00		50%			50%			00%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	266	Dec:	0%				
										'88	199		0%				
										'95	160		13%				
										'00	40		100%				

Trend Study 9-14-00

Study site name: Red Pine Canyon.

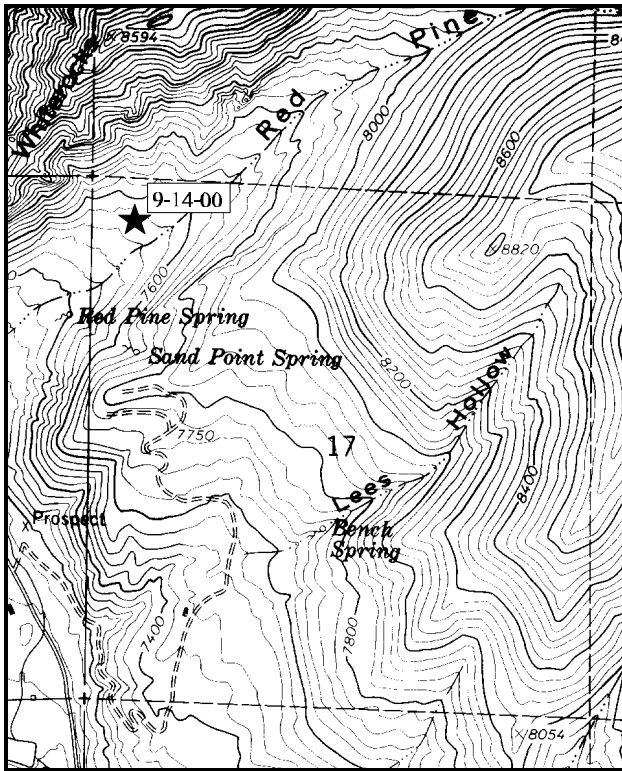
Range type: Mixed Mountain Brush.

Compass bearing: frequency baseline 340°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (10 & 25ft), line 2 (70ft), line 3 (41ft), line 4 (98ft).

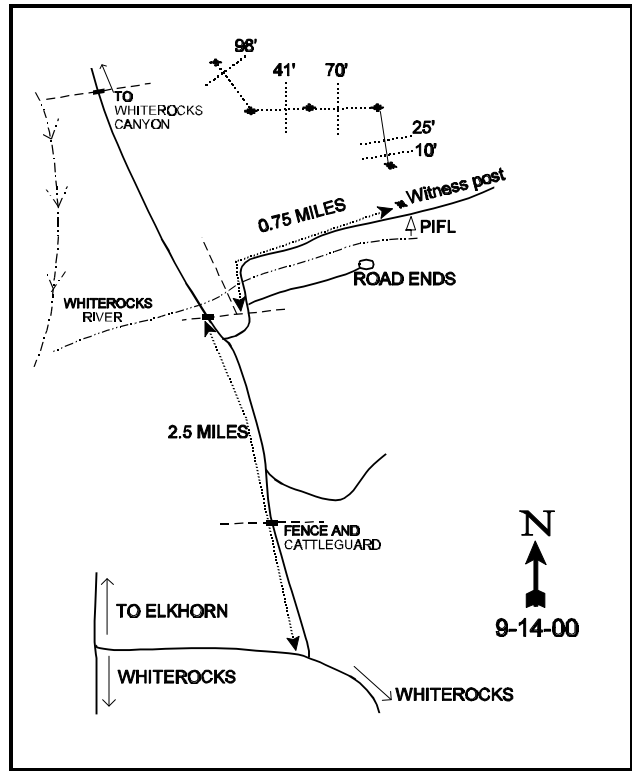
LOCATION DESCRIPTION

From the town of Whiterocks, go east 1.75 miles to a "T" intersection. Turn left and proceed north approximately 4.5 miles to the point where the road makes a sharp bend to the west. Just after the bend, turn north onto the Whiterocks Canyon Road. Proceed approximately 2.6 miles to a dirt road to the east. Turn right, before the cattle guard. Follow the road along the fence, cross the creek then bear right and go up the canyon about 0.75 miles to a witness post on the left side of the road. A lone limber pine is near the witness post on the right side of the road. From the witness post, the 0-foot baseline stake is located 6 paces away at a bearing of 300°M. The 0-foot stake is marked with a browse tag #9038. The frequency baseline stakes are marked by green fenceposts 12-18 inches in height.



Map Name: Ice Cave Peak

Township 2N Range 1W, Section 17



Diagrammatic Sketch

UTM 4492156.525 N, 591955.356 E

DISCUSSION

Trend Study No. 9-14 (12-3)

The Red Pine Canyon study is located in the Whiterocks River drainage on the north side of Red Pine Canyon. The area is within the Ashley National Forest and is considered critical winter range for deer and elk in most years. The study site is on a southerly exposure with a 10% to 12% slope at an elevation of 7,300 feet. Pellet group transect data taken along the baseline in 2000 estimate 33 deer days use/acre (81 ddu/ha), 2 elk days use/acre (5 edu/ha), and 1 cow day use/acre (3 cdu/ha). Rabbit pellets were the most abundant category in the pellet transect. Two deer were observed on the site when it was read in 2000. Thermal and escape cover are abundant with tall trees and shrubs in all directions.

Soils on the site are alluvially derived and not well consolidated in recognizable horizons. Soil texture is a sandy loam and moderately deep with an estimated effective rooting depth of nearly 14 inches. Large boulders and cobbles are present on the surface and throughout the profile. The soil appears highly erodible but currently is in good condition due primarily to abundance of vegetation and litter. Bare ground is low at 5%, with most occurring in open spaces underneath the shrub canopy. A few inactive gullies are present on the site with estimated depths of about 6 feet.

Shrubs dominate the site providing 74% of the vegetation cover. Key browse species include mountain big sagebrush and antelope bitterbrush, with lesser numbers of serviceberry and true mountain mahogany. Mountain big sagebrush averages around 20% cover in 1995 and 2000. It provides nearly half the shrub cover at the site. Density was estimated at 3,199 plants/acre for mountain big sagebrush in 1982, increasing to 4,332 by 1988. With the much larger sample used in 1995, density was estimated at 2,640 plants/acre in 1995 and 2,360 in 2000. The larger sample better estimates shrub densities that are characteristically clumped and/or have discontinuous distributions. Young plants comprised over 30% of the population in 1982 and 1988, but were apparently overestimated with the small sample used in those earlier years. Recruitment is currently ('00) low at 1%. Utilization has generally been light with percent decadency ranging between 8% in 1982 to 19% in 2000. This level is not unreasonable for sagebrush. The proportion of the plants classified with poor vigor is estimated at 8% in both 1995 and 2000. This is an overly mature, dense population that would improve with thinning.

Antelope bitterbrush has an estimated cover of 14% and density of 2,400 plants/acre in 2000. Percent decadency is currently ('00) low at 8% with almost all individuals showing good vigor. Use has steadily decreased on bitterbrush with each reading. Currently ('00), only 14% display heavy use. This level of utilization is relatively low for bitterbrush and is mostly likely due to the abundance of bitterbrush over the site as well as current light use by big game. Although bitterbrush was noted as producing abundant seed in 2000, few seedlings or young were encountered in 1995 or 2000.

True mountain mahogany and serviceberry occur at much lower densities. Currently ('00), they have densities estimated at 380 and 120 plants/acre respectively. Poor vigor has been high on serviceberry the past two readings at 78% ('95) and 50% ('00). Use is moderate on serviceberry and mostly light on mahogany. With only light to moderate use on bitterbrush, mahogany and serviceberry, this site apparently has not been used by very large numbers of big game over the past several winters.

Grasses are only moderately abundant for a mountain brush site and appear to be suppressed by the abundant shrub cover. Perennial grasses sampled include: thickspike wheatgrass, mutton bluegrass, Kentucky bluegrass and needle-and-thread. Perennial grasses combine to provide just 8% average cover in 2000. Sum of nested frequency of perennial grasses did slightly increase in 2000, but still not back up to the level they were in 1988. Cheatgrass is the most abundant grass, but it significantly decreased in nested frequency in 2000 due to drought.

It still provides nearly 7% average cover and will likely increase with normal precipitation patterns in the future. Forbs are very diverse but not very common. On average, they only contribute 2% average cover in 1995 and 2000. The most common useful forbs are silvery lupine and low penstemon. Sum of nested frequency of perennial forbs decreased by nearly half in 2000 with drought. Forbs will likely never be a significant component at this site due to the dominance of the shrub cover.

1982 APPARENT TREND ASSESSMENT

Soil trend appears stable but somewhat unstable. The potential for erosion is high with an herbaceous understory that is not very abundant. However, the abundance of shrub cover helps limit erosion. Vegetative trend also appears stable but could decline if significantly heavier animal use were to be applied. The browse component is healthy with a possibly expanding mountain big sagebrush population. Antelope bitterbrush appears more static, but with adequate vegetative reproduction occurring. Grasses and forbs provide a moderate amount of forage and valuable ground cover, which is essential on this site.

1988 TREND ASSESSMENT

Soil trend is stable with no significant changes in ground cover percentages. The gully through the site is well vegetated and erosion is limited by abundant vegetation and litter cover. The browse trend is stable for the key species, mountain big sagebrush and antelope bitterbrush. Bitterbrush displays more heavy use and increased decadency, but the number of mature plants/acre is similar to that of 1982 and recruitment appears better with an estimated 200 seedlings/acre and 266 young plants/acre. Trend for the herbaceous understory is slightly improved. Quadrat frequency of grasses increased while frequency of forbs remained the same.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly improving (4)

1995 TREND ASSESSMENT

Soil trend remains stable with adequate ground cover from vegetation and litter. The browse trend is stable for mountain big sagebrush and bitterbrush. Density of sagebrush declined overall, but the population of mature plants remains similar. The greatly increased sample size used this year accounts for most of the difference in density between years. Bitterbrush decadence declined from 21% to 3% since 1988, while the proportion of heavily utilized plants also declined. Trend for the herbaceous understory is down likely due to the effects of drought and the dominance of the site by shrubs. Sum of nested frequency of perennial grasses declined by 44% with the frequency of forbs also declining moderately. Cheatgrass is currently the dominate grass on the site.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - down with a high amount of cheatgrass in the understory (1)

2000 TREND ASSESSMENT

Trend for soil is slightly up. Vegetation and litter cover are abundant and well disbursed. The ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil increased from an already high value of 8.3:1 to 10.5:1. Trend for browse is stable. Mountain big sagebrush has a stable, but overly mature population, with percent decadence slightly increasing. Use is mostly light and vigor generally good. Bitterbrush slightly increased in density, but also shows slight increases in those classified with poor vigor and decadency. However, poor vigor and percent decadency are currently low even with these slight increases. Use remains mostly moderate with heavy use at a moderately low 14%. Recruitment is low for both sagebrush and bitterbrush. The shrub component appears to be suppressing the understory and a thinning treatment should be considered. Trend for the herbaceous understory is stable overall. Sum of nested frequency slightly increased for perennial grasses, but decreased for perennial forbs due to drought. Cheatgrass nested frequency significantly decreased due to drought as well, however, it still remains the dominate understory species.

TREND ASSESSMENT

soil - slightly up (4)

browse - stable (3) and needs to be thinned

herbaceous understory - stable overall; slightly up for grasses, down for forbs (3)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 14

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	_b 169	_a 89	_a 87	43	72	43	38	.80	1.19
G	Bouteloua gracilis	7	14	2	7	3	4	2	.36	.03
G	Bromus tectorum (a)	-	_b 208	_a 158	-	-	60	53	8.42	6.80
G	Carex spp.	_a -	_b 18	_a 7	1	-	9	2	.41	.30
G	Poa fendleriana	_a 38	_a 24	_b 97	5	18	10	35	.56	2.86
G	Poa pratensis	38	76	76	1	17	25	24	1.77	2.94
G	Poa secunda	_b 80	_a -	_a -	35	36	-	-	-	-
G	Sitanion hystrix	-	3	-	-	-	1	-	.00	-
G	Sporobolus cryptandrus	_b 11	_a -	_a -	3	4	-	-	-	-
G	Stipa comata	_b 105	_a 27	_a 38	40	51	14	16	.51	.68
Total for Annual Grasses		0	208	158	0	0	60	53	8.42	6.80
Total for Perennial Grasses		448	251	307	135	201	106	117	4.43	8.02
Total for Grasses		448	459	465	135	201	166	170	12.85	14.82
F	Antennaria rosea	3	3	3	1	1	1	1	.15	.15
F	Arabis spp.	15	9	4	4	6	5	3	.02	.04
F	Artemisia ludoviciana	6	6	4	4	4	2	2	.01	.03
F	Castilleja chromosa	-	3	-	-	-	1	-	.00	-
F	Chenopodium leptophyllum (a)	6	15	15	-	3	6	6	.03	.33
F	Comandra pallida	_b 8	_a -	_{ab} 4	-	3	-	2	-	.01

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	<i>Collinsia parviflora</i> (a)	-	_b 21	_a -	-	-	9	-	.07	-
F	<i>Crepis acuminata</i>	-	-	1	-	-	-	1	-	.00
F	<i>Cryptantha</i> spp.	_b 4	_b 16	_a -	11	3	8	-	.09	-
F	<i>Cymopterus</i> spp.	2	3	-	-	1	1	-	.03	-
F	<i>Descurainia pinnata</i> (a)	-	3	3	-	-	1	1	.00	.00
F	<i>Eriogonum racemosum</i>	12	13	6	13	6	6	5	.13	.07
F	<i>Eriogonum umbellatum</i>	_b 5	_a -	_a -	5	3	-	-	-	-
F	<i>Ipomopsis aggregata</i>	-	3	-	-	-	1	-	.15	-
F	<i>Lappula occidentalis</i> (a)	-	_b 4	_a -	-	-	3	-	.01	-
F	<i>Lactuca serriola</i>	-	-	2	-	-	-	1	-	.03
F	<i>Lepidium densiflorum</i> (a)	-	4	-	-	-	2	-	.01	-
F	<i>Lupinus argenteus</i>	10	10	6	7	6	5	3	1.02	.33
F	<i>Microsteris gracilis</i> (a)	-	1	-	-	-	1	-	.00	-
F	<i>Mirabilis linearis</i> var. <i>linearis</i>	_b 13	_a -	_a -	-	7	-	-	-	-
F	<i>Oenothera pallida</i>	_b 42	_a 15	_a 12	-	21	6	7	.05	.11
F	<i>Penstemon humilis</i>	_a -	_b 15	_b 6	-	-	6	3	.37	.04
F	<i>Penstemon</i> spp.	_b 22	_{ab} 9	_a 2	13	11	4	1	.21	.03
F	<i>Phlox longifolia</i>	3	-	2	-	1	-	1	-	.00
F	<i>Polygonum douglasii</i> (a)	-	3	1	-	-	2	1	.01	.00
F	<i>Schoenocrambe linifolia</i>	_a -	_b 8	_a 1	-	-	4	1	.04	.00
F	<i>Senecio integerrimus</i>	_a -	_b 7	_b 8	3	-	3	3	.06	.12
F	<i>Senecio multilobatus</i>	-	3	4	17	-	1	2	.00	.01
F	<i>Sisymbrium altissimum</i> (a)	-	-	2	-	-	-	1	-	.15
F	<i>Tragopogon dubius</i>	-	1	-	-	-	1	-	.00	-
F	Unknown forb-perennial	4	-	-	-	1	-	-	-	-
Total for Annual Forbs		6	51	21	0	3	24	9	0.15	0.48
Total for Perennial Forbs		149	124	65	78	74	55	36	2.37	0.99
Total for Forbs		155	175	86	78	77	79	45	2.52	1.48

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

BROWSE TRENDS --
Herd unit 09 , Study no: 14

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	6	3	.36	.03
B	Artemisia tridentata vaseyana	78	66	21.55	19.42
B	Cercocarpus montanus	11	14	1.89	1.24
B	Chrysothamnus viscidiflorus lanceolatus	11	8	.53	.06
B	Eriogonum heracleoides	6	3	.09	.36
B	Mahonia repens	11	11	.60	.24
B	Opuntia spp.	17	17	.43	.49
B	Pediocactus simpsonii	1	3	-	.03
B	Pinus edulis	-	-	.63	.85
B	Purshia tridentata	59	77	9.26	14.32
B	Sambucus cerulea	4	3	.68	.56
B	Symphoricarpos oreophilus	32	38	5.85	8.13
Total for Browse		236	243	41.90	45.75

CANOPY COVER --
Herd unit 09 , Study no: 14

Species	Percent Cover	
	'95	'00
Pinus edulis	-	1

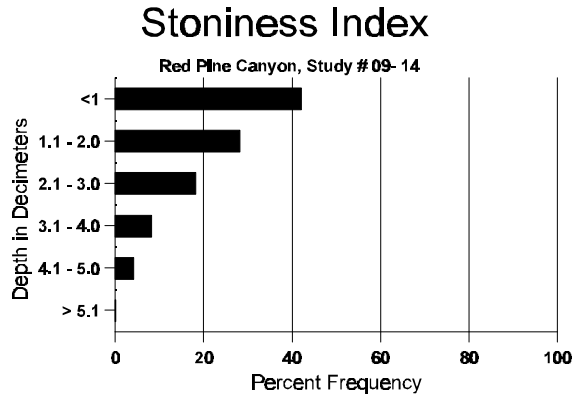
BASIC COVER --
Herd unit 09 , Study no: 14

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	350	333	9.00	6.25	47.95	60.52
Rock	192	143	5.25	9.25	13.94	11.85
Pavement	12	4	0	.25	.03	.03
Litter	392	385	75.25	74.50	59.10	69.05
Cryptogams	27	16	4.00	1.50	.64	.89
Bare Ground	93	70	9.00	8.25	4.92	5.51

SOIL ANALYSIS DATA --

Herd Unit 09, Study # 14, Study Name: Red Pine Canyon

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	%OM	PPM P	PPM K	dS/m
13.81	54.0 (15.91)	6.7	74.9	13.8	11.3	3.2	15.7	80.0	0.6



PELLET GROUP FREQUENCY --

Herd unit 09 , Study no: 14

Type	Quadrat Frequency	
	'95	'00
Rabbit	22	11
Elk	2	1
Deer	20	12
Cattle	1	2
Moose	-	-

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
'00	'00
705	N/A
26	2 (5)
426	33 (81)
17	2 (5)
9	1 (2)

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 14

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier alnifolia																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	2	-	-	1	-	-	-	-	-	-	-	3	-	60		3	
	'00	-	-	-	-	-	-	2	-	-	2	-	-	-	40		2	
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'95	3	-	1	2	-	-	-	-	-	1	1	4	-	120	32	32	
	'00	-	4	-	-	-	-	-	-	-	1	-	3	-	80	42	46	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			11%			78%			-33%							
'00		67%			00%			50%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	180		-			
												'00	120		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	18	-	-	-	-	-	-	-	-	18	-	-	-	1200		18	
	88	17	1	1	2	-	-	-	-	-	21	-	-	-	1400		21	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	82	23	-	-	3	-	-	-	-	-	25	1	-	-	1733	27 32	26	
	88	32	2	-	-	-	-	-	-	-	31	3	-	-	2266	31 32	34	
	95	93	23	-	-	-	-	-	-	-	116	-	-	-	2320	36 48	116	
	00	80	6	-	8	-	-	-	-	-	94	-	-	-	1880	41 42	94	
D	82	3	1	-	-	-	-	-	-	-	2	-	1	1	266		4	
	88	9	1	-	-	-	-	-	-	-	8	-	2	-	666		10	
	95	10	5	-	-	-	-	-	-	-	5	-	-	10	300		15	
	00	17	4	-	2	-	-	-	-	-	14	-	-	9	460		23	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	320		16	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	420		21	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		02%			00%			04%			+26%							
'88		06%			02%			03%			-39%							
'95		21%			00%			08%			-11%							
'00		08%			00%			08%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	3199	Dec:	8%			
												'88	4332		15%			
												'95	2640		11%			
												'00	2360		19%			

A G R E	Y R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cercocarpus montanus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	1	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	2	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
M	82	1	1	1	-	-	-	-	-	-	3	-	-	-	200	35	31	3
	88	-	1	1	-	-	-	-	-	-	2	-	-	-	133	47	39	2
	95	5	4	1	-	-	-	-	-	-	10	-	-	-	200	36	39	10
	00	13	-	1	-	1	-	-	-	-	15	-	-	-	300	48	46	15
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	1	1	-	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		33%			33%			00%			- 1%							
'88		67%			33%			00%			+29%							
'95		50%			14%			00%			+26%							
'00		05%			05%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	200	Dec:	0%				
											'88	199		0%				
											'95	280		14%				
											'00	380		0%				
Chrysothamnus viscidiflorus lanceolatus																		
M	82	2	-	-	-	-	-	-	-	-	2	-	-	-	133	14	17	2
	88	-	-	-	1	-	-	-	-	-	1	-	-	-	66	20	7	1
	95	9	-	-	2	-	-	-	-	-	11	-	-	-	220	21	25	11
	00	4	-	1	4	-	-	-	-	-	9	-	-	-	180	19	17	9
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	1	-	-	-	-	-	-	-	1	-	1	-	133		2	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+33%							
'88		33%			00%			33%			+10%							
'95		00%			00%			00%			-18%							
'00		00%			11%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	133	Dec:	0%				
											'88	199		67%				
											'95	220		0%				
											'00	180		0%				

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4		1	2				
Eriogonum heracleoides												
M	'82	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	0	-	-	0
	'95	6	-	-	3	-	-	-	180	11	10	9
	'00	1	-	-	4	-	-	-	100	3	10	5
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>% Change</u>			
	'82	00%			00%		00%					
	'88	00%			00%		00%					
	'95	00%			00%		00%		-44%			
	'00	00%			00%		00%					
Total Plants/Acre (excluding Dead & Seedlings)							'82	0	Dec:			-
							'88	0				-
							'95	180				-
							'00	100				-
Mahonia repens												
Y	'82	100	-	-	-	-	-	-	100	-	-	100
	'88	145	56	-	-	-	-	-	201	-	-	201
	'95	7	-	-	-	-	-	-	7	-	-	7
	'00	-	-	-	-	-	-	-	0	-	-	0
M	'82	212	-	-	-	-	-	-	212	-	-	212
	'88	54	149	-	-	-	124	-	320	7	-	327
	'95	42	-	-	11	-	-	-	53	-	-	53
	'00	43	-	-	6	-	-	-	49	-	-	49
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>% Change</u>			
	'82	00%			00%		00%		+41%			
	'88	39%			00%		00%		-97%			
	'95	00%			00%		00%		-18%			
	'00	00%			00%		00%					
Total Plants/Acre (excluding Dead & Seedlings)							'82	20799	Dec:			-
							'88	35200				-
							'95	1200				-
							'00	980				-

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Opuntia spp.																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333			5
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	1	-	-	4	-	-	-	-	-	5	-	-	-	100			5
M	82	8	-	-	-	-	-	-	-	-	8	-	-	-	533	2	5	8
	88	6	-	-	1	-	-	-	-	-	7	-	-	-	466	4	7	7
	95	26	-	-	2	-	-	-	-	-	28	-	-	-	560	4	17	28
	00	23	-	-	-	-	-	2	-	-	25	-	-	-	500	4	13	25
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+33%							
'88		00%			00%			00%			-25%							
'95		00%			00%			00%			+ 0%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	533	Dec:	-				
											'88	799		-				
											'95	600		-				
											'00	600		-				
Pediocactus simpsonii																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	5	6	1
	00	2	-	-	1	-	-	-	-	-	3	-	-	-	60	2	2	3
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			+67%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	0	Dec:	-				
											'88	0		-				
											'95	20		-				
											'00	60		-				

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Purshia tridentata																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	2	-	-	-	-	-	1	-	-	3	-	-	-	200		3	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	88	-	1	-	3	-	-	-	-	-	4	-	-	-	266		4	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	3	-	-	-	-	-	-	-	-	2	-	1	-	60		3	
M	82	6	12	2	1	-	-	-	-	-	17	1	3	-	1400	31	38	21
	88	1	6	8	-	-	-	-	-	-	14	-	1	-	1000	29	35	15
	95	49	18	6	11	6	-	-	-	-	90	-	-	-	1800	25	44	90
	00	45	27	17	13	1	-	5	-	-	104	-	4	-	2160	29	45	108
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	4	1	-	-	-	-	-	-	5	-	-	-	333		5	
	95	1	-	-	1	1	-	-	-	-	-	-	-	3	60		3	
	00	4	3	-	2	-	-	-	-	-	7	-	-	2	180		9	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	100		5	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		55%			09%			14%			+ 8%							
'88		46%			38%			04%			+14%							
'95		27%			06%			03%			+23%							
'00		26%			14%			06%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	1466	Dec:	0%			
												'88	1599		21%			
												'95	1860		3%			
												'00	2400		8%			
Sambucus cerulea																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	5	-	-	-	-	-	2	-	-	7	-	-	-	140	48	46	7
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80	66	28	4
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			-29%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	140		-			
												'00	100		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	5	-	-	1	-	-	-	-	-	6	-	-	-	400		6	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	8	1	2	-	-	-	-	-	-	10	-	1	-	733		11	
	95	12	-	-	-	-	-	-	-	-	12	-	-	-	240		12	
	00	4	-	-	1	-	-	-	-	-	5	-	-	-	100		5	
M	82	3	3	-	-	-	-	-	-	-	6	-	-	-	400	14 23	6	
	88	3	-	1	-	-	-	-	-	-	4	-	-	-	266	15 19	4	
	95	53	1	-	15	-	-	-	-	-	69	-	-	-	1380	27 57	69	
	00	57	-	-	9	-	-	5	-	-	68	-	3	-	1420	24 48	71	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		50%			00%			00%			+60%							
'88		07%			20%			07%			+38%							
'95		01%			00%			00%			- 6%							
'00		00%			00%			04%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	400	Dec:	-			
												'88	999		-			
												'95	1620		-			
												'00	1520		-			

Trend Study 9-15-00

Study site name: Mud Springs Draw .

Range type: Mixed Mountain Brush .

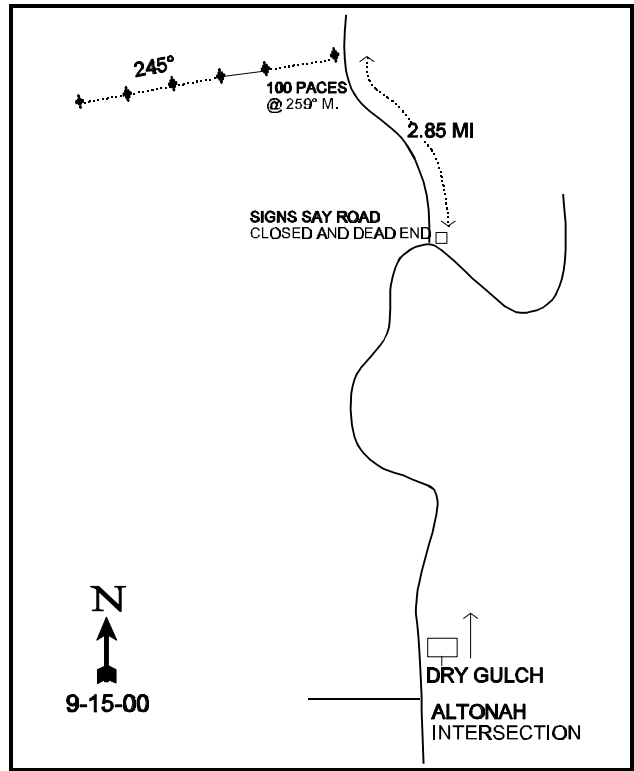
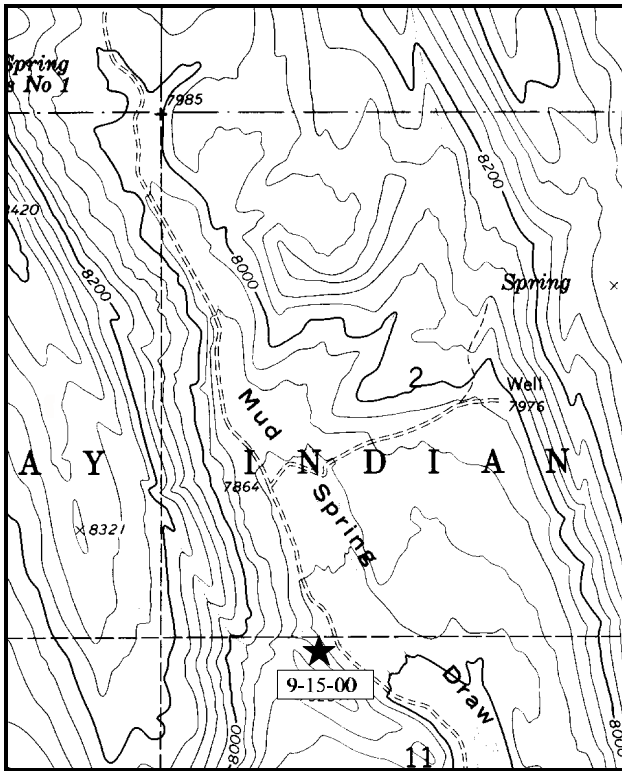
Compass bearing: frequency baseline 328°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (7 & 96ft), line 2 (32ft), line 3 (50ft), line 4 (79ft).

LOCATION DESCRIPTION

From the town of Altonah, proceed north for 2.0 miles to an intersection. Take the road which runs to the northwest for 2.65 miles until you come to another intersection. Go straight through the intersection and go up Mud Spring Draw for 2.85 miles to a red stake on the left side of the road. From the stake, the 0-foot baseline stake is 125 paces away at a bearing of 252°M. The frequency baseline stakes are marked by green steel fenceposts cut to 12-18" in height.

**Roads closed onto the reservation from the south and north.



Map Name: Burnt Mill Springs

Diagrammatic Sketch

Township 1N , Range 4W , Section 11

UTM 4483993 N, 558392 E

DISCUSSION

Trend Study No. 9-15 (12-4)

*** This study was not read in 2000 and will be discontinued due to road closures. Only text is included here. For maps and data tables refer to the 1995 Big Game Range Trend Studies report.

The Mud Spring Draw study is located within the Ute Indian Reservation in Mud Spring Draw at approximately 7,000 feet elevation. Cattle grazing and winter use by big game are the principal resource values. The range type is mixed mountain brush with a westerly aspect and a 50% slope.

Soils are rocky and moderately shallow with numerous large rocks on the surface. Vegetation and litter cover are abundant and adequately protect the soil from erosion.

The key preferred browse species is true mountain mahogany which accounts for 50% of the browse cover on the site. Population density has remained somewhat similar in 1982 and 1995, with a notable increase in 1988 due mostly to an increase in the number of young (69% of population was classified as young). This portion of the population can easily be lost when experiencing prolonged drought. Percent decadence is low and vigor generally good. Utilization is light to moderate with heavier use reported in 1988.

Other important secondary species include: serviceberry, mountain big sagebrush, antelope bitterbrush and snowberry. Together these species contribute to 26% of the browse cover. Serviceberry, mountain big sagebrush, and bitterbrush number from 500 to 600 plants/acre. They exhibit moderate to heavy hedging. Sagebrush displays a slightly increased decadency from 1988 (36%, but still quite high) and heavy use. Dead plants number 460 plants/acre which means that almost 50% are dead.

Grasses and forbs are diverse and quite abundant. They provide a total cover of 9%, while forbs account for 12% cover. Bluebunch wheatgrass, slender wheatgrass, Carex, and mutton bluegrass are the most abundant grass species. Annual forbs dominate the forb component with 8 species accounting for 68% of the forb cover. Common perennial species include: hooker balsamroot, sulfur eriogonum and silvery lupine.

1982 APPARENT TREND ASSESSMENT

Current soil condition is fair with an apparent stable to perhaps slightly downward trend. In spite of good vegetative and litter cover, some soil loss is occurring. Slope steepness (50%) is undoubtedly a major contributing factor. Vegetative conditions look good for trend, from a big game winter range standpoint, it appears stable to improving. The condition of the key browse species is especially encouraging.

1988 TREND ASSESSMENT

The soil trend on this site is improving due to the accumulation of litter and minimal evidence of soil movement. Slightly less bare soil was measured in 1988 due to increases in the percentage of basal vegetative cover. The key browse species, true mountain mahogany, continues on an upward trend. It was rated in excellent condition. Individuals were moderately hedged, in good vigor, with few decadent shrubs. Browsing appears to have increased over the years, but it is still well within acceptable levels. Although frequency of the several valuable browse species was unchanged, density of the mountain mahogany, serviceberry and big sagebrush increased. These shrubs also have healthy populations of young plants. In 1988, these species were classified as 16% heavily hedged, 53% moderately hedged and the remainder only lightly used. Trend for the herbaceous understory is improving with significant increases in quadrat frequency for grasses and forbs.

TREND ASSESSMENT

soil - improved (4)

browse - slightly up for key species (4)

herbaceous understory - up (5)

1995 TREND ASSESSMENT

Soil conditions continue to improve. Litter cover declined from 72% to 57%, likely due to prolonged drought, but percent bare ground declined to only 4%. Trend for the key browse species is slightly improved since 1988. Less seedling and young plants were encountered in 1995, but the number of mature plants has remained stable since 1982. It appears that some mature plants might have been classified as young in 1988 resulting in a lower population density for mature plants and an inflated estimate of young plants. Currently, percent decadence is low, vigor is good, and utilization is moderate. Trend for the herbaceous understory is slightly down for grasses, but improved for forbs. Overall the trend appears stable.

TREND ASSESSMENT

soil - up slightly (4)

browse - slightly improved (4)

herbaceous understory - stable (3)

Trend Study 9-16-00

Study site name: Mosby Mountain .

Range type: Big Sagebrush-Grass .

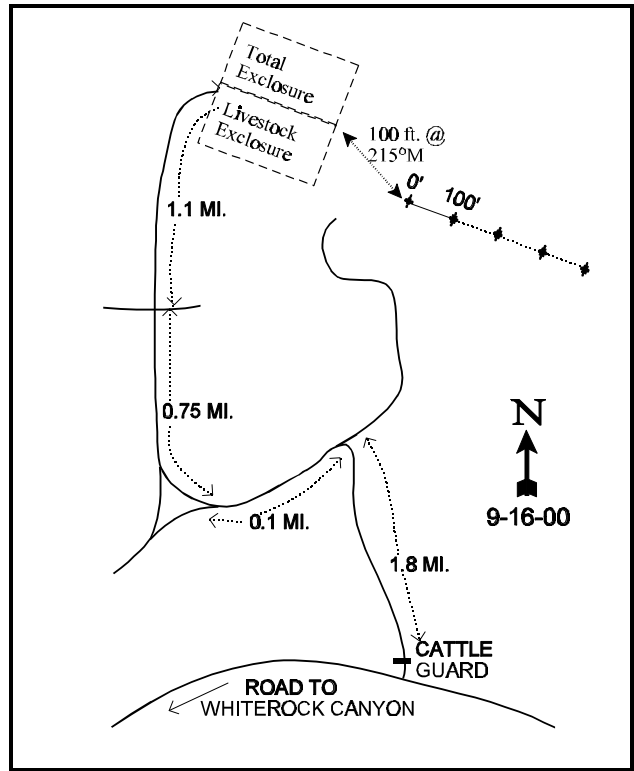
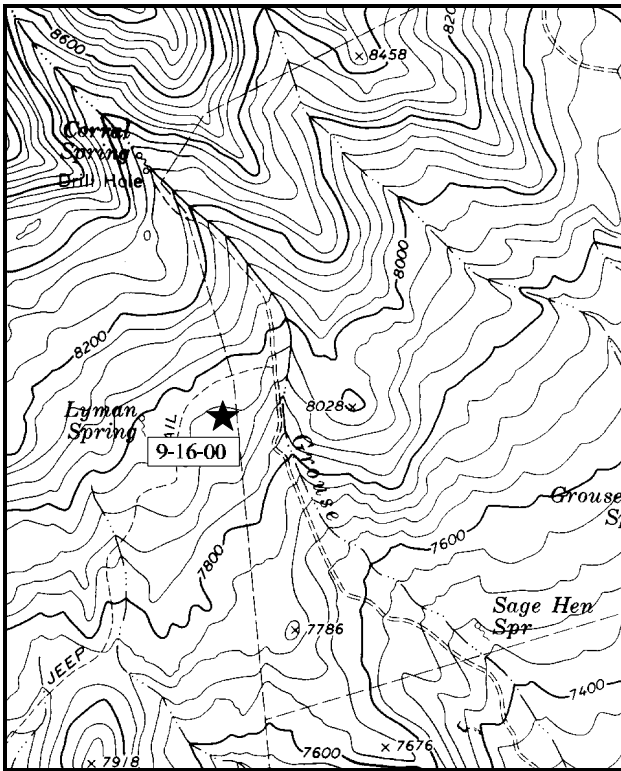
Compass bearing: frequency baseline 155°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 96ft), line 2 (30ft), line 3 (50ft), line 4 (72ft).

LOCATION DESCRIPTION

From the town of Whiterocks, go east for approximately 1.75 miles to a "T" in the road. Turn left (north) and go 3.5 miles to an intersection where 2 roads fork off to the right Turn right then take the left fork. Head north for approximately 4.0 miles to the Mosby Mountain Exclosure. The 0-foot baseline stake is located 12 paces from the southwest corner of the big game exclosure bearing 210°M.

This site may also be accessed from the east by traveling north through Tridell on 8000 E. Go though the reservation then west to Mosby Mountain.



Map Name: Lake Mountain

Diagrammatic Sketch

Township 3S, Range 18E, Section 14

UTM 4490403.305 N, 595962.705 E

DISCUSSION

Trend Study No. 9-16 (12-5)

The Mosby Mountain study samples a sagebrush-grass type with scattered serviceberry and bitterbrush at an elevation of about 7,900 feet. Slope varies from 8-10% and a southerly aspect. The relatively high elevation may limit or prohibit big game use during severe winters. The study site is in close proximity to the Mosby Mountain big game exclosure and pellet group transect. Soon after the reading of this study in August 1988, the area was burned by a wildfire. During the 1995 reading, it was noted that belts 1 and 5 from the original baseline were not burned while belts 2, 3, and 4 were burned. As a result, most of the shrubs on the burned belts were eliminated. Past and present cattle use is heavy with cattle still on the site during the 1995 and 2000 readings. Pellet group transect data taken along the baseline in 2000 estimate light use by big game and slightly higher use by livestock. Deer use was estimated at 9 days use/acre (22 ddu/ha) and elk use was estimated at 20 days use/acre (50 edu/ha). Livestock use was estimated at 36 days use/acre (89 cdu/ha).

Soil on the site is relatively shallow and rocky with deeper soil further down slope. Effective rooting depth is estimated at just over 9 inches. Soils are loam to sandy clay loam in texture and are fairly high in organic matter (4.5%). Soil reactivity is slightly acidic (pH of 6.4). On nearby steeper slopes, noticeable soil movement was reported in 1988. Bare ground is moderate at about 21% in 2000, but abundant herbaceous vegetation and litter cover keep erosion at minimal levels.

Browse on the site are scattered and accounted for an estimated 8% average cover in 1995, increasing to 11% by 2000. The most abundant shrub in both cover and density is mountain big sagebrush. Density has varied between readings for several reasons, including the burn following the 1988 reading, and the much larger sample size utilized for the northeast region beginning in 1995. The 1988 burn was spotty over the study site with many sagebrush surviving. Mountain big sagebrush density is currently ('00) estimated at 1,900 plants/acre with light to moderate use and mostly good vigor. Percent decadency increased from 8% in 1995 to 14% in 2000. Recruitment is good at 12% (220 plants/acre). It appears to be adequate to replace the decadent plants classified as dying in the population (80 plants/acre).

Secondary browse species consist of serviceberry and bitterbrush. Total density of serviceberry declined from 1,265 plants/acre in 1988 to 400 by 2000, while bitterbrush declined from about 600 plants/acre in 1988 to 300 in 2000. Changes in density could be due to the burn or the increased sample size used beginning in 1995, or possibly both. Serviceberry shows moderate to heavy use in all readings. Currently ('00), 50% of the serviceberry display moderate use, with an additional 25% showing heavy use. No decadent plants were sampled in 2000, and vigor is good. A positive trend for serviceberry is the high level of recruitment in 2000 at 20%. Bitterbrush display moderate use on 60% of the population and heavy use on 27% of the population in 2000. Vigor is also good throughout the bitterbrush population with no decadent plants sampled in 2000. Bitterbrush on the site have a prostrate growth form and currently average 1 foot in height with a 3 ½ foot crown. When the site was read in 2000, it was noted that some shrubs of different species have been heavily browsed to the ground. As deer and elk pellet groups are not abundant, this is probably due to cattle use especially during the extended drought during the past decade.

The herbaceous understory is quite diverse and accounts for 75% of the total vegetative cover on the site. Grasses provided about 17% cover in 1995, half of which came from thickspike wheatgrass. In 2000, cover from grasses increased to almost 23%, with thickspike again providing half of this. Nested frequency of thickspike significantly decreased in 2000. Mutton bluegrass is also abundant providing nearly 5% average cover in 2000 and significantly increasing in nested frequency. Other perennial species include: Kentucky bluegrass, Sandberg bluegrass, needle-and-thread, squirreltail and Letterman needlegrass. Some grasses had been heavily utilized when the site was read in 2000. As a group, perennial grasses slightly decreased in sum of

nested frequency in 2000. Cheatgrass, which was moderately abundant in 1995, was not sampled in 2000 due to drought. Forbs are diverse and provide over 11% average cover in 2000. Although average forb cover increased in 2000, sum of nested frequency for perennial species decreased. Annual forbs were abundant in 1995 with the wet spring of that year, but nearly disappeared from the site in 2000 with drought. Many of the forb species are weedy increasers. The most common perennial species include: hooker balsamroot, trailing fleabane, pussytoes and aster.

1982 APPARENT TREND ASSESSMENT

Within the immediate area of the study site, soil trend appears stable to declining. On nearby steeper sites, the trend would be more downward. Vegetative condition is below optimum. Browse density, especially of the more preferred species, is substandard. Animal use is almost certainly one of the more causative factors. Many increaser species of all vegetative classes are present and may be expanding. Range trend appears to be slightly downward.

1988 TREND ASSESSMENT

The soil trend appears fairly stable. Percent bare ground increased slightly, while percent litter cover declined. However, basal vegetative cover increased from 7% to 13%. Mountain big sagebrush has increased in density due to a significant increase in the number of seedlings and young plants. Percent decadence increased from 5% to 28%, but vigor is generally good. The majority of the sagebrush is lightly hedged so this increase in decadency is more a reflection of the age of the stand in conjunction with drought. The more preferred serviceberry and bitterbrush show improved recruitment, but serviceberry displays heavy use on 100% of the mature plants with an increased rate of decadency. Overall trend for browse is stable. Trend for the herbaceous understory is significantly improved. Quadrat frequency of grasses and forbs nearly doubled since 1982. Quadrat frequency of thickspike wheatgrass and mutton grass increased from 52% and 53% respectively to 92% and 95%.

TREND ASSESSMENT

soil - stable (3)

browse - stable for key species with improved recruitment (3)

herbaceous understory - up (5)

1995 TREND ASSESSMENT

Trend for soil is slightly up with a good stand of rhizomatous grasses to help prevent erosion. The fire that burned the site in 1988 reduced the density of the shrubs, but did not eliminate them. The remaining stand of mountain big sagebrush and serviceberry, though smaller, are healthier with less decadence. Use is still heavy yet vigor is good. Trend is stable. Trend for the herbaceous understory is slightly down. Sum nested frequency of perennial grasses and perennial forbs has declined since 1988.

TREND ASSESSMENT

soil - slightly up (4)

browse - stable for key species (3)

herbaceous understory - slightly down for perennial species (2)

2000 TREND ASSESSMENT

Trend for soil is slightly up. Erosion remains minimal as herbaceous vegetation is abundant. The ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil increased from 2.7:1 to 3.3:1 in 2000.

This ratio indicates high nested frequency values for vegetation and litter and well disbursed protective ground cover over the site. Trend for browse is stable. Mountain big sagebrush has good recruitment at 12%, mostly good vigor and moderate decadence at 14%. Use is light to moderate. Serviceberry have high recruitment at 20%, no decadency and good vigor. Bitterbrush displays good vigor and no decadence. Use is moderate to heavy on both serviceberry and bitterbrush. However, these species can tolerate higher levels of use and don't appear to be negatively affected at the present time. Trend for the herbaceous understory is slightly down as sum of nested frequency for both perennial grasses and forbs slightly decreased in 2000.

TREND ASSESSMENT

soil - slightly up (4)

browse - stable (3)

herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 16

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	_b 260	_b 266	_a 211	52	92	85	68	8.28	11.19
G	Bromus tectorum (a)	-	_b 115	_a -	-	-	37	-	1.28	-
G	Poa fendleriana	_c 277	_a 149	_b 200	53	95	59	66	2.87	4.78
G	Poa pratensis	_a 4	_c 105	_b 42	-	2	39	15	1.05	1.29
G	Poa secunda	_b 182	_a 33	_a 30	53	72	13	14	.31	.58
G	Sitanion hystrix	_a 16	_a 19	_b 58	6	10	9	23	.09	1.87
G	Stipa comata	_a 21	_a 63	_b 70	2	12	27	27	1.77	2.75
G	Stipa lettermani	_b 53	_b 58	_a 7	20	22	24	3	.84	.30
Total for Annual Grasses		0	115	0	0	0	37	0	1.28	0
Total for Perennial Grasses		813	693	618	186	305	256	216	15.22	22.78
Total for Grasses		813	808	618	186	305	293	216	16.51	22.78
F	Agoseris glauca	-	3	-	4	-	1	-	.00	-
F	Allium spp.	_a 3	_b 60	_a -	5	2	30	-	.15	-
F	Antennaria rosea	_b 61	_a 31	_{ab} 56	10	26	12	22	.93	3.15
F	Arabis spp.	_c 60	_b 12	_a -	5	32	6	-	.03	-
F	Artemisia ludoviciana	-	-	-	-	-	-	-	-	.00
F	Astragalus purshii	_c 28	_b 7	_a -	6	9	3	-	.06	-
F	Aster spp.	68	65	75	34	26	29	30	.95	1.70
F	Astragalus spp.	19	2	3	1	6	1	2	.00	.01
F	Balsamorhiza hookeri	_c 157	_b 104	_a 60	24	69	45	28	1.15	2.28
F	Camelina microcarpa (a)	-	_b 7	_a -	-	-	4	-	.02	-
F	Calochortus nuttallii	3	-	-	-	1	-	-	-	-
F	Collomia linearis (a)	-	_b 75	_a -	-	-	33	-	.24	-

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	<i>Comandra pallida</i>	-	-	3	-	-	-	2	-	.15
F	<i>Collinsia parviflora</i> (a)	-	_b 60	_a 9	-	-	25	4	.27	.02
F	<i>Crepis acuminata</i>	_a -	_b 18	_a -	-	-	9	-	.07	-
F	<i>Cryptantha</i> spp.	-	1	-	-	-	1	-	.00	-
F	<i>Cymopterus</i> spp.	-	3	3	-	-	1	1	.00	.00
F	<i>Descurainia pinnata</i> (a)	_b 23	_b 27	_a 2	-	11	15	1	.10	.00
F	<i>Eriogonum alatum</i>	_b 122	_a 3	_a 11	4	47	3	4	.01	.24
F	<i>Erigeron flagellaris</i>	_a 19	_a 30	_b 92	11	9	13	38	.09	2.88
F	<i>Eriogonum umbellatum</i>	_b 6	_{ab} 1	_a -	4	4	1	-	.03	-
F	<i>Heterotheca villosa</i>	_a -	_b 13	_b 12	-	-	6	7	.20	.16
F	<i>Lappula occidentalis</i> (a)	-	1	-	-	-	1	-	.00	-
F	<i>Lactuca serriola</i>	_a -	_b 5	_a -	-	-	3	-	.01	-
F	<i>Lepidium densiflorum</i> (a)	-	_b 92	_a -	-	-	45	-	.25	-
F	<i>Lithospermum ruderales</i>	8	15	7	-	4	8	5	.41	.08
F	<i>Lupinus argenteus</i>	_{ab} 17	_a 3	_b 23	8	9	2	11	.06	.35
F	<i>Microsteris gracilis</i> (a)	-	4	-	-	-	2	-	.01	-
F	<i>Penstemon</i> spp.	15	8	9	3	10	3	5	.01	.10
F	<i>Phlox longifolia</i>	_b 24	_{ab} 16	_a 2	-	11	7	1	.03	.00
F	<i>Polygonum douglasii</i> (a)	-	_b 177	_a 4	15	-	65	1	1.08	.00
F	<i>Potentilla gracilis</i>	-	1	2	-	-	1	1	.00	.15
F	<i>Sedum lanceolatum</i>	5	1	-	1	2	1	-	.00	-
F	<i>Senecio multilobatus</i>	-	-	1	-	-	-	1	-	.00
F	<i>Sphaeralcea coccinea</i>	_{ab} 13	_b 19	_a 3	8	6	8	2	.11	.06
F	<i>Taraxacum officinale</i>	_a -	_c 28	_b 6	-	-	13	3	.16	.06
F	<i>Tragopogon dubius</i>	10	6	5	-	8	3	3	.04	.04
Total for Annual Forbs		23	443	15	15	11	190	6	1.98	0.02
Total for Perennial Forbs		638	455	373	128	281	210	166	4.59	11.47
Total for Forbs		661	898	388	143	292	400	172	6.57	11.50

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

BROWSE TRENDS --
Herd unit 09 , Study no: 16

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	22	19	1.81	2.75
B	Artemisia tridentata vaseyana	41	43	3.40	4.54
B	Ceanothus fendleri	7	7	1.92	2.12
B	Chrysothamnus nauseosus graveolens	0	1	-	-
B	Chrysothamnus viscidiflorus lanceolatus	4	3	.18	.03
B	Eriogonum heracleoides	12	6	.56	.30
B	Gutierrezia sarothrae	3	7	-	.15
B	Opuntia spp.	6	5	-	.03
B	Purshia tridentata	10	12	.03	1.00
B	Symphoricarpos oreophilus	6	6	.06	.15
Total for Browse		111	109	7.98	11.09

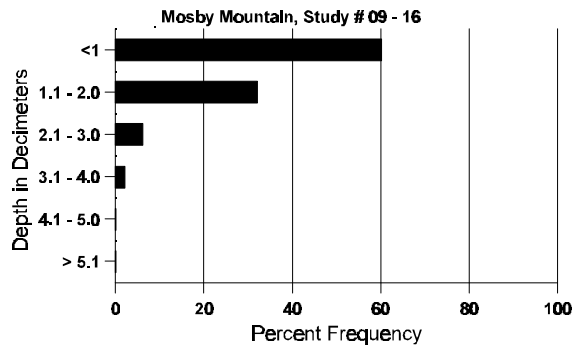
BASIC COVER --
Herd unit 09 , Study no: 16

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	369	365	7.00	13.00	39.93	49.49
Rock	193	102	.25	2.50	6.85	7.48
Pavement	94	60	.50	1.00	.23	.60
Litter	395	392	72.00	56.50	49.51	50.47
Cryptogams	2	23	.75	5.25	.00	.46
Bare Ground	282	234	19.50	21.75	14.68	20.87

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 16, Study Name: Mosby Mountain

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
9.29	59.2 (10.00)	6.4	50.9	28.8	20.3	4.5	27.8	316.8	1.4

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 09 , Study no: 16

Type	Quadrat Frequency	
	'95	'00
Rabbit	3	-
Horse	1	-
Elk	21	13
Deer	16	12
Cattle	24	7

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
'00	'00
174	N/A
-	-
261	20 (50)
122	9 (22)
426	36 (88)

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 16

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier alnifolia																		
S	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	'95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	'82	-	4	-	-	-	-	-	-	-	1	3	-	-	266		4	
	'88	8	1	-	-	-	-	1	-	-	9	-	1	-	666		10	
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	'00	1	1	-	1	-	-	1	-	-	4	-	-	-	80		4	
M	'82	-	2	10	-	-	-	-	-	-	-	11	1	-	800	23 25	12	
	'88	-	-	5	-	-	-	-	-	-	5	-	-	-	333	35 37	5	
	'95	2	8	9	2	-	-	-	-	-	21	-	-	-	420	23 34	21	
	'00	2	6	2	-	3	3	-	-	-	16	-	-	-	320	31 43	16	
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	3	1	-	-	-	-	-	-	4	-	-	-	266		4	
	'95	-	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	80		4	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		38%			63%			06%			+16%							
'88		21%			32%			05%			-64%							
'95		39%			39%			00%			-13%							
'00		50%			25%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	1066	Dec:	0%			
												'88	1265		21%			
												'95	460		4%			
												'00	400		0%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total				
		1	2	3	4		1	2					
<i>Artemisia tridentata vaseyana</i>													
S	82	-	-	-	-	-	-	-	0		0		
	88	2	-	-	-	-	-	-	133		2		
	95	3	-	-	-	-	-	-	60		3		
	00	-	-	-	-	-	-	-	0		0		
Y	82	6	-	-	-	-	-	-	400		6		
	88	10	-	-	-	-	-	-	666		10		
	95	4	2	-	-	-	-	-	120		6		
	00	11	-	-	-	-	-	-	220		11		
M	82	34	2	-	-	-	-	-	2400	16	21	36	
	88	19	9	-	1	-	-	-	1933	25	29	29	
	95	11	41	16	-	-	-	-	1360	14	21	68	
	00	50	21	-	-	-	-	-	1420	13	23	71	
D	82	1	1	-	-	-	-	-	133			2	
	88	13	1	-	1	-	-	-	1000			15	
	95	-	6	-	-	-	-	-	120			6	
	00	7	6	-	-	-	-	-	260			13	
X	82	-	-	-	-	-	-	-	0			0	
	88	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	220			11	
	00	-	-	-	-	-	-	-	120			6	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>% Change</u>					
'82		07%		00%		00%		+19%					
'88		19%		00%		02%		-56%					
'95		61%		20%		00%		+16%					
'00		28%		00%		04%							
Total Plants/Acre (excluding Dead & Seedlings)										'82	2933	Dec:	5%
										'88	3599		28%
										'95	1600		8%
										'00	1900		14%
<i>Ceanothus fendleri</i>													
M	82	-	-	-	-	-	-	-	0	-	-	0	
	88	-	-	-	-	-	-	-	0	-	-	0	
	95	13	-	-	-	-	-	-	260	9	54	13	
	00	10	-	-	-	-	-	-	200	11	67	10	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>% Change</u>					
'82		00%		00%		00%							
'88		00%		00%		00%							
'95		00%		00%		00%		-23%					
'00		00%		00%		00%							
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-
										'88	0		-
										'95	260		-
										'00	200		-

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4		1	2				
Chrysothamnus nauseosus graveolens												
M	82	1	-	-	-	-	-	-	1	19	15	1
	88	-	-	1	-	-	-	-	-	29	9	1
	95	-	-	-	-	-	-	-	-	13	11	0
	00	1	-	-	-	-	-	-	1	15	19	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>		<u>% Change</u>		
	'82	00%			00%			00%		+ 0%		
	'88	00%			00%			100%				
	'95	00%			00%			00%				
	'00	00%			00%			00%				
Total Plants/Acre (excluding Dead & Seedlings)									'82	66	Dec:	-
									'88	66		-
									'95	0		-
									'00	20		-
Chrysothamnus viscidiflorus lanceolatus												
Y	82	2	-	-	-	-	-	-	2			2
	88	4	-	-	-	-	-	-	1	-	3	4
	95	-	-	-	-	-	-	-	-	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	0
M	82	4	-	-	-	-	-	-	4	-	-	4
	88	6	-	-	-	-	-	-	3	-	3	6
	95	3	-	1	-	-	-	-	4	-	-	4
	00	3	-	-	-	-	-	-	3	-	-	3
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>		<u>% Change</u>		
	'82	00%			00%			00%		+40%		
	'88	00%			00%			60%		-88%		
	'95	00%			25%			00%		-25%		
	'00	00%			00%			00%				
Total Plants/Acre (excluding Dead & Seedlings)									'82	399	Dec:	-
									'88	666		-
									'95	80		-
									'00	60		-

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Eriogonum heracleoides																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	9	-	-	-	-	-	-	-	-	9	-	-	-	180		9	
	'00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'95	18	-	-	-	-	-	-	-	-	18	-	-	-	360	5 16	18	
	'00	7	-	-	-	-	-	-	-	-	7	-	-	-	140	4 11	7	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			-59%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	540		-			
												'00	220		-			
Eriogonum microthecum																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'88	2	1	-	-	-	-	-	-	-	3	-	-	-	200	4 7	3	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		25%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	266		-			
												'95	0		-			
												'00	0		-			

A G R E	Y R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	6	-	-	-	-	-	-	-	-	6	-	-	-	120	9	12	
	00	15	-	-	-	-	-	-	-	-	15	-	-	-	300	7	8	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			+63%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	0	Dec:	-				
											'88	0		-				
											'95	120		-				
											'00	320		-				
Opuntia spp.																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	-	-	1	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	4	-	-	-	-	-	-	-	-	2	-	2	-	266		4	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	82	2	-	-	-	-	-	-	-	-	2	-	-	-	133	1	12	
	88	6	-	-	-	-	-	-	-	-	6	-	-	-	400	4	9	
	95	7	-	-	-	-	-	-	-	-	5	-	2	-	140	3	14	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	2	12	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	6	-	-	-	-	-	-	-	-	5	-	-	1	120		6	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+80%							
'88		00%			00%			20%			-79%							
'95		00%			00%			29%			+30%							
'00		00%			00%			10%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	133	Dec:	0%				
											'88	666		0%				
											'95	140		0%				
											'00	200		60%				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Purshia tridentata																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	3	1	-	-	-	-	-	-	-	4	-	-	-	266		4	
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	-	3	2	-	-	-	-	-	-	5	-	-	-	333	7	19	5
	88	-	2	3	-	-	-	-	-	-	5	-	-	-	333	10	19	5
	95	1	6	2	-	-	-	-	-	-	9	-	-	-	180	10	32	9
	00	1	6	3	1	3	1	-	-	-	15	-	-	-	300	12	42	15
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		60%			40%			00%			+44%							
'88		33%			33%			00%			-60%							
'95		50%			17%			00%			+20%							
'00		60%			27%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	333	Dec:	-			
												'88	599		-			
												'95	240		-			
												'00	300		-			
Sambucus cerulea																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	47	69	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	1	-	-	-	-	-	1	-	-	-	66	16	14	1
	'95	2	1	3	-	-	-	-	-	-	6	-	-	-	120	11	19	6
	'00	5	-	-	1	-	-	1	-	-	7	-	-	-	140	15	21	7
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%			+67%							
'95		10%			30%			00%			-30%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	66		-			
												'95	200		-			
												'00	140		-			

Trend Study 9-17-00

Study site name: Farm Creek .

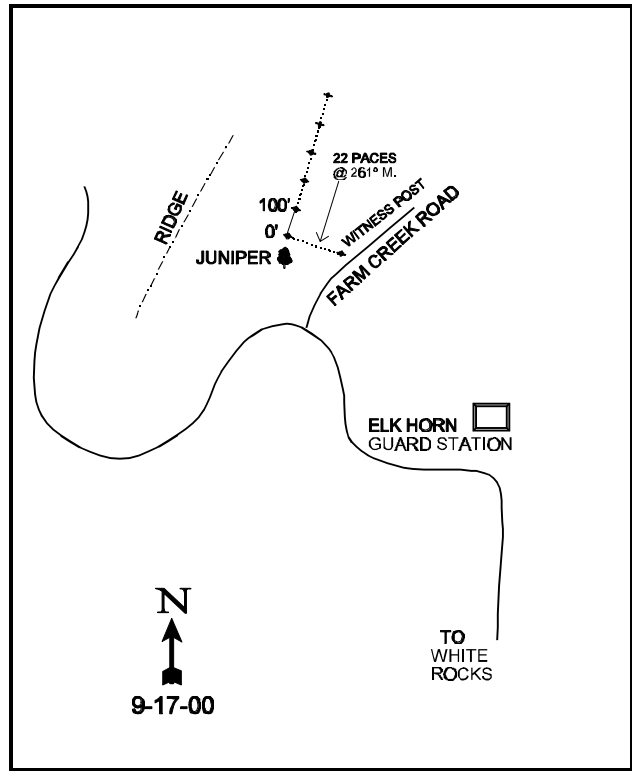
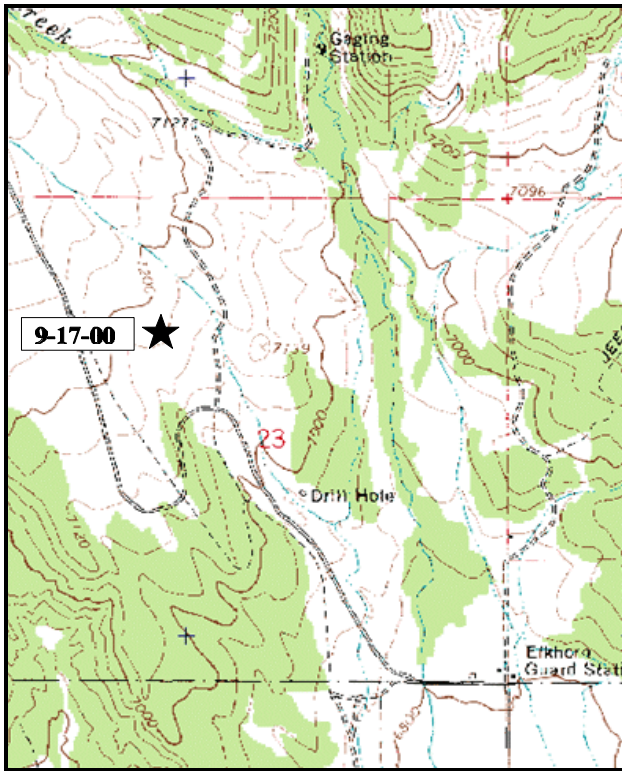
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 322°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

LOCATION DESCRIPTION

From the Elk Horn Guard Station located North of White Rocks, continue on USFS road #117 to the Farm Creek Road for 1 mile. At the first switchback turn right (north) and travel 0.1 miles to the witness located on the left (west) side of the road. From the witness walk 22 paces at 261°M to the 0 foot baseline stake.



Map Name: Ice cave Peak

Diagrammatic Sketch

Township 2N , Range 1W , Section 23

UTM 4490101.235 N, 587599.836 E

DISCUSSION

Trend Study No. 9-17 (12-10)

The Farm Creek study was established in 1995 to replace the trend study in Cart Hollow which is now inaccessible with a road exclosure. This site monitors a sagebrush grass type on Forest Service land. Elevation at the site is approximately 7,100 feet with a southern exposure and slope of 6% to 8%. The area is considered winter range, but current use by big game is light. Pellet group transect data taken along the baseline in 2000 estimate 27 deer days use/acre (66 ddu/ha) and 8 elk days use/acre (20 edu/ha). Livestock use is estimated at 15 cow days use/acre (36 cdu/ha). This area is in the Farm Creek allotment which is grazed by cattle on a 4-unit rest-rotation system from June 11 to September 10. Quadrat frequency of deer, elk, and cow pellets are all less in 2000 compared to 1995.

Soils are sandy loam in texture and very rocky in the profile. Effective rooting depth is estimated at just over 10 inches. Rooting depth does not appear to be restricted as mountain big sagebrush, a deep rooted species, is dominant on the site. Bare ground is low at an estimated 7% in 1995, increasing to 12% in 2000. Vegetation and litter are abundant, with mountain big sagebrush, bitterbrush and crested wheatgrass dominating the site. Pedestalizing of soil around bunch grasses is minimal, increasing slightly around sagebrush stems.

The dominant browse is mountain big sagebrush, with bitterbrush also being fairly abundant. These two species combine to provide over 95% of the total browse cover on the site and nearly half of the total vegetative cover. Mountain big sagebrush has an estimated cover of 15% and a population density of 3,560 plants/acre in 2000. Sagebrush recruitment slightly increased from 8% to 11% in 2000, while percent decadency shows a large increase from 1% to 29%. Use on sagebrush is light to moderate so this increase in decadency can be attributed to drought. Other sagebrush sites in the region also show an increase in decadency in 2000 with the dry conditions. The proportion of decadent plants classified as dying is relatively low (40 plants/acre), with numbers of young plants being adequate to replace this class of plants. Sagebrush vigor remains good. Average leader growth on sagebrush is only 1 inch in 2000.

The more preferred antelope bitterbrush had an estimated population of about 2,100 plants/acre in 1995 and 2000. These shrubs have a prostrate growth form averaging 19 inches in height and a crown of 42 inches. Use is moderate to heavy but bitterbrush can tolerate heavier levels of use than sagebrush. With a low amount of deer and elk sign on this site in 2000, some of the use on bitterbrush is likely from livestock. Vigor remains mostly good, with percent decadency stable at 13%. Bitterbrush seedlings are rare, but recruitment from young plants is good at 16% and 9% in 1995 and 2000 respectively. Average leader growth is between 2-3 inches in 2000, with moderate seed production. Other browse found on the site consist of pricklypear cactus, mountain low rabbitbrush and broom snakeweed.

Crested wheatgrass dominates the understory by providing almost 27% average cover in 2000, representing 92% of the herbaceous cover. Crested wheatgrass is vigorous and was sampled in 94% and 99% of the quadrats in 1995 and 2000 respectively. Bulbous bluegrass is the second most abundant grass. This species significantly decreased in nested frequency in 2000 and only provides about 1% cover. Forbs are diverse but not abundant as they provide under 2% average cover in 1995 and 2000. Sum of nested frequency of perennial forbs decreased by 57% in 2000. With the dry conditions in 2000, the decrease in forb frequency has been seen in most other sites in this management unit as well.

1995 APPARENT TREND ASSESSMENT

The soil trend appears stable as long as vegetation and litter cover remain high. No erosion is currently occurring. The browse trend appears stable for mountain big sagebrush due to low decadency rates, the lack of dead plants, and adequate numbers of seedlings and young. Trend for bitterbrush also appears stable. Use is mostly moderate and decadency rates low (13%). The herbaceous understory is in good condition but species composition is poor. The seeded species, crested wheatgrass, is abundant but the other perennial grasses are rare. Forbs are diverse but scarce.

2000 TREND ASSESSMENT

Trend for soil is stable. Protective cover from vegetation and litter are abundant. Bare ground is relatively low. Trend for browse is stable. Mountain big sagebrush experienced a large increase in decadency from 1% to 29%, but with only light use, this increase is drought related. Recruitment is good at 11%. Bitterbrush is stable in density and decadency. It has moderate recruitment numbers at 9%. Vigor is good for both species. Trend for the herbaceous understory is stable. Although sum of nested frequency of perennial forbs significantly decreased in 2000, forbs only provide 3% of the vegetative cover on the site and this decrease does not warrant a downward trend. Nested frequency of the dominant species, crested wheatgrass, increased which counters the loss of perennial forbs.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 17

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
G	Agropyron cristatum	387	405	94	99	17.89	26.90
G	Agropyron dasystachyum	3	8	1	5	.00	.05
G	Bromus tectorum (a)	17	*-	5	-	.05	-
G	Poa bulbosa	85	*51	28	20	2.67	.85
G	Poa fendleriana	5	8	2	3	.06	.04
G	Poa pratensis	5	-	1	-	.03	-
G	Poa secunda	2	-	1	-	.00	-
Total for Annual Grasses		17	0	5	0	0.05	0
Total for Perennial Grasses		487	472	127	127	20.67	27.85
Total for Grasses		504	472	132	127	20.72	27.85
F	Allium spp.	20	*-	13	-	.06	-
F	Antennaria rosea	-	4	-	1	-	.38
F	Arabis spp.	14	*3	8	1	.06	.00
F	Artemisia ludoviciana	27	*7	11	3	.18	.18

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
		F	<i>Astragalus convallarius</i>	7	2	4	1
F	<i>Balsamorhiza hookeri</i>	4	3	2	2	.01	.06
F	<i>Castilleja linariaefolia</i>	1	-	1	-	.00	-
F	<i>Conyza canadensis</i> (a)	6	-	2	-	.01	-
F	<i>Collomia linearis</i> (a)	48	*-	22	-	.16	-
F	<i>Collinsia parviflora</i> (a)	-	4	-	1	-	.00
F	<i>Cryptantha</i> spp.	5	-	2	-	.01	-
F	<i>Draba reptans</i> (a)	64	*1	22	1	.11	.00
F	<i>Erigeron eatonii</i>	-	6	-	2	-	.01
F	<i>Erigeron flagellaris</i>	4	*13	1	6	.00	.22
F	<i>Eriogonum racemosum</i>	10	4	6	3	.14	.07
F	<i>Heterotheca villosa</i>	12	*5	4	2	.33	.18
F	<i>Lappula occidentalis</i> (a)	9	*-	4	-	.02	-
F	<i>Lactuca serriola</i>	2	-	1	-	.00	-
F	<i>Lepidium densiflorum</i> (a)	55	*-	24	-	.17	-
F	<i>Lithospermum ruderales</i>	-	4	-	2	.03	.18
F	<i>Lomatium</i> spp.	3	-	2	-	.01	-
F	<i>Lupinus argenteus</i>	-	4	-	3	-	.04
F	<i>Microsteris gracilis</i> (a)	1	-	1	-	.00	-
F	<i>Orobancha</i> spp.	2	-	1	-	.00	-
F	<i>Phlox longifolia</i>	14	*-	4	-	.02	-
F	<i>Polygonum douglasii</i> (a)	49	*-	20	-	.12	-
F	<i>Schoenocrambe linifolia</i>	9	*-	3	-	.01	-
F	<i>Sphaeralcea coccinea</i>	21	11	7	4	.10	.12
F	<i>Tragopogon dubius</i>	1	-	1	-	.00	-
F	<i>Trifolium gymnocarpon</i>	9	3	5	1	.05	.03
F	<i>Zigadenus paniculatus</i>	1	2	1	1	.00	.00
Total for Annual Forbs		232	5	95	2	0.60	0.00
Total for Perennial Forbs		166	71	77	32	1.30	1.51
Total for Forbs		398	76	172	34	1.90	1.52

* Indicates significant difference at $\alpha = 0.10$

BROWSE TRENDS --
Herd unit 09 , Study no: 17

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	1	1	-	-
B	Artemisia tridentata vaseyana	66	77	13.01	15.14
B	Chrysothamnus viscidiflorus lanceolatus	2	0	-	-
B	Gutierrezia sarothrae	14	26	.04	.88
B	Opuntia spp.	21	18	.39	.16
B	Pediocactus simpsonii	2	1	-	-
B	Purshia tridentata	51	54	6.77	11.37
Total for Browse		157	177	20.23	27.55

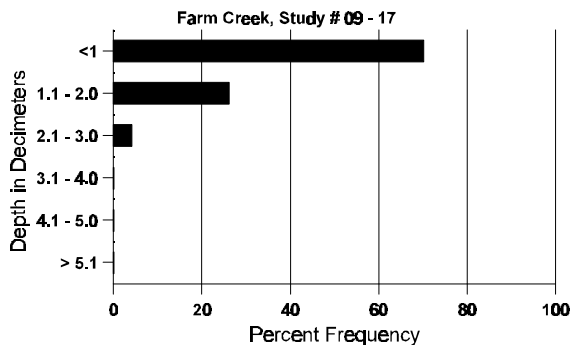
BASIC COVER --
Herd unit 09 , Study no: 17

Cover Type	Nested Frequency		Average Cover %	
	'95	'00	'95	'00
Vegetation	445	417	45.22	52.87
Rock	268	197	10.75	10.65
Pavement	135	89	.50	.92
Litter	490	465	56.27	58.82
Cryptogams	36	57	.39	1.21
Bare Ground	225	227	7.24	11.98

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 17, Study Name: Farm Creek

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
10.58	63.4 (11.02)	6.8	58.9	22.8	18.3	3.7	19.2	211.2	1.0

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 09 , Study no: 17

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'95	'00	'00	'00
Rabbit	10	16	574	N/A
Elk	4	2	104	8 (20)
Deer	9	2	348	27 (66)
Cattle	22	11	174	15 (36)

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 17

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht. Cr.		
<i>Amelanchier alnifolia</i>																		
M	95	-	-	1	-	-	-	-	-	-	-	-	1	-	20	8	22	1
	00	-	-	-	-	-	-	1	-	-	-	-	-	-	20	22	27	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			100%			100%			+ 0%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	20	Dec:	-			
												'00	20		-			
<i>Artemisia tridentata vaseyana</i>																		
S	95	3	-	-	-	-	-	-	-	-	-	3	-	-	60			3
	00	3	-	-	-	-	-	-	-	-	-	3	-	-	60			3
Y	95	9	-	-	3	-	-	-	-	-	-	12	-	-	240			12
	00	17	2	-	-	-	-	-	-	-	-	19	-	-	380			19
M	95	95	33	-	2	-	-	-	-	-	-	130	-	-	2600	24	41	130
	00	103	3	-	2	-	-	-	-	-	-	108	-	-	2160	28	39	108
D	95	-	-	1	-	-	-	-	-	-	-	1	-	-	20			1
	00	17	29	-	5	-	-	-	-	-	-	49	-	-	1020			51
X	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		23%			.69%			00%			+20%							
'00		19%			00%			01%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	2860	Dec:	1%			
												'00	3560		29%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Chrysothamnus viscidiflorus lanceolatus</i>																		
Y	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	95	5	-	-	1	-	-	-	-	-	6	-	-	-	120	14	23	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	15	28	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'95	140	Dec:	-				
											'00	0		-				
<i>Gutierrezia sarothrae</i>																		
S	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	95	25	-	-	-	-	-	-	-	-	25	-	-	-	500	9	12	
	00	110	-	-	-	-	-	-	-	-	110	-	-	-	2200	7	8	
D	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%			+78%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'95	500	Dec:	0%				
											'00	2280		2%				
<i>Opuntia spp.</i>																		
S	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
M	95	52	-	-	1	-	-	-	-	-	53	-	-	-	1060	5	9	
	00	27	-	-	1	-	-	-	-	-	28	-	-	-	560	2	9	
D	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	1	-	-	-	-	-	2	-	-	1	60		3	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%			-36%							
'00		00%			00%			03%										
Total Plants/Acre (excluding Dead & Seedlings)											'95	1060	Dec:	0%				
											'00	680		9%				

A G R E	Y	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Pediocactus simpsonii</i>																		
M	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	2	3	2
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	2	3	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%			-50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'95	40	Dec:	-				
											'00	20		-				
<i>Purshia tridentata</i>																		
S	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	95	10	7	-	-	-	-	-	-	-	17	-	-	-	340			17
	00	2	2	1	1	-	-	3	-	-	9	-	-	-	180			9
M	95	3	31	33	4	2	1	-	-	-	74	-	-	-	1480	13	37	74
	00	11	31	18	-	18	-	5	-	-	83	-	-	-	1660	19	42	83
D	95	-	3	9	-	2	-	-	-	-	13	-	-	1	280			14
	00	-	9	3	-	-	-	-	-	-	10	-	-	2	240			12
X	95	-	-	-	-	-	-	-	-	-	-	-	-	-	280			14
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		43%			41%			.95%			- 1%							
'00		58%			21%			02%										
Total Plants/Acre (excluding Dead & Seedlings)											'95	2100	Dec:	13%				
											'00	2080		12%				

Trend Study 9-18-00

Study site name: Gooseberry Spring .

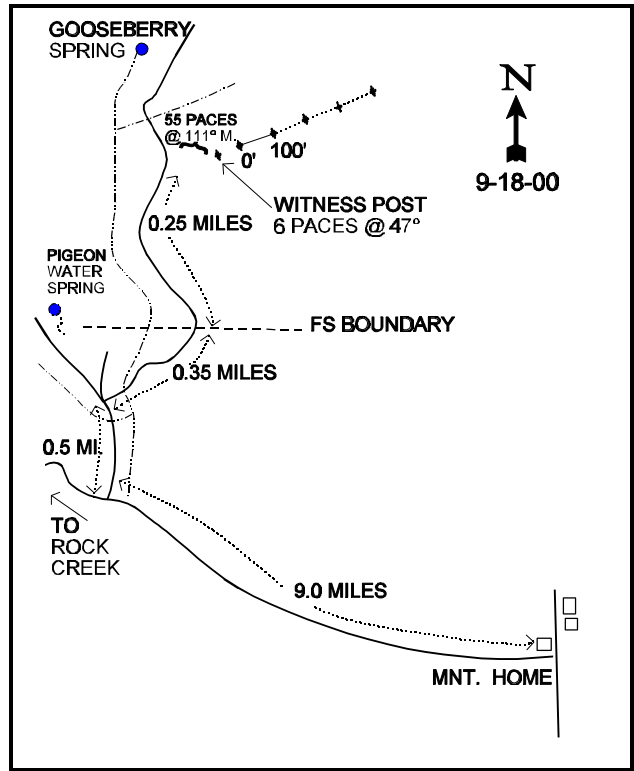
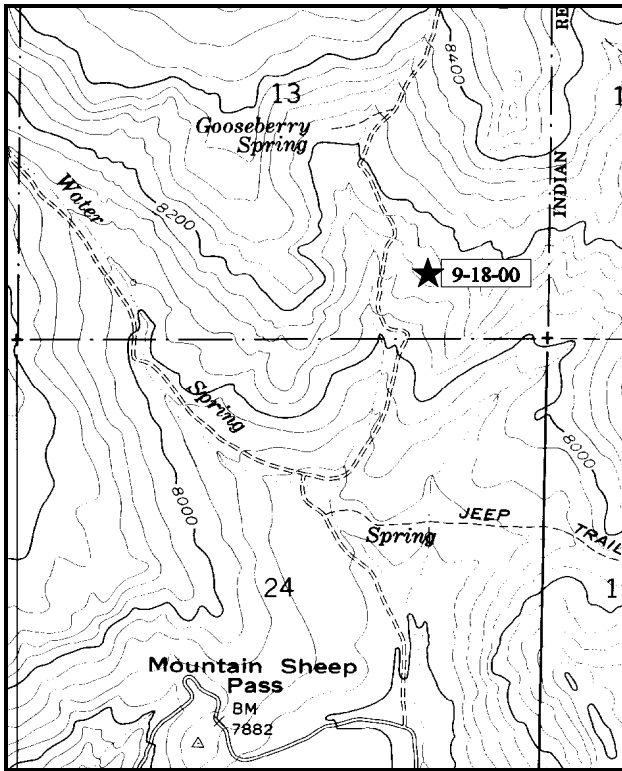
Range type: Mixed Mountain Brush

Compass bearing: frequency baseline 47°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (16 & 92ft), line 2 (30ft), line 3 (47ft), line 4 (66ft).

LOCATION DESCRIPTION

From the town of Mountain Home, travel in a northwest direction towards Rock Creek. Approximately 9.0 miles from Mountain Home, you will come to a dirt road to the right (north). Before the road, there is a sign which points to Pigeon Water Spring. Take the dirt road to the north for 0.5 miles to a 3-way fork. Take the right fork for 0.35 miles to the forest boundary. From the fence, continue 0.25 miles to a bend in the road in a small drainage. From the road, the 0-foot baseline stake is approximately 65 paces up the drainage. The frequency baseline stakes are marked by green, 18 inch tall fenceposts. The 0-foot baseline stake is marked with a browse tag, #7196.



Map Name: Dry Mountain

Diagrammatic Sketch

Township 1N, Range 6W, Section 13

UTM 4480676.190 N, 541631.574 E

DISCUSSION

Trend Study No. 9-18 (12-7)

The Gooseberry Spring trend study is located on high winter range near Gooseberry Spring on the Ashley National Forest. Elevation is approximately 8,160 feet. The aspect is to the southwest with a slope of 13%. The range type is mixed mountain brush with a strong black sagebrush component. The baseline runs up a small draw which contains a large number of serviceberry, snowberry and mountain big sagebrush. The side hills are drier and dominated by nearly pure stands of black sagebrush. Intense animal use from deer, elk, cattle and possibly domestic sheep was reported in 1982. However, quadrat frequency of deer and elk pellet groups were moderately low in 1995 and 2000. Pellet group transect data taken along the baseline in 2000 estimate 12 deer days use/acre (30 ddu/ha) and 48 elk days use/acre (117 edu/ha). Livestock use was estimated at 7 cow days use/acre (18 cdu/ha). This site is in the Pigeon Water allotment which is grazed by cattle from June 16 to September 25 on a rest-rotation system.

Soils have a clay texture and are variable in depth. Soil depth is relatively shallow on the sides of the draws, increasing in the drainage bottoms. In the draw where the site is located, effective rooting depth is estimated at nearly 15 inches. Phosphorus is low at 4.8 ppm as values less than 10 ppm may be limiting to plant growth and development. Vegetation and litter cover are abundant, although both slightly decreased in 2000. Bare ground increased in 2000, but remains moderately low at 14%. Rock cover is high at 12%. Current erosion levels are not severe, although there is evidence of soil movement and pedestalling is moderate.

The browse composition is diverse, and provides at least 60% of the total vegetative cover in 1995 and 2000. Preferred key species include: mountain big sagebrush, black sagebrush, serviceberry and bitterbrush. Snowberry is also abundant and provides more cover than any other species. These 5 species make up over 90% of the total browse cover on the site. Serviceberry density is estimated at 1,380 plants/acre in 2000, with mature plants making up about 75% of the population. Mature serviceberry average nearly 3 feet in height and crown. They currently ('00) show moderate to heavy use. Vigor is generally good, with the proportion of the population displaying poor vigor increasing to only 6% in 2000. Percent decadency is low at 10%, with high recruitment at 19% (260 plants/acre) in 2000. Average leader growth is low averaging less than 2 inches in 2000 due to drought. Mountain big sagebrush shows a stable population at around 2,400 plants/acre in 1995 and 2000. Mature plants have numbered approximately 2,000 plants/acre during the last 3 readings. In 1995, use was mostly moderate on big sagebrush (60%) with 8% of the population displaying heavy use. Currently ('00), moderate and heavy use have decreased to an estimated 18% and 4% respectively. Twenty-four percent of the population displays poor vigor, an increase from 9% in 1995. Percent decadency is low at 10% and recruitment is good at 13%. Leader growth on big sagebrush is low in 2000, averaging about 3 inches.

Another important browse species is bitterbrush. Bitterbrush density is currently estimated at 420 plants/acre. The population has good vigor and no decadent plants. Moderate and heavy use are currently estimated at 24%, a decrease in moderate use, but an increase in heavy use since 1995. Recruitment increased from 4% in 1995 to 10% in 2000. Leader growth averages about 3 inches in 2000. Black sagebrush has an estimated density of 2,900 plants/acre in 2000, a decrease from 4,360 plants/acre in 1995. This large decrease in population density is due to the difference in young plants between 1995 and 2000. In 1995, 1,200 young plants/acre were estimated, decreasing to only 40 in 2000. In 2000, vigor is mostly good on black sagebrush plants and percent decadency is moderately low at 10%. Although not a preferred forage species, snowberry is abundant and currently ('00) estimated at 4,240 plants/acre. Use is light, vigor good, with no decadent plants being sampled in either 1995 or 2000.

The herbaceous understory is diverse for both grasses and forbs. Dominant grasses are mutton bluegrass and thickspike wheatgrass. Kentucky bluegrass, Sandberg bluegrass, a Carex and prairie junegrass are also present

on the site. Sum of nested frequency of these perennial species decreased by 20% in 2000. Kentucky bluegrass was heavily utilized in 2000. Many forb species are present on the site, yet none are very abundant. Sum of nested frequency of perennial forbs decreased by 53% in 2000 due to drought. Low growing and increaser species are prominent and include: rose pussytoes, desert phlox, fleabane, aster and dandelion. The current forb composition is indicative of many years of heavy grazing on this site.

1982 APPARENT TREND ASSESSMENT

Soil trend appears stable. There is little evidence for any extensive soil movement. Vegetative trend, at least with respect to the browse component, is more questionable. A stable condition may currently exist, but the potential for a decline is present. The area is receiving heavy use over a large part of the year, the effect of which is unclear at present. Careful monitoring of shrub populations should provide some answers in the near future.

1988 TREND ASSESSMENT

Ground cover percentages are fairly constant. Slight increases in vegetative, litter and rock cover led to a decrease in the percentage of bare soil to about 17%. Soil movement is minimal. Browse trend is up. The age structure of snowberry and serviceberry suggest that the populations are increasing. Serviceberry did increase significantly in density since 1982. Eighty percent of the serviceberry were classified as seedlings or young shrubs, as were 71% of the snowberry. The age structure of the sagebrush population has not changed since 1982 and it has declined slightly in numbers. The most significant trend is the reduction in the number of heavily hedged shrubs; down from 21% of the total in 1982 to 3% in 1988. Vigor is apparently improving. Another indicator of a positive trend is the prevalence of young plants in the populations of the key browse species. There is not much sign of recent use by big game. Trend for the herbaceous understory is up with increased frequency for grasses and forbs. A total of 40 species of forbs were encountered in the nested frequency plots, up from 20 species in 1982. Most occur only occasionally, but as a group, the forbs constitute an important source of forage at this high-elevation winter range site. Eaton fleabane, desert phlox, lupine, rock goldenrod, and looseflower milkvetch continue to top the list of the most frequent forbs. The increase in total forb frequency is significant, changing from 169 to 457 occurrences.

TREND ASSESSMENT

soil - stable (3)

browse - up for key species (5)

herbaceous understory - up (5)

1995 TREND ASSESSMENT

Trend for ground cover is slightly improved. Percent bare ground declined to only 7%, down from almost 17%. Percent cover of litter declined, however litter and vegetative cover are adequate to protect the soil surface. Trend for browse is improved slightly for the key species due to reduced heavy use, improved vigor and lower decadency rates. Trend for the herbaceous understory is down for grasses and stable for forbs. Overall, the herbaceous trend is slightly down but will likely rebound with normal precipitation patterns.

TREND ASSESSMENT

soil - up slightly (4)

browse - improved for key species (4)

herbaceous understory - slightly down (2)

2000 TREND ASSESSMENT

Trend for soil is slightly down. Bare ground increased from 7% to 14%, while vegetation and litter cover both slightly decreased. The ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil decreased as a result of these ground cover changes, but it still remains fairly high at 3.5:1 and erosion is minimal. Trend for browse is stable. The key species all appear to have stable populations and for the most part, good vigor and low decadency. The exception is mountain big sagebrush which has 24% of its population classified as having poor vigor. Recruitment is good for serviceberry, mountain big sagebrush and bitterbrush, but low for black sagebrush. The key browse component on this site appears to be in good condition. It is not showing as many negative changes as some other browse communities on the unit with the dry conditions of this year. Trend for the herbaceous understory is down due to drought. Sum of nested frequency of perennial grasses and forbs declined by 20% and 53% respectively.

TREND ASSESSMENT

soil - slightly down (2)

browse - stable (3)

herbaceous understory - down (1)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 18

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	_b 289	_a 200	_a 195	44	111	78	68	2.40	3.74
G	Agropyron spicatum	-	2	-	-	-	1	-	.03	-
G	Bouteloua gracilis	_b 13	_a -	_a -	-	7	-	-	-	-
G	Bromus anomalus	3	-	4	-	2	-	2	-	.01
G	Carex spp.	_b 99	_b 93	_a 41	18	42	41	17	.35	.65
G	Koeleria cristata	19	18	39	21	11	9	15	.15	1.14
G	Poa fendleriana	_a -	_b 192	_b 205	-	-	66	69	4.03	6.61
G	Poa pratensis	_c 113	_b 76	_a 20	1	51	26	6	1.81	.75
G	Poa secunda	_b 264	_a 67	_a 46	54	87	28	20	.92	.76
G	Sitanion hystrix	-	1	1	1	-	1	-	.00	-
G	Stipa comata	_a 2	_b 27	_a 8	7	1	11	3	.29	.18
G	Stipa lettermani	_b 20	_b 25	_a 2	2	13	9	1	.11	.15
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		822	701	560	148	325	270	201	10.13	14.01
Total for Grasses		822	701	560	148	325	270	201	10.13	14.01
F	Agoseris glauca	_a 3	_b 13	_a -	-	1	6	-	.03	-
F	Allium cernuum	_b 24	_b 17	_a -	-	14	8	-	.07	-
F	Antennaria rosea	_a 1	_b 22	_b 34	-	1	10	11	.22	1.04
F	Arabis spp.	4	2	9	-	3	1	4	.00	.07

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	<i>Astragalus convallarius</i>	_b 61	_a 34	_a 16	-	30	16	10	.42	.32
F	<i>Astragalus spatulatus</i>	_b 10	_a -	_b 11	-	3	-	4	-	.71
F	<i>Astragalus tenellus</i>	_c 71	_b 29	_a 6	-	38	14	2	.56	.06
F	<i>Aster</i> spp.	39	47	40	3	16	19	20	.35	.25
F	<i>Astragalus</i> spp.	_b 7	_a -	_a -	12	3	-	-	-	-
F	<i>Balsamorhiza hookeri</i>	_b 23	_{ab} 30	_a 7	6	12	12	5	.40	.07
F	<i>Castilleja chromosa</i>	_b 13	_b 20	_a -	4	6	9	-	.26	-
F	<i>Castilleja linariaefolia</i>	_a 4	_b 22	_a 5	-	3	10	2	.18	.03
F	<i>Calochortus nuttallii</i>	_a -	_b 39	_a 1	-	-	17	1	.49	.00
F	<i>Chaenactis douglasii</i>	1	3	3	-	1	2	1	.03	.03
F	<i>Cirsium undulatum</i>	14	9	7	-	8	5	4	.07	.09
F	<i>Collomia linearis</i> (a)	-	_b 27	_a -	-	-	13	-	.16	-
F	<i>Comandra pallida</i>	53	50	27	-	23	22	13	.21	.36
F	<i>Cryptantha</i> spp.	-	-	-	2	-	-	-	-	-
F	<i>Collinsia parviflora</i> (a)	-	35	9	-	-	15	4	.29	.07
F	<i>Crepis acuminata</i>	_a 14	_b 43	_a 9	-	7	23	4	.32	.07
F	<i>Cymopterus</i> spp.	_a 2	_b 57	_a -	-	1	28	-	.16	-
F	<i>Cynoglossum officinale</i>	-	2	-	-	-	1	-	.00	-
F	<i>Eriogonum alatum</i>	7	28	9	-	4	11	5	.10	.07
F	<i>Erigeron eatonii</i>	_c 97	_b 55	_a 13	22	41	22	5	.53	.10
F	<i>Eriogonum umbellatum</i>	5	14	9	2	3	6	3	.27	.09
F	<i>Euphorbia brachycera</i>	1	-	-	2	1	-	-	-	-
F	<i>Geranium richardsonii</i>	-	1	-	-	-	1	-	.03	-
F	<i>Hymenoxys acaulis</i>	_b 24	_{ab} 4	_a 1	-	9	3	1	.06	.03
F	<i>Lesquerella</i> spp.	3	-	-	-	1	-	-	-	-
F	<i>Linum lewisii</i>	3	-	-	-	1	-	-	-	-
F	<i>Lithospermum</i> spp.	_b 14	_{ab} 8	_a 5	-	8	3	2	.01	.03
F	<i>Lupinus argenteus</i>	_b 77	_a 54	_a 56	22	39	26	28	.98	.89
F	<i>Lychnis drummondii</i>	-	5	3	-	-	2	1	.01	.03
F	<i>Lygodesmia grandiflora</i>	-	1	-	-	-	1	-	.01	-
F	<i>Machaeranthera canescens</i>	-	-	4	-	-	-	1	-	.00
F	<i>Orthocarpus luteus</i> (a)	_b 11	_b 23	_a -	2	5	11	-	.17	-
F	<i>Penstemon caespitosus</i>	10	10	7	2	5	6	4	.10	.09
F	<i>Penstemon dolius</i>	_b 8	_b 7	_a -	-	3	4	-	.21	-
F	<i>Penstemon</i> spp.	23	28	-	3	13	13	-	.16	-
F	<i>Penstemon pachyphyllus</i>	-	1	8	-	-	1	3	.01	.21
F	<i>Petradoria pumila</i>	_b 59	_a 24	_a 33	26	28	9	13	.72	.70
F	<i>Phlox austromontana</i>	_b 93	_b 71	_a 34	32	40	27	17	.94	1.39

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Phlox longifolia	_b 53	_b 63	_a 9	8	21	25	4	.22	.09
F	Physaria spp.	-	3	-	-	-	1	-	.00	-
F	Polygonum douglasii (a)	-	16	-	-	-	7	-	.03	-
F	Potentilla gracilis	18	17	7	3	11	11	3	.13	.04
F	Schoenrambe linifolia	-	3	-	-	-	1	-	.00	-
F	Senecio multilobatus	_b 70	_a 6	_a 5	7	33	2	3	.01	.01
F	Sphaeralcea coccinea	31	20	19	8	13	10	10	.10	.41
F	Taraxacum officinale	16	16	10	-	7	5	5	.05	.07
F	Trifolium gymnocarpon	-	-	3	-	-	-	1	-	.03
F	Viguiera multiflora	3	-	-	3	1	-	-	-	-
F	Zigadenus elegans	-	3	-	-	-	1	-	.00	-
Total for Annual Forbs		11	101	9	0	5	46	4	0.66	0.07
Total for Perennial Forbs		959	881	410	175	452	394	190	8.54	7.45
Total for Forbs		970	982	419	175	457	440	194	9.21	7.52

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

BROWSE TRENDS --

Herd unit 09 , Study no: 18

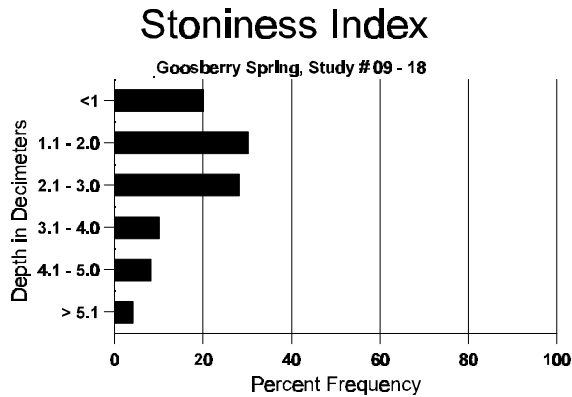
T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	48	51	6.88	6.53
B	Artemisia nova	43	35	4.39	3.34
B	Artemisia tridentata vaseyana	64	67	8.00	6.43
B	Chrysothamnus depressus	4	5	.06	.16
B	Chrysothamnus viscidiflorus lanceolatus	57	44	2.43	1.68
B	Echinocereus spp.	2	1	.01	.03
B	Eriogonum corymbosum	1	0	.15	-
B	Gutierrezia sarothrae	17	17	.18	.16
B	Mahonia repens	1	1	.18	-
B	Purshia tridentata	19	16	2.84	3.32
B	Quercus gambelii	0	1	-	-
B	Ribes cereum cereum	1	0	.03	-
B	Symphoricarpos oreophilus	63	70	11.79	10.39
B	Tetradymia canescens	5	3	.03	.00
Total for Browse		325	311	36.99	32.08

BASIC COVER --
Herd unit 09 , Study no: 18

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	356	345	8.50	13.00	50.28	48.70
Rock	196	163	6.50	9.00	11.72	12.62
Pavement	130	144	2.25	4.50	.95	2.19
Litter	390	378	54.75	57.00	48.87	47.49
Cryptogams	4	16	1.75	0	.01	.16
Bare Ground	186	209	25.50	16.50	7.05	14.61

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 18, Study Name: Gooseberry

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
14.61	52.0 (11.47)	7.0	37.9	20.8	41.3	2.2	4.8	240.0	0.8



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 18

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre	Days Use per Acre (ha)
Rabbit	2	-	122	N/A
Elk	20	10	618	48 (117)
Deer	12	7	218	17 (41)
Cattle	4	1	87	7 (18)

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 18

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier alnifolia																		
S	'82	-	-	2	-	-	-	-	-	-	2	-	-	-	133		2	
	'88	22	-	-	3	-	-	-	-	-	25	-	-	-	1666		25	
	'95	1	-	-	1	-	-	-	-	-	2	-	-	-	40		2	
	'00	3	-	-	1	-	-	-	-	-	4	-	-	-	80		4	
Y	'82	-	1	3	-	-	2	-	-	-	5	1	-	-	400		6	
	'88	15	8	6	2	1	-	2	-	-	27	3	3	1	2266		34	
	'95	12	3	1	-	-	-	-	-	-	16	-	-	-	320		16	
	'00	11	2	-	-	-	-	-	-	-	13	-	-	-	260		13	
M	'82	3	4	9	-	5	2	-	-	-	21	2	-	-	1533	45 18	23	
	'88	2	3	3	1	-	-	-	2	-	11	-	-	-	733	47 31	11	
	'95	16	11	5	4	3	6	-	-	-	45	-	-	-	900	35 41	45	
	'00	11	3	15	4	11	4	1	-	-	49	-	-	-	980	33 34	49	
D	'82	-	-	2	-	-	-	1	-	-	2	-	1	-	200		3	
	'88	-	3	-	1	-	-	-	-	-	4	-	-	-	266		4	
	'95	-	-	1	-	-	-	-	-	-	1	-	-	-	20		1	
	'00	-	-	2	-	2	3	-	-	-	3	-	-	4	140		7	
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		31%			56%			03%			+35%							
'88		31%			18%			08%			-62%							
'95		27%			21%			00%			+10%							
'00		26%			35%			06%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	2133	Dec:	9%				
											'88	3265		8%				
											'95	1240		2%				
											'00	1380		10%				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia nova																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	1	-	-	1	-	-	-	66		1	
	95	-	-	-	10	-	-	-	-	-	10	-	-	-	200		10	
	00	10	-	-	-	-	-	-	-	-	10	-	-	-	200		10	
Y	82	11	1	-	-	-	-	-	-	-	12	-	-	-	800		12	
	88	11	2	-	-	-	-	-	-	-	13	-	-	-	866		13	
	95	54	5	1	-	-	-	-	-	-	60	-	-	-	1200		60	
	00	1	1	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	82	2	11	1	-	-	-	-	-	-	13	-	1	-	933	12 15	14	
	88	4	5	-	1	-	-	-	-	-	10	-	-	-	666	9 14	10	
	95	41	91	10	3	-	-	-	-	-	145	-	-	-	2900	10 21	145	
	00	124	3	-	2	-	-	-	-	-	129	-	-	-	2580	12 20	129	
D	82	1	1	1	-	-	-	-	-	-	1	-	2	-	200		3	
	88	3	1	-	-	-	-	-	-	-	1	-	1	2	266		4	
	95	4	7	2	-	-	-	-	-	-	3	-	-	10	260		13	
	00	13	-	1	-	-	-	-	-	-	9	-	-	5	280		14	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	260		13	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	100		5	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		45%			07%			10%			- 7%							
'88		30%			00%			11%			+59%							
'95		47%			06%			05%			-33%							
'00		03%			.68%			03%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	1933	Dec:	10%			
												'88	1798		15%			
												'95	4360		6%			
												'00	2900		10%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	3	-	-	-	-	-	-	-	-	-	-	-	-	60		3	
Y	82	5	2	-	1	-	-	-	-	-	-	-	-	533		8		
	88	4	1	-	1	-	-	-	-	-	-	-	-	400		6		
	95	2	3	-	1	1	-	-	-	-	-	-	-	140		7		
	00	9	3	-	3	-	-	-	-	-	-	-	-	300		15		
M	82	17	9	2	-	5	-	-	-	-	-	-	2200	18	16	33		
	88	23	5	-	-	-	-	-	-	-	-	-	1866	18	14	28		
	95	29	62	10	2	1	-	-	-	-	-	-	2080	21	29	104		
	00	73	15	3	-	-	-	-	-	-	-	-	1820	21	27	91		
D	82	3	4	5	-	-	-	-	-	-	-	-	800			12		
	88	6	4	1	-	-	-	1	-	-	-	-	800			12		
	95	3	6	-	1	-	-	-	-	-	-	-	200			10		
	00	6	3	2	1	-	-	-	-	-	-	-	240			12		
X	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	95	-	-	-	-	-	-	-	-	-	-	-	-	60		3		
	00	-	-	-	-	-	-	-	-	-	-	-	-	240		12		
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		38%			13%			26%			-13%							
'88		22%			02%			09%			-21%							
'95		60%			08%			09%			-2%							
'00		18%			04%			24%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	3533	Dec:	23%			
												'88	3066		26%			
												'95	2420		8%			
												'00	2360		10%			
Chrysothamnus depressus																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	88	7	-	-	-	-	-	-	-	-	-	-	-	466		7		
	95	1	-	-	2	-	-	-	-	-	-	-	-	60		3		
	00	1	-	-	-	-	-	-	-	-	-	-	-	20		1		
M	82	-	-	8	-	-	-	-	-	-	-	-	533	2	6	8		
	88	1	-	-	-	-	-	-	-	-	-	-	66	4	5	1		
	95	2	-	-	-	-	-	-	-	-	-	-	40	6	12	2		
	00	8	-	-	-	-	-	-	-	-	-	-	160	4	9	8		
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			100%			38%			-0%							
'88		00%			00%			00%			-81%							
'95		00%			00%			00%			+44%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	533	Dec:	-			
												'88	532		-			
												'95	100		-			
												'00	180		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4		1	2									
Chrysothamnus viscidiflorus lanceolatus																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	4	1	2	-	-	-	-	-	6	-	1	-	466		7	
	88	69	-	-	-	-	-	1	-	70	-	-	-	4666		70	
	95	26	-	-	1	-	-	-	-	27	-	-	-	540		27	
	00	32	-	-	-	-	-	-	-	32	-	-	-	640		32	
M	82	6	9	37	1	4	-	-	-	41	3	13	-	3800	8	12	57
	88	29	1	-	-	-	-	1	-	31	-	-	-	2066	10	12	31
	95	117	1	-	15	1	-	-	-	134	-	-	-	2680	12	13	134
	00	56	4	2	9	-	1	-	-	72	-	-	-	1440	9	10	72
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	-	1	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	1	3	-	-	-	-	-	4	-	-	-	80		4	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		22%			61%			22%			+37%						
'88		.98%			00%			.98%			-53%						
'95		01%			00%			00%			-33%						
'00		05%			06%			00%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	4266	Dec:	0%				
										'88	6798		1%				
										'95	3220		0%				
										'00	2160		4%				
Echinocereus spp.																	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	1	-	-	-	20	2	4	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		00%			00%			00%									
'88		00%			00%			00%									
'95		00%			00%			00%			-50%						
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-				
										'88	0		-				
										'95	40		-				
										'00	20		-				

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Eriogonum corymbosum																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	7	12	2
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	40		-			
												'00	0		-			
Gutierrezia sarothrae																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
	'00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	22	-	-	-	-	-	-	-	-	22	-	-	-	440	8	10	22
	'00	50	-	-	-	-	-	-	-	-	50	-	-	-	1000	4	5	50
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			+44%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	580		-			
												'00	1040		-			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Mahonia repens																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	5	6	2
	'00	3	-	-	-	-	-	-	-	-	3	-	-	-	60	-	-	3
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'82 00%			'82 00%			'82 00%										
		'88 00%			'88 00%			'88 00%										
		'95 00%			'95 00%			'95 00%			+33%							
		'00 00%			'00 00%			'00 00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	40		-			
												'00	60		-			
Purshia tridentata																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	2	-	-	-	-	-	-	-	2	-	-	-	133			2
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	'00	1	-	1	-	-	-	-	-	-	2	-	-	-	40			2
M	'82	-	-	4	-	-	1	-	-	-	5	-	-	-	333	13	19	5
	'88	-	-	4	-	-	-	-	-	-	4	-	-	-	266	17	23	4
	'95	8	6	1	-	9	-	-	-	-	24	-	-	-	480	16	38	24
	'00	10	3	-	-	2	4	-	-	-	19	-	-	-	380	19	41	19
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	1	-	-	-	-	-	-	-	1	-	-	-	20			1
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'82 00%			'82 100%			'82 00%			+17%							
		'88 33%			'88 67%			'88 00%			+23%							
		'95 62%			'95 04%			'95 00%			-19%							
		'00 24%			'00 24%			'00 00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	333	Dec:	0%			
												'88	399		0%			
												'95	520		4%			
												'00	420		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Quercus gambelii																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	'00	4	-	-	-	-	-	-	-	-	-	-	-	80	-	-	4	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
	'82	00%			00%			00%										
	'88	00%			00%			00%										
	'95	00%			00%			00%										
	'00	00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	80		-			
Ribes cereum cereum																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	'95	-	-	-	1	-	-	-	-	-	-	-	1	20	29	52	1	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
	'82	00%			00%			00%										
	'88	00%			00%			00%										
	'95	00%			00%			00%										
	'00	00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	20		-			
												'00	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
S	82	6	-	-	-	-	-	-	-	-	6	-	-	-	400		6	
	88	22	-	-	-	-	-	12	-	-	31	-	3	-	2266		34	
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
	00	11	-	-	-	-	-	-	-	-	11	-	-	-	220		11	
Y	82	41	6	-	12	-	-	-	-	-	51	8	-	-	3933		59	
	88	128	6	-	1	-	-	4	-	-	134	-	5	-	9266		139	
	95	71	5	10	6	-	-	-	-	-	92	-	-	-	1840		92	
	00	37	2	-	-	-	-	-	-	-	39	-	-	-	780		39	
M	82	67	55	8	20	-	-	-	-	-	129	17	4	-	10000	19	23	150
	88	53	3	1	10	-	-	3	-	-	70	-	-	-	4666	18	17	70
	95	75	40	2	11	-	-	-	-	-	128	-	-	-	2560	16	28	128
	00	159	-	-	14	-	-	-	-	-	173	-	-	-	3460	15	32	173
D	82	-	3	-	-	-	-	-	-	-	-	-	3	-	200		3	
	88	1	1	-	-	-	-	-	-	-	1	-	1	-	133		2	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		30%			04%			03%			- 0%							
'88		05%			.47%			03%			-69%							
'95		20%			05%			00%			- 4%							
'00		.94%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	14133	Dec:	1%				
											'88	14065		1%				
											'95	4400		0%				
											'00	4240		0%				
Tetradymia canescens																		
Y	82	-	-	1	-	-	-	-	-	-	1	-	-	-	66		1	
	88	6	-	-	1	-	-	-	-	-	7	-	-	-	466		7	
	95	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	2	1	-	-	-	-	-	-	-	3	-	-	-	200	4	3	3
	95	7	-	-	-	-	-	-	-	-	7	-	-	-	140	9	8	7
	00	-	-	1	-	-	-	-	-	-	1	-	-	-	20	6	6	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			100%			00%			+90%							
'88		10%			00%			00%			-64%							
'95		00%			00%			00%			-75%							
'00		00%			33%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	66	Dec:	-				
											'88	666		-				
											'95	240		-				
											'00	60		-				

Trend Study 9-19-00

Study site name: Mosby Mountain South .

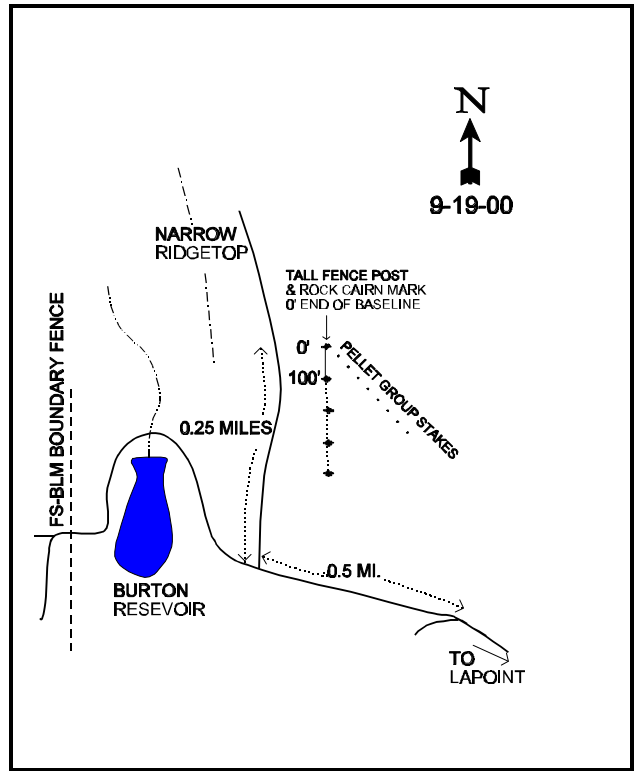
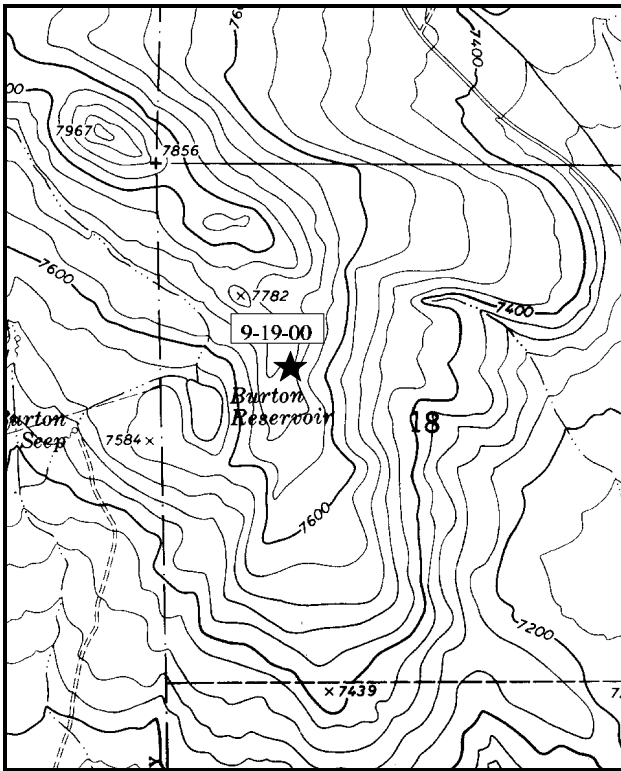
Range type: Mixed Mountain Brush .

Compass bearing: frequency baseline 167°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Just east of Lapoint, turn north from highway 121. Go 6.9 miles to a fork, keep left toward Mosby Mountain. Proceed 4.8 miles and turn left onto a dirt road heading west. Go 0.15 miles to a 3-way intersection, bear left on the main road. Continue 0.45 miles to a fork, stay left. Go 0.2 miles to another fork, stay to the right. Go 0.5 miles to an intersection on the ridge above Burton Reservoir. Drive 0.25 miles north on a very rocky road to the study site. A tall fencepost which marks the location of a pellet group transect is also the 0-foot baseline stake. It is marked by browse tag #7870. The frequency baseline stakes are short green fenceposts.



Map Name: Lake Mountain

Diagrammatic Sketch

Township 3S Range 19E ,Section 18

UTM 4490148.529 N, 598272.521 E

DISCUSSION

Trend Study No. 9-19 (12-8)

The Mosby Mountain South study was established in 1988 to sample a key area that was missed in 1982. The site is located on a narrow ridge top which drops off sharply to Burton Reservoir to the west and a sagebrush and pinyon-juniper valley to the east. The slope at the site is gentle (2-3%), with a southeast aspect. Elevation is about 7,600 feet. A large fire burned the entire area after the initial reading in 1988, where much of the sagebrush was eradicated. Springs are common in the area and most have been developed for cattle. Evidence of sage grouse was observed on this site during study establishment. Sage grouse droppings were sampled in the pellet group transect that was read in 2000. According to Forest Service personnel, the area between this study and study #9-14 (Red Pine Canyon) is an important wintering area for several hundred elk. Pellet group transect data taken directly on the site in 2000 estimate light use for both elk and deer. Elk use is estimated at 15 days use/acre (36 edu/ha) and deer use at 7 days use/acre (17 ddu/ha). This estimated light use may be due to the fact that the past several winters have been mild and animals may not have had to use the site as heavily as in the past. Quadrat frequency of deer and elk pellet groups is much lower in 2000 compared to 1995. Cattle were on the site, as well as the surrounding area in 2000 when the site was read. However, it was noted that most of the cattle were bunched closer to the reservoir about ½ mile away. Cattle use directly on the site is estimated at 9 cow days use/acre (22 cdu/ha).

The soil is very rocky and has a sandy loam texture. Rocks of all sizes are distributed throughout the soil profile and continuously over the surface. They are cobble type rocks from alluvial deposits off of the Uinta mountains. Effective rooting depth is estimated at about 7 inches due to the rocky profile. However, due to the presence of deep rooted shrubs, shrub roots apparently are able to penetrate down through the rock to deeper levels. The estimate of about 17% rock cover was moderately high in 1988, but this increased after the fire to 26% in 1995 and 2000. There was a considerable amount of litter cover (67%) in addition to the extensive shrub cover in 1988, providing good soil protection. Litter cover declined after the fire. It is estimated at 46% in 1995, decreasing to 37% in 2000. Percent bare ground was low at 4% in 1995, increasing to 10% in 2000.

Mountain big sagebrush is currently the dominant shrub on this site as it contributes 32% of the total browse cover. The population appeared stable in 1988 with an estimated 7,533 plants per acre. The proportion of decadent plants (34%) was offset by the high proportion of young (32%) and seedlings (3%). Mountain big sagebrush cover was estimated at 20% in 1988. At this elevation, the sagebrush showed evidence of only light to moderate hedging. Black sagebrush was abundant in 1988 and density increased where soils were more shallow. It showed only light to moderate hedging. Bitterbrush and serviceberry were scattered throughout the area at relatively lower densities, although bitterbrush was more abundant. These species were utilized to a greater extent by mule deer and the majority of the plants appeared heavily hedged. The most preferred browse species showed evidence of stress from drought and insect damage, while the big sagebrush appeared vigorous.

After the fire, density of all shrub species declined but none were lost. Mountain big sagebrush density dropped from 7,533 plants/acre before the fire, to 1,380 in 1995 and 1,280 in 2000 following the fire. Some of this difference could also be the result of the greatly increased sampled size used following the 1988 reading which better estimates shrub populations that have clumped and/or discontinuous distributions. Seedlings and young plants have been few since the fire. Percent decadency was high in both 1988 (34%) and 1995 (30%), but greatly decreased in 2000 to only 5%. Vigor has been good for all readings. Use has decreased since 1995. Currently use is light to moderate. Leader growth averages about 3 inches in 2000, but seed production is high on big sagebrush.

Black sagebrush is estimated at 240 plants/acre and 120 plants/acre in 1995 and 2000 following the fire. Use remains moderate to heavy following fire. Percent decadency has steadily declined from a high of 56% in 1988 (drought year and pre-fire) to 17% in 1995, and 0% in 2000. Bitterbrush density has remained about the same

both before and after the fire. Currently ('00), bitterbrush is estimated at 380 plants/acre, with high recruitment (21%), good vigor, and no decadency. Use is mostly heavy. This should be watched in the future as the low density may accentuate the heavy use. Average leader growth is about 3 inches in 2000, with moderate seed production on bitterbrush. Serviceberry is currently estimated at 220 plants/acre. The entire population in 1995 and 2000 consist of mature plants that show moderate to heavy use.

During the initial reading in 1988, a significant amount of cheatgrass in the understory was reported. In 1995, cheatgrass had the highest nested frequency of any species and accounted for 21% of the grass cover. With drought in 2000, cheatgrass was sampled in only 2 quadrats. Perennial grasses consist of a mix of native and seeded species and include: several wheatgrass's (crested, thickspike, intermediate and bluebunch); needle-and-thread; squirreltail; Sandberg, Kentucky, and mutton bluegrass; and a Carex. Crested wheatgrass and needle-and-thread are the dominate species. Both remained at stable frequencies in 2000. As a group, perennial grasses decreased in sum of nested frequency in 2000 by 17%, but increased in cover from 17% to 19%. Utilization was moderate to heavy on most species in 2000.

Forbs contribute about 25% of the total vegetative cover at the site in 2000. Perennial species are moderately diverse, but only hairy goldaster is common. This species provides nearly 7% average cover in 2000, which significantly increased in nested frequency. Silvery lupine is also moderately abundant. Annual forbs are very infrequent, especially in 2000 with the dry conditions. Perennial forbs slightly increased in sum of nested frequency in 2000, which is surprising as perennial forbs have decreased on most other sites in 2000 due to drought.

1995 TREND ASSESSMENT

The soil trend is stable. Litter cover declined due to the fire but there is still adequate soil protection. Currently, percent bare ground is only 4%. The browse trend is down with reduced densities of all species encountered in 1988. The key species, mountain big sagebrush, declined in density and has a moderately high rate of decadency (34%). This species is not tolerant of fire, as some of the other species are. Recruitment is also poor with no seedlings encountered and only 140 young plants/acre were estimated. Vigor was good on most other browse, with the density expected to eventually increase in time. Trend for the preferred bitterbrush is slightly up due to a consistent mature population, low decadency, reduced heavy use, and more tolerance to fire. Trend for the herbaceous understory is up with increased sum of nested frequency for grasses and forbs.

TREND ASSESSMENT

soil - stable (3)

browse - down due to fire, but will increase in time (1)

herbaceous understory - up (5)

2000 TREND ASSESSMENT

Trend for soil is slightly down. Bare soil increased from 4% to 10%, while litter cover decreased from 46% to 37% in 2000. Rock cover remains high at 26%. The ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil decreased from 6:1 to 3:1. Trend for browse is stable. All of the key and preferred browse species show stable to slightly increasing populations in 2000. Recruitment is low for all species except bitterbrush, but all species show low and improving decadency rates and good vigor. Trend for the herbaceous understory is stable. Sum of nested frequency of perennial grasses as a group decreased in 2000, but the dominant species, crested wheatgrass and needle-and-thread, remained at fairly stable frequencies. Also, cheatgrass was nearly non-existent in 2000 due to drought. Sum of nested frequency of perennial forbs actually slightly increased with drought in 2000 which offset some of the losses of the grasses. This increase is the exception in this unit.

TREND ASSESSMENT

soil - slightly down (2)

browse - stable (3)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 19

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	Agropyron cristatum	a-	b ₁₄₄	b ₁₅₉	-	54	61	3.26	5.83
G	Agropyron dasystachyum	a-	cb ₇₄	b ₄	-	26	3	1.99	.04
G	Agropyron intermedium	a-	b ₃₂	a ₂	-	11	1	.32	.00
G	Agropyron spicatum	b ₉₃	a ₃₁	a ₁₆	41	12	5	.61	.36
G	Bouteloua gracilis	b ₂₇	a ₃	a-	14	1	-	.03	-
G	Bromus tectorum (a)	-	b ₂₉₈	a ₅	-	91	2	3.60	.03
G	Carex spp.	7	9	11	4	4	7	.02	.10
G	Poa fendleriana	-	4	22	-	2	6	.03	.30
G	Poa pratensis	ab ₂₅	b ₄₀	a ₅	10	16	2	.88	.18
G	Poa secunda	b ₆₆	a ₂	a ₁₈	31	1	6	.00	.30
G	Sitanion hystrix	b ₁₅₅	a ₄₀	a ₁₈	64	18	8	.31	.51
G	Sporobolus cryptandrus	a-	ab ₂	b ₇	-	1	3	.00	.04
G	Stipa comata	a ₃₁	b ₁₈₁	b ₂₀₅	14	66	68	5.77	11.26
Total for Annual Grasses		0	298	5	0	91	2	3.60	0.03
Total for Perennial Grasses		404	562	467	178	212	170	13.25	18.95
Total for Grasses		404	860	472	178	303	172	16.86	18.99
F	Allium spp.	-	5	-	-	2	-	.01	-
F	Arabis spp.	7	3	2	4	1	1	.00	.03
F	Artemisia ludoviciana	-	-	3	-	-	1	-	.15
F	Astragalus purshii	b ₈	a-	a-	3	-	-	-	-
F	Aster spp.	a-	ab ₄	b ₁₀	-	2	5	.01	.10
F	Balsamorhiza hookeri	a-	b ₃	a-	-	3	-	.04	-
F	Chenopodium leptophyllum (a)	-	b ₁₄	a-	-	5	-	.02	-
F	Collomia linearis (a)	-	b ₂₉	a-	-	15	-	.07	-
F	Comandra pallida	3	-	1	1	-	1	-	.03
F	Collinsia parviflora (a)	-	8	2	-	3	1	.01	.00
F	Cryptantha spp.	-	1	-	-	1	-	.00	-
F	Descurainia pinnata (a)	-	b ₈	a-	-	3	-	.01	-
F	Draba spp. (a)	-	1	-	-	1	-	.03	-
F	Erigeron flagellaris	-	1	2	-	1	2	.03	.03

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
F	<i>Eriogonum racemosum</i>	_b 25	_{ab} 6	_a 3	10	4	2	.16	.06
F	<i>Heterotheca villosa</i>	_a 18	_b 142	_c 171	9	59	68	4.69	6.92
F	<i>Hymenoxys acaulis</i>	2	1	-	2	1	-	.00	-
F	<i>Lappula occidentalis</i> (a)	-	3	-	-	2	-	.01	-
F	<i>Lepidium densiflorum</i> (a)	-	_b 44	_a 2	-	21	1	.15	.03
F	<i>Lithospermum</i> spp.	-	-	4	-	-	2	-	.01
F	<i>Lupinus argenteus</i>	_b 13	_a 41	_c 72	5	21	32	1.75	2.72
F	<i>Oenothera pallida</i>	1	-	-	1	-	-	-	-
F	<i>Penstemon</i> spp.	_{ab} 5	_b 5	_a -	2	3	-	.04	-
F	<i>Petrorhiza pumila</i>	_b 8	_{ab} 3	_a -	4	1	-	.15	-
F	<i>Phlox longifolia</i>	_b 9	_a -	_a -	3	-	-	-	-
F	<i>Polygonum douglasii</i> (a)	-	_b 29	_a -	-	14	-	.07	-
F	<i>Sedum lanceolatum</i>	1	-	-	1	-	-	-	-
F	<i>Senecio multilobatus</i>	1	4	8	1	2	3	.01	.06
F	<i>Sphaeralcea coccinea</i>	5	11	2	2	4	2	.09	.01
F	<i>Taraxacum officinale</i>	-	3	-	-	2	-	.01	-
F	<i>Tragopogon dubius</i>	_a -	_b 10	_a -	-	7	-	.06	-
Total for Annual Forbs		0	136	4	0	64	2	0.39	0.03
Total for Perennial Forbs		106	243	278	48	114	119	7.09	10.14
Total for Forbs		106	379	282	48	178	121	7.49	10.18

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

BROWSE TRENDS --
Herd unit 09 , Study no: 19

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier utahensis	10	11	1.94	2.63
B	Artemisia nova	7	4	.18	.03
B	Artemisia tridentata vaseyana	33	34	2.27	3.00
B	Chrysothamnus nauseosus graveolens	0	0	-	.03
B	Chrysothamnus viscidiflorus lanceolatus	3	0	.15	-
B	Eriogonum heracleoides	3	6	.66	.41
B	Gutierrezia sarothrae	12	23	.31	.63
B	Opuntia spp.	19	24	.41	.41
B	Pediocactus simpsonii	6	3	.45	.03
B	Purshia tridentata	14	19	1.16	2.05
Total for Browse		107	124	7.55	9.25

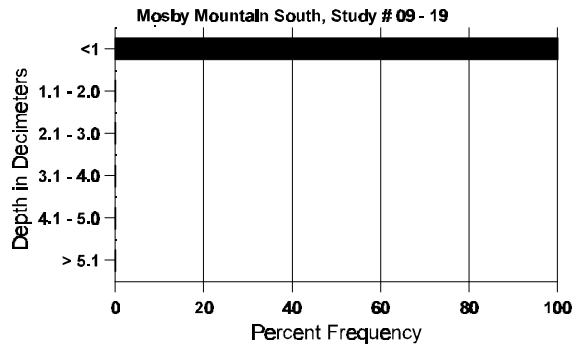
BASIC COVER --
Herd unit 09 , Study no: 19

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	374	347	7.50	40.06	42.06
Rock	323	280	16.50	26.87	26.17
Pavement	90	160	1.00	2.96	5.90
Litter	383	375	67.00	46.25	37.31
Cryptogams	23	2	0	.12	.15
Bare Ground	127	230	8.00	3.95	10.04

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 19, Study Name: Mosby Mountain South

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
6.83	67.4 (8.66)	6.6	72.0	13.4	14.6	8.0	19.6	208.0	0.6

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 09 , Study no: 19

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'95	'00	'00	'00
Rabbit	3	13	165	N/A
Grouse	-	1	35	N/A
Elk	30	12	191	15 (37)
Deer	19	6	87	7 (17)
Cattle	1	7	104	9 (22)

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 19

A G R E	Y	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Amelanchier utahensis																		
Y	88	1	2	6	-	-	-	-	-	-	5	-	4	-	600			9
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	2	7	2	-	-	-	-	-	-	10	-	1	-	220	25	34	11
	00	3	1	1	1	4	1	-	-	-	11	-	-	-	220	27	47	11
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		22%			67%			44%			-63%							
'95		64%			18%			09%			+ 0%							
'00		45%			18%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	600	Dec:	-			
												'95	220		-			
												'00	220		-			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Artemisia nova																	
S	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200		3
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
Y	88	12	3	-	-	-	-	-	-	-	15	-	-	-	1000		15
	95	-	2	-	-	-	-	-	-	-	2	-	-	-	40		2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
M	88	1	3	-	-	-	-	-	-	-	4	-	-	-	266	12 20	4
	95	-	4	1	-	1	2	-	-	-	8	-	-	-	160	7 18	8
	00	1	1	2	2	-	-	-	-	-	6	-	-	-	120	18 28	6
D	88	8	14	2	-	-	-	-	-	-	22	-	1	1	1600		24
	95	-	1	1	-	-	-	-	-	-	2	-	-	-	40		2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'88		47%			05%			05%			-92%						
'95		67%			33%			00%			-50%						
'00		17%			33%			00%									
Total Plants/Acre (excluding Dead & Seedlings)											'88	2866	Dec:	56%			
											'95	240		17%			
											'00	120		0%			
Artemisia tridentata vaseyana																	
S	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200		3
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3
Y	88	14	22	-	-	-	-	-	-	-	36	-	-	-	2400		36
	95	5	1	1	-	-	-	-	-	-	7	-	-	-	140		7
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
M	88	23	14	1	1	-	-	-	-	-	38	1	-	-	2600	14 21	39
	95	12	29	-	-	-	-	-	-	-	41	-	-	-	820	10 16	41
	00	34	21	-	3	-	3	-	-	-	61	-	-	-	1220	14 23	61
D	88	18	17	3	-	-	-	-	-	-	36	-	1	1	2533		38
	95	-	20	1	-	-	-	-	-	-	20	-	-	1	420		21
	00	1	1	-	-	1	-	-	-	-	2	-	-	1	60		3
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	900		45
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	60		3
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'88		47%			04%			02%			-82%						
'95		72%			03%			01%			- 7%						
'00		36%			05%			02%									
Total Plants/Acre (excluding Dead & Seedlings)											'88	7533	Dec:	34%			
											'95	1380		30%			
											'00	1280		5%			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Ceanothus fendleri</i>																		
M	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	9	31	0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	10	41	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
	'88	00%			00%			00%										
	'95	00%			00%			00%										
	'00	00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	0		-			
												'00	0		-			
<i>Chrysothamnus nauseosus graveolens</i>																		
M	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	24	24	0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	27	41	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
	'88	00%			00%			00%										
	'95	00%			00%			00%										
	'00	00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	0		-			
												'00	0		-			
<i>Chrysothamnus viscidiflorus lanceolatus</i>																		
M	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	12	17	3
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	7	17	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
	'88	00%			00%			00%										
	'95	00%			00%			00%										
	'00	00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	60		-			
												'00	0		-			
<i>Eriogonum heracleoides</i>																		
M	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	7	-	-	-	-	-	-	-	-	7	-	-	-	140	5	22	7
	'00	8	1	-	-	-	-	-	-	-	9	-	-	-	180	3	17	9
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
	'88	00%			00%			00%										
	'95	00%			00%			00%			+22%							
	'00	11%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	140		-			
												'00	180		-			

A G R E	Y R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	88	29	-	-	-	-	-	-	-	-	29	-	-	-	1933	6	6	29
	95	21	-	-	-	-	-	-	-	-	21	-	-	-	420	7	9	21
	00	99	-	-	-	-	-	-	-	-	99	-	-	-	1980	6	8	99
D	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			-78%							
'95		00%			00%			00%			+78%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	1999	Dec:	3%				
											'95	440		0%				
											'00	1980		0%				
Opuntia spp.																		
S	88	9	-	-	-	-	-	-	-	-	9	-	-	-	600		9	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	25	-	-	-	-	-	-	-	-	23	-	2	-	1666		25	
	95	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7	
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
M	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	2	10	1
	95	22	-	-	-	-	-	-	-	-	22	-	-	-	440	3	10	22
	00	33	-	-	3	-	-	-	-	-	36	-	-	-	720	2	10	36
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			08%			-67%							
'95		00%			00%			00%			+28%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	1732	Dec:	0%				
											'95	580		0%				
											'00	800		3%				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Pediocactus simpsonii																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	4	-	-	-	-	-	-	-	-	4	-	-	-	80	2	3	
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60	1	3	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			-50%							
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	120		-			
												'00	60		-			
Purshia tridentata																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	1	-	1	-	-	-	-	-	-	2	-	-	-	133		2	
	95	-	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	1	3	-	-	-	-	-	-	4	-	-	-	80		4	
M	88	-	-	5	-	-	-	-	-	-	5	-	-	-	333	12	43	
	95	2	6	5	-	-	2	-	-	-	15	-	-	-	300	7	26	
	00	-	1	5	-	-	8	1	-	-	15	-	-	-	300	7	33	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			86%			00%			-31%							
'95		44%			44%			00%			+16%							
'00		11%			84%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	466	Dec:	-			
												'95	320		-			
												'00	380		-			

Trend Study 9-20-00

Study site name: Seep Hollow.

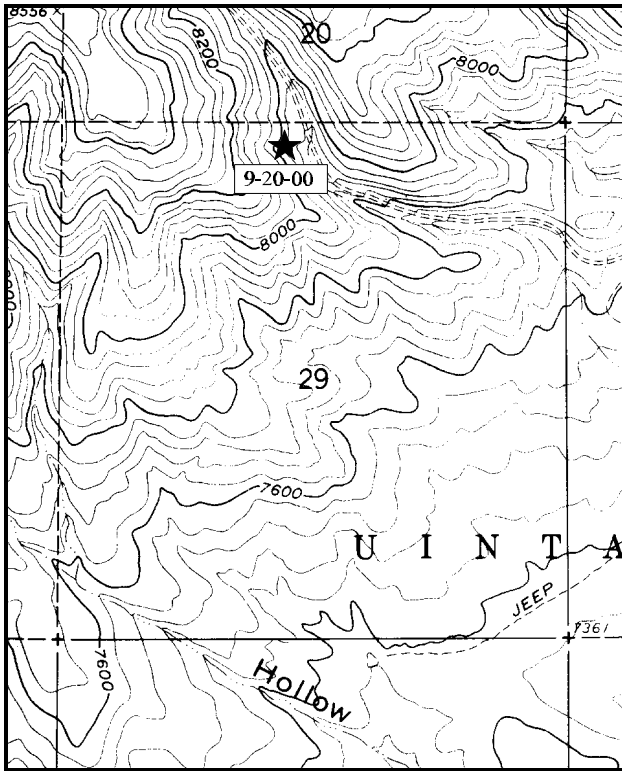
Range type: Mixed Mountain Brush.

Compass bearing: frequency baseline 329°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (7 & 86ft), line 2 (25ft), line 3 (59ft), line 4 (39ft). No rebar marking belt placement.

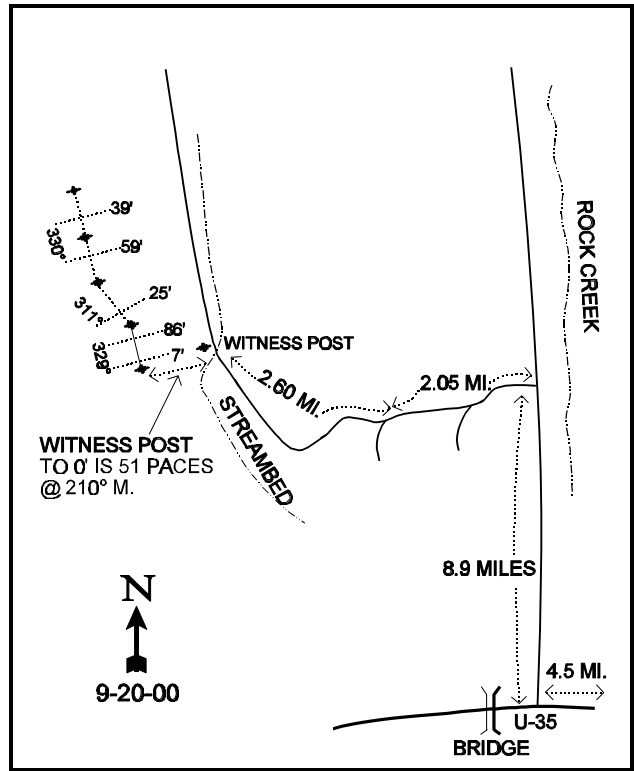
LOCATION DESCRIPTION

From highway U-87, turn onto highway U-35 and travel west to the Rock Creek Road, which is just east of mile marker 59 and the bridge over the Duchesne River. Turn right onto Rock Creek Road and go north for 8.95 miles to a road on the left. Turn and travel west 2.05 miles to a fork. Bear right and proceed 2.6 miles to a streambed. From the intersection of the road and the streambed, the 0-foot baseline stake is 65 paces away at the heading of 210°M. The frequency baseline stakes are marked by green fenceposts 12-18 inches in height.



Map Name: Blacktail Mountain

Township 1S, Range 6W, Section 29



Diagrammatic Sketch

UTM 4468680.438 N, 535104.967 E

DISCUSSION

Trend Study No. 9-20 (12-9)

The Seep Hollow trend study used to be in the Currant Creek management unit (17), but is now within the South Slope management unit. This study is on deer and elk winter range in the Seep Hollow-Dry Mountain Hollow area. Elevation is slightly below 8,000 feet on a northeast exposure with a steep 50% to 60% slope. The site may not be accessible to wildlife during severe winters. The range type is mixed mountain brush on land owned by the Ute Indian Tribe. Pellet group transect data taken along the baseline in 2000 estimate 44 deer days use/acre (107 ddu/ha) and 15 elk days use/acre (36 edu/ha).

Soils are sandy loam in texture and very rocky on the surface and throughout the profile. Rocks range in size from a few inches to more than a foot in diameter. Due to the rockiness, effective rooting depth is estimated at only 8 inches. Excluding rock, litter and vegetative cover are excellent and considering steepness of the slope, erosion is minimal. Bare ground is quite low at about 10% of the ground surface.

Browse dominates the site by providing 67% of the total vegetative cover in 2000. Key species include: serviceberry, mountain big sagebrush, true mountain mahogany and bitterbrush. Serviceberry currently ('00) provides 32% of the browse cover with an estimated density of 1,400 plants/acre. Density increased since 1995 due to the increase in young plants from 280 plants/acre to 560, representing a 40% rate of recruitment. Mature plants also slightly increased from 640 to 820 plants/acre in 2000. They average about 4 feet in height with a 5 foot crown. A small portion of the mature serviceberry were classified as unavailable due to height. In 2000, percent decadency is low at 1%, vigor is good and utilization is light to moderate with only 3% heavy use.

Mountain big sagebrush density has remained fairly stable over all readings. Sagebrush density is currently estimated at 2,340 plants/acre with moderate decadency at 26%. This level of decadency is an increase from 14% in 1995, but still below the 1988 level of 32%, which was also a drought year. Poor vigor increased from 6% in 1995 to 28% in 2000. Increases in decadency and poor vigor on big sagebrush are drought related and have been documented on many other sagebrush stands in this unit in 2000. Biotic potential (number of seedlings) and recruitment are currently ('00) low at 1% and 3% respectively. It appears that this population is becoming increasingly mature with limited reproduction. Dead sagebrush numbered 560 plants/acre or 1 dead plant to every 4 live plants in 1995. This ratio improved in 2000 to 1:11. Utilization of mountain big sagebrush is light to moderate with less than 5% of the population showing heavy use in any year.

True mountain mahogany currently ('00) makes up 15% of the browse cover with an estimated density of 500 plants/acre. Density is lower in 2000 compared to 1995, as young plants decreased from 160 to 40 plants/acre. However, 8% recruitment in 2000 is still good. Its biotic potential (number of seedlings) is also estimated at 8%. Mature plants average about 3 feet in height and width, are moderate to heavily hedged, and display mostly good vigor in 2000. Heavy use increased from 9% of the population in 1995 to 48% in 2000. Decadency remains low at only 4%. Bitterbrush is currently estimated at 720 plants/acre, with nearly all of the population being mature individuals. Recruitment is low at 3%, but no decadent plants were sampled in 2000. Vigor is good. This species displays a prostrate growth form as it averages about 1½ feet in height by a nearly 4 foot crown. Use is moderate, with 22% of the population displaying heavy use in 2000.

The herbaceous understory is dominated by perennial grasses. Bluebunch wheatgrass, needle-and-thread and mutton bluegrass are the most common. All of these species remained at stable frequencies in 2000. Several other species that occur less frequently include: thickspike wheatgrass, a Carex, Sandberg bluegrass and squirreltail. All of these species significantly decreased in nested frequency in 2000 except squirreltail which remained stable. As a group, perennial grasses decreased in sum of nested frequency by 15% in 2000. Utilization of grasses is currently minimal. Forbs are somewhat diverse but relatively scarce compared to

grasses. They provided only 5% of the total vegetative cover at the site in 2000. The most common forbs include: biscuitroot, littleleaf alumroot, spring parsley and arrowleaf balsamroot. Perennial forb sum of nested frequency decreased by 32% in 2000 due to drought. Annual forbs had a higher sum of nested frequency in 1995 than perennials did, but were nearly non-existent in 2000 with the dry conditions.

1982 APPARENT TREND ASSESSMENT

Soil and vegetative trend both appear stable. Although the site is on a steep slope, a good vegetative and litter cover limit soil loss. The browse component is in generally good condition and does not suffer from heavy use. A reasonable management objective might be to encourage expansion of true mountain mahogany and antelope bitterbrush. Hopefully, this could be achieved at the expense of low rabbitbrush and pricklypear.

1988 TREND ASSESSMENT

On this steep slope, ground cover is especially important for soil protection. Ground cover percentages are almost unchanged from 1982 and currently soil erosion is not a problem. The community is basically stable, but data comparisons between readings in 1982 and 1988 do indicate a few significant changes. There was a rather large decrease in the number of snowberry encountered on the density plots, but the other large browse species have maintained stable populations. Mountain big sagebrush appears to be more moderately hedged in recent years, in contrast to the lightly hedged growth form reported in 1982. Still, the key browse species have good vigor and adequate recruitment. In the understory, there has been an increase in the frequency and density of western wheatgrass. A decrease in forb density was noted, along with an increase in the number of several small shrubs such as slenderbush eriogonum, Oregon grape, low rabbitbrush and pricklypear cactus.

TREND ASSESSMENT

soil - stable (3)

browse - stable for key species (3)

herbaceous understory - stable (3)

1995 TREND ASSESSMENT

Trend for soil is slightly improved with a decline in percent bare ground from about 14% to almost 4%. Nested frequency of grasses and forbs also increased providing additional soil protection. Trend for key browse species is improving slightly for serviceberry, true mountain mahogany, bitterbrush and snowberry; but stable for the most abundant shrub, mountain big sagebrush which provides 27% of the browse cover. The population of sagebrush is becoming increasingly mature with no seedlings and few young observed. Density of the less desirable shrubs like mountain low rabbitbrush and wyeth eriogonum appear stable. Trend for the herbaceous understory is up with increased sum of nested frequency for perennial grasses and forbs. The 4 most abundant grasses all increased in nested frequency since 1988.

TREND ASSESSMENT

soil - slightly up (4)

browse - stable for sagebrush and slightly up for serviceberry, mountain mahogany, bitterbrush and snowberry (4)

herbaceous understory - up (5)

2000 TREND ASSESSMENT

Trend for soil is stable. Erosion remains minimal due to good protective cover from vegetation and litter. Bare ground increased, but remains quite low at about 10%. The ratio of protective ground cover (vegetation, litter,

and cryptogams) to bare soil decreased, but it still remains high at over 5:1 which indicates well disbursed ground cover. Trend for browse is stable overall. The preferred species: serviceberry, true mountain mahogany and bitterbrush show stable trends with good vigor, low decadency and acceptable levels of use. Mountain big sagebrush shows a slightly downward trend with increased decadency from 14% to 26%, increased poor vigor from 6% to 28% and low recruitment. These downward parameters are drought related and should improve with better precipitation in the future. Trend for the herbaceous understory is slightly down as sum of nested frequency of perennial grasses and forbs decreased in 2000 due to drought.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 20

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	_b 82	_b 66	_a 22	2	33	25	9	.93	.19
G	Agropyron spicatum	157	160	122	52	64	55	43	2.94	4.10
G	Bromus tectorum (a)	-	_b 14	_a 2	-	-	6	1	.08	.00
G	Carex spp.	_a 21	_b 58	_a 32	17	12	25	12	1.12	.96
G	Koeleria cristata	9	2	9	2	4	2	4	.04	.36
G	Oryzopsis hymenoides	13	1	1	2	5	1	1	.03	.03
G	Poa fendleriana	122	124	142	35	50	47	51	2.27	4.82
G	Poa secunda	15	23	35	33	8	9	14	.48	.51
G	Sitanion hystrix	_a -	_b 11	_{ab} 5	2	-	4	2	.08	.03
G	Stipa comata	68	119	109	41	29	50	46	4.09	5.21
Total for Annual Grasses		0	14	2	0	0	6	1	0.07	0.00
Total for Perennial Grasses		487	564	477	186	205	218	182	12.01	16.23
Total for Grasses		487	578	479	186	205	224	183	12.09	16.24
F	Allium spp.	-	3	-	-	-	1	-	.00	-
F	Antennaria rosea	_a -	_b 11	_{ab} 4	-	-	4	2	.07	.06
F	Arabis spp.	2	-	-	7	1	-	-	-	-
F	Artemisia ludoviciana	-	4	3	-	-	2	1	.18	.15
F	Astragalus spp.	-	5	1	1	-	2	1	.01	.00
F	Balsamorhiza sagittata	-	1	2	2	-	1	1	.15	.03
F	Castilleja linariaefolia	17	5	13	-	8	2	7	.06	.52
F	Calochortus nuttallii	_a -	_b 13	_a -	-	-	7	-	.04	-
F	Chenopodium leptophyllum (a)	-	2	-	-	-	2	-	.01	-
F	Cirsium spp.	7	7	2	-	4	4	1	.21	.15

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	<i>Collomia linearis</i> (a)	-	_b 119	_a -	-	-	55	-	.62	-
F	<i>Comandra pallida</i>	34	29	28	13	16	12	12	.21	.26
F	<i>Collinsia parviflora</i> (a)	-	_b 244	_a 12	-	-	82	4	1.53	.04
F	<i>Crepis acuminata</i>	_a -	_c 19	_b 7	-	-	11	4	.21	.07
F	<i>Cryptantha</i> spp.	_b 7	_a -	_a -	4	3	-	-	-	-
F	<i>Descurainia pinnata</i> (a)	-	_b 11	_a -	-	-	5	-	.05	-
F	<i>Draba</i> spp. (a)	-	_b 67	_a -	-	-	20	-	.20	-
F	<i>Erigeron eatonii</i>	-	1	-	-	-	1	-	.00	-
F	<i>Erigeron flagellaris</i>	4	4	4	-	2	2	2	.04	.18
F	<i>Eriogonum racemosum</i>	_a -	_b 7	_{ab} 3	-	-	4	1	.04	.03
F	<i>Eriogonum umbellatum</i>	-	-	7	9	-	-	2	-	.15
F	<i>Gayophytum ramosissimum</i> (a)	-	5	-	-	-	2	-	.01	-
F	<i>Heuchera parvifolia</i>	_a -	_b 41	_b 24	23	-	18	11	.93	.37
F	<i>Heterotheca villosa</i>	_a -	_a -	_b 8	-	-	-	3	-	.16
F	<i>Lappula occidentalis</i> (a)	-	3	-	-	-	2	-	.01	-
F	<i>Lithospermum ruderales</i>	_a -	_b 5	_b 4	-	-	3	3	.21	.06
F	<i>Lomatium</i> spp.	_a 20	_b 83	_{ab} 49	22	9	40	19	1.55	.39
F	<i>Lupinus argenteus</i>	-	-	3	-	-	-	1	-	.03
F	<i>Penstemon</i> spp.	_b 11	_{ab} 3	_a -	4	4	1	-	.15	-
F	<i>Penstemon procerus</i>	-	11	8	-	-	5	5	.12	.36
F	<i>Petradoria pumila</i>	-	3	1	-	-	1	1	.03	.03
F	<i>Polygonum douglasii</i> (a)	-	_b 20	_a -	-	-	11	-	.05	-
F	<i>Schoenocrambe linifolia</i>	-	-	-	-	-	-	-	-	.03
F	<i>Senecio integerrimus</i>	13	12	12	3	6	6	6	.05	.05
F	<i>Sedum lanceolatum</i>	-	4	-	-	-	2	-	.01	-
F	<i>Senecio multilobatus</i>	-	-	3	-	-	-	1	-	.00
F	<i>Sphaeralcea coccinea</i>	-	2	2	-	-	1	1	.03	.00
F	<i>Stellaria jamesiana</i>	-	4	-	-	-	2	-	.01	-
Total for Annual Forbs		0	471	12	0	0	179	4	2.48	0.04
Total for Perennial Forbs		115	277	188	88	53	132	85	4.36	3.15
Total for Forbs		115	748	200	88	53	311	89	6.84	3.19

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

BROWSE TRENDS --
Herd unit 09 , Study no: 20

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	30	37	9.44	12.58
B	Artemisia tridentata vaseyana	76	72	8.63	6.60
B	Cercocarpus montanus	24	19	5.23	5.76
B	Chrysothamnus viscidiflorus lanceolatus	37	28	.88	1.20
B	Eriogonum heracleoides	51	50	2.42	2.65
B	Mahonia repens	2	6	.00	.22
B	Opuntia spp.	24	18	.37	.25
B	Pediocactus simpsonii	3	0	.03	-
B	Pinus edulis	0	4	1.04	.56
B	Prunus virginiana	0	0	.03	-
B	Purshia tridentata	20	28	2.42	4.71
B	Symphoricarpos oreophilus	46	42	3.95	4.66
Total for Browse		313	304	34.46	39.23

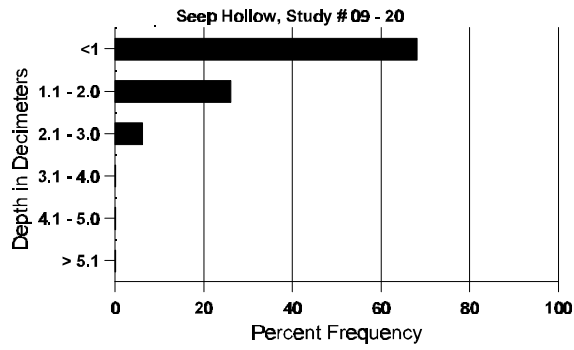
BASIC COVER --
Herd unit 09 , Study no: 20

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	360	343	8.50	7.50	43.34	58.95
Rock	242	215	10.50	14.00	14.42	14.38
Pavement	8	93	0	0	.07	1.13
Litter	394	386	64.25	64.25	60.95	66.43
Cryptogams	42	38	1.25	0	.33	1.05
Bare Ground	123	145	15.50	14.25	4.36	9.90

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 20, Study Name: Seep Hollow

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
8.36	57.6 (9.45)	6.7	73.3	16.2	10.6	4.7	9.6	102.4	0.7

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 09 , Study no: 20

Type	Quadrat Frequency	
	'95	'00
Rabbit	5	3
Elk	9	9
Deer	27	15

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
'00	'00
61	N/A
191	15 (37)
566	44 (107)

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 20

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier alnifolia																		
S	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	2	-	-	-	-	-	2	-	-	-	40		2	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	'82	7	-	-	-	-	-	-	-	-	7	-	-	-	466		7	
	'88	5	1	-	-	-	-	-	-	-	5	1	-	-	400		6	
	'95	8	1	-	3	2	-	-	-	-	14	-	-	-	280		14	
	'00	22	2	-	2	-	-	2	-	-	28	-	-	-	560		28	
M	'82	3	2	-	-	-	-	-	-	-	5	-	-	-	333	16 14	5	
	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	56 32	1	
	'95	15	11	1	-	2	-	-	3	-	32	-	-	-	640	58 75	32	
	'00	8	4	1	2	11	1	12	2	-	41	-	-	-	820	52 63	41	
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	-	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		17%			00%			00%			-42%							
'88		14%			00%			00%			+49%							
'95		35%			02%			00%			+34%							
'00		24%			03%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	799	Dec:	0%			
												'88	466		0%			
												'95	920		0%			
												'00	1400		1%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Artemisia tridentata vaseyana																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	6	-	-	-	-	-	-	-	-	6	-	-	-	400		6
	95	-	1	-	-	-	-	-	-	-	1	-	-	-	20		1
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3
M	82	31	3	-	-	-	-	-	-	-	31	2	1	-	2266	19 24	34
	88	6	16	-	-	-	-	-	-	-	22	-	-	-	1466	17 22	22
	95	49	45	3	4	3	-	-	-	-	102	-	-	2	2080	21 31	104
	00	70	4	3	6	-	-	-	-	-	61	-	22	-	1660	22 28	83
D	82	-	4	2	-	-	-	-	-	-	-	2	3	1	400		6
	88	8	4	1	-	-	-	-	-	-	11	-	1	1	866		13
	95	4	13	-	-	-	-	-	-	-	12	-	-	5	340		17
	00	19	7	-	1	2	-	2	-	-	18	2	5	6	620		31
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	560		28
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	220		11
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'82		18%			05%			13%			+ 2%						
'88		49%			02%			05%			-11%						
'95		51%			02%			06%			- 4%						
'00		11%			03%			28%									
Total Plants/Acre (excluding Dead & Seedlings)											'82	2666	Dec:	15%			
											'88	2732		32%			
											'95	2440		14%			
											'00	2340		26%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cercocarpus montanus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	2	-	-	-	-	-	-	-	2	-	-	-	133		2	
	95	2	6	-	-	-	-	-	-	-	8	-	-	-	160		8	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	82	5	3	-	-	-	-	-	-	-	6	-	2	-	533	33 21	8	
	88	-	5	-	-	-	-	-	-	-	5	-	-	-	333	28 39	5	
	95	5	11	3	4	3	-	-	-	-	26	-	-	-	520	44 47	26	
	00	1	1	4	1	6	7	2	-	-	21	-	1	-	440	36 38	22	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	1	-	-	-	1	-	-	-	20		1	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		38%			00%			25%			-13%							
'88		100%			00%			00%			+31%							
'95		59%			09%			00%			-26%							
'00		28%			48%			04%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	533	Dec:	0%			
												'88	466		0%			
												'95	680		0%			
												'00	500		4%			

A G R E	Y R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus viscidiflorus lanceolatus																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	88	4	-	-	-	-	-	-	-	-	-	-	-	266			4	
	95	-	-	-	1	-	-	-	-	-	-	-	-	20			1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
M	82	11	-	-	-	-	-	-	-	-	-	-	-	733	11	9	11	
	88	10	2	-	-	-	-	-	-	-	-	-	-	800	11	11	12	
	95	45	-	-	7	-	-	-	-	-	-	-	-	1040	15	16	52	
	00	37	-	-	3	-	-	1	-	-	-	-	-	820	14	13	41	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	88	2	-	-	2	-	-	-	-	-	-	-	-	266			4	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	00	-	-	-	2	-	-	-	-	-	-	-	-	40			2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+45%							
'88		10%			00%			00%			-20%							
'95		00%			00%			00%			-19%							
'00		00%			00%			05%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	733	Dec:	0%			
												'88	1332		20%			
												'95	1060		0%			
												'00	860		5%			
Eriogonum corymbosum																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0	13	13	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Eriogonum heracleoides</i>																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	27	-	-	-	-	-	-	-	-	21	-	6	-	1800		27	
	95	19	-	-	-	-	-	-	-	-	19	-	-	-	380		19	
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
M	82	29	-	-	-	-	-	-	-	-	29	-	-	-	1933	13 10	29	
	88	19	-	-	-	-	-	-	-	-	11	-	8	-	1266	5 7	19	
	95	109	-	-	8	-	-	-	-	-	117	-	-	-	2340	8 15	117	
	00	125	-	-	2	-	-	-	-	-	127	-	-	-	2540	6 9	127	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	3	-	-	-	-	-	-	-	-	-	-	-	3	60		3	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%			+37%							
'88		00%			00%			30%			-11%							
'95		00%			00%			00%			- 2%							
'00		00%			00%			02%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	1933	Dec:	0%			
												'88	3066		0%			
												'95	2720		0%			
												'00	2660		2%			
<i>Mahonia repens</i>																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	38	-	-	-	-	-	-	-	-	38	-	-	-	2533		38	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	82	16	-	-	-	-	-	-	-	-	16	-	-	-	1066	4 6	16	
	88	5	-	-	-	-	-	-	-	-	2	-	3	-	333	3 5	5	
	95	14	-	-	-	-	-	-	-	-	14	-	-	-	280	5 7	14	
	00	16	-	-	-	-	-	-	-	-	16	-	-	-	320	4 5	16	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%			+63%							
'88		00%			00%			07%			-90%							
'95		00%			00%			00%			+18%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	1066	Dec:	-			
												'88	2866		-			
												'95	280		-			
												'00	340		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Opuntia spp.																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	7	-	-	-	-	-	-	-	-	7	-	-	-	466			7
	88	22	-	-	-	-	-	-	-	-	19	-	3	-	1466			22
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	82	13	-	-	-	-	-	-	-	-	13	-	-	-	866	4	8	13
	88	15	-	-	-	-	-	-	-	-	13	-	2	-	1000	4	9	15
	95	44	-	-	-	-	-	-	-	-	44	-	-	-	880	3	8	44
	00	27	-	-	-	-	-	-	-	-	27	-	-	-	540	2	5	27
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+46%							
'88		00%			00%			14%			-61%							
'95		00%			00%			00%			-35%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	1332	Dec:	0%			
												'88	2466		0%			
												'95	960		4%			
												'00	620		0%			
Pediocactus simpsonii																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	2	4	3
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	60		-			
												'00	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Pinus edulis																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
M	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66	69	59	1
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	83	47	1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20	-	-	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+ 0%							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	66	Dec:	-			
												'88	66		-			
												'95	0		-			
												'00	80		-			
Purshia tridentata																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	1	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	1	-	-	2	-	-	-	-	-	3	-	-	-	60		3	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	82	1	4	-	-	-	-	-	-	-	5	-	-	-	333	12	16	5
	88	2	3	-	-	-	-	-	-	-	5	-	-	-	333	24	21	5
	95	9	11	-	3	1	-	-	-	-	24	-	-	-	480	16	37	24
	00	15	9	4	-	2	4	1	-	-	35	-	-	-	700	17	44	35
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		80%			00%			00%			+28%							
'88		57%			00%			00%			+14%							
'95		44%			00%			00%			+25%							
'00		31%			22%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	333	Dec:	0%			
												'88	465		14%			
												'95	540		0%			
												'00	720		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Symphoricarpos oreophilus																	
S	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'95	-	-	-	2	-	-	-	-	-	2	-	-	-	40		2
	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1
Y	'82	1	-	-	2	-	-	-	-	-	3	-	-	-	200		3
	'88	8	2	-	-	-	-	-	-	-	10	-	-	-	666		10
	'95	14	-	-	6	-	-	-	-	-	20	-	-	-	400		20
	'00	11	-	-	-	-	-	5	-	-	16	-	-	-	320		16
M	'82	9	1	-	9	-	-	-	-	-	19	-	-	-	1266	16 27	19
	'88	-	2	-	-	-	-	-	-	-	2	-	-	-	133	28 22	2
	'95	72	-	-	25	-	-	-	-	-	97	-	-	-	1940	16 30	97
	'00	81	-	-	9	-	-	10	-	-	100	-	-	-	2000	13 21	100
D	'82	2	-	-	-	-	-	-	-	-	-	-	2	-	133		2
	'88	1	1	-	-	-	-	-	-	-	2	-	-	-	133		2
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		04%			00%			08%			-42%						
'88		36%			00%			00%			+60%						
'95		00%			00%			00%			+ 1%						
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'82	1599	Dec:	8%		
												'88	932		14%		
												'95	2340		0%		
												'00	2360		2%		

Trend Study 9-21-00

Study site name: Browns Park River Corridor-Cattle .

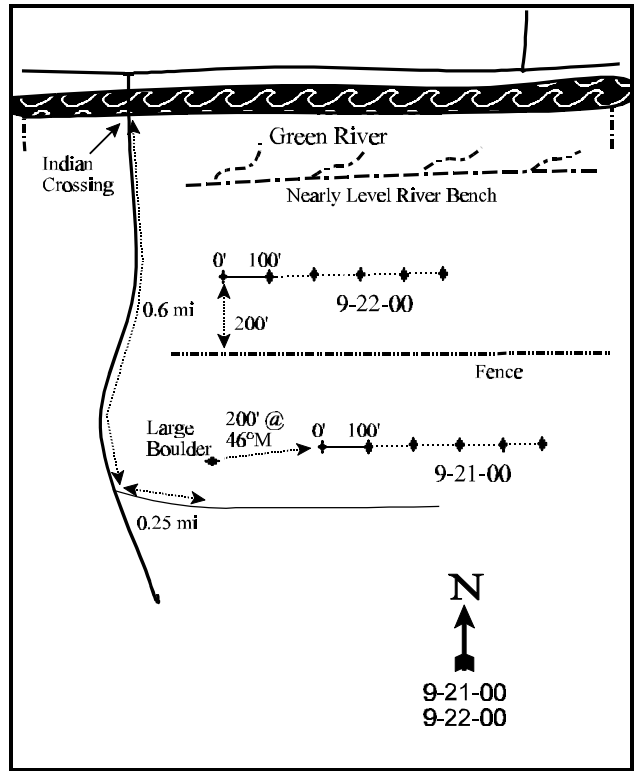
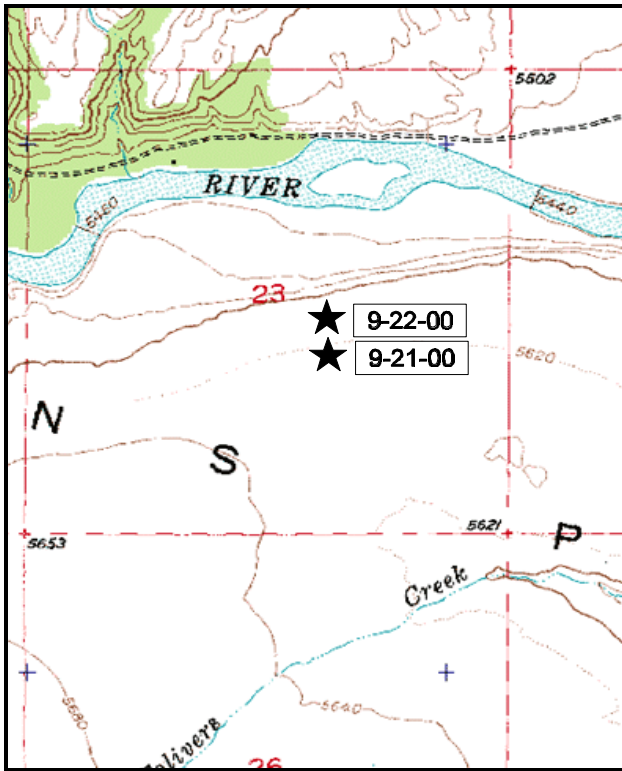
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 69°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

LOCATION DESCRIPTION

From the Indian Crossing bridge at Browns Park travel south for 0.6 miles to a fork. Turn left onto a small road and proceed 0.25 miles. There is a large boulder on the north side of the road. From the boulder the 0-foot baseline stake is 200 feet away at a bearing of 46°M. The frequency baseline stakes are marked by green fenceposts 12-18 inches in height.



Map Name: Clay Basin

Diagrammatic Sketch

Township 2N , Range 24E ,Section 23

UTM 4528354.839 N, 654031.942 E

DISCUSSION

Trend Study No. 9-21

The Brown's Park River Corridor-Livestock study is a new study established in 2000. This study was placed to monitor differences between livestock and wildlife use on two sides of a fence line that was built in 1963. The fence was built to exclude cattle grazing on one side of the fence line while allowing grazing on the other side. Wildlife are not excluded from either side of the fence line. The area is approximately ½ mile south of the Green River at Brown's Park on a sagebrush-grass flat. This study samples the south side of the fence that is accessible to livestock. The site is nearly flat, but has a slight slope of 1-2%, and aspect is to the north. Elevation is 5,600 feet. Cattle did not graze the site in 2000. Pellet group transect data taken along the baseline estimate 31 deer days use/acre (76 ddu/ha), with no elk pellets being sampled. The cattle pats sampled in the quadrats were from the previous year and thus were not counted in the pellet transect in 2000.

Soils on the site are sandy loam in texture and moderately deep with an estimated effective rooting depth of nearly 14 inches. The effective rooting depth was estimated closer to shrubs as the interspaces were much more shallow (8 inches). Moderate pedestaling around shrub stems is common over the site. Shrub interspaces between sagebrush contain a lot of bare soil and pavement. Bare ground is estimated to cover 54% of the ground surface, while pavement is estimated at 31%. Litter is very low at 12%. Vegetation cover is moderately low at 26%, and most of this is aerial cover provided by Wyoming big sagebrush. With very little build-up of litter and so much bare soil, erosion would be much higher if not for the nearly level terrain. Phosphorus is low at 4.1 ppm as values less than 10 ppm may be limiting to normal plant growth and development. Soil reactivity is slightly alkaline (pH of 7.8).

Wyoming big sagebrush is the dominant species on the site providing over 52% of the browse cover and 37% of the total vegetative cover. Sagebrush has an estimated density of 3,740 plants/acre. Age class analysis indicates the population to consist of 64% mature, 29% decadent and 7% young plants. Twelve percent of the population shows poor vigor and use is moderate to heavy. Poor vigor and decadency are moderately high and are accentuated by the drought conditions in 2000, as well as intraspecific and interspecific competition. Other Wyoming big sagebrush sites in this unit show elevated rates of decadency and poor vigor due to low precipitation from the fall of 1999 through the summer of 2000. Leader growth is extremely low averaging 1 inch over the site.

Shadscale is also moderately abundant with an estimated population density of 1,720 plants/acre. Decadency is moderately high at 37%. Ten percent of the population shows poor vigor. This depressed condition of shadscale is drought caused and should improve with a return to normal precipitation patterns. Broom snakeweed is the most abundant browse on the site with an estimated density of 39,460 plants/acre which provide over 7% average cover. Mature plants make up 92% of the population and plants are very small statured.

Herbaceous vegetation is not very diverse and is dominated by needle-and-thread grass. This species provides 92% of the herbaceous cover on the site. Only two other perennial species were sampled, squirreltail and sand dropseed, but both are infrequent. Two annual species, cheatgrass and sixweeks fescue, were also sampled in 2000. Although these species do not currently make up a significant portion of the understory, with better precipitation in the future the potential for rapid expansion is there with a high amount of bare soil. Forbs are nearly non-existent with only 2 species being sampled in 2000.

2000 APPARENT TREND ASSESSMENT

Soils appear to be downward and are in poor condition. Bare ground and pavement cover are high, and protective ground cover from herbaceous vegetation and litter are sparse. Currently, erosion is not excessive, but only because of the nearly level slope of the site. Trend for browse also appears down as broom snakeweed occurs at a very high density and Wyoming big sagebrush has high decadency. The herbaceous understory has a poor composition with only needle-and-thread grass being abundant. Forbs are nearly non-existent and will probably never be important at this site.

HERBACEOUS TRENDS --

Herd unit 09 , Study no: 21

T y p e	Species	Nested Frequency	Quadrat Frequency	Average Cover %
		'00	'00	'00
G	Bromus tectorum (a)	11	5	.02
G	Sitanion hystrix	21	12	.18
G	Sporobolus cryptandrus	20	5	.36
G	Stipa comata	300	94	6.61
G	Vulpia octoflora (a)	3	1	.00
Total for Annual Grasses		14	6	0.03
Total for Perennial Grasses		341	111	7.16
Total for Grasses		355	117	7.19
F	Sphaeralcea coccinea	8	3	.01
F	Townsendia incana	7	3	.01
Total for Annual Forbs		0	0	0
Total for Perennial Forbs		15	6	0.03
Total for Forbs		15	6	0.03

BROWSE TRENDS --

Herd unit 09 , Study no: 21

T y p e	Species	Strip Frequency	Average Cover %
		'00	'00
B	Artemisia tridentata wyomingensis	76	9.28
B	Atriplex confertifolia	56	1.25
B	Gutierrezia sarothrae	99	7.10
B	Opuntia spp.	7	.18
Total for Browse		238	17.84

BASIC COVER --

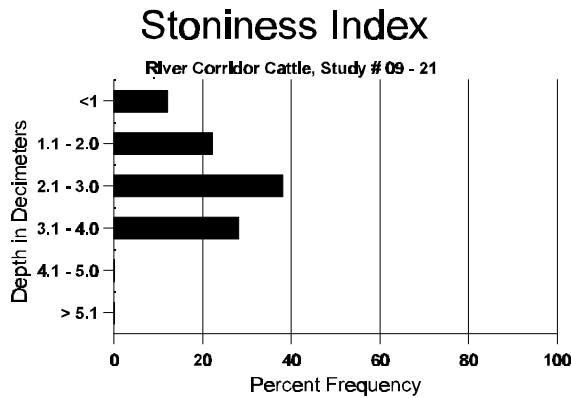
Herd unit 09 , Study no: 21

Cover Type	Nested Frequency '00	Average Cover % '00
Vegetation	378	25.92
Rock	38	.28
Pavement	456	31.00
Litter	365	12.51
Cryptogams	113	1.50
Bare Ground	450	54.47

SOIL ANALYSIS DATA --

Herd Unit 09, Study # 21, Study Name: River Corridor Cattle

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
13.87	62 (13.94)	7.8	63.6	18.1	18.2	0.8	4.1	131.2	0.5



PELLET GROUP FREQUENCY --

Herd unit 09 , Study no: 21

Type	Quadncy Frequency '00	Pellet Transect	
		Pellet Groups per Acre (ha) '00	Days Use per Acre (ha) '00
Rabbit	5	96	N/A
Deer	28	400	31 (76)
Cattle	7	-	-

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 21

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Artemisia tridentata wyomingensis</i>																		
Y	'00	13	-	-	-	-	-	-	-	-	13	-	-	-	260		13	
M	'00	43	65	11	-	-	-	-	-	-	119	-	-	-	2380	11	25	119
D	'00	18	30	7	-	-	-	-	-	-	33	-	-	22	1100		55	
X	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	480		24	
% Plants Showing '00		<u>Moderate Use</u> 51%			<u>Heavy Use</u> 10%			<u>Poor Vigor</u> 12%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'00	3740	Dec:	29%	
<i>Atriplex confertifolia</i>																		
S	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	'00	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5	
M	'00	30	2	2	8	6	1	-	-	-	49	-	-	-	980	7	12	49
D	'00	31	-	-	1	-	-	-	-	-	23	-	-	9	640		32	
X	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	60		3	
% Plants Showing '00		<u>Moderate Use</u> 09%			<u>Heavy Use</u> 03%			<u>Poor Vigor</u> 10%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'00	1720	Dec:	37%	
<i>Gutierrezia sarothrae</i>																		
S	'00	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8	
Y	'00	48	-	-	-	-	-	-	-	-	48	-	-	-	960		48	
M	'00	1821	-	-	-	-	-	-	-	-	1682	-	139	-	36420	4	6	1821
D	'00	104	-	-	-	-	-	-	-	-	6	-	24	74	2080		104	
X	'00	8	-	-	-	-	-	-	-	-	8	-	-	-	1700		85	
% Plants Showing '00		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 12%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'00	39460	Dec:	5%	
<i>Opuntia spp.</i>																		
M	'00	7	-	-	-	-	-	-	-	-	7	-	-	-	140	3	12	7
D	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing '00		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 00%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'00	160	Dec:	13%	

Trend Study 9-22-00

Study site name: Browns Park River Corridor-Wildlife .

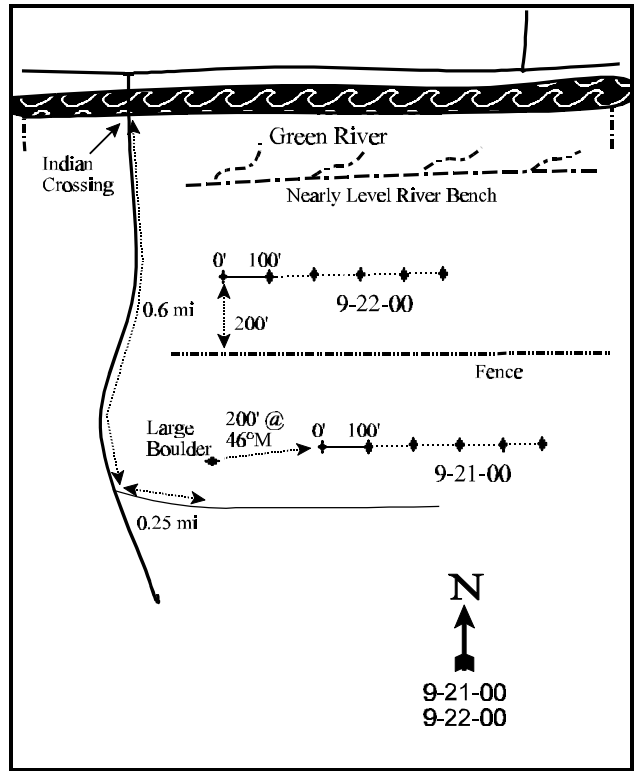
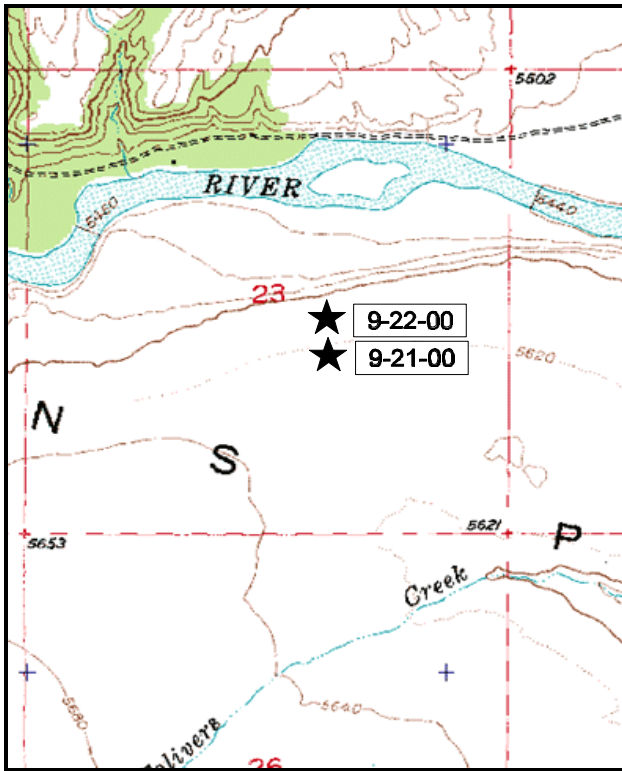
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 68°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

LOCATION DESCRIPTION

From the Indian Crossing bridge at Browns Park travel south for 0.6 miles to a fork. Turn left onto a small road and proceed 0.25 miles. There is a large boulder on the north side of the road. From the boulder walk north to the fence at a bearing of 0°M. From the fence the 0-foot baseline stake is another 200 feet away. The frequency baseline stakes are marked by green fenceposts 12-18 inches in height.



Map Name: Clay Basin

Diagrammatic Sketch

Township 2N , Range 24E ,Section 23

UTM 4528444.094 N, 654014.211 E

DISCUSSION

Trend Study No. 9-22

The Brown's Park River Corridor-Wildlife study is a new site established in 2000. This study was placed to monitor differences between livestock and wildlife use on two sides of a fence line that was built in 1963. The fence was built to exclude cattle grazing on one side of the fence line while allowing grazing on the other side. Wildlife are not excluded from either side of the fence line. This study samples the north side of the fence that is not accessible to livestock. The area is approximately ½ mile south of the Green River at Brown's Park on a sagebrush-grass flat. The site is nearly flat, but has a slight slope of 1-2% and a north aspect. Elevation is 5,600 feet. Pellet group data taken along the baseline in 2000 estimates 40 deer days use/acre (99 ddu/ha). Soil is a sandy loam in texture and moderately deep with an estimated effective rooting depth of over 13 inches. Soil reactivity is moderately alkaline (pH of 7.9) and phosphorus is low at 3.9 ppm. Phosphorus levels below 10 ppm may limit normal plant growth and development. Bare soil is high at 40%, while protective cover from vegetation and litter are moderately low at 28% and 21% respectively. Pavement is abundant on the surface at an estimated 20% cover. Presently, erosion is minimal due to the gentle slope and the abundance of grass cover (74% of total vegetation cover).

Wyoming big sagebrush is the dominant browse and key species on this site. Density is estimated at 2,240 plants/acre with high decadency (46%) and low recruitment (1%). In addition, 63% of the decadent class is classified as dying which represents 660 plants/acre that could be lost to die-off. With recruitment being low, this population could decrease in the future. Poor vigor is high at 32%, and leader growth is low averaging only 2-3 inches in 2000. Use is mostly light to moderate with low heavy use (2%). With big game use being light at the present time, high decadency, poor vigor and low recruitment can be attributed to drought, intraspecific competition between sagebrush plants and interspecific competition with needle-and-thread grass. Drought related increases in decadency and poor vigor in sagebrush communities have been documented on several other trend studies in this region in 2000. With high competition from needle-and-thread and very low precipitation, young plants will have a difficult time becoming established and persisting on this site.

Other browse sampled on this site are: shadscale, broom snakeweed and pricklypear cactus. Shadscale is estimated at 2,340 plants/acre, with the population consisting mostly of mature and decadent plants. Like Wyoming big sagebrush, percent decadency is high at 36% and recruitment is low at 2%. Those with poor vigor is estimated at 15%. Again, drought and competition with sagebrush and needle-and-thread are likely the key factors influencing these downward parameters for shadscale. Broom snakeweed is present, but is not nearly as abundant as it is on study 9-21 across the fence line. Density is estimated at 1,740 plants/acre, with very high decadency at 64%. Drought and high competition with other species appears to be getting the best of the snakeweed population here.

The herbaceous understory is comprised of mainly one species, needle-and-thread grass. This species provides over 18% average cover on the site, which represents 95% of the herbaceous cover and 70% of the total vegetative cover of the site. Squirreltail and sand dropseed are present in low frequencies as well. Two annual species, cheatgrass and sixweeks fescue, were sampled but are insignificant. Forbs are very rare with only two species being sampled in 2000.

2000 TREND ASSESSMENT

Trend for soil appears stable. Although litter and vegetation cover are moderately low and bare ground is abundant, erosion is not severe due to the gentle slope and abundant cover from needle-and-thread grass. Browse is currently in poor condition with high decadency and poor vigor on Wyoming big sagebrush and shadscale. Recruitment from young plants is low for both species. Drought and high competition are apparently the key

factors influencing these downward parameters. The herbaceous understory appears stable, but composition is poor with needle-and-thread dominating the site. All other species, both grasses and forbs, are insignificant on this site.

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 22

T y p e	Species	Nested Frequency	Quadrat Frequency	Average Cover %
		'00	'00	'00
G	Bromus tectorum (a)	8	4	.04
G	Sitanion hystrix	42	20	.80
G	Stipa comata	324	96	18.66
G	Vulpia octoflora (a)	4	1	.03
Total for Annual Grasses		12	5	0.07
Total for Perennial Grasses		366	116	19.47
Total for Grasses		378	121	19.54
F	Descurainia pinnata (a)	5	1	.00
F	Townsendia incana	1	1	.00
Total for Annual Forbs		5	1	0.00
Total for Perennial Forbs		1	1	0.00
Total for Forbs		6	2	0.00

BROWSE TRENDS --
Herd unit 09 , Study no: 22

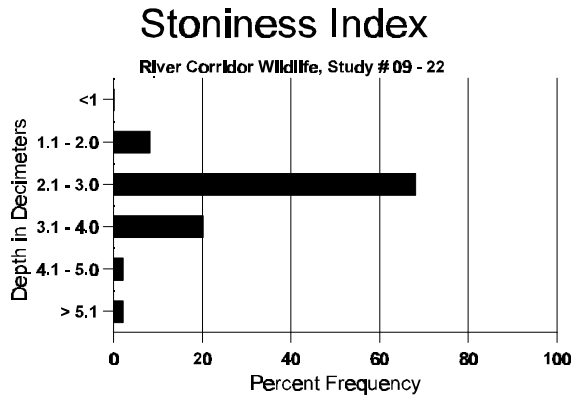
T y p e	Species	Strip Frequency	Average Cover %
		'00	'00
B	Artemisia tridentata wyomingensis	53	3.39
B	Atriplex confertifolia	72	2.25
B	Gutierrezia sarothrae	28	.73
B	Opuntia spp.	10	.56
Total for Browse		163	6.94

BASIC COVER --
 Herd unit 09 , Study no: 22

Cover Type	Nested Frequency '00	Average Cover % '00
Vegetation	353	27.92
Rock	23	.07
Pavement	381	20.76
Litter	442	30.07
Cryptogams	260	6.69
Bare Ground	410	40.15

SOIL ANALYSIS DATA --
 Herd Unit 09, Study # 22, Study Name: River Corridor Wildlife

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
13.50	62.2 (13.70)	7.9	59.6	23.1	17.3	0.7	3.9	150.4	0.5



PELLET GROUP FREQUENCY --
 Herd unit 09 , Study no: 22

Type	Quadncy Frequency '00	Pellet Transect	
		Pellet Groups per Acre (ha) '00	Days Use per Acre (ha) '00
Rabbit	9	296	N/A
Deer	24	513	40 (99)
Grouse	-	9	N/A

BROWSE CHARACTERISTICS --

Herd unit 09 , Study no: 22

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Artemisia tridentata wyomingensis</i>																		
Y	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	'00	51	6	2	-	-	-	-	-	-	56	-	3	-	1180	12	22	
D	'00	40	12	-	-	-	-	-	-	-	19	-	-	33	1040		52	
X	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	2360		118	
% Plants Showing '00		<u>Moderate Use</u> 16%			<u>Heavy Use</u> 02%			<u>Poor Vigor</u> 32%			<u>% Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'00	2240	Dec:	46%	
<i>Atriplex confertifolia</i>																		
Y	'00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	'00	42	1	-	28	2	-	-	-	-	72	-	1	-	1460	8	14	
D	'00	33	-	-	9	-	-	-	-	-	25	-	2	15	840		42	
X	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	400		20	
% Plants Showing '00		<u>Moderate Use</u> 03%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 15%			<u>% Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'00	2340	Dec:	36%	
<i>Gutierrezia sarothrae</i>																		
M	'00	29	-	1	1	-	-	-	-	-	16	-	15	-	620	5	7	
D	'00	55	-	-	1	-	-	-	-	-	1	-	4	51	1120		56	
X	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	640		32	
% Plants Showing '00		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 01%			<u>Poor Vigor</u> 80%			<u>% Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'00	1740	Dec:	64%	
<i>Opuntia spp.</i>																		
M	'00	12	-	-	-	-	-	-	-	-	12	-	-	-	240	3	12	
D	'00	1	-	-	-	-	-	-	-	-	-	-	1	-	20		1	
% Plants Showing '00		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 08%			<u>% Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'00	260	Dec:	8%	

BROWN'S PARK RIVER CORRIDOR TREND STUDY COMPARISON

Trend studies 9-21 (River Corridor-Livestock) and 9-22 (River Corridor-Wildlife)

2000 data comparisons

	River Corridor-Livestock (accessible to livestock)	River Corridor-Wildlife (inaccessible to livestock)
Wyoming big sagebrush		
Average cover (%)	9.2	3.4
Density (plants/acre)	3,740	2,240
% young	7	1
% decadent	29	46
% decadent/dying	40	63
% poor vigor	12	32
Shadscale		
Average cover (%)	1.3	2.3
Density (plants/acre)	1,720	2,340
% young	6	2
% decadent	37	36
% decadent/dying	28	36
% poor vigor	10	15
Broom snakeweed		
Average cover (%)	7.1	0.7
Density (plants/acre)	39,460	1,740
Needle-and-thread grass		
Average cover (%)	6.6	18.7
Ground cover		
Vegetation cover (%)	25.9	27.9
Litter cover (%)	12.5	30.1
Bare ground (%)	54.5	40.2

Although total vegetation cover is about the same on both sides of the fence line, the nature of the vegetation is quite different. Seventy-one percent of the vegetation cover on the livestock accessible side comes from browse with only 29% being provided by herbaceous species. In contrast, 74% of the vegetation cover on the side not accessible to livestock (no grazing) is provided by herbaceous species, with only 26% coming from browse. Litter cover is low on both sides of the fence, but extremely so on the side accessible to livestock grazing. Bare ground is high on both sides of the fence as well, but more so on the side where livestock grazing occurs.

Herbaceous vegetation consists primarily of one species on both sites, needle-and-thread grass. However, this species provides nearly 3 times more average cover on the side not grazed by livestock.

The shrub component on these sites appears to be suffering from drought and competition. Wyoming big sagebrush and shadscale on both sites show high decadency and a higher than normal proportion of plants displaying poor vigor. With use currently being mostly light to moderate on both sites, high decadency and poor vigor can be attributed more to drought and competition than to any other factors. Decadency in the Wyoming big sagebrush population is higher on the side not accessible to livestock grazing. Recruitment from young plants is much lower for both sagebrush and shadscale on this side of the fence as well. Shrubs have higher competition on the side not accessible to livestock grazing because needle-and-thread grass provides nearly 3 times more cover. Thus, there are fewer microsites available for young plants to establish due to higher perennial grass cover, and more competition for resources.

SUMMARY

MANAGEMENT UNIT 9 - SOUTH SLOPE

Management unit 9 has 22 trend studies, of which 20 were read in 2000. Two sites, Toliver Creek P-J and Mud springs Draw were not read in 2000. The study at Toliver Creek in the untreated pinyon-juniper was not read because it is in very poor condition and very little wildlife use is present on the site. This study was originally established to compare with the adjacent Toliver Creek Chaining study (9-10). It may be reread in the future but it is apparent that no significant changes have taken place since 1995. The study at Mud Springs Draw was also not read due to road closures and lack of access.

In 2000, the browse and herbaceous understory components on the majority of studies in this unit show negative characteristics due to drought. Of the trend studies read in 2000 (excluding new studies):

- < The key browse species, most notably Wyoming or mountain big sagebrush, have increased decadency on 15 sites (83%)
- < Wyoming and/or mountain big sagebrush has increased poor vigor on 10 sites (56%)
- < Sum of nested frequency for perennial grasses decreased on 13 sites (72%)
- < Sum of nested frequency for perennial forbs decreased on 17 sites (94%)

Increases in decadency and poor vigor in key browse populations, specifically sagebrush, did not result in a downward browse trend on most studies in 2000. Only 3 studies were assessed as having a downward or slightly downward browse trend. However, increased decadency and poor vigor should be watched closely in the future for further increases in these 2 key parameters. Herbaceous vegetation, primarily perennial forbs, appear to have been negatively effected significantly by drought in 2000. Ten studies were assessed as having down or slightly down herbaceous understory trends in 2000, with the primary factor being decreased sum of nested frequencies for perennial grasses and/or forbs due to drought. Normal precipitation in the future will improve decadency and poor vigor in shrub populations and result in increases in frequency for herbaceous species.

Trend Summary

	Category	1982	1988	1995	2000
9-1 Red Mountain Allotment	soil	est	4	4	2
	browse	est	2	4	2
	herbaceous understory	est	4	2	1
9-2 Taylor Mountain	soil	est	5	4	3
	browse	est	5	3	3
	herbaceous understory	est	5	3	3
9-3 Dry Fork Mountain	soil	est	4	4	3
	browse	est	3	4	3
	herbaceous understory	est	5	4	3
9-4 Sawtooth - Flat Spring	soil	est	4	4	3
	browse	est	4	3	3
	herbaceous understory	est	4	3	2
9-5 Island Park	soil	est	2	4	2
	browse	est	2	1	1
	herbaceous understory	est	5	4	1
9-6 Above Steinaker Draw	soil		est	3	3
	browse		est	4	2
	herbaceous understory		est	3	2
9-7 Warren Draw	soil	est	3	3	3
	browse	est	4	4	3
	herbaceous understory	est	5	5	2
9-8 Rye Grass	soil	est	3	4	3
	browse	est	2	4	3
	herbaceous understory	est	5	1	2
9-9 Little Hole	soil	est	5	4	3
	browse	est	3	4	3
	herbaceous understory	est	5	3	2

(1) = down, (2), slightly down, (3) = stable, (4) = slightly up, (5) = up
 (est) = site established, (NR) = site not read

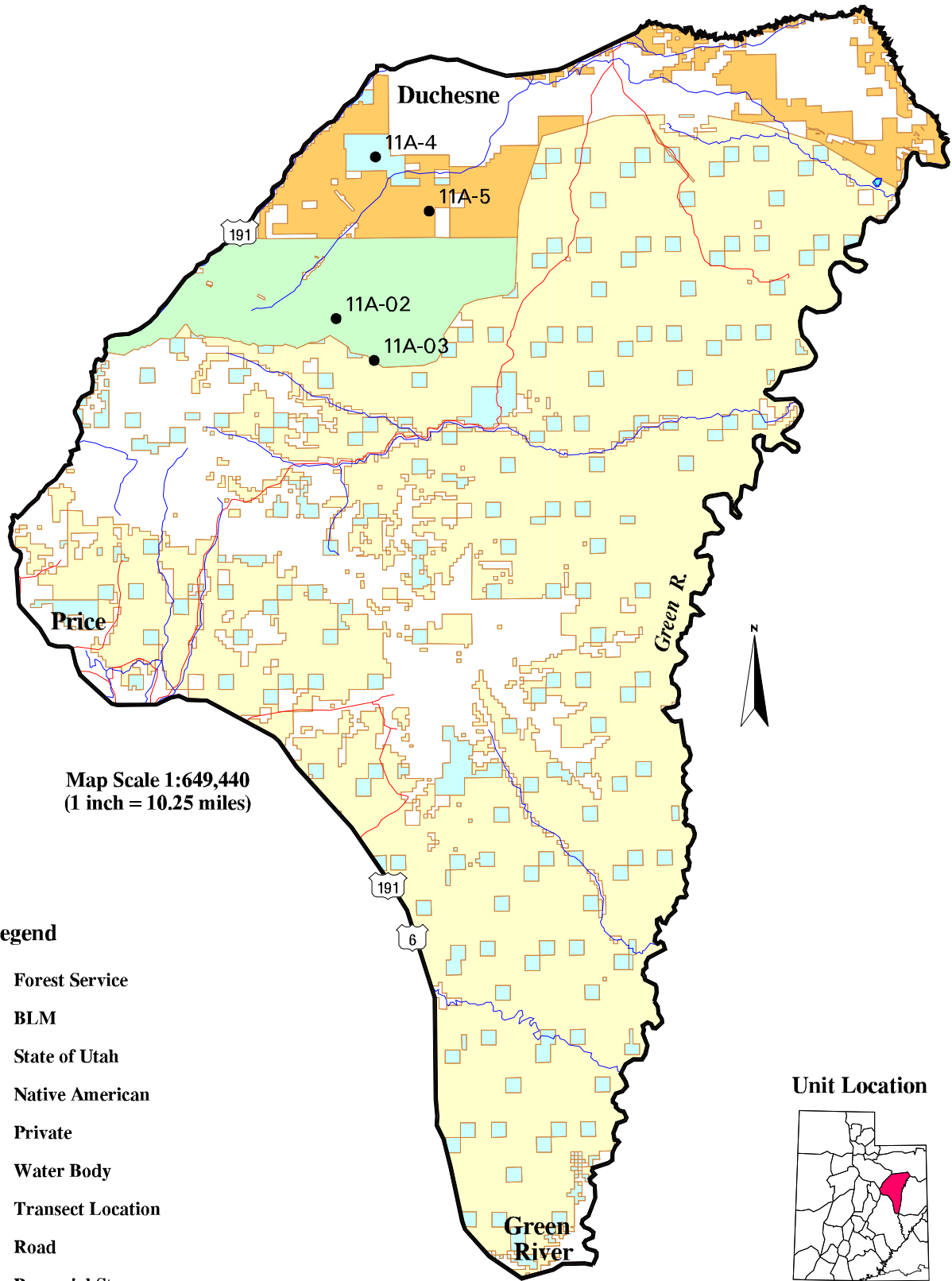
	Category	1982	1988	1995	2000
9-10 Toliver Creek Chaining	soil		est	5	2
	browse		est	4	4
	herbaceous understory		est	1	4
9-11 Toliver Creek P-J	soil		est	4	NR
	browse		est	1	NR
	herbaceous understory		est	4	NR
9-12 Brown's Park P-J and Burn	soil		est	5	4
	browse		est	5	3
	herbaceous understory		est	5	4
9-13 John Starr Flat	soil	est	3	3	2
	browse	est	4	4	3
	herbaceous understory	est	3	2	3
9-14 Red Pine Canyon	soil	est	3	3	4
	browse	est	3	3	3
	herbaceous understory	est	4	1	3
9-15 Mud Springs Draw	soil	est	4	4	NR
	browse	est	4	4	NR
	herbaceous understory	est	5	3	NR
9-16 Mosby Mountain	soil	est	3	4	4
	browse	est	3	3	3
	herbaceous understory	est	5	2	2
9-17 Farm Creek	soil			est	3
	browse			est	3
	herbaceous understory			est	3
9-18 Gooseberry Spring	soil	est	3	4	2
	browse	est	5	4	3
	herbaceous understory	est	5	2	1

(1) = down, (2), slightly down, (3) = stable, (4) = slightly up, (5) = up
(est) = site established, (NR) = site not read

	Category	1982	1988	1995	2000
9-19 Mosby Mountain South	soil		est	3	2
	browse		est	1	3
	herbaceous understory		est	5	3
9-20 Seep Hollow	soil	est	3	4	3
	browse	est	3	4	3
	herbaceous understory	est	3	5	2
9-21 Brown's Park River Corridor-Livestock	soil				est
	browse				est
	herbaceous understory				est
9-22 Brown's Park River Corridor-Wildlife	soil				est
	browse				est
	herbaceous understory				est

(1) = down, (2), slightly down, (3) = stable, (4) = slightly up, (5) = up
(est) = site established, (NR) = site not read

Management Unit 11A



MANAGEMENT UNIT 11A (15) - ANTHRO/RANGE CREEK, ANTHRO

Boundary Description

Duchesne and Uintah counties - Boundary begins at Duchesne and Highway US-191; then southwest on US-191 to the Argyle Canyon Road; southeast on this road to the Nine Mile Canyon Road; east along this road to its end near Bulls Canyon; south from the end of the road to Nine Mile Creek; east along this creek to the Green River; north along this river to the Duchesne River; northwest along this river to Highway US-40; west on US-40 to Duchesne and beginning point (excludes all Ute Indian Tribal lands within this boundary).

Management Unit Description

The 1996 Utah Big Game Annual Report identifies 639,228 acres of land within management unit 11A. The Bureau of Land Management is responsible for 43% of the land area, with U.S. Forest Service and State of Utah lands making up an additional 16% and 5% of the land area respectively. Indian and private lands make up one-third of the land area at 14% and 21% respectively. There is a long and gradual northerly slope to the Anthro Mountain terrain, which lends itself to an abundance of winter range. The long slopes are covered by pinyon-juniper woodland with natural openings of sagebrush. Grassy openings are often found in the drainages. Some ridge tops are covered with black sagebrush. Summer range is limited with most of the high country being comprised of open sagebrush slopes with scattered patches of aspen. Most of the winter range in the unit is available even in severe winters. The upper limits for winter range are generally considered between 8,000 and 8,500 feet. The desert country below 4,000 feet is seldom used by migrating deer.

Livestock Grazing

Cattle grazing is the major activity occurring on Forest Service managed lands within management unit 11A. Oil and gas exploration and drilling with their associated roads and year-round activity are the prominent activities taking place on the lower ends of the ridges. These lands are administered by the BLM and Ute Indians. Firewood cutting is also an important use on the Ute Indian lands.

Information on the current livestock grazing program was provided by the Ashley National Forest. The Cottonwood allotment, where study 11A-1 is located, is a 2-unit deferred rotation system with 326 head of cattle from June 16 to October 15. Prior to 1981, the allotment was generally grazed season long. Study 11A-2 is in the Anthro Mountain allotment and is currently grazed by 481 head of cattle under a 7- unit rest-rotation system from June 1 to October 15. The Antelope Winter allotment, where study 11A-3 is located, is a 3-unit deferred rotation system with 200 head of cattle grazing the allotment from December 1 to March 23.

Big Game Management Objectives

A small, but increasing number of elk constitute the Anthro herd. It has been hunted under a bull only permit system since 1978, but was separated from the larger Avintaquin-White River herd unit in 1983. The elk herd is currently (1996) managed as a limited entry hunting area with an emphasis on quality hunting by maintaining low hunter numbers and a high percentage of mature bulls in the population. The high for bull permits came in 1990 with 22 permits allowed. In 1995, only 7 bull permits were allowed, compared to 13-15 permits allowed between 1991 and 1994. Eleven permits were available in 1997, and 13 in 1998. Hunter success is usually high. Current elk herd management objectives call for a target winter herd size of 700 animals with a minimum post season bull to cow ratio of 8:100, with at least 4 bulls being 2 ½ years of age or older.

Deer numbers on the Anthro Mountain unit continue to be relatively low. Buck harvest averaged 161/year from 1979 to 1983 and then doubled to an average annual harvest of 387 bucks from 1984 to 1988. From 1989 to 1991, buck harvest numbers steadily declined from a high of 579 in 1988 to 237 in 1991. Since 1991, buck harvest numbers have stayed fairly constant with an average of 154/year. Success has remained fairly constant over all years at around 33%. The current deer herd unit plan calls for a target wintering herd of 2,500 animals with an annual harvest of 250 bucks.

Unfortunately, the pellet transects are no longer maintained so deer days use per hectare estimates for key areas are unavailable.

Pronghorn are also present in the study area. They have been observed on Myton Bench and on the pinyon-juniper and sagebrush ridges of Lower Cottonwood and Antelope Canyons. Buck hunting was first permitted in 1978.

Study Site Description

The Upper Cottonwood Ridge (11A-1) study samples an aspen type at 9,200 feet, while the Wirefence Canyon (11A-2) and Chokeycherry Canyon (11A-3) studies are located in the predominant sagebrush/grass type. These studies were established in late September of 1982, then re-read in late July 1988. Two additional studies were established in early August 1988, which sample representative winter range for the area. The Cottonwood Canyon (11A-4) study is on DWR land, while the Nutters Canyon (11A-5) study is apparently on the Uintah and Ouray Indian Reservation (it was originally thought to be on BLM). They are both located in naturally open sagebrush valleys surrounded by pinyon-juniper woodland. All sites were reread in 1995 and 2000, with the exception of study number 11A-1 which was not read in 2000.

Trend Study 11A-1-00

Study site name: Upper Cottonwood Ridge .

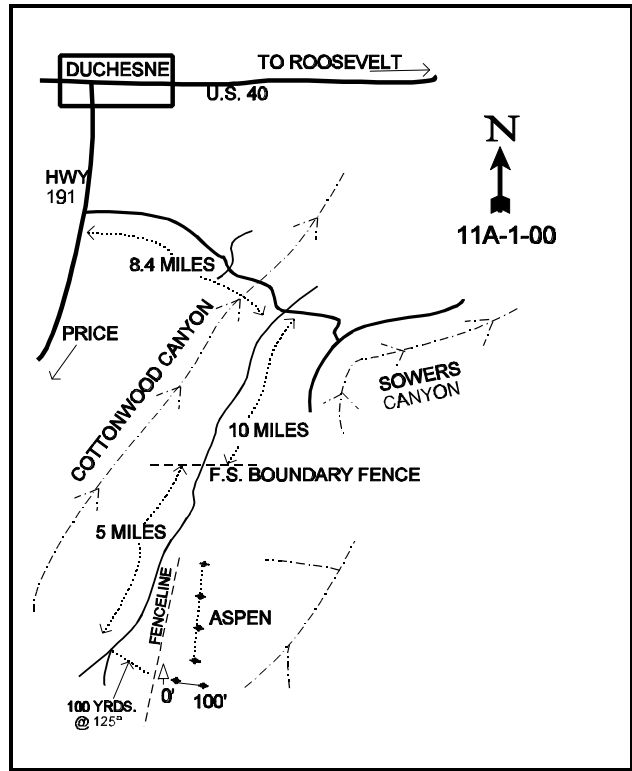
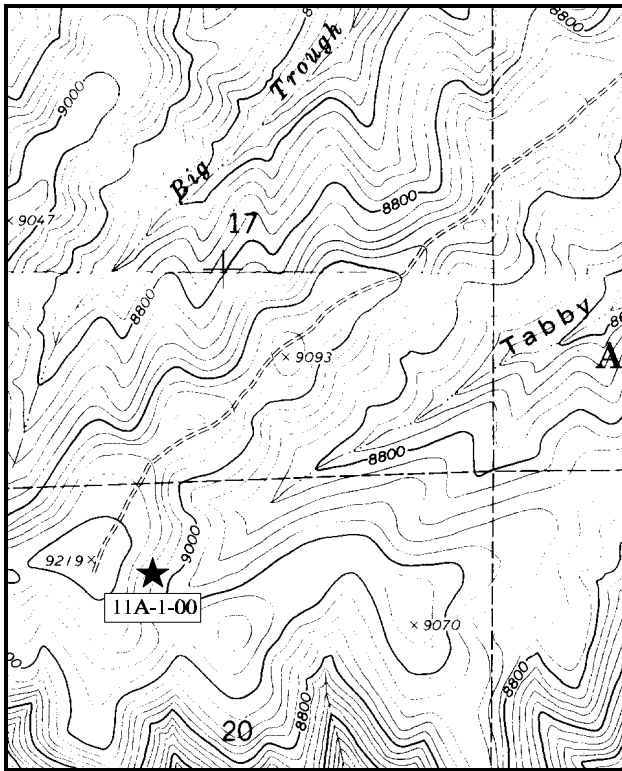
Range type: Quaking Aspen .

Compass bearing: frequency baseline 110°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From Duchesne, go south on Highway 191 towards Price for approximately 2.5 miles. Turn left and proceed southeast on the main road for 8.4 miles to a fork above Sowers Canyon. Bear right and drive up along Cottonwood Ridge for about 10 miles to the FS boundary fence. From there, continue 5 miles to a faint fork on top of the ridge above the head of Tabby Canyon. From the fork, walk 64 paces bearing 110°M to the 0-foot baseline stake. The 0-foot stake is just beyond a lone conifer, on the edge of the aspens. The baseline runs SE into the young aspen stand. The 0-foot baseline stake has a red browse tag, #7088, attached.



Map Name: Lance Canyon

Diagrammatic Sketch

Township 6S, Range 6W, Section 20

UTM 4421962 N, 535263 E

DISCUSSION

Trend Study No. 11A-1 (15-1)

*** This site was not read in 2000. Only the site narrative is included here. Refer to the 1995 "Utah Big Game Range Trend Studies" report for maps and data tables for this site.

The Upper Cottonwood Ridge study samples summer range at an elevation of 9,160 feet. This study has an easterly aspect with a slope of 50%. Soils are fine textured and contain moderate amounts organic matter. Surface rock and pavement are scarce. Due to the steep slope, dense aspen with a thick shrub understory, cattle are not able to make much use of this site.

This small, uneven-aged stand of quacking aspen at the head of Tabby Canyon receives light to moderate use by big game. This allotment is grazed by 326 head of cattle from June 16 to October 15 as part of a two-unit deferred rotation system.

Vegetative aerial cover for the site was estimated at 47% in 1995. This is an increase from the previous years data as only basal cover was estimated. Litter cover estimates are similar and is estimated at 69%. No erosion is evident with a low percentage of bare ground (12%) because of the high amounts of protective vegetative and litter cover.

During the 1982 and 1988 reading, aspen density was estimated using three 1/200 acre density plots which estimated 3,933 plants/acre and 6,066 plants/acre for each year respectively. All aspen trees were classified as young with no apparent hedging in 1988. In 1995, point-center quarter data estimated 1,044 trees/acre with an average diameter of 2.4 inches. Aspen was mistakenly not counted in the shrub strips and not classified for form class and vigor in 1995, so no comparisons can be made with the past data. Serviceberry, not encountered on the density plots in 1982, yet estimated at 9,266 shrubs/acre in 1988, now have an estimated density of only 180 plants/acre. The high 1988 density estimate can be attributed to an abundance of young plants and a much smaller sample size. These young plants did not survive the drier years or the intraspecific competition. The serviceberry plants show only light utilization with an average height of 20 inches and crown diameter of 29 inches. The mountain big sagebrush population has shifted from a mostly young population reported in 1982 and 1988, to a mostly mature population in 1995. The plants have increased in average height to 19 inches and crown diameter to 25 inches. There is light use, if any, on the plants at this time. Very few of the plants were classified as decadent and the dead to live ratio is 1:36. Snowberry has shown a steady increase over the years and now has an estimated density of 9,040 plants/acre. Snowberry is stoloniferous and was counted as a plant if it was rooted within the sample area. An increase in this species would be expected because it is moderately shade tolerant, allowing it to out-compete the surrounding species as the aspen canopy closes. The size of the plants has stayed relatively stable with an average height of 17 inches and an average crown diameter of 23 inches. The Wood's rose density has also increased and is estimated at 6,180 plants/acre in 1995. It is a mostly mature, small statured population. Chokecherry is scattered throughout the site with an estimated density of 1,000 plants/acre. These plants average less than 2 feet in height with an average crown diameter of 1½ feet. Currently, all of these browse species show only light utilization.

Grasses comprise 9% of the total vegetative cover. Nearly half of the grass cover is contributed by a sedge. Bluebunch wheatgrass has the next highest cover for grasses. Other grasses include: Kentucky bluegrass, mountain brome, slender wheatgrass, muttongrass and Columbia needlegrass.

Thirty-three species of forbs were encountered with a *Penstemon spp.* having the highest cover value. Sum of nested frequency for perennial forbs has increased since 1988 and total quadrat frequency has increased since 1982. Most species encountered are perennials with very little chance of annual species invading this high elevation site.

1982 APPARENT TREND ASSESSMENT

This site is currently in good to excellent condition. It is unfortunate that deer herd unit 11A does not contain more acreage of similar vegetation. Herd unit productivity could be greatly improved. A key factor on this site is the apparent relative lack of livestock use. Other aspen sites further to the east and south have been heavily utilized and hence have rather depleted understories. Range trend is stable or perhaps even improving. A few conifers (i.e., white fir and douglas fir) are present but offer no immediate ecological threat.

1988 TREND ASSESSMENT

The increased density and frequency of a variety of herbaceous vegetation found in 1988 confirms the upward vegetative trend. The increase in forbs, a key management component, was not as large as the increase in grasses. The changes in browse density shown on the density plots were not supported by the frequency data, so are probably not significant. Conifer invasion is not a factor in this aspen community type.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - up (5)

1995 TREND ASSESSMENT

Soil trend on this site is stable and in excellent condition. The herbaceous understory and litter, as well as the aspen canopy, provide good protection to the soil. There is abundant browse cover, but at this elevation, grasses and forbs will be preferred for most of the season over browse. Browse trend is stable. It should be noted that the large change in density for serviceberry was due to a combination of a very large number of young plants that were lost with the extended drought and the small sample size in 1988 which happened to be directly over a patch of small plants. This has been remedied with a much larger sample size and better distributed sample giving much more reflective estimates for browse that have clumped or discontinuous distributions. Density of conifers is low at this time. The herbaceous understory accounts for 39% of the vegetative cover (30% forbs and 9% grasses). Both forbs and grasses are diverse and fairly abundant. Sum of nested frequency for grasses and forbs has increased since 1988 with most species being relatively palatable to livestock and wildlife. Herbaceous understory trend is up.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - up (5)

Trend Study 11A-2-00

Study site name: Wirefence Canyon .

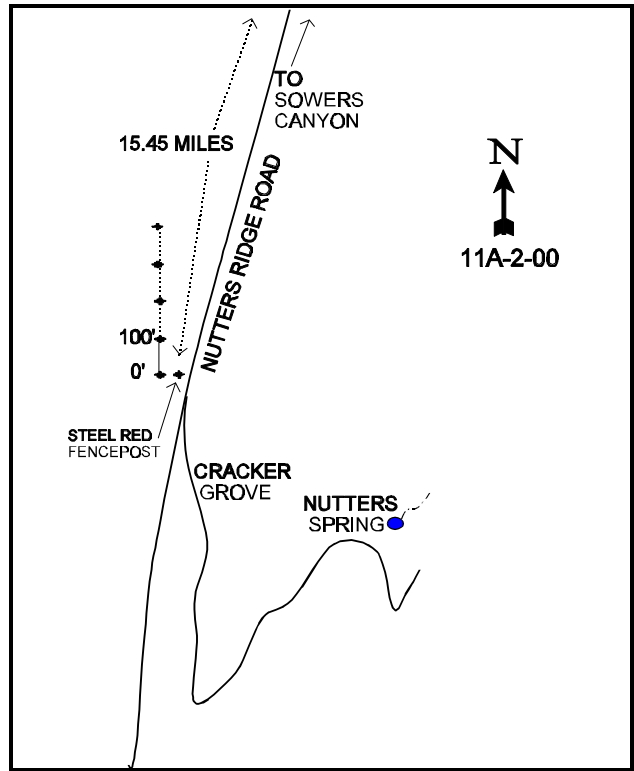
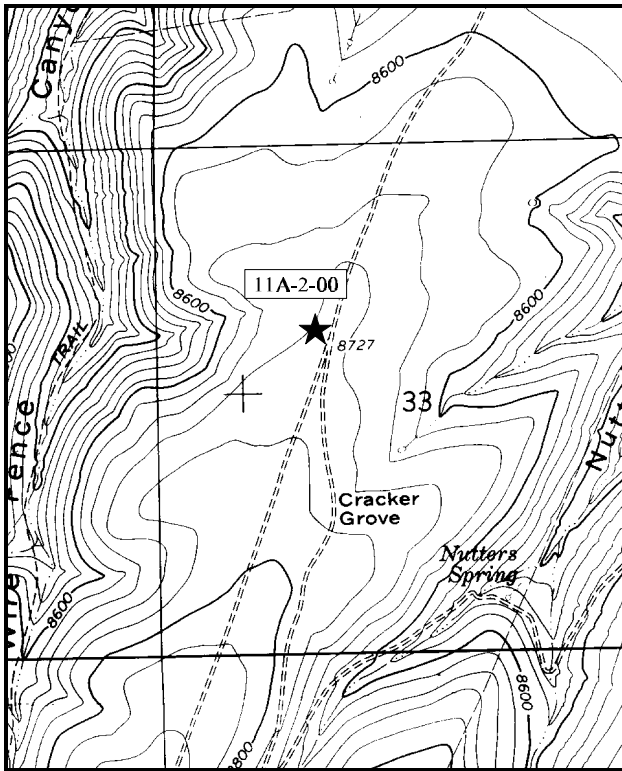
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 348°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (16 & 86ft), line 2 (33ft), line 3 (52ft), line 4 (66ft). Belt 3 and belt 5 rebar @ 2ft.

LOCATION DESCRIPTION

From the junction of Highway U.S. 40 and the Sowers Canyon Road (near Bridgeland), drive south on the Sowers Canyon Road for 8.5 miles to the Nutters Ridge Road. Turn left here by an old ranch and proceed south along Nutters Ridge for 15.5 miles to a narrow “Y” in the road. Six paces west of the fork is a red steel fencepost. The 0-foot baseline stake is 15 paces west of the red fencepost. The baseline is marked by green, 12-18 inch tall fenceposts.



Map Name: Dyer Mountain

Diagrammatic Sketch

Township 6S, Range 5W, Section 33

UTM 4418575.272 N, 546523.990 E

DISCUSSION

Trend Study No. 11A-2 (15-2)

The Wirefence Canyon trend study is located on summer range within the large sagebrush-grass park occupying a flat ridge between the uppermost reaches of Wirefence and Nutters Canyons. Elevation is 8,700 feet with almost flat terrain. This study is located immediately adjacent to an old permanent line-intercept study established in 1977 and is intended to replace it. After decades of season-long grazing by cattle and sheep from 1915 to 1944, a summer rest-rotation grazing system was established in 1972. This study is now grazed by 481 head of cattle from June 1 to October 15 as a 7-unit rest-rotation system. Escape or thermal cover is totally lacking on the study site. The nearest cover is a ½ mile away in Nutters Canyon or within an isolated but badly depleted aspen grove (Cracker Grove), approximately the same distance to the southeast. Use of the site by wildlife is currently light with 1 deer day use/acre (3 ddu/ha) and 18 elk days use/acre (44 edu/ha) being estimated from pellet group transect data taken along the baseline in 2000. Livestock use is currently at a more moderate level with 52 cow days use/acre (128 cdu/ha) being estimated in 2000.

Supplemental site information provided by the Ashley National Forest indicate that numerous treatments have been done on the Anthro Mountain allotment, including plowing and seeding on this particular study site (a 2,363 acre treatment) in 1958 and 1959. These old treatments have future plans for maintenance, which includes burning and/or spraying.

Soil on the site is a moderately shallow loam with an estimated effective rooting depth of just less than 12 inches. Soils are neutral in reactivity (pH of 7.2) and average soil temperature is 53°F at nearly 14 inches in depth. Phosphorus is low at 5.1 ppm, where values less than 10 ppm can limit normal plant growth and development. A hardpan is present about 6 inches below the soil surface as illustrated by the stoniness index estimated from penetrometer readings. Due to the nearly level terrain, erosion is not severe. Vegetative aerial cover was estimated at 36% in 1995, increasing to 48% in 2000. Earlier estimates are considerably lower as only basal vegetative cover was estimated prior to 1995. Cover from rock and pavement combined are estimated at 6% in 1995 and 8% in 2000. Litter cover has fluctuated through time as a function of precipitation. At this time, litter cover is estimated at 40%, an increase from 34% in 1995. Percent bare ground, while fairly steady at 24% in 1982 and 1988, has increased to 32% and 37% in 1995 and 2000 respectively.

Mountain big sagebrush is the dominant overstory species. It has generally been healthy and vigorous in the past with light to moderate use and mostly good vigor. However in 2000, sagebrush displays a dramatic increase in plants showing poor vigor (4% in 1995 to 41% in 2000) with a moderate increase in percent decadency (6% in 1995 to 19% in 2000). Many of the mature and decadent individuals in the population displayed a chlorotic appearance in 2000. Therefore, they were classified as having poor vigor. The drought in 2000 is most likely the cause of this increase in poor vigor on sagebrush. A return to normal precipitation patterns should improve sagebrush vigor in the future. Currently, the sagebrush population is composed of mostly mature individuals (70%) with a moderate level of young plant recruitment (11%) into the population. Biotic potential (# of seedlings) is relatively low at 3% and 1% in 1995 and 2000 respectively. Average leader growth on sagebrush is currently low at only 3 inches. Mountain big sagebrush provides about 70% of the total browse cover in both 1995 and 2000.

Mountain low rabbitbrush density has remained relatively constant over all years with a mostly mature age structure. Mountain low rabbitbrush currently accounts for 28% of the total browse cover with an estimated density of 3,980 plants/acre. Other browse present on the site include: broom snakeweed, gray horsebrush, snowberry and fringed sagebrush.

The understory is the key component on this summer range and it makes up nearly 80% of the total vegetative cover for the site in 2000. Smooth brome is the dominant species, being sampled in every quadrat during all sampling periods and remaining at a fairly stable nested frequency. Smooth brome is more palatable when it is young and loses palatability with age. However, when it has been covered by snow it will soften and increase in palatability. Mutton bluegrass is the second most abundant grass, increasing significantly in nested frequency in 2000. Other species include: sheep fescue, Sandberg bluegrass, Prairie junegrass, crested wheatgrass, intermediate wheatgrass and bluebunch wheatgrass. There was no noticeable use on grasses in 2000. As a group, perennial grasses showed almost no change in sum of nested frequency from 1995 to 2000. No annual grasses have been sampled in any year. Perennial forbs are diverse, but significantly decreased in sum of nested frequency in 2000 due to drought. Many of the species encountered are considered low growing increasers. Looseflower milkvetch is the most abundant forb providing over 6% average cover (or 74% of the total forb cover) and significantly increasing in nested frequency in 2000. Annual forbs are present, but infrequent.

1982 APPARENT TREND ASSESSMENT

Range trend appears to be in a state of decline. The principle cause is almost certainly cattle grazing. Without some serious reduction or a grazing system allowing some rest and regeneration, the prognosis is not good for this site.

1988 TREND ASSESSMENT

Ground cover percentages remained about the same between 1982 and 1988. The estimate for litter cover (51%) is good, especially considering the grazing pressure this site received in 1988 due to its close proximity to water and a salt lick. Percent cover of bare ground remains at 24%. Current observations indicate that the soil condition and trends have stabilized. Trend for browse is stable. Mountain big sagebrush remains at a stable density, displays a low decadency rate and has a high rate of recruitment from young plants (46%). Trend for the herbaceous understory appears stable. Twenty-three perennial grass and forb species were sampled in 1988 making it an important component of this vegetative community.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

1995 TREND ASSESSMENT

The bare interspaces between the mountain big sagebrush show some signs of erosion, but this is only slight. The level terrain helps keep the soil in place along with the vegetation and litter cover. Therefore, soil trend is considered stable. The mountain big sagebrush population is stable with moderate utilization and a low decadency rate. The broom snakeweed and mountain low rabbitbrush populations also appear stable with a mature age structure, although the mature plants are increasing in size. Browse trend is stable at this time. The herbaceous understory accounts for 69% of the total vegetative cover. The dominant species is smooth brome which comprises 27% of the total vegetative cover. The sum of nested frequency for perennial forbs has increased slightly. Many of the forb species are not sought after by wildlife or livestock. Although sum of nested frequency has increased for forbs, a different composition may be desired. Herbaceous understory trend is slightly upward.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly upward (4)

2000 TREND ASSESSMENT

Trend for soil is stable. Erosion appears minimal at the present time and the ratio of protective ground cover to bare ground remained at nearly the same level as in 1995. Trend for browse is slightly down as the number of mountain big sagebrush with poor vigor sharply increased (4% to 41%). There was also a moderate increase in those classified as decadent (6% to 19%) since 1995. Recruitment from young plants also decreased from 42% to 11%. Increases in poor vigor and decadency are likely due to the extremely dry conditions in 2000. These parameters should improve with normal precipitation. Trend for the herbaceous understory is slightly down as sum of nested frequency for perennial forbs decreased by almost 50% due to drought. Forbs should increase on this summer range with normal precipitation.

TREND ASSESSMENT

soil - stable (3)

browse - slightly down (2)

herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --

Herd unit 11A, Study no: 2

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron cristatum	16	33	22	19	7	14	12	.97	1.05
G	Agropyron intermedium	_b 41	_a 3	_a 8	-	19	2	3	.01	.16
G	Agropyron spicatum	_a -	_a -	_b 13	-	-	-	8	-	.55
G	Bromus inermis	330	337	334	23	100	100	100	9.80	16.74
G	Elymus salina	_b 34	_c 56	_a 4	-	13	24	2	.68	.18
G	Festuca ovina	_a -	_b 45	_c 72	-	-	20	35	.63	1.30
G	Koeleria cristata	_b 52	_b 51	_a 27	2	29	25	11	.73	.73
G	Poa fendleriana	_b 123	_a 66	_b 120	-	53	30	52	1.52	2.95
G	Poa secunda	-	40	39	29	-	18	18	.60	.36
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		596	631	639	71	221	233	241	14.96	24.04
Total for Grasses		596	631	639	71	221	233	241	14.96	24.04
F	Agoseris glauca	-	2	-	-	-	1	-	.00	-
F	Allium spp.	-	3	-	-	-	1	-	.00	-
F	Androsace septentrionalis (a)	-	_b 32	_a 7	-	-	13	3	.06	.01
F	Arabis drummondi	_a 4	_b 20	_a 1	-	2	10	1	.07	.00
F	Astragalus argophyllus	_a 4	_{ab} 23	_b 33	1	3	11	14	.22	.46
F	Astragalus convallarius	4	12	4	1	2	5	2	.05	.03
F	Astragalus detritalis	-	6	-	-	-	2	-	.03	-
F	Astragalus tenellus	_a 132	_a 99	_b 167	-	54	42	72	4.39	6.58
F	Aster spp.	_a -	_b 26	_a -	-	-	9	-	.70	-

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Castilleja flava	_b 19	_{ab} 12	_a 5	-	11	6	3	.14	.04
F	Chaenactis douglasii	_b 6	_b 8	_a -	-	4	3	-	.16	-
F	Cymopterus longipes	_a -	_c 122	_b 33	-	-	54	16	.77	.22
F	Descurainia pinnata (a)	-	3	-	-	-	1	-	.00	-
F	Eriogonum alatum	-	-	-	5	-	-	-	.00	-
F	Erigeron eatonii	_b 26	_b 30	_a 7	2	13	17	3	.17	.06
F	Eriogonum umbellatum	_a 15	_b 65	_a 26	-	7	25	14	1.56	.78
F	Hedysarum boreale	_a -	_b 18	_a 4	-	-	7	1	.25	.00
F	Hymenoxys acaulis	-	1	-	-	-	1	-	.00	-
F	Ipomopsis aggregata	_b 8	_a -	_a 1	-	3	-	1	-	.03
F	Lesquerella spp.	_b 40	_a -	_a -	-	24	-	-	-	-
F	Linum lewisii	2	-	3	2	1	-	1	.00	.01
F	Lupinus argenteus	6	10	6	1	5	4	3	.16	.33
F	Machaeranthera canescens	_a -	_b 13	_a 1	1	-	6	1	.27	.15
F	Oxytropis sericea	_b 40	_a 2	_a -	-	19	2	-	.01	-
F	Penstemon caespitosus	_b 48	_b 48	_a 5	-	24	21	4	.66	.09
F	Penstemon comarrhenus	-	1	-	-	-	1	-	.15	-
F	Physaria acutifolia	_a -	_c 63	_b 7	-	-	29	4	.23	.04
F	Phlox longifolia	11	21	9	-	5	9	4	.09	.04
F	Potentilla spp.	3	-	-	-	1	-	-	-	-
F	Schoenocrambe linifolia	5	7	-	-	3	3	-	.02	-
F	Senecio canus	_a -	_b 7	_{ab} 2	-	-	3	1	.06	.00
F	Thlaspi arvense (a)	-	1	-	-	-	1	-	.00	-
Total for Annual Forbs		0	36	7	0	0	15	3	0.07	0.01
Total for Perennial Forbs		373	619	314	13	181	272	145	10.24	8.93
Total for Forbs		373	655	321	13	181	287	148	10.32	8.94

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

BROWSE TRENDS --
Herd unit 11A, Study no: 2

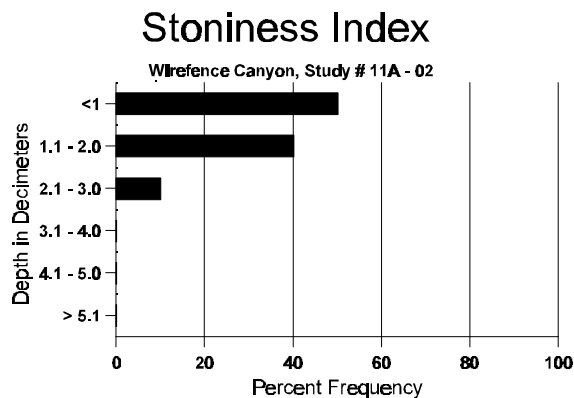
Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia frigida	2	1	.00	-
B	Artemisia tridentata vaseyana	80	70	8.18	6.43
B	Chrysothamnus viscidiflorus lanceolatus	80	68	3.20	2.56
B	Gutierrezia sarothrae	34	23	.04	.27
B	Tetradymia canescens	9	15	.15	.03
Total for Browse		205	177	11.58	9.30

BASIC COVER --
Herd unit 11A, Study no: 2

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	354	357	7.5	6.25	36.06	48.48
Rock	193	100	3.25	3.00	3.17	2.85
Pavement	252	257	18.00	15.50	3.07	5.52
Litter	392	374	46.25	51.25	34.34	40.47
Cryptogams	4	1	.50	0	.15	.15
Bare Ground	344	341	24.50	24.00	32.06	37.24

SOIL ANALYSIS DATA --
Herd Unit 11A, Study # 2, Study Name: Wirefence Canyon

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	%OM	PPM P	PPM K	dS/m
11.67	53.6 (13.94)	7.2	43.4	33.0	23.56	4.4	5.1	96.0	0.8



PELLET GROUP FREQUENCY --

Herd unit 11A, Study no: 2

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'95	'00	00	00
Rabbit	6	10	339	N/A
Elk	15	10	235	18 (45)
Deer	1	6	52	4 (10)
Cattle	1	12	626	52 (129)
Sage Grouse	-	-	44	N/A

BROWSE CHARACTERISTICS --

Herd unit 11A, Study no: 2

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht. Cr.		
Artemisia frigida																		
S	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	1	1	-	-	-	-	-	-	-	2	-	-	-	40	4	10	2
	'00	-	-	-	-	-	-	1	-	-	1	-	-	-	20	3	4	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		50%			00%			00%			-50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	40		-			
												'00	20		-			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Artemisia tridentata vaseyana																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	3	1	-	-	-	-	-	-	-	4	-	-	-	266		4
	95	6	-	-	-	-	-	-	-	-	6	-	-	-	120		6
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2
Y	82	10	-	-	-	-	-	-	-	-	10	-	-	-	666		10
	88	19	11	-	-	-	-	-	-	-	30	-	-	-	2000		30
	95	61	25	-	-	-	-	-	-	-	86	-	-	-	1720		86
	00	12	7	-	-	-	-	-	-	-	18	-	1	-	380		19
M	82	36	1	-	-	-	-	-	-	-	35	-	2	-	2466	15 18	37
	88	24	6	-	-	-	-	-	-	-	30	-	-	-	2000	14 20	30
	95	37	55	14	-	-	-	-	-	-	103	-	3	-	2120	14 26	106
	00	54	59	5	-	-	-	-	-	-	66	-	52	-	2360	13 25	118
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	1	4	-	-	-	-	-	-	-	5	-	-	-	333		5
	95	4	3	5	-	-	-	-	-	-	7	-	-	5	240		12
	00	14	17	1	-	-	-	-	-	-	16	-	10	6	640		32
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	160		8
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	180		9
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'82		02%			00%			04%			+28%						
'88		32%			00%			00%			- 6%						
'95		41%			09%			04%			-17%						
'00		49%			04%			41%									
Total Plants/Acre (excluding Dead & Seedlings)												'82	3132	Dec:	0%		
												'88	4333		8%		
												'95	4080		6%		
												'00	3380		19%		

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total		
		1	2	3	4		1	2			
<i>Chrysothamnus viscidiflorus lanceolatus</i>											
S	82	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	0		0
	95	1	-	-	-	-	-	-	20		1
	00	1	-	-	-	-	-	-	20		1
Y	82	7	-	-	-	-	-	-	466		7
	88	13	-	-	-	-	-	-	866		13
	95	27	-	-	-	-	-	-	540		27
	00	27	-	-	-	-	-	-	540		27
M	82	50	2	-	-	-	-	-	3466	8 13	52
	88	41	2	-	-	-	-	-	2866	5 4	43
	95	217	-	-	-	-	-	-	4340	8 11	217
	00	166	-	-	-	-	-	-	3320	7 9	166
D	82	-	-	-	-	-	-	-	0		0
	88	1	-	-	-	-	-	-	66		1
	95	-	-	-	-	-	-	-	0		0
	00	2	-	-	1	-	-	-	60		3
X	82	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	0		0
	00	-	-	-	-	-	-	-	20		1
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>	<u>%Change</u>						
'82		03%	00%	00%	- 3%						
'88		04%	00%	00%	+22%						
'95		00%	00%	00%	-20%						
'00		00%	00%	00%							
Total Plants/Acre (excluding Dead & Seedlings)					'82	3932	Dec:	0%			
					'88	3798		2%			
					'95	4880		0%			
					'00	3920		2%			
<i>Eriogonum microthecum</i>											
M	82	9	-	-	-	-	-	-	600	2 4	9
	88	-	-	-	-	-	-	-	0	- -	0
	95	-	-	-	-	-	-	-	0	- -	0
	00	-	-	-	-	-	-	-	0	- -	0
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>	<u>%Change</u>						
'82		00%	00%	00%							
'88		00%	00%	00%							
'95		00%	00%	00%							
'00		00%	00%	00%							
Total Plants/Acre (excluding Dead & Seedlings)					'82	600	Dec:	-			
					'88	0		-			
					'95	0		-			
					'00	0		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4		1	2				
Gutierrezia sarothrae												
S	82	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	0	-	0	
	95	3	-	-	-	-	-	-	60	-	3	
	00	-	-	-	-	-	-	-	0	-	0	
Y	82	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	0	-	0	
	95	7	-	-	-	-	-	-	140	-	7	
	00	-	-	-	-	-	-	-	0	-	0	
M	82	-	-	-	-	-	-	-	0	-	0	
	88	25	-	-	-	-	1	-	1733	4	4	26
	95	72	-	-	-	-	-	-	1440	7	8	72
	00	36	-	-	-	-	-	-	720	4	5	36
D	82	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	0	-	0	
	00	2	-	-	-	-	-	-	40	-	2	
X	82	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	40	-	2	
	00	-	-	-	-	-	-	-	20	-	1	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%						
'88		00%		00%		00%		- 9%				
'95		00%		00%		00%		-52%				
'00		00%		00%		05%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	0%			
						'88	1733		0%			
						'95	1580		0%			
						'00	760		5%			
Symphoricarpos oreophilus												
M	82	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	0	-	0	
	95	1	-	-	-	-	-	-	20	12	15	1
	00	-	-	-	-	-	-	-	0	9	20	0
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%						
'88		00%		00%		00%						
'95		00%		00%		00%						
'00		00%		00%		00%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	-			
						'88	0		-			
						'95	20		-			
						'00	0		-			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Tetradymia canescens																		
Y	'82	1	4	-	-	-	-	-	-	-	1	4	-	-	333			5
	'88	5	-	-	-	-	-	-	-	-	5	-	-	-	333			5
	'95	2	1	-	-	-	-	-	-	-	3	-	-	-	60			3
	'00	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	'82	-	1	-	-	-	-	-	-	-	-	1	-	-	66	10	11	1
	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	9	12	1
	'95	5	2	-	-	-	-	-	-	-	7	-	-	-	140	7	10	7
	'00	14	2	2	-	-	-	-	-	-	18	-	-	-	360	6	9	18
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		83%			00%			00%			+40%							
'88		00%			00%			00%			-70%							
'95		30%			00%			00%			+52%							
'00		10%			10%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	399	Dec:	0%			
												'88	665		40%			
												'95	200		0%			
												'00	420		0%			

Trend Study 11A-3-00

Study site name: Chokecherry Canyon .

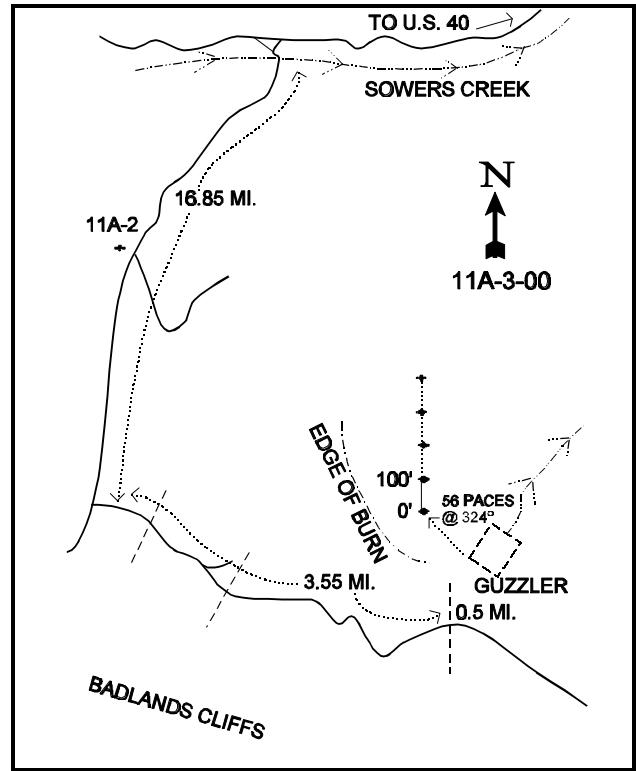
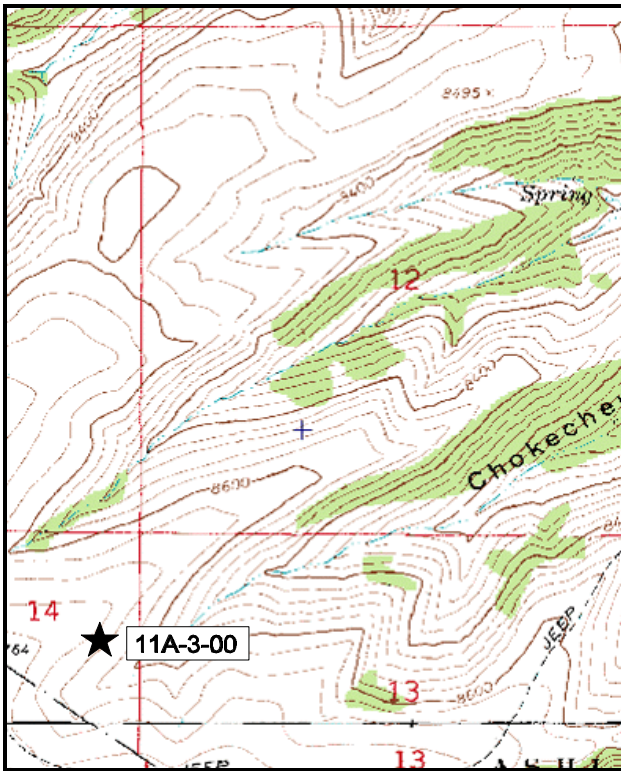
Range type: Sagebrush- Grass Burn .

Compass bearing: frequency baseline 348°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (6 & 95ft), line 2 (25ft), line 3 (46ft), line 4 (62ft).

LOCATION DESCRIPTION

From the junction of Highway U.S. 40 and the Sowers Canyon Road (near Bridgeland), proceed south on the Sowers Canyon Road for 8.5 miles to the Nutters Ridge road. Turn left and drive south 16.85 miles up Nutters Ridge to a "T" intersection above the Badland Cliffs. Turn left and go 3.55 miles along the edge to a fence. Continue 0.5 miles and stop. Walk north over the ridge to a large, fenced guzzler. From the southwest fence corner, the 0-foot baseline stake is located 56 paces away at a bearing of 324°. The baseline is marked by green steel fenceposts, 12-18 inches in height.



Map Name: Anthro Mountain

Diagrammatic Sketch

Township 7S, Range 5W, Section 14

UTM 4414055.516 N, 550639.866 E

DISCUSSION

Trend Study No. 11A-3 (15-3)

The Chokecherry Canyon trend study is located at the head of Chokecherry and Alkali Canyons and samples a prescribed burn treatment on a sagebrush/grass type. The burn was completed in 1977 and consumed approximately 500 acres. The burn was not seeded, however native species have readily recolonized the burned area. Elevation at the study site is 8,600 feet. A wildlife guzzler is located adjacent to the site. The aspect is to the north with a gentle 10% slope. The area where the site lies is grazed on a 3-unit deferred rotation system with 200 head of cattle grazed from December 1 to March 23. Wildlife use on the site is light by deer and moderately high for elk with an estimated 4 deer days use/acre (10 ddu/ha) and 84 elk days use/acre (207 edu/ha) in 2000. Cattle use was light this past year with only 1 cow day use/acre (2 cdu/ha) being estimated. Animal use is estimated from a pellet group transect read along the sampling baseline of the study site.

Soils are a moderately shallow clay loam with neutral reactivity (pH of 6.9). The stoniness index shows rock to be fairly uniformly distributed throughout the profile. Soil depth increases further down slope in the drainage bottom. Total vegetative cover is moderately high at 45% and 50% in 1995 and 2000 respectively, with at least half of this total coming from perennial grasses in both years. High grass cover, coupled with abundant litter cover at nearly 50%, results in minimal erosion. Rock and pavement cover combined are estimated at 10%. Percent bare ground was low in 1995 at 13%, but increased in 2000 due to a large decrease in the forb component due to drought.

The two principle browse species are mountain big sagebrush and mountain low rabbitbrush. In 2000, the mountain low rabbitbrush population is estimated at 5,800 plants/acre with a mostly mature age structure (80%). Mature plants show light use and average height is 8 inches with an average crown diameter of 11 inches. Leader growth on rabbitbrush averaged between 3-4 inches in 2000. The mountain big sagebrush population is productive and vigorous and is the key browse at this site. Mountain big sagebrush density was estimated at 1,500 plants/acre in 1995, increasing to an estimated 6,000 plants/acre in 2000. Hedging is light to moderate with mostly good vigor throughout the population. Stature of sagebrush on this site is relatively small with an average height of 14 inches and crown of 25 inches in 2000. Age class distribution indicates a rapidly expanding population with nearly half of the population being young plants. Percent decadency remains low at 3% in 2000. Average leader growth on sagebrush was estimated at about 3 inches. Other browse include: snowberry, gray horsebrush and dwarf rabbitbrush. In 2000, gray horsebrush showed the most use of any browse species on the site with 88% of the plants sampled displaying moderate to heavy use. Average leader growth was less than one inch in 2000. Density for this species is currently estimated at 500 plants/acre.

Perennial grasses are the dominant vegetative component on the site. They provided 22% and 26% average cover in 1995 and 2000 respectively. Eleven species have been sampled during the past 3 sampling years, with bluebunch wheatgrass currently being the most abundant. Other abundant species include: Letterman needlegrass, needle-and-thread, slender wheatgrass and thickspike wheatgrass. Sum of nested frequency for perennial grass species has slightly decreased with each reading since 1988. In 2000, nested frequency of thickspike wheatgrass, needle-and-thread and Prairie junegrass significantly decreased, while that of bluebunch wheatgrass significantly increased. All other species remained at stable frequencies in 2000. Identification of grasses was difficult in 2000 due to the lack of heads and common physical characteristics between the species. Minimal use was noted on grasses in 2000.

Forbs are diverse and have been moderately abundant at this site. In 1995, twenty-nine species of forbs were encountered, with an increase in sum of nested frequency from the 1988 level. However, due to drought in 2000, forbs were far less abundant in number, cover and sum of nested frequency. Bastard toadflax provides the greatest amount of forb cover, followed by silvery lupine, sulfur eriogonum and Watson penstemon.

1982 APPARENT TREND ASSESSMENT

Soil trend appears stable but could decline if grazing intensity were to increase. Vegetative condition is good considering the perceived management objectives of forb enhancement.

1988 TREND ASSESSMENT

Trend for soil is stable with adequate cover from litter and herbaceous vegetation to limit erosion. Browse species are increasing in abundance following the prescribed burn. Trend for browse is slightly up with the increase in shrub densities. Trend for the herbaceous understory is up with abundant herbaceous vegetation. Basal vegetative cover nearly doubled in 1988.

TREND ASSESSMENT

soil - stable (3)

browse - slightly up (4)

herbaceous understory - up (5)

1995 TREND ASSESSMENT

Soil trend is stable with little bare ground and excellent vegetative and litter cover. The mountain big sagebrush density appears to be expanding in size and exhibits moderate hedging. Mountain low rabbitbrush is the dominate browse species (50% of browse cover) with light to moderate hedging and a stable population. Snowberry is heavily utilized with an apparent stable population and heavy hedging. These factors lead to a slightly upward browse trend. The herbaceous understory sum of nested frequency is increasing although there is a slight decrease in the grass sum of nested frequency. Diversity of forbs has increased along with the sum of nested frequency for perennial forbs. There are very few annual species. This would indicate a stable herbaceous understory trend.

TREND ASSESSMENT

soil - stable (3)

browse - slightly upward (4)

herbaceous understory - stable, slightly down for grasses and slightly up for forbs (3)

2000 TREND ASSESSMENT

Trend for soil is stable. Vegetation and litter cover remain high and erosion is minimal. Trend for browse is slightly up. Mountain big sagebrush has high recruitment from young plants and continues to increase in density. However, this increase in density is not at the expense of the herbaceous understory as cover from sagebrush is currently only 7%. Trend for the herbaceous understory is slightly down. Sum of nested frequency for perennial grasses slightly decreased, while that of perennial forbs decreased by more than half in 2000. This drastic decrease is due to the drought experienced in 2000. This trend should improve with normal precipitation patterns.

TREND ASSESSMENT

soil - stable (3)

browse - slightly up (4)

herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --
Herd unit 11A, Study no: 3

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	<i>Agropyron dasystachyum</i>	c307	b211	a89	46	96	67	36	4.99	.77
G	<i>Agropyron spicatum</i>	a-	b32	c209	-	-	11	66	.87	12.41
G	<i>Agropyron trachycaulum</i>	a16	b85	b56	28	5	30	25	2.70	1.16
G	<i>Bromus anomalus</i>	b25	a-	a3	-	9	-	1	-	.03
G	<i>Carex</i> spp.	b49	a5	a9	-	22	2	5	.03	.27
G	<i>Festuca ovina</i>	a-	b11	b10	-	-	4	6	.04	.27
G	<i>Koeleria cristata</i>	a7	b49	a12	1	5	16	4	2.57	.21
G	<i>Poa fendleriana</i>	b83	a18	a42	-	32	10	16	.25	.69
G	<i>Stipa columbiana</i>	-	4	-	9	-	1	-	.15	-
G	<i>Stipa comata</i>	a17	c122	b62	16	7	45	25	3.59	1.60
G	<i>Stipa lettermani</i>	b252	a154	a160	42	84	48	52	6.78	9.46
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		756	691	652	96	260	234	236	22.01	26.90
Total for Grasses		756	691	652	96	260	234	236	22.01	26.90
F	<i>Antennaria rosea</i>	b6	a-	ab4	-	3	-	2	-	.30
F	<i>Androsace septentrionalis</i> (a)	-	b31	a-	-	-	14	-	.27	-
F	<i>Arabis drummondi</i>	a1	b16	a-	-	1	7	-	.06	-
F	<i>Astragalus convallarius</i>	1	4	-	9	1	1	-	.00	-
F	<i>Astragalus</i> spp.	4	-	-	-	2	-	-	-	-
F	<i>Castilleja flava</i>	a-	b10	a-	-	-	5	-	.33	-
F	<i>Calochortus nuttallii</i>	-	3	-	-	-	1	-	.00	-
F	<i>Chenopodium album</i> (a)	-	b42	a-	-	-	16	-	.15	-
F	<i>Chaenactis douglasii</i>	b34	b20	a6	-	15	12	2	.13	.03
F	<i>Comandra pallida</i>	a186	b250	a186	31	70	86	65	3.52	3.40
F	<i>Collinsia parviflora</i> (a)	-	a-	b40	-	-	-	17	-	.77
F	<i>Crepis acuminata</i>	a3	b76	a4	-	1	35	2	.37	.06
F	<i>Cymopterus longipes</i>	-	-	3	-	-	-	1	-	.00
F	<i>Delphinium nuttallianum</i>	-	1	-	-	-	1	-	.00	-
F	<i>Eriogonum alatum</i>	a-	a2	b14	-	-	1	8	.00	.21
F	<i>Erigeron eatonii</i>	b19	b8	a-	-	8	4	-	.07	-
F	<i>Eriogonum umbellatum</i>	a35	b70	a34	2	15	33	18	1.72	.45
F	<i>Geranium</i> spp.	3	-	3	-	1	-	-	-	-
F	<i>Hedysarum boreale</i>	-	1	-	-	-	1	-	.00	-

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	<i>Heterotheca villosa</i>	-	-	3	-	-	-	1	-	.03
F	<i>Hymenoxys acaulis</i>	a-	b19	b12	-	-	10	6	.32	.15
F	<i>Ipomopsis aggregata</i>	b8	ab3	a-	-	3	2	-	.03	-
F	<i>Linum lewisii</i>	a-	b21	b10	-	-	10	5	.27	.10
F	<i>Lithospermum ruderales</i>	a-	b8	ab5	-	-	5	2	.19	.06
F	<i>Lupinus argenteus</i>	b67	a25	a8	30	33	12	6	.65	.55
F	<i>Lychnis spp.</i>	2	-	-	-	1	-	-	-	-
F	<i>Machaeranthera canescens</i>	c31	b4	a-	-	15	4	-	.07	-
F	<i>Oenothera lavandulaefolia</i>	a-	b22	b9	-	-	9	5	.98	.05
F	<i>Penstemon caespitosus</i>	a-	b21	a3	-	-	9	2	.58	.01
F	<i>Penstemon comarrhenus</i>	b50	a27	a18	-	30	14	9	.36	.31
F	<i>Penstemon watsonii</i>	b73	b84	a13	-	30	35	6	1.38	.27
F	<i>Physaria acutifolia</i>	a-	b9	ab4	-	-	5	2	.08	.03
F	<i>Phlox longifolia</i>	b86	a20	a4	-	45	10	2	.10	.06
F	<i>Polygonum douglasii</i> (a)	-	b51	a-	-	-	19	-	.22	-
F	<i>Potentilla gracilis</i>	a-	b8	b9	-	-	4	4	.07	.02
F	<i>Schoenocrambe linifolia</i>	-	-	1	-	-	-	1	-	.00
F	<i>Tragopogon dubius</i>	-	3	-	-	-	1	-	.03	-
F	Unknown forb-perennial	b20	a-	a-	-	10	-	-	-	-
Total for Annual Forbs		0	124	40	0	0	49	17	0.64	0.76
Total for Perennial Forbs		629	735	350	75	284	317	149	11.41	6.15
Total for Forbs		629	859	390	75	284	366	166	12.06	6.92

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

BROWSE TRENDS --

Herd unit 11A, Study no: 3

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia nova	2	0	-	-
B	Artemisia tridentata vaseyana	40	69	1.45	7.04
B	Chrysothamnus depressus	7	15	.16	.39
B	Chrysothamnus viscidiflorus lanceolatus	83	82	4.86	4.06
B	Gutierrezia sarothrae	2	1	.01	.00
B	Opuntia spp.	4	2	.03	-
B	Symphoricarpos oreophilus	24	9	2.28	.21
B	Tetradymia canescens	12	17	.83	.39
Total for Browse		174	195	9.63	12.10

BASIC COVER --

Herd unit 11A, Study no: 3

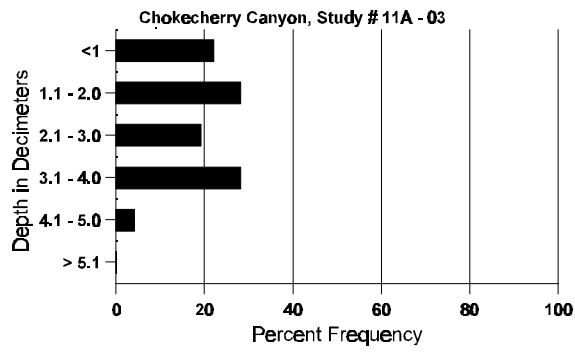
Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	379	368	12.50	23.00	45.31	50.65
Rock	252	143	2.00	5.50	8.19	5.89
Pavement	136	271	4.75	2.50	1.29	10.82
Litter	396	379	55.75	53.75	47.58	49.29
Cryptogams	2	-	0	0	.63	0
Bare Ground	308	281	25.00	15.25	12.67	26.07

SOIL ANALYSIS DATA --

Herd Unit 11A, Study # 3, Study Name: Chokecherry Canyon

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
13.54	56.2 (14.65)	6.9	32.9	33.8	33.2	4.3	11.8	217.6	0.9

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 11A, Study no: 3

Type	Quadrat Frequency	
	'95	'00
Rabbit	4	3
Elk	27	46
Deer	3	9
Cattle	-	1

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
00	00
157	N/A
1096	84 (208)
148	11 (28)
9	1 (2)

BROWSE CHARACTERISTICS --

Herd unit 11A, Study no: 3

AGE	Y	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht. Cr.		
Artemisia nova																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'95	2	-	1	-	-	-	-	-	-	3	-	-	-	60	5	7	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			17%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	0		0%			
												'95	120		33%			
												'00	0		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
S	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	'95	48	-	-	-	-	-	-	-	-	48	-	-	-	960		48	
	'00	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8	
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	9	-	-	-	-	-	-	-	-	9	-	-	-	600		9	
	'95	33	8	-	-	-	-	-	-	-	41	-	-	-	820		41	
	'00	144	-	-	1	-	-	-	-	-	145	-	-	-	2900		145	
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	'88	1	2	-	-	-	-	-	-	-	3	-	-	-	200	11	16	
	'95	19	12	-	-	-	-	1	-	-	30	2	-	-	640	16	23	
	'00	114	33	-	-	-	-	-	-	-	139	-	5	3	2940	14	25	
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	1	-	-	-	1	-	-	-	1	-	1	-	40		2	
	'00	6	2	-	-	-	-	-	-	-	7	-	-	1	160		8	
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	240		12	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	460		23	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		17%			00%			00%			+47%							
'95		28%			01%			01%			+75%							
'00		12%			00%			03%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	0	Dec:	0%				
											'88	800		0%				
											'95	1500		3%				
											'00	6000		3%				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus depressus																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	13	4	-	-	-	-	-	-	17	-	-	-	340	3	9	17
	'00	27	20	-	-	-	-	-	-	-	47	-	-	-	940	2	5	47
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1
	'00	-	1	-	-	-	-	-	-	-	1	-	-	-	20			1
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	140			7
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		72%			22%			06%			+63%							
'00		44%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	0		0%			
												'95	360		6%			
												'00	960		2%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus viscidiflorus lanceolatus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	88	4	-	-	-	-	-	-	-	-	-	-	-	266			4	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	00	1	-	-	-	-	-	-	-	-	-	-	-	20			1	
Y	82	8	-	-	-	-	-	-	-	-	-	-	-	533			8	
	88	75	3	-	-	-	-	-	-	-	-	-	-	5200			78	
	95	83	-	-	-	-	-	-	-	-	-	-	-	1660			83	
	00	32	-	-	-	-	-	-	-	-	-	-	-	640			32	
M	82	48	-	-	-	-	-	-	-	-	-	-	-	3200	12	18	48	
	88	41	2	-	-	-	-	-	-	-	-	-	-	2866	13	14	43	
	95	296	104	-	-	-	-	-	-	-	-	-	-	8000	9	13	400	
	00	215	11	7	-	-	-	-	-	-	-	-	-	4660	8	11	233	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	88	12	5	-	-	-	-	-	-	-	-	-	-	1133			17	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	00	15	4	6	-	-	-	-	-	-	-	-	-	500			25	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	20			1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%			+59%							
'88		07%			00%			13%			+ 5%							
'95		22%			00%			00%			-40%							
'00		05%			04%			02%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	3733	Dec:	0%			
												'88	9199		12%			
												'95	9660		0%			
												'00	5800		9%			
Gutierrezia sarothrae																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	1	-	-	-	-	-	-	-	-	-	-	-	20			1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	1	-	-	-	-	-	-	-	-	-	-	-	20	3	5	1	
	00	4	-	-	-	-	-	-	-	-	-	-	-	80	4	4	4	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			+50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	40		-			
												'00	80		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Opuntia spp.																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	4	-	-	-	-	-	-	-	-	4	-	-	-	80	4	15	4
	'00	1	-	-	1	-	-	-	-	-	2	-	-	-	40	3	10	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'82 00%			'82 00%			'82 00%										
		'88 00%			'88 00%			'88 00%										
		'95 00%			'95 00%			'95 00%			-50%							
		'00 00%			'00 00%			'00 00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	0	Dec:	-				
											'88	0		-				
											'95	80		-				
											'00	40		-				
Symphoricarpos oreophilus																		
S	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	5	5	2	-	-	-	-	-	-	12	-	-	-	800			12
	'95	6	-	-	1	-	-	-	-	-	7	-	-	-	140			7
	'00	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
M	'82	4	-	-	-	-	-	-	-	-	4	-	-	-	266	12	21	4
	'88	-	5	-	-	-	-	-	-	-	5	-	-	-	333	15	26	5
	'95	10	1	15	3	-	19	-	-	-	40	8	-	-	960	13	28	48
	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	11	20	1
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	1	-	-	-	-	-	-	-	1	-	-	-	66			1
	'95	-	2	-	-	-	-	2	-	-	4	-	-	-	80			4
	'00	3	-	-	-	-	-	1	-	-	4	-	-	-	80			4
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'82 00%			'82 00%			'82 00%			+78%							
		'88 61%			'88 11%			'88 00%			- 2%							
		'95 05%			'95 58%			'95 00%			-83%							
		'00 00%			'00 00%			'00 00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	266	Dec:	0%				
											'88	1199		6%				
											'95	1180		7%				
											'00	200		40%				

A G R E	Y R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Tetradymia canescens																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	'95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	'00	1	2	-	-	-	-	-	-	-	3	-	-	-	60		3	
M	'82	2	-	-	-	-	-	-	-	-	2	-	-	-	133	7 11	2	
	'88	1	1	-	-	-	-	-	-	-	2	-	-	-	133	11 12	2	
	'95	2	17	-	-	-	-	-	-	-	19	-	-	-	380	9 13	19	
	'00	1	8	4	-	2	4	-	-	-	19	-	-	-	380	7 12	19	
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	1	-	-	-	1	-	-	-	20		1	
	'00	1	1	1	-	-	-	-	-	-	3	-	-	-	60		3	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+33%							
'88		33%			00%			00%			+55%							
'95		77%			05%			00%			+12%							
'00		52%			36%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	133	Dec:	0%			
												'88	199		0%			
												'95	440		5%			
												'00	500		12%			

Trend Study 11A-4-00

Study site name: Cottonwood Canyon .

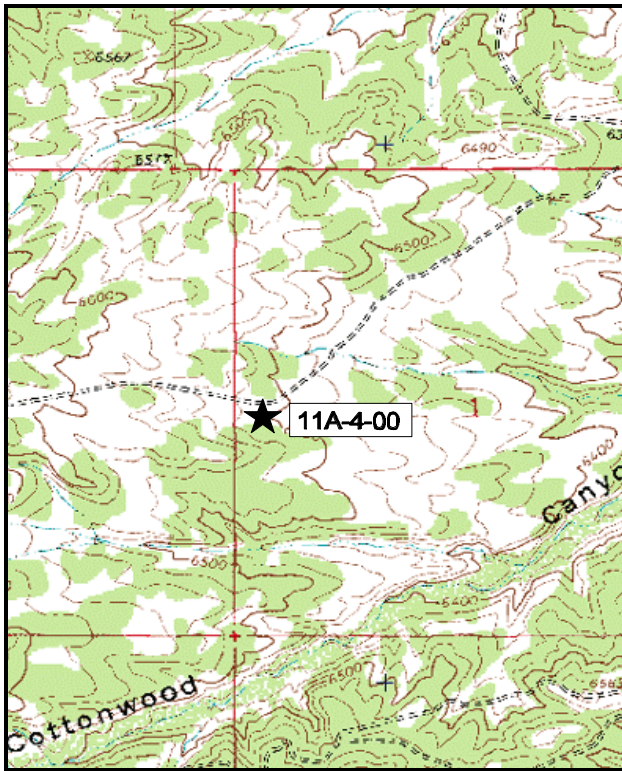
Range type: Salt Desert Shrub .

Compass bearing: frequency baseline 151°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). Belt 4 no rebar.

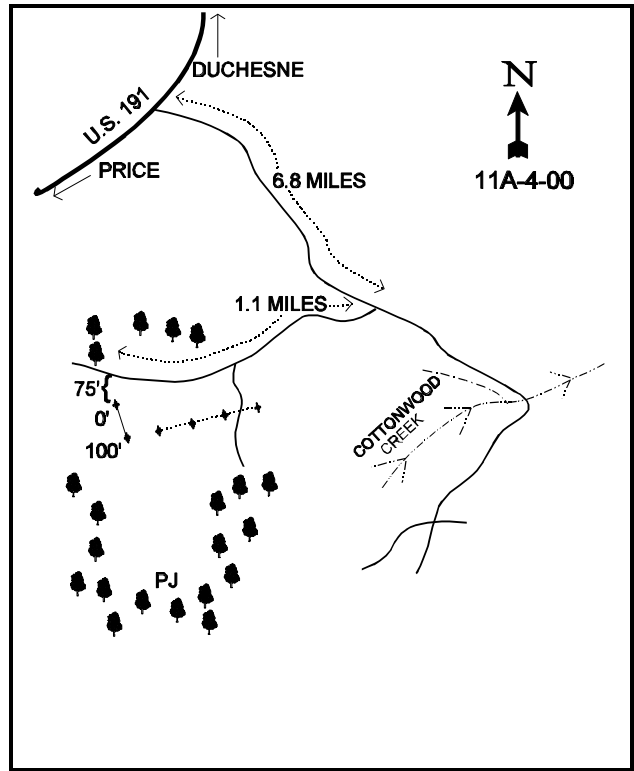
LOCATION DESCRIPTION

From Duchesne, go up Indian Canyon approximately 2.5 miles to the Cottonwood - Sower Canyon Road. Turn left and to the southeast on the main road 6.8 miles to a jeep trail on top of the ridge just before Cottonwood Creek. Turn right on the jeep trail and drive 1 mile west to a fork. Continue approximately 0.1 miles up the right fork to the study site. The 0-foot baseline stake is 15 paces south of the road in the sage/grass type. The study is marked with 12 inch tall fenceposts. The 0-foot baseline stake is marked with browse tag #9037. The baseline is interrupted between the first and second lines.



Map Name: Duchesne SW

Township 5S, Range 5W, Section 1



Diagrammatic Sketch

UTM 4436057 N, 550778.721 E

DISCUSSION

Trend Study No. 11A-4 (15-4)

The Cottonwood Canyon trend study samples winter range on the long slope down from Anthro Mountain and the Badland Cliffs to the Duchesne River. The study is in a mixed shrub/grass community on a 2%, east facing slope surrounded by pinyon-juniper woodland. The site is located on a DWR wildlife management area at an elevation of 6,500 feet. The unit is surrounded by BLM and Ute tribal lands. A pellet group transect read near the baseline in 2000 estimates light use by deer (15 deer days use/acre, 37 ddu/ha) and moderate use by elk (59 elk days use/acre, 146 edu/ha). No cattle pats were sampled in 2000. Antelope also utilize the site but sign was relatively infrequent.

The clay loam soil is moderately deep with an estimated effective rooting depth of over 27 inches. The soil reaction is slightly alkaline (pH of 7.5). A stoniness index estimated from penetrometer readings shows the majority of probes to be 16 inches or deeper in the profile. However, these readings were more a measure of compaction than rock, as very little rock was contacted within the profile. Soil erosion is not a significant problem on the site, although some soil loss is evident in the interspaces resulting in some pedestalling around shrubs. Erosion is more severe in the surrounding pinyon-juniper woodland type. Rock and pavement cover values combined are estimated at nearly 9%. Vegetative cover is estimated at 31% in 1995, decreasing to about 29% in 2000. The main negative factor influencing the soil at this site is the sudden increase of bare ground cover in 2000.

Fringed sagebrush is the most abundant browse species and it accounted for 42% of the browse cover in 2000. Estimated population density of fringed sagebrush is currently 8,680 plants/acre, a decrease of nearly half the estimated number in 1995. Percent decadency also increased to 21%. The dry year in 2000 is most likely the cause of the decrease in density and increase in percent decadency. Plants in poor vigor increased from zero in 1995 to 42% in 2000. Shadscale currently ('00) provides as much cover as fringed sagebrush and has an estimated density of 1,740 plants/acre. Vigor was mostly good in 1995, but in 2000, 53% of the population displayed poor vigor. Percent decadency was low in 1995 at 10%, this drastically increased to 70% in 2000. Use was moderate to heavy in 2000. Winterfat shows many of the same changes as shadscale in 2000. Percent decadency and poor vigor on winterfat increased from 0% in 1995 to 63% in 2000. Also, 52% of the population were classified as having heavy use in 2000. The level of use may have been overestimated due to the dry conditions yielding very little annual growth. These downward changes in key browse parameters are mostly due to the drought experienced in 2000 and should improve with better precipitation in the future. Both winterfat and shadscale have a higher proportion of decadent, dying plants than young plants. This should be watched in the future for possible population losses. Other browse species that are present, but in low abundance include: bud sage, black sagebrush, basin big sagebrush, Wyoming big sagebrush, fourwing saltbush, rabbitbrush, broom snakeweed and prickly pear.

Grasses provided 62% of the total vegetative cover in 1995, increasing to 84% in 2000. Needle-and-thread, thickspike wheatgrass and blue grama are the dominant species which provide nearly all of the grass cover. Needle-and-thread and thickspike remained at stable frequencies in 2000, while blue grama significantly decreased. Blue grama is a warm season species and this decrease is not surprising with the extremely dry conditions in 2000, especially in the summer. Other grasses include: Indian ricegrass, bottlebrush squirreltail and galleta. Cheatgrass was sampled in one quadrat in 1995, but was not sampled in 2000. Sum of nested frequency of grasses has been stable over all sampling periods and only decreasing slightly in 2000 with the dry conditions. In 1995, forbs were dominated by annual species which included woolly navarretia, Fremont goosefoot, slimleaf goosefoot, annual stickweed and tansy mustard. However, no annual forbs were sampled in 2000 due to drought. Sum of nested frequency of all forbs declined from 430 in 1995 to 22 in 2000. Total cover for forbs has never really exceeded 3% in any year. Perennial forbs have been very scarce in all years.

1988 APPARENT TREND ASSESSMENT

The grasses are quite competitive. Forb density and diversity is predictably low. The grasses provide significant ground cover. Most of the vegetative ground cover is provided by mats of blue grama and numerous western wheatgrass stems which together provide excellent erosion control. There is also a significant amount of pavement cover (25%).

1995 TREND ASSESSMENT

The soil shows little sign of erosion due to the abundance of herbaceous vegetation and litter cover. Soil trend is stable. Fringed sagebrush density is high and the plants have become more robust since 1988. The most preferred forage species are found in moderate densities with mostly moderate hedging and nearly the same height and crown measurements. The exception is winterfat which doubled in size (height and crown). Other invasive species are in low abundance and do not appear to be increasing. The browse trend is stable, although there is a dense population of fringed sagebrush. Sum of nested frequency for perennial grasses has stayed nearly the same with only a single occurrence of cheatgrass. Perennial forb sum of nested frequency has increased, but the forbs are still proportionally dominated by annual species. Grasses contribute the most to the herbaceous understory. This leads to a stable herbaceous understory at this time, although there is poor forb composition.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

2000 TREND ASSESSMENT

Trend for soil is slightly down with a large increase of bare ground and evident soil loss in the interspaces. The ratio of protective ground cover to bare soil decreased as well. The large increase in bare ground is the result of the drought experienced in 2000. Trend for browse is down as shadscale and winterfat show drastic increases in poor vigor and percent decadency. Estimated use increased on these species in 2000, but this may be overestimated due to these species appearing heavily used because of low annual growth with drought. Although sum of nested frequency of perennial grasses and forbs slightly decreased in 2000, trend is considered stable. Most of the loss in frequency is from perennial forbs which have been in low abundance in all years. Currently, forbs only contribute 0.1% cover. Perennial grasses are the dominant component in the herbaceous understory and remained at nearly the same sum of nested frequency as the previous reading.

TREND ASSESSMENT

soil - slightly down (2)

browse - down (1)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 11A, Study no: 4

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	<i>Agropyron dasystachyum</i>	_a 179	_b 255	_b 279	64	80	92	6.46	5.86
G	<i>Agropyron spicatum</i>	-	4	-	-	2	-	.04	-
G	<i>Bouteloua gracilis</i>	_c 298	_b 190	_a 152	89	67	55	4.76	4.83
G	<i>Bromus tectorum</i> (a)	-	1	-	-	1	-	.00	-
G	<i>Hilaria jamesii</i>	-	-	-	-	-	-	.00	-
G	<i>Oryzopsis hymenoides</i>	_a 12	_b 44	_{ab} 21	6	19	13	1.10	.51
G	<i>Sitanion hystrix</i>	15	15	36	9	8	13	.09	.84
G	<i>Stipa comata</i>	190	167	172	81	63	67	5.62	9.39
Total for Annual Grasses		0	1	0	0	1	0	0.00	0
Total for Perennial Grasses		694	675	660	249	239	240	18.09	21.44
Total for Grasses		694	676	660	249	240	240	18.09	21.44
F	<i>Astragalus purshii</i>	_a -	_b 6	_a -	-	3	-	.01	-
F	<i>Chenopodium fremontii</i> (a)	-	_b 77	_a -	-	37	-	.55	-
F	<i>Chenopodium leptophyllum</i> (a)	-	_b 66	_a -	-	30	-	.23	-
F	<i>Cryptantha</i> spp.	5	4	-	3	2	-	.01	-
F	<i>Descurainia pinnata</i> (a)	-	_b 38	_a -	-	17	-	.39	-
F	<i>Lappula occidentalis</i> (a)	-	_b 32	_a -	-	15	-	.32	-
F	<i>Machaeranthera grindelioides</i>	-	3	-	-	1	-	.00	-
F	<i>Navarretia intertexta</i> (a)	-	_b 135	_a -	-	65	-	1.06	-
F	<i>Orthocarpus luteus</i> (a)	3	-	-	1	-	-	-	-
F	<i>Phlox austromontana</i>	3	-	5	1	-	2	-	.03
F	<i>Schoenocrambe linifolia</i>	_a 1	_b 48	_a 5	1	24	2	.31	.01
F	<i>Sphaeralcea coccinea</i>	9	15	8	7	9	4	.09	.04
F	<i>Taraxacum officinale</i>	-	2	-	-	1	-	.00	-
F	<i>Townsendia incana</i>	-	4	4	-	2	2	.01	.01
F	<i>Tragopogon dubius</i>	2	-	-	1	-	-	-	-
Total for Annual Forbs		3	348	0	1	164	0	2.56	0
Total for Perennial Forbs		20	82	22	13	42	10	0.45	0.10
Total for Forbs		23	430	22	14	206	10	3.02	0.10

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

BROWSE TRENDS --
Herd unit 11A, Study no: 4

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia frigida	93	87	1.34	1.63
B	Artemisia nova	5	3	-	.15
B	Artemisia spinescens	15	1	.19	.18
B	Artemisia tridentata wyomingensis	1	1	-	-
B	Atriplex confertifolia	62	49	4.85	1.62
B	Ceratoides lanata	29	27	1.56	.30
B	Chrysothamnus viscidiflorus viscidiflorus	1	2	-	-
B	Gutierrezia sarothrae	4	2	.15	-
B	Opuntia spp.	1	0	-	-
B	Pediocactus simpsonii	2	0	-	-
Total for Browse		213	172	8.10	3.89

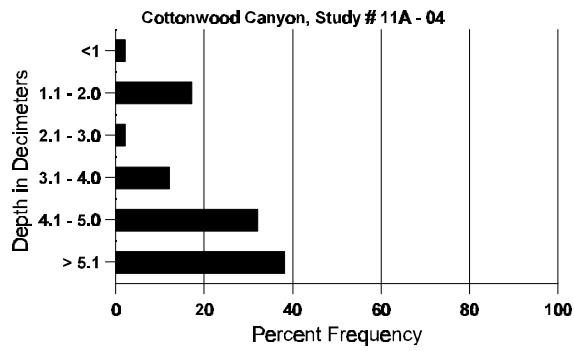
BASIC COVER --
Herd unit 11A, Study no: 4

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	344	347	23.50	31.20	28.95
Rock	135	32	0	.91	.08
Pavement	322	325	24.75	7.81	8.63
Litter	394	376	30.50	28.26	29.41
Cryptogams	194	111	.25	4.27	1.81
Bare Ground	343	362	21.00	20.09	39.95

SOIL ANALYSIS DATA --
Herd Unit 11A, Study # 4, Study Name: Cottonwood Canyon

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	%OM	PPM P	PPM K	dS/m
27.32	60.0 (18.11)	7.5	36.9	34.8	28.3	1.9	8.7	233.6	0.7

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 11A, Study no: 4

Type	Quadrat Frequency	
	'95	'00
Rabbit	26	36
Elk	15	28
Deer	13	7
Cattle	2	-

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
00	00
731	N/A
766	59 (146)
200	15 (37)
-	-

BROWSE CHARACTERISTICS --

Herd unit 11A, Study no: 4

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia frigida																		
S	88	4	-	-	-	-	-	3	-	-	7	-	-	-	466		7	
	95	146	-	-	-	-	-	-	-	-	146	-	-	-	2920		146	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	88	56	-	-	4	-	-	9	-	-	68	-	1	-	4600		69	
	95	485	-	-	-	-	-	-	-	-	485	-	-	-	9700		485	
	00	25	48	-	-	-	-	-	-	-	55	1	11	6	1460		73	
M	88	76	-	-	15	-	-	4	-	-	89	-	5	1	6333	6	4	95
	95	207	16	-	5	-	-	-	-	-	228	-	-	-	4560	15	9	228
	00	240	28	1	-	-	-	-	-	-	169	2	93	5	5380	2	4	269
D	88	15	-	-	-	-	-	-	-	-	4	-	8	3	1000		15	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	77	14	1	-	-	-	-	-	-	25	-	19	48	1840		92	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	200		10	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			10%			+16%							
'95		02%			00%			00%			-39%							
'00		21%			.46%			42%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	11933	Dec:	8%				
											'95	14260		0%				
											'00	8680		21%				
Artemisia nova																		
Y	88	2	-	-	1	-	-	-	-	-	3	-	-	-	200		3	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	3	5	-	-	-	-	-	-	-	8	-	-	-	160	13	18	8
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	6	21	0
D	88	1	-	-	-	-	-	-	-	-	-	-	-	1	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	5	-	1	-	-	-	-	-	-	-	8	160		8	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			25%			-40%							
'95		63%			00%			00%			+ 0%							
'00		13%			63%			100%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	266	Dec:	25%				
											'95	160		0%				
											'00	160		100%				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Artemisia spinescens</i>																		
Y	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333		5	
	95	-	-	1	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	88	16	-	-	1	-	-	4	-	-	20	-	1	-	1400	5	6	21
	95	-	6	15	-	-	-	-	-	21	-	-	-	-	420	6	12	21
	00	1	-	-	-	-	-	-	-	1	-	-	-	20	4	13	1	
D	88	9	-	-	-	-	-	-	-	5	-	1	3	600		9		
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			14%			-81%							
'95		27%			73%			00%			-95%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	2333	Dec:	26%			
												'95	440		0%			
												'00	20		0%			
<i>Artemisia tridentata wyomingensis</i>																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	-	1	-	-	-	-	-	-	1	-	-	-	20	17	26	1	
	00	-	-	1	-	-	-	-	-	-	-	1	-	20	21	40	1	
D	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	00	-	-	1	-	-	-	-	-	-	-	-	1	20		1		
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			00%										
'95		100%			00%			00%			+50%							
'00		00%			100%			100%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	0%			
												'95	20		0%			
												'00	40		50%			
<i>Atriplex canescens</i>																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	18	31	0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	0		-			
												'00	0		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total									
		1	2	3	4		5	6		7	8	9	1	2	3	4		
<i>Atriplex confertifolia</i>																		
S	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333			5
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	11	-	-	1	-	-	1	-	-	13	-	-	-	866			13
	95	1	1	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	22	3	-	-	-	-	-	-	-	25	-	-	-	1666	13	18	25
	95	84	7	2	-	-	-	-	-	-	93	-	-	-	1860	13	23	93
	00	4	6	5	1	5	4	1	-	-	25	1	-	-	520	8	17	26
D	88	22	3	-	-	-	-	-	-	-	24	-	-	1	1666			25
	95	8	2	-	-	-	-	-	-	-	5	-	-	5	200			10
	00	2	15	30	-	1	3	10	-	-	15	-	8	38	1220			61
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	340			17
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	520			26
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		10%			00%			02%			-50%							
'95		10%			02%			05%			-17%							
'00		31%			48%			53%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	4198	Dec:	40%				
											'95	2100		10%				
											'00	1740		70%				
<i>Ceratoides lanata</i>																		
S	88	1	-	-	-	-	-	1	-	-	2	-	-	-	133			2
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	22	2	1	3	-	-	8	-	-	36	-	-	-	2400			36
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	88	9	6	-	2	-	-	1	-	-	18	-	-	-	1200	6	6	18
	95	39	27	1	1	-	-	-	-	-	68	-	-	-	1360	12	11	68
	00	6	-	6	-	-	6	-	-	-	13	-	5	-	360	3	5	18
D	88	9	-	1	-	-	-	-	-	-	7	-	1	2	666			10
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	10	16	-	6	-	-	-	-	5	-	11	18	680			34
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	140			7
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		13%			03%			05%			-67%							
'95		38%			01%			00%			-24%							
'00		30%			52%			63%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	4266	Dec:	16%				
											'95	1420		0%				
											'00	1080		63%				

A G R E	Y R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Chrysothamnus viscidiflorus viscidiflorus</i>																		
Y	88	20	-	-	-	-	-	1	-	-	21	-	-	-	1400		21	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	88	9	-	-	-	-	-	-	-	-	9	-	-	-	600	7	4	9
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20	10	12	1
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	2	4	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			00%			-99%							
'95		00%			00%			00%			+50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	2000	Dec:	-				
											'95	20		-				
											'00	40		-				
<i>Gutierrezia sarothrae</i>																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	-	-	-	-	-	-	1	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	6	-	-	-	-	-	-	-	-	6	-	-	-	120	10	12	6
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	4	6	1
D	88	2	-	-	-	-	-	1	-	-	2	-	-	1	200		3	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			25%			-55%							
'95		00%			00%			00%			-50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	266	Dec:	75%				
											'95	120		0%				
											'00	60		67%				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Opuntia spp.																		
M	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	4	12	1
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	6	14	0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	3	10	0
D	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	1	-	-	-	-	-	-	-	-	-	-	1	20			1	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			00%			-70%							
'95		00%			00%			100%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	66	Dec:	0%			
												'95	20		100%			
												'00	0		0%			
Pediocactus simpsonii																		
M	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	1	2	3
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	60		-			
												'00	0		-			

Trend Study 11A-5-00

Study site name: Nutters Canyon .

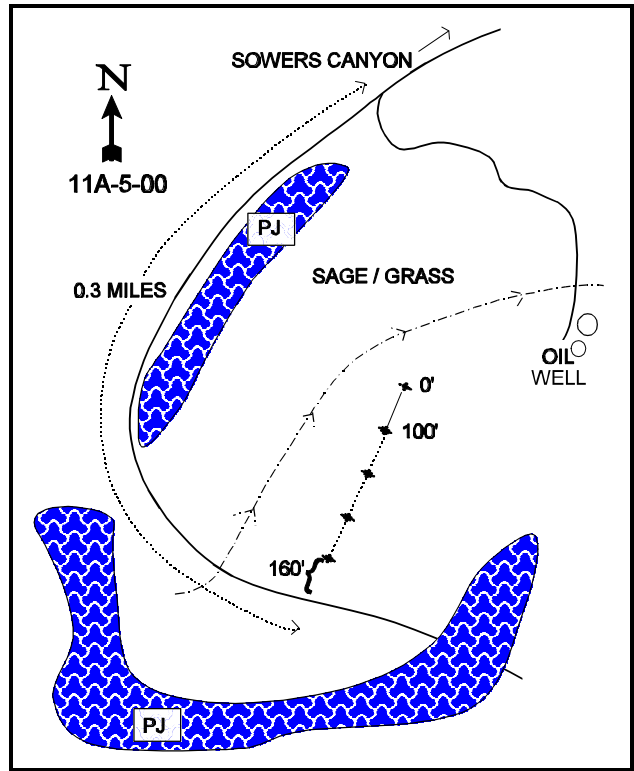
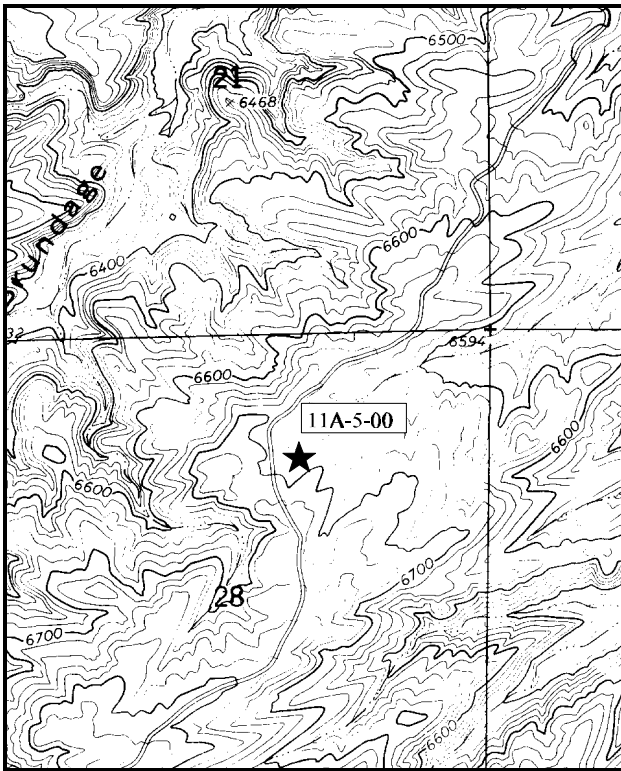
Range type: Black Sagebrush .

Compass bearing: frequency baseline 206°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). Belt 3 rebar @ 2ft.

LOCATION DESCRIPTION

From Highway U.S. 40 near Bridgeland, turn south and go up the Anthro Mountain-Sower Canyon Road 8.6 miles to the turnoff to Nutters Ridge by an old cabin and an oil well. Turn left and go 4.5 miles up the ridge on the main road (stay left at major forks) to another fork to an oil well. Bear right and continue 0.3 miles to where the road curves and crosses a small drainage. Stop before you drive back into the P-J and walk down into the sage opening about 180 feet to the 400-foot baseline stake. The 0-foot baseline stake is marked with browse tag #9035. The study is marked by green fenceposts approximately 18 inches tall.



Map Name: Duchesne SE

Diagrammatic Sketch

Township 5S , Range 4W , Section 28

UTM 4430200.986 N , 556570.209 E

DISCUSSION

Trend Study No. 11A-5 (15-5)

The Nutters Canyon trend study is located above Nutters Canyon in the middle of a sagebrush/grass swale surrounded by pinyon-juniper woodland. Natural sagebrush/grass openings are found within the heads of most drainages. This swale drains to the east-northeast and has a north aspect. The study has a slope of 3-5% at an elevation of approximately 6,600 feet. There are roads along most of the main ridges, plus spur roads going to numerous oil wells within the area. Cattle grazing is of relatively minor use on this Ute Reservation land. The area receives light to moderate use from deer, elk and antelope. A pellet group transect read along the baseline in 2000 estimates 5 deer days use/acre(12 ddu/ha) and 40 elk days use/acre (99 edu/ha).

Soils at the site are loamy in texture and slightly alkaline (pH of 7.4). Soil depth is moderate with an estimated effective rooting depth of nearly 18 inches. Rocks are fairly uniformly distributed throughout the profile as illustrated by the stoniness index estimated from penetrometer readings. Erosion appears light at this time, although vegetation and litter cover are not particularly abundant. Pavement is high at 44% in 2000, with the bare soil cover value low, at less than 10%. Pedestaling is slight around the base of sagebrush plants. Phosphorus is low at 6.6 ppm as values less than 10 ppm may limit normal plant growth and development.

The sagebrush is classified as black sagebrush, although there appears to be some hybridization between mountain big sagebrush and black sagebrush. Along the edge of the pinyon-juniper type and along the drainage bottom, there are shrubs more characteristic of mountain big sagebrush. Black sagebrush provided 16% average cover in both 1995 and 2000 or over 90% of the total browse cover in both years. The population had an estimated density of 12,100 plants/acre in 2000, with most of the population being either mature (58%) or decadent (39%). The decadency rate is an increase from 12% in 1995, and is most likely due to the drought experienced statewide in 2000. Nearly one-third (31%) of the decadent plants were classified as dying in 2000, representing about 1,460 plants/acre that could be lost from the population in the future. Recruitment from young plants is currently low at 3%, a decrease from 17% in 1995 and 42% in 1988. This current low recruitment level is not adequate to replace those individuals in the population classified as dying. A return to normal precipitation patterns could increase recruitment and decrease percent decadency. Biotic potential (proportion of seedlings to the population) remains low at 2%. Black sagebrush shows moderate to heavy hedging with 32% and 35% of the plants classified as heavily hedged in 1995 and 2000 respectively. The proportion of the population displaying poor vigor increased from 5% in both 1988 and 1995, to 13% in 2000. Once again, this increase is most likely drought caused and should improve with normal precipitation. Leader growth on black sagebrush was minimal in 2000. Other browse on the site include: winterfat, shadscale, fringed sagebrush, stickyleaf low rabbitbrush and snakeweed. These species have low densities and combine to provide just over 1% average cover.

The herbaceous understory is dominated by perennial grasses. Blue grama, bottlebrush squirreltail and needle-and-thread grass were nearly equal in frequency and cover in 2000. Each of these species increased in average cover and nested frequency in 2000, except for needle-and-thread which increased in average cover but significantly decreased in nested frequency. Other perennial species sampled at the site but occur infrequently include: thickspike wheatgrass, galleta, Indian ricegrass and Sandberg bluegrass. As a group, perennial grasses slightly decreased in sum of nested frequency in 2000. However, with the extremely dry conditions, this decrease was not significant.

Forbs have provided very little vegetative cover on this site during all sampling periods and especially in 2000. Due to drought in 2000, forbs are nearly non-existent with only four species being sampled. Currently ('00), all forbs combined provide only 1/100 of 1% average cover. Sum of nested frequency for forbs declined from 368 in 1995 to only 6 in 2000, with over half of this decline being from perennial species.

1988 APPARENT TREND ASSESSMENT

Grasses provide considerable litter cover at this site (44%). Decomposition is relatively slow with the soil containing very little organic matter. Pavement contributes 33% of the ground cover. With the 11% vegetative cover provided by the grasses, total ground cover is adequate with only 11% of the surface exposed as bare soil.

1995 TREND ASSESSMENT

Percent bare ground is low, while pavement cover is extremely high. Although pavement does protect from rain drop impact, it also can accelerate runoff across the ground. Percent bare ground has decreased and pavement cover has increased. This increase in pavement could have been a differing interpretation of what pavement is on the site, as there is little current evidence of soil movement. The majority of the soil loss most likely occurred in the past. As a result, soil trend is stable. The black sagebrush population appears to be shifting to a more mature population at this time with 8% of the population was classified as dead. Hedging is moderate to heavy with height staying nearly the same and the crown measurements increasing by 6 inches. There is low biotic potential which is due to drought conditions over the past several years. Other increaser species such as broom snakeweed, sticky leaf rabbitbrush and fringed sagebrush appear to have stable populations with low densities. Browse trend is stable. Sum of nested frequency for perennial grasses has greatly decreased while there was a great increase in perennial forb sum of nested frequency. Many forbs are annual species and account for high amounts of cover and nested frequency values. Because of the large decrease in perennial grass, herbaceous understory trend is slightly downward.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly downward (2)

2000 TREND ASSESSMENT

Trend for soil is stable. Ground cover characteristics are similar to previous levels, with vegetation and bare ground slightly increasing and litter and pavement cover slightly decreasing. Erosion still appears to be minimal even with a large decrease in the abundance of forbs in 2000. The ratio of protective ground cover to bare soil decreased, however it remains adequate to minimize erosion at the present time. Trend for browse is slightly down. Black sagebrush shows increases in percent decadency and poor vigor and a decrease in recruitment from young plants. The proportion of decadent plants classified as dying is currently about 3½ times higher than the number of young plants in the population. These negative trends for black sagebrush are mostly drought related and should improve with normal precipitation. Trend for the herbaceous understory is slightly down overall due to drought. Perennial grasses slightly decreased in sum of nested frequency in 2000, while perennial forbs drastically decreased in sum of nested frequency.

TREND ASSESSMENT

soil - stable (3)

browse - slightly down (2)

herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --
Herd unit 11A, Study no: 5

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	<i>Agropyron dasystachyum</i>	a ⁻	b ¹⁷	b ²⁰	-	7	10	.16	.05
G	<i>Bouteloua gracilis</i>	b ²⁰⁹	a ¹³⁹	a ¹⁵⁴	76	53	61	1.20	3.24
G	<i>Hilaria jamesii</i>	a ⁻	b ¹⁸	b ¹⁴	-	9	5	.24	.07
G	<i>Oryzopsis hymenoides</i>	10	8	6	6	5	4	.06	.07
G	<i>Poa secunda</i>	14	17	7	5	8	4	.11	.04
G	<i>Sitanion hystrix</i>	b ²²¹	a ¹⁵⁷	a ¹⁶⁵	86	65	67	2.01	3.34
G	<i>Stipa comata</i>	c ²⁸¹	b ¹⁷⁴	a ¹³⁶	93	70	48	2.88	4.56
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		735	530	502	266	217	199	6.67	11.38
Total for Grasses		735	530	502	266	217	199	6.67	11.38
F	<i>Arabis perennans</i>	a ⁻	b ¹⁸	a ⁻	-	8	-	.06	-
F	<i>Astragalus purshii</i>	a ⁻	b ⁵⁸	a ⁻	-	28	-	.19	-
F	<i>Astragalus</i> spp.	a ⁷	b ⁴⁴	a ⁻	2	21	-	.15	-
F	<i>Chenopodium fremontii</i> (a)	-	b ³⁵	a ⁻	-	18	-	.23	-
F	<i>Chenopodium leptophyllum</i> (a)	-	3	-	-	2	-	.01	-
F	<i>Cryptantha</i> spp.	-	1	-	-	1	-	.00	-
F	<i>Descurainia pinnata</i> (a)	-	b ⁴⁸	a ⁻	-	21	-	.33	-
F	<i>Eriogonum cernuum</i> (a)	-	4	-	-	2	-	.01	-
F	<i>Erigeron pumilus</i>	-	3	-	-	1	-	.00	-
F	<i>Lappula occidentalis</i> (a)	-	b ⁴⁹	a ⁻	-	20	-	.20	-
F	<i>Machaeranthera canescens</i>	1	3	-	1	2	-	.01	-
F	<i>Navarretia intertexta</i> (a)	-	b ³²	a ⁻	-	19	-	.12	-
F	<i>Orobancha</i> spp.	-	1	-	-	1	-	.00	-
F	<i>Phlox longifolia</i>	a ⁻	b ³⁸	a ⁻	-	15	-	.07	-
F	<i>Schoenocrambe linifolia</i>	7	10	4	2	7	2	.03	.01
F	<i>Sphaeralcea coccinea</i>	b ³²	b ²⁰	a ²	18	11	2	.13	.01
F	<i>Taraxacum officinale</i>	-	1	-	-	1	-	.00	-
Total for Annual Forbs		0	171	0	0	82	0	0.91	0
Total for Perennial Forbs		47	197	6	23	96	4	0.68	0.01
Total for Forbs		47	368	6	23	178	4	1.60	0.01

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

BROWSE TRENDS --
Herd unit 11A, Study no: 5

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia frigida	6	5	.01	.04
B	Artemisia nova	92	95	16.18	16.71
B	Artemisia tridentata vaseyana	1	0	-	-
B	Atriplex confertifolia	12	8	1.32	.71
B	Ceratoides lanata	10	6	.06	.00
B	Chrysothamnus nauseosus graveolens	3	2	.07	.00
B	Chrysothamnus viscidiflorus viscidiflorus	6	7	.01	.21
B	Gutierrezia sarothrae	10	23	.08	.28
B	Opuntia spp.	3	2	.00	.03
B	Pediocactus simpsonii	2	10	.00	.04
B	Pinus edulis	0	4	-	-
Total for Browse		145	162	17.76	18.05

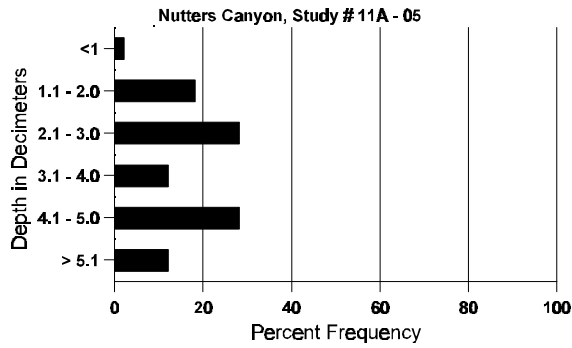
BASIC COVER --
Herd unit 11A, Study no: 5

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	329	318	11.00	25.97	29.31
Rock	84	123	.50	.84	2.42
Pavement	357	362	33.00	47.27	44.26
Litter	371	341	44.50	25.42	19.22
Cryptogams	15	165	0	.05	2.71
Bare Ground	188	270	11.00	5.48	9.82

SOIL ANALYSIS DATA --
Herd Unit 11A, Study # 5, Study Name: Nutters Canyon

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
17.83	60.8 (18.11)	7.4	44.9	33.8	21.3	2.3	6.6	220.8	0.9

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 11A, Study no: 5

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre 00	Days Use per Acre (ha) 00
Rabbit	6	10	731	N/A
Elk	15	24	522	40 (99)
Deer	17	9	69	5 (13)

BROWSE CHARACTERISTICS --

Herd unit 11A, Study no: 5

A Y E	G R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Artemisia frigida																	
S	88	18	-	-	-	-	-	-	-	-	18	-	-	-	1200		18
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
Y	88	23	-	-	-	-	-	-	-	-	22	-	1	-	1533		23
	95	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3
M	88	5	6	3	-	-	-	-	-	-	13	-	1	-	933	7 11	14
	95	5	-	-	-	-	-	-	-	-	5	-	-	-	100	12 10	5
	00	7	-	-	-	-	-	-	-	-	7	-	-	-	140	3 5	7
D	88	-	-	1	-	-	-	-	-	-	1	-	-	-	66		1
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'88		16%			11%			05%			-91%						
'95		00%			00%			00%			-17%						
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)											'88	2532	Dec:	3%			
											'95	240		0%			
											'00	200		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Artemisia nova</i>																		
S	88	76	-	-	1	-	-	11	-	-	87	-	1	-	5866		88	
	95	16	-	-	-	-	-	-	-	16	-	-	-	320		16		
	00	10	-	-	-	-	-	-	-	9	-	-	-	200		10		
Y	88	133	1	-	-	-	-	-	-	132	-	2	-	8933		134		
	95	28	48	13	1	-	-	-	-	90	-	-	-	1800		90		
	00	18	2	-	-	-	1	-	-	21	-	-	-	420		21		
M	88	102	32	1	-	-	-	-	-	132	-	3	-	9000	10	12	135	
	95	13	213	115	4	19	23	-	-	383	4	-	-	7740	11	18	387	
	00	239	15	71	9	2	15	-	-	340	4	3	4	7020	7	15	351	
D	88	38	9	-	-	-	-	-	-	37	-	4	6	3133		47		
	95	8	30	13	-	5	9	-	-	39	-	-	26	1300		65		
	00	22	66	121	10	5	5	4	-	160	-	-	73	4660		233		
X	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	95	-	-	-	-	-	-	-	-	-	-	-	-	980		49		
	00	-	-	-	-	-	-	-	-	-	-	-	-	1160		58		
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		13%			.31%			05%			-49%							
'95		58%			32%			05%			+10%							
'00		15%			35%			13%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	21066	Dec:	15%				
											'95	10840		12%				
											'00	12100		39%				
<i>Artemisia tridentata vaseyana</i>																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	-	1	-	-	-	-	-	-	1	-	-	-	20	15	7	1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		100%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	-				
											'95	20		-				
											'00	0		-				

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4		1	2				
<i>Atriplex confertifolia</i>												
Y	88	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	20		1	
	00	-	-	-	2	-	-	-	40		2	
M	88	2	-	-	-	-	-	-	133	8	13	2
	95	16	-	-	-	-	-	-	320	16	29	16
	00	-	1	-	-	-	3	-	80	13	28	4
D	88	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	20			1
	00	6	1	2	-	1	-	-	200			10
X	88	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'88		00%		00%		00%		+63%				
'95		00%		00%		06%		-11%				
'00		19%		31%		06%						
Total Plants/Acre (excluding Dead & Seedlings)							'88	133	Dec:	0%		
							'95	360		6%		
							'00	320		63%		
<i>Ceratoides lanata</i>												
Y	88	3	-	-	-	-	-	-	200			3
	95	2	-	-	-	-	-	-	40			2
	00	-	-	-	-	-	-	-	0			0
M	88	-	-	-	-	-	-	-	0	-	-	0
	95	10	3	1	-	-	-	-	280	10	10	14
	00	-	-	4	-	1	-	-	100	3	3	5
D	88	1	-	-	-	-	-	-	66			1
	95	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	1	-	-	20			1
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'88		00%		00%		00%		+17%				
'95		19%		06%		00%		-63%				
'00		33%		67%		17%						
Total Plants/Acre (excluding Dead & Seedlings)							'88	266	Dec:	25%		
							'95	320		0%		
							'00	120		17%		

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus nauseosus graveolens																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	12	-	-	-	-	-	-	-	-	12	-	-	-	240	9	11	
	00	1	-	-	-	-	-	-	-	-	-	1	-	-	20	11	6	
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	1	-	-	-	-	-	-	-	-	-	1	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%			-87%							
'00		00%			50%			50%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	0%			
												'95	300		0%			
												'00	40		50%			
Chrysothamnus viscidiflorus viscidiflorus																		
S	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	3	2	
	95	7	-	-	-	-	-	-	-	-	7	-	-	-	140	6	7	
	00	5	-	-	-	-	-	-	-	-	3	2	-	-	100	2	7	
D	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	6	-	-	-	-	4	-	-	-	-	-	-	10	200		10	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'88		00%			00%			00%			+ 6%							
'95		00%			00%			00%			+59%							
'00		00%			24%			59%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	132	Dec:	50%			
												'95	140		0%			
												'00	340		59%			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	19	-	-	-	-	-	-	-	-	19	-	-	-	380		19	
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
Y	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	5	-	-	1	-	-	-	-	-	6	-	-	-	120		6	
M	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200	5	5	3
	95	10	-	-	1	-	-	-	-	-	11	-	-	-	220	7	6	11
	00	76	-	-	2	-	-	-	-	-	78	-	-	-	1560	3	5	78
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			-10%							
'95		00%			00%			00%			+86%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	266	Dec:	-				
											'95	240		-				
											'00	1680		-				
Opuntia spp.																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	6	10	3
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	-	-	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%			-33%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	-				
											'95	60		-				
											'00	40		-				
Pediocactus simpsonii																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	0	1	2
	00	7	-	-	1	1	-	-	-	-	9	-	-	-	180	1	2	9
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%			+85%							
'00		08%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'88	0	Dec:	-				
											'95	40		-				
											'00	260		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Pinus edulis																	
S	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'00	-	-	-	1	-	-	-	-	-	-	1	-	-	20		1
Y	'88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'00	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'88		00%			00%			00%									
'95		00%			00%			00%									
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'88	133	Dec:	-		
												'95	0		-		
												'00	100		-		

SUMMARY

WILDLIFE MANAGEMENT UNIT 11A (OLD 15)

Summer range on this unit is sampled by two sites, Wirefence Canyon (11A-2) and Chokecherry Canyon (11A-3). Upper Cottonwood Ridge (11A-1) also samples summer range, but was not read in 2000. Wirefence Canyon and Chokecherry Canyon both sample high elevation mountain big sagebrush areas. Cottonwood Canyon (11A-4) and Nutters Canyon (11A-5) sample winter ranges within the unit.

Due to drought conditions in 2000, a majority of the sites show downward browse and herbaceous understory trends. Browse trends are down or slightly down due to increases in poor vigor and decadency. Herbaceous understory trends are down or slightly down due to a decrease in sum of nested frequency of perennial species. With normal precipitation in the future, these trends will most likely improve.

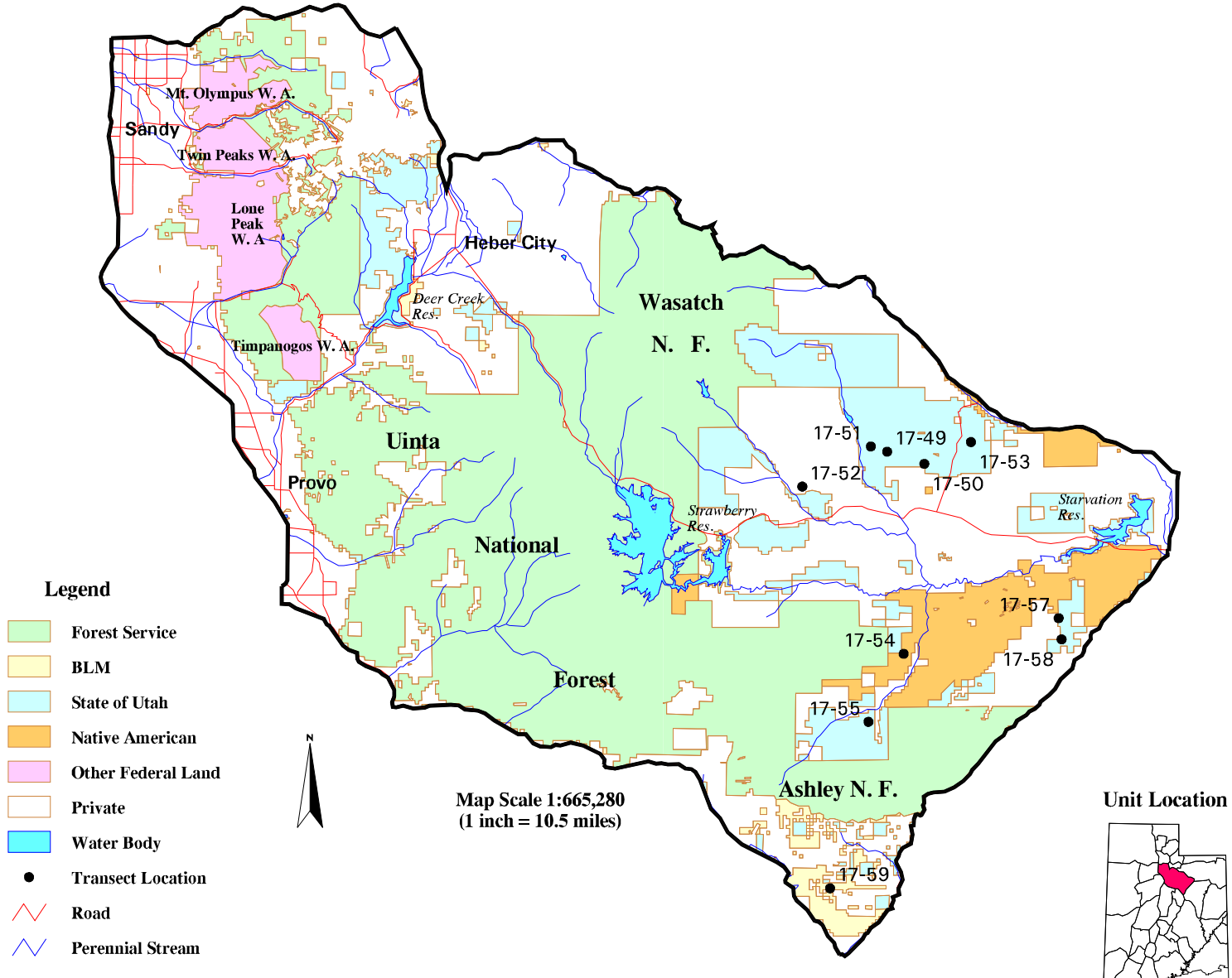
In summary, although pinyon and juniper stands dominate much of the winter range, there are sufficient natural openings to provide good quality winter range. There are pinyon-juniper sites with the potential after treatment, to provide more forage during the fall-spring period. The summer range remains the limiting factor, especially for deer.

Trend Summary

	Category	1982	1988	1995	2000
11A-1 Upper Cottonwood Ridge	soil	est	3	3	NR
	browse	est	3	3	NR
	herbaceous understory	est	5	5	NR
11A-2 Wirefence Canyon	soil	est	3	3	3
	browse	est	3	3	2
	herbaceous understory	est	3	4	2
11A-3 Chokecherry Canyon	soil	est	3	3	3
	browse	est	4	4	4
	herbaceous understory	est	5	3	2
11A-4 Cottonwood Canyon	soil		est	3	2
	browse		est	3	1
	herbaceous understory		est	3	3
11A-5 Nutters Canyon	soil		est	3	3
	browse		est	3	2
	herbaceous understory		est	2	2

(1) = down, (2), slightly down, (3) = stable, (4) = slightly up, (5) = up
(est) = site established, (NR) = site not read

Management Unit 17



WILDLIFE MANAGEMENT UNIT 17 (13 & 14) - WASATCH MOUNTAINS

Boundary Description

Salt Lake, Summit, Wasatch, Duchesne, Carbon, Utah counties - Boundary begins at the junction of Interstate 15 and Interstate 80 in Salt Lake City, then east on I-80 to Highway US-40; south on US-40 to Highway SR-32; east on SR-32 to Highway SR-35; southeast on SR-35 to Highway SR-87; south on SR-87 to Duchesne and Highway US-191; south on US-191 to Highway US-6; northeast on US-6 to I-15; north on I-15 to I-80 in Salt Lake City.

Old deer herd units 13 - Currant Creek and 14 - Avintaquin are now contained with the large Wasatch Mountains Wildlife Management Unit 17. The old deer herd unit boundary descriptions and unit descriptions have been retained below. Old trend study numbers are found in parentheses next to the new unit 17 study numbers on the discussion page for each trend study.

OLD DEER HERD UNIT 13 - CURRANT CREEK

Boundary Description

Duchesne and Wasatch counties - Boundary begins at Duchesne; then north on Highway SR-87 to Highway SR-35; northwesterly on SR-35 to Wolf Creek Pass and the Provo River-Duchesne River drainage divide; south along this drainage divide to Heber Mountain and the Strawberry River-Daniels Canyon drainage divide; south along this divide to Highway US-40; east on US-40 to the Soldier creek Dam road; south on this road to the Strawberry River; east along this river to Duchesne and the beginning point.

Unit Description

The Currant Creek portion of unit 17 encompasses an area of almost 320,000 acres. Winter range is estimated to be 117,500 acres, with the majority (84%) being divided almost equally between state and private lands. The summer range is a little over 200,000 acres, with 62% of it being on U.S. Forest Service lands. The remainder of the summer range is divided between state (25%) and private lands (13%).

Winter range is the critical habitat factor on this unit. All trend studies sample winter range sites. The winter range extends in a virtually solid block north from the Strawberry River to a maximum elevation of about 8,000 to 8,700 feet in the Duchesne River, Red Creek and Currant Creek drainages. At lower elevations, vegetation is primarily pinyon-juniper. At higher elevations, sagebrush-grass and mountain brush communities are more prevalent. See Huff and Coles (1966) and Olsen (1975) for a more complete description.

Management Objectives

The current objective for the Currant Creek portion of unit 17 is to achieve a target winter herd size of 12,000 deer and 1,200 elk. A herd composition of 15 bucks to 100 does will be maintained, with 30% of the bucks being 3-point or better. The desired herd composition for elk is to attain a bull to cow ratio of 8 bulls to 100 cows with 4 of the bulls being 2 ½ years of age or older.

Trend Study Description

Six trend studies were established in 1982 and reread in 1988, 1995 and 2000. These include: Blacktail Ridge (17-1), Grey Wolf Mountain (17-2), Lower Santaquin Draw (17-3), Santaquins Cabin (17-4), Cutoff (17-5) and Two Bar Ranch (17-6). The road to the Blacktail Ridge was impassible to trucks in 2000 so the site was not reread.

OLD DEER HERD UNIT - 14 - AVINTAQUIN

Boundary Description

Duchesne, Utah and Wasatch counties - Boundary begins at Duchesne and Highway US-191; then southerly on US-191 to the Reservation Ridge road; westerly and northerly on this road to Big Beaver Springs road; northerly on this road to Big Beaver Springs and Beaver Canyon; northeasterly along this canyon to the Strawberry River; easterly along this river to Duchesne and beginning point (excluding all Ute Tribal lands within this boundary).

Unit Description

The Avintaquin portion of unit 17 contains approximately 97,361 acres of summer range, 96% of which is administered by the Forest Service (Evans 1995). The other 4% is privately owned. Winter range acreage totals about 141,513 acres, where 47% is on Ute Tribal lands and 26% is on private lands. The State of Utah administers an additional 18%.

The principal limiting factor on this portion of the unit is mostly the condition and productivity of the winter range. Winter range extends as high as 8,500 feet in elevation during severe winters. The canyon bottoms of the Strawberry River and its tributaries are very important. The dominant vegetative type on the winter range is pinyon-juniper woodland. There are other areas smaller in size that also play an important role for usefulness as winter range. Most notably, they are pinyon-juniper chainings and sagebrush-grass areas. See Coles and Pederson (1967) and Giunta (1979) for a more detailed description of habitat.

Unit Management Objectives

The current big game management objectives for the Avintaquin portion of unit 17 are to achieve target winter deer and elk herd sizes of 3,000 and 1,000 animals respectively. The herd composition for deer is to maintain a buck to doe ratio of 15:100 with 30% of the bucks being 3-point or better. The elk herd composition objective is to achieve a minimum bull to cow ratio of 8:100 with at least 4 of those bulls being 2 ½ years of age or older.

Trend Study Description

On the Avintaquin portion of unit 17, three range trend studies were established on DWR land 1 on private land and 1 on the Uintah and Ouray Indian Reservation. There is little federally-owned winter range and the majority remains under private ownership or on the Indian Reservation. All study sites sample deer winter range. Two sites sample pinyon-juniper chainings, 1 samples an open pinyon-juniper woodland and 2 sites are placed on higher elevation mountain brush winter ranges. This area is not ranked as a priority for winter range acquisition. All sites were originally established in 1982 and reread in 1988 and 1995. All sites except for Sam's Canyon (17-9) were reread in 2000. The road to Sam's Canyon, on Ute Indian land was impassible in 2000.

Trend Study 17-48-00

Study site name: Blacktail Ridge .

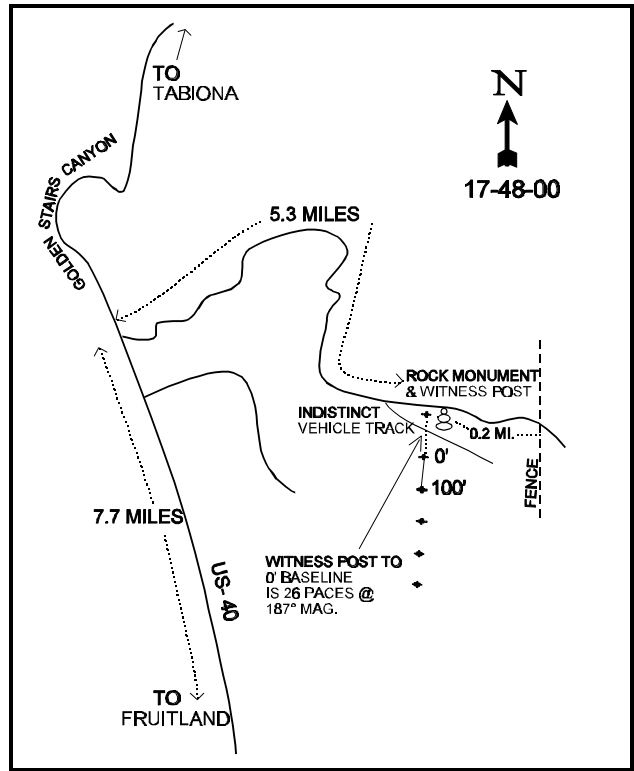
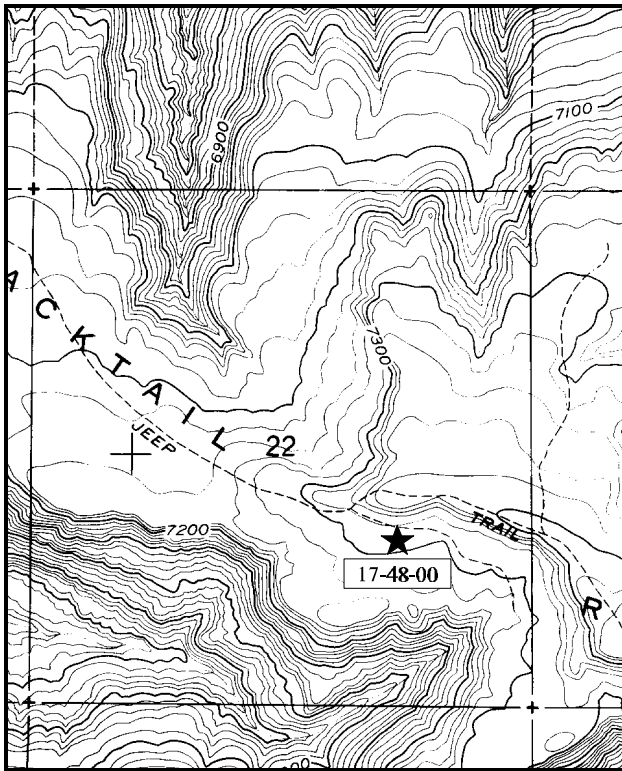
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 181°M .

Footmark (first frame placement) 5 feet, footmarks (frequency line 1 (6 & 91ft), line 2 (32ft), line 3 (53ft), line 4 (71ft).

LOCATION DESCRIPTION

From Highway U.S. 40, take Highway U-208 towards Tabiona, at which point there will be a steep downgrade sign for Golden Stairs Canyon. Just before Golden Stairs Canyon, turn right through a gate. Proceed along this road for 5.3 miles, up a steep rocky four wheel drive road to the top of the bench and on to a sagebrush opening. If you go too far, there is a fence line 0.2 miles past the study area. The study area is marked by a rock cairn along the south side of the road. From the cairn, the 0-foot baseline stake is 36 paces away at a bearing of 247°M.



Map Name: Tabiona

Diagrammatic Sketch

Township 2S , Range 7W ,Section 22

UTM 4460582 N, 528005 E

DISCUSSION

Trend Study No.17-48 (13-2)

***This site was not read in 2000. The site is no longer accessible by truck. Text has been retained. Consult the 1995 "Utah Big Game Range Trend Studies" report for maps and data tables.

The Blacktail Ridge trend study is located on winter range on Blacktail Ridge. The study site lies within a small sagebrush-grass park surrounded by dense pinyon-juniper woodland. Deer use of the area is moderately heavy. There was no sign of livestock grazing on this portion of the Two-Bar East Unit of the Red Creek Wildlife Management Area in 1988 or 1995. Terrain is essentially flat and the elevation is 7,300 feet. The land is owned by the Utah Division of Wildlife Resources.

Soil is light-colored and rather sandy in texture. Rooting depth is variable and obviously restricted in some areas where black sagebrush occurs. Little to no rock and pavement cover occurs on the surface. Ground cover from vegetation (basal cover) and litter was moderately good at 71% in 1982 and 64% in 1988. Percent bare ground declined in 1988 due to a significant increase in cryptogamic cover (2% to 14%). Aerial vegetative cover was estimated at 35% in 1995 with litter declining slightly to 46%. Percent bare ground continued to decline and currently ('95) is estimated at almost 18%. Erosion does not currently appear to be a problem on the site due to the lack of significant slope. Some erosion is occurring on disturbed areas, such as vehicle tracks.

Key browse on this site consist of mountain big sagebrush intermixed with black sagebrush. Some hybridizing is occurring between these two sub-species. Density of mature mountain big sagebrush has remained fairly constant at around 3,000 plants/acre since 1982. The large reduction in the number of mature plants noted in 1988 is the result of increased decadence from 6% in 1982 to 59% in 1988. It also appears that many of the mature plants were misidentified as young plants. Without any sign of reproduction (seedlings) in 1982 or 1988, this would have to be the only logical explanation for this disproportionate statistic for mature plants in 1988. Currently ('95), 31% of the stand is classified as decadent. Dead plants number only 940 plants/acre or a ratio of 1 dead plant for every 6 live plants. It appears that many of the decadent plants sampled in 1988 recovered by 1995. Data indicated that 57% of the mountain big sagebrush were heavily hedged in 1988. Vigor was also reduced on 20% of the population. During the 1995 reading, the proportion of heavily hedged sagebrush declined to only 12% with 18% displaying poor vigor. Some of the decadence in 1995 could have been the result of winter injury which was reported in field notes. Currently ('95), recruitment is low with only 7% of the population consisting of young plants and no seedlings were found.

Black sagebrush occurs in patches where soil depth is somewhat restricted. Percent decadency in the black sagebrush population is similar to those observed in mountain big sagebrush. The 1988 reading found dramatically increased decadence (0% to 46%) and poor vigor on 13% of the population. However, utilization was light indicating the possibility of increased decadence caused by prolonged drought coupled with winter injury. Percent decadence has now (1995) gone down to only 3% with mostly light use.

The herbaceous understory is well developed and accounts for nearly one half of the total vegetative cover. Eight perennial grass species were encountered in 1995 with needle-and-thread, mutton grass and Sandberg bluegrass providing 86% of the grass cover. Forbs are fairly diverse with 16 perennial species encountered in 1995. However, none of these species are particularly abundant.

1982 APPARENT TREND ASSESSMENT

Although the soil is highly erodible, the level terrain limits soil loss. Nonetheless, there is 28% exposed bare ground which, if on a slope, would readily erode. Current trend is stable. Vegetative composition and trend appear stable. There is little evidence of any profound vegetative change. Mountain big sagebrush may slowly be increasing, with black sagebrush slowly decreasing in numbers. Future readings of the study should provide a more clear picture.

1988 TREND ASSESSMENT

Trend for soil is up with an increase in basal vegetative cover from 6% to 16%. Litter cover declined but cryptogamic cover was more prevalent, increasing from 2% to 14%. Trend for the key browse species, mountain big sagebrush, is down. Big game heavily utilized the big sagebrush this year with 56% of the plants classified as all available and heavily hedged. Young plants now make up 28% of the population (refer to introductory discussion), while the majority of the mature sagebrush have shifted to a more decadent population. Decadence has increased from 7% to 58%. This is clearly supported by photographic comparisons, which show more decadent and severely clubbed sagebrush. Vigor is currently poor. Sagebrush cover is still moderately high at 22%, but declining. Grass frequency is high and has increased 39% since 1982. All but one of the grass species increased in quadrat frequency since 1982. Species composition is similar between years, with needle-and-thread the dominant species.

TREND ASSESSMENT

soil - up (5)

browse - down with dramatically increased decadence and very heavy use (1)

herbaceous understory - up (5)

1995 TREND ASSESSMENT

Soil trend is stable. Litter cover continues to decline, but percent bare ground decreased from 22% to 17%. Cryptogamic cover also declined significantly. Trend for the key browse species, mountain big sagebrush, has improved. Percent decadency has declined from 59% to 31% and the proportion of shrubs heavily utilized has declined from 57% to 12%. However, vigor is poor on 52% of the decadent sagebrush indicating a possible further die off of decadent individuals which would further reduce the rate of decadency. If all of the individuals with poor vigor should die, the total population will be reduced but the surviving plants will be healthier with less intraspecific competition. No seedlings were encountered in 1995, yet 7% of the population consists of young plants. Trend for the herbaceous understory is down slightly with the sum of nested frequency for two of the three dominant grasses declining significantly. Nested frequency of perennial forbs remained at similar levels to those reported in 1988.

TREND ASSESSMENT

soil - stable (3)

browse - slightly up with improving conditions for mountain big sagebrush (4)

herbaceous understory - slightly down (2)

Trend Study 17-49-00

Study site name: Grey Wolf Mountain .

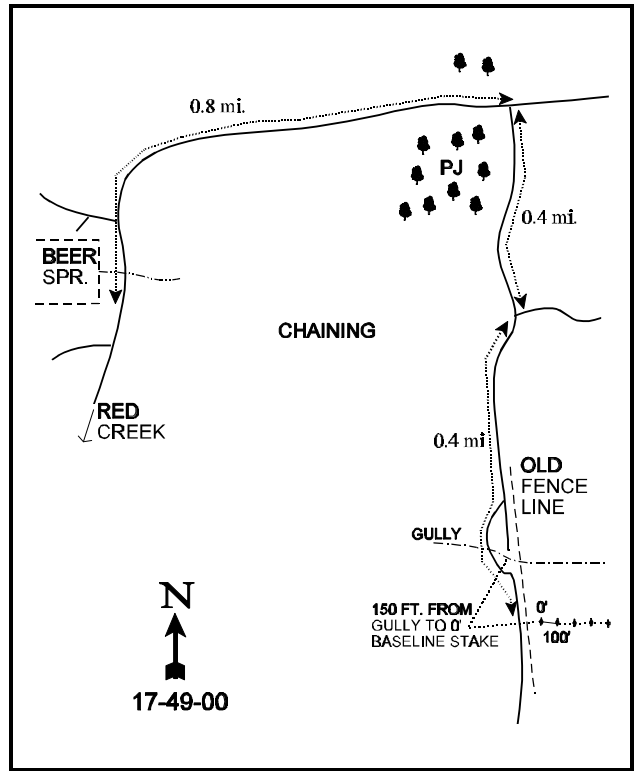
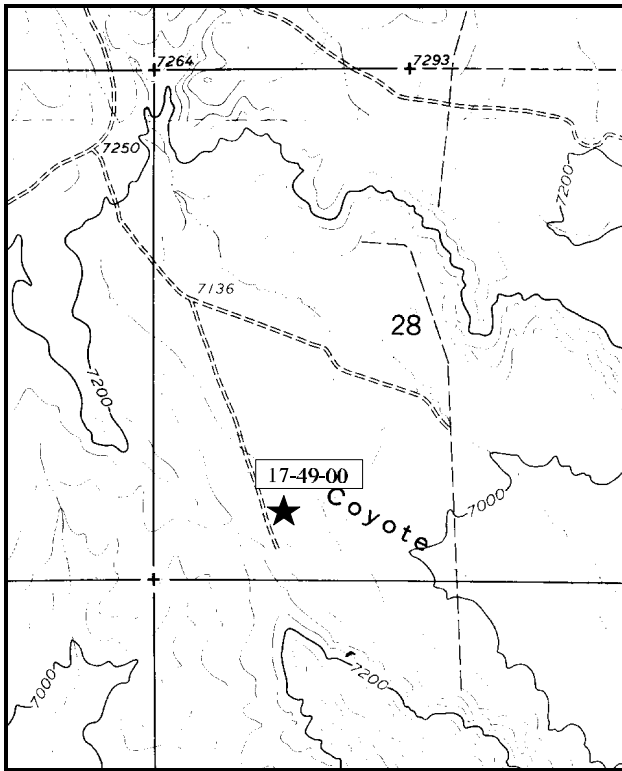
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 97°M .

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (15 & 96ft), line 2 (39ft), line 3 (52ft), line 4 (66ft).

LOCATION DESCRIPTION

From U.S. 40 in Fruitland, travel north up the Red Creek Road 1.8 miles to a 3-way fork. Take the middle fork and go 2.6 miles. After crossing Red Creek, turn right onto a dirt road. Proceed northeast on this road for 1.95 miles to Beer Spring, and the fork to Study 17-51-00. From the southwest corner of the fenced spring bear right and continue for 0.8 miles. Turn right and go 0.35 miles. Stay right and go 0.4 miles going around the gully to an old fence line to a witness post on the left. The 0-foot stake is 20 feet east of the witness. It may not be possible to drive across the deep gully. The start of the baseline is approximately 150 feet south of the gully. The 0-foot baseline Stake, a green, short fencepost, is marked by browse tag #7090.



Map Name: Tabby Mountain

Diagrammatic Sketch

Township 2S, Range 8W, Section 28

UTM 4457860.345 N, 517197.962 E

DISCUSSION

Trend Study No. 17-49 (13-4)

The Grey Wolf Mountain trend study is located at the north end of Grey Wolf Mountain at an elevation of approximately 7,080 feet, near the head of Coyote Draw. Slope is less than 5% with an east aspect. The current trend study replaces a line-intercept study established in 1981. Land is administered by the Utah Division of Wildlife Resource in an area which is utilized as winter range by both deer and elk. The area was disked on contour and seeded in the fall of 1990 as a habitat and watershed improvement project. Livestock grazing was removed after the treatment. Cattle and horses grazed the area in the past and use was reported heavy in 1988. Numerous trespass cattle have been observed in the area during past readings. A pellet group transect read along the study site baseline in 2000 estimated 34 deer, 13 elk and 6 cow days use/acre (84 ddu/ha, 32 edu/ha and 15 cdu/ha). Deer and elk pellet groups appear to be primarily from winter use.

Soils are alluvially deposited and of considerable depth. Effective rooting depth was estimated at just over 15 inches. There is little rock in the soil profile and soil depth measurements were limited only by soil compaction. Actual soil depth would be deeper. Soil texture is a clay loam with a slightly alkaline soil reaction (pH of 7.5). Phosphorus is limited at only 3.6 ppm. Values less than 10 ppm can limit normal plant growth and development. Protective ground cover has been poor in the past, consisting mostly of old mature sagebrush cover. Currently ('00), there is still a high proportion of bare ground (58%), but herbaceous cover is now more abundant and better distributed. There is evidence of some overland flow between shrubs and rills are beginning to form which feed into a large (10' to 12' deep) active gully northeast of the site. The only thing keeping erosion from increasing is the cover provided by herbaceous vegetation.

The key browse species on the site is Wyoming big sagebrush. There appears to be some hybridization with mountain big sagebrush and basin big sagebrush since some of the sagebrush on this site display characteristics of both these subspecies. For this report to help alleviate any confusion, all the sagebrush encountered on the study was classified as Wyoming big sagebrush. These shrubs vary considerably in color, size, growth form and degree of hedging. Typically, Wyoming big sagebrush occurs more in the flat, integrating into the basin big sagebrush type which occurs more along the gullies with deeper soils. Wyoming big sagebrush had an estimated density of 1,265 mostly mature plants/acre in 1982. By 1988, the density had increased to 6,466 plants/acre due to a dramatic increase in the number of young shrubs (4,733 plants/acre). Utilization was light to moderate with heavy use reported on 11% of the population. After the disking treatment (thinning) in 1990, the number of mature sagebrush remained similar (1,040 plants/acre) with the number of seedlings and young declining dramatically. The percentage of seedlings and young still remain in adequate numbers to maintain the population. The percentage of decadent plants was very low in 1982 and 1988 at 5% and 3% respectively. It has since increased slightly to 10% in 1995 and 13% in 2000. Use was light to moderate from 1982 through 1995. Current ('00) use is moderate to heavy with 21% of the plants sampled displaying heavy use (>60% of stems browsed). Even with the increased heavy use, vigor remains normal on all but 11% of the decadent plants which appear to be dying.

Small populations of winterfat, fourwing saltbush and rubber rabbitbrush provide a limited amount of additional forage for wintering big game. Corymbed eriogonum is also fairly abundant. The undesirable increaser, narrowleaf low rabbitbrush, provides about 1/3 of the shrub cover with a stable population of around 3,000 plants/acre since 1988.

Before treatment, the herbaceous understory consisted of crested wheatgrass and a few forbs. Crested wheatgrass was reported to be heavily utilized in both 1982 and 1988. As a result of use and competition, vigor was reduced. After the disking treatment, crested wheatgrass declined significantly in nested frequency, but it is still the most abundant grass accounting for 93% and 96% of the grass cover in 1995 and 2000 respectively.

Several other grasses were encountered on the site yet all occur in small numbers. Forbs are also more abundant after treatment with 19 perennial species sampled in 1995. Total forb cover was almost 9%. Useful species include Lewis flax, yellow sweet clover, low penstemon and scarlet globemallow which accounted for 53% of the forb cover. In 2000, nested frequency of crested wheatgrass increased significantly and is now similar to pretreatment levels. Cover has increased to 17%. Due to drought conditions, cover and frequency of forbs have declined.

1982 APPARENT TREND ASSESSMENT

Trend is difficult to evaluate. Based on soil loss, the percentage of bare ground and the trampling effect of livestock, soil trend is probably slightly downward. However, from a management standpoint, this may be an acceptable trade-off if shrub density and composition can be improved. A rather speculative estimate of vegetative trend is stable to slowly improving. The apparent increase in the key species is encouraging, especially if increases of low rabbitbrush can be limited or avoided.

1988 TREND ASSESSMENT

Trend for soil is stable yet in poor condition. A large amount of bare soil remains exposed, 50% of the ground surface. Litter cover is poor and severe gullyng continues in Coyote Draw which is adjacent to the site. With reduced grass vigor and litter build-up, there is accelerated soil loss from the flat. Trend for the key browse species is up. Sagebrush density has gone from 1,265 plants/acre to 6,466 plants/acre. The density of mature plants is similar between years, with a moderate density of 1,533 mature plants/acre. The large increase in sagebrush density occurred because of the number of young plants. Sagebrush has increased from 18% to 44% of the browse composition. Overall, use remains moderate and vigor is fair. Annual growth and seed production were low this year. Density of undesirable browse species has increased since 1982. Trend for the herbaceous understory is slightly up with an increase in quadrat frequency of grasses and forbs.

TREND ASSESSMENT

soil - stable but poor condition (3)

browse - up (5)

herbaceous understory - slightly up (4)

1995 TREND ASSESSMENT

Since the contoured thinning treatment of sagebrush, percent bare ground has increased from 50% to 54%. Litter cover also declined from 36% to 22%, but the litter is more evenly distributed. Even with these negative changes, sum of nested frequency of grasses and forbs increased providing much better soil protection. No erosion was reported in 1995 and trend for soil is considered stable. The browse trend is stable. Even though total density of Wyoming big sagebrush declined substantially, the number of mature plants remained similar to previous years. The disking treatment thinned the population and eliminated most of the older plants. The remaining stand has better vigor and is less heavily hedged. Percent decadence is still low at 10%. Trend for the herbaceous understory is up slightly. Sum of nested frequency of grasses increased slightly, but more importantly composition is improved with 7 new perennial grass species being sampled. Sum of nested frequency of forbs increased with significant increases in 15 of the 20 perennial species sampled in 1995.

TREND ASSESSMENT

soil - stable (3)

browse - stable with better composition characteristics (3)

herbaceous understory - slightly up with more species diversity (4)

2000 TREND ASSESSMENT

Trend for soil is up slightly with an increase in relative percent cover of vegetation and litter and a decline in bare ground. The ratio of protective cover to bare soil has also improved. In addition, herbaceous cover has increased slightly since 1995. Trend for browse is stable. Density of the key browse species, Wyoming big sagebrush, is stable. Use is heavier but vigor is normal and percent decadence remains low at 13%. Trend for the herbaceous understory is mixed. Sum of nested frequency of perennial grasses has increased slightly, while nested frequency of the dominant grass, crested wheatgrass, has increased significantly. Crested wheatgrass provides 96% of the grass cover and 81% of the herbaceous cover. Due to drought conditions, sum of nested frequency for perennial forbs has declined by 53%. Cover of forbs during the same period has declined from 9% in 1995 to 3% in 2000. Perennial forbs provided 45% of the herbaceous cover in 1995. Currently, perennial forbs account for only 15% of the herbaceous cover. Taking all of these factors into consideration, trend for the herbaceous understory is considered down slightly due to a substantial decline in cover and frequency of perennial forbs which used to provide nearly half of the herbaceous cover.

TREND ASSESSMENT

soil - up slightly (4)

browse - stable (3)

herbaceous understory - stable for grasses but down for forbs, down slightly overall (2)

HERBACEOUS TRENDS --

Herd unit 17 , Study no: 49

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron cristatum	_b 316	_a 260	_b 326	43	99	80	100	9.44	17.05
G	Agropyron dasystachyum	_a 6	_{ab} 21	_b 31	2	3	9	12	.28	.35
G	Agropyron intermedium	-	30	5	-	-	13	2	.12	.03
G	Bromus inermis	-	4	2	-	-	2	1	.01	.03
G	Carex spp.	_a -	_b 10	_a 1	-	-	4	1	.04	.00
G	Dactylis glomerata	_a -	_b 8	_b 5	-	-	4	3	.04	.09
G	Oryzopsis hymenoides	-	6	-	1	-	2	-	.06	-
G	Poa fendleriana	-	-	7	-	-	-	2	-	.15
G	Poa secunda	-	2	-	-	-	1	-	.03	-
G	Secale cereale (a)	-	_b 7	_a -	-	-	3	-	.06	-
G	Stipa comata	-	-	1	-	-	-	1	-	.03
Total for Annual Grasses		0	7	0	0	0	3	0	0.06	0
Total for Perennial Grasses		322	341	378	46	102	115	122	10.04	17.76
Total for Grasses		322	348	378	46	102	118	122	10.10	17.76

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	<i>Agoseris glauca</i>	a-	b61	a-	-	-	18	-	1.92	-
F	<i>Allium</i> spp.	a-	b6	a-	-	-	4	-	.02	-
F	<i>Arabis</i> spp.	-	-	3	1	-	-	1	-	.00
F	<i>Astragalus convallarius</i>	17	23	6	6	8	11	4	.21	.07
F	<i>Astragalus mollissimus</i>	a-	ab5	b4	-	-	2	3	.01	.04
F	<i>Astragalus tenellus</i>	1	-	-	-	1	-	-	-	-
F	<i>Calochortus nuttallii</i>	a-	b7	a-	-	-	6	-	.03	-
F	<i>Chaenactis douglasii</i>	-	-	3	-	-	-	1	-	.00
F	<i>Chenopodium fremontii</i> (a)	-	b7	a-	-	-	3	-	.01	-
F	<i>Chenopodium leptophyllum</i> (a)	-	b10	a-	-	-	5	-	.02	-
F	<i>Cirsium</i> spp.	-	-	3	-	-	-	1	.15	.00
F	<i>Cordylanthus kingii</i> (a)	-	b11	a-	-	-	6	-	.08	-
F	<i>Cymopterus</i> spp.	-	-	1	-	-	-	1	-	.15
F	<i>Descurainia pinnata</i> (a)	-	5	-	-	-	2	-	.01	-
F	<i>Erigeron eatonii</i>	-	3	-	-	-	1	-	.00	-
F	<i>Haplopappus</i> spp.	-	-	-	2	-	-	-	-	-
F	<i>Hedysarum boreale</i>	-	7	5	-	-	3	4	.08	.07
F	<i>Lactuca serriola</i>	-	1	-	-	-	1	-	.01	-
F	<i>Linum lewisii</i>	a-	c69	b19	-	-	34	13	1.16	.36
F	<i>Lygodesmia grandiflora</i>	-	3	-	2	-	1	-	.00	-
F	<i>Machaeranthera canescens</i>	b21	a4	a4	4	12	1	2	.03	.03
F	<i>Machaeranthera grindelioides</i>	4	-	-	-	2	-	-	.00	-
F	<i>Melilotus officinalis</i>	a-	b16	a3	-	-	9	1	.32	.15
F	<i>Penstemon humilis</i>	10	11	8	2	6	5	6	.65	.05
F	<i>Phlox hoodii</i>	b101	a35	a38	-	42	16	20	.43	.96
F	<i>Phlox longifolia</i>	b70	b76	a20	9	25	28	7	.29	.13
F	<i>Sanguisorba minor</i>	a-	b28	a2	-	-	15	2	.21	.03
F	<i>Sphaeralcea coccinea</i>	183	166	152	44	77	70	63	2.40	.98
F	<i>Tragopogon dubius</i>	ab4	b8	a-	-	2	5	-	.18	-
F	<i>Trifolium gymnocarpon</i>	a8	b46	b33	3	5	22	15	.19	.17
Total for Annual Forbs		0	33	0	0	0	16	0	0.12	0
Total for Perennial Forbs		419	575	304	73	180	252	144	8.34	3.24
Total for Forbs		419	608	304	73	180	268	144	8.47	3.24

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

BROWSE TRENDS --
Herd unit 17 , Study no: 49

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	<i>Artemisia tridentata wyomingensis</i>	50	65	2.61	3.95
B	<i>Atriplex canescens</i>	0	1	-	-
B	<i>Ceratoides lanata</i>	9	6	.03	.18
B	<i>Chrysothamnus depressus</i>	2	2	.01	-
B	<i>Chrysothamnus nauseosus hololeucus</i>	3	5	.03	.03
B	<i>Chrysothamnus viscidiflorus stenophyllus</i>	54	61	1.96	2.41
B	<i>Eriogonum corymbosum</i>	71	72	1.45	2.00
B	<i>Gutierrezia sarothrae</i>	1	4	-	.03
B	<i>Opuntia spp.</i>	15	14	.01	.00
B	<i>Pinus edulis</i>	0	1	-	-
Total for Browse		205	231	6.11	8.63

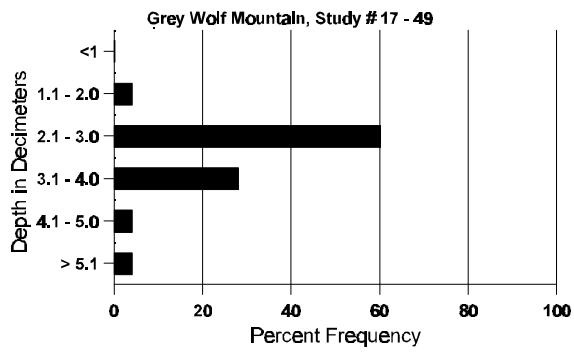
BASIC COVER --
Herd unit 17 , Study no: 49

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	344	341	6.25	8.00	23.68	30.28
Rock	-	3	0	0	0	.00
Pavement	-	41	0	0	0	.11
Litter	377	374	40.25	36.00	21.52	33.00
Cryptogams	16	16	0	6.25	.23	.49
Bare Ground	376	355	53.50	49.75	54.37	58.32

SOIL ANALYSIS DATA --
Herd Unit 17, Study # 49, Study Name: Grey Wolf Mountain

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	%OM	PPM P	PPM K	dS/m
15.51	60.2 (16.61)	7.5	42.9	26.8	30.3	2.1	3.6	204.8	0.7

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 17 , Study no: 49

Type	Quadrat Frequency	
	'95	'00
Rabbit	2	1
Elk	7	15
Deer	11	25
Cattle	1	2

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
'00	'00
35	N/A
165	13 (31)
444	34 (84)
70	6 (14)

BROWSE CHARACTERISTICS --

Herd unit 17 , Study no: 49

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total							
		1	2	3	4											
<i>Artemisia tridentata wyomingensis</i>																
S	82	17	-	-	-	-	-	-	17	-	-	17				
	88	79	3	-	2	-	-	-	76	-	7	1	5600	84		
	95	9	-	-	-	-	-	-	9	-	-	-	180	9		
	00	2	-	-	-	-	-	-	2	-	-	-	40	2		
Y	82	2	-	-	-	-	-	-	2	-	-	-	133	2		
	88	58	10	1	2	-	-	-	64	1	6	-	4733	71		
	95	52	-	-	-	-	-	-	52	-	-	-	1040	52		
	00	32	3	6	-	-	-	-	41	-	-	-	820	41		
M	82	8	7	1	-	-	-	-	16	-	-	-	1066	23 27	16	
	88	10	4	9	-	-	-	-	18	2	3	-	1533	20 17	23	
	95	41	9	2	-	-	-	-	52	-	-	-	1040	15 20	52	
	00	19	39	23	-	-	-	-	81	-	-	-	1620	15 22	81	
D	82	-	1	-	-	-	-	-	-	-	1	-	66	-	1	
	88	2	-	1	-	-	-	-	2	-	1	-	200	-	3	
	95	3	7	1	-	-	-	-	5	-	-	6	220	-	11	
	00	6	12	-	-	-	-	-	16	-	-	2	360	-	18	
X	82	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	780	-	39	
	00	-	-	-	-	-	-	-	-	-	-	-	420	-	21	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>					<u>%Change</u>					
'82		42%		05%		05%					+80%					
'88		14%		11%		10%					-64%					
'95		14%		03%		05%					+18%					
'00		39%		21%		01%										
Total Plants/Acre (excluding Dead & Seedlings)										'82	1265	Dec:	5%			
										'88	6466		3%			
										'95	2300		10%			
										'00	2800		13%			
<i>Atriplex canescens</i>																
M	82	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	1	-	-	-	-	-	-	1	-	-	-	20	-	-
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>					<u>%Change</u>					
'82		00%		00%		00%										
'88		00%		00%		00%										
'95		00%		00%		00%										
'00		100%		00%		00%										
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-			
										'88	0		-			
										'95	0		-			
										'00	20		-			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Ceratoides lanata																		
Y	'82	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	'82	2	2	-	-	-	-	-	-	-	3	1	-	-	266	8	8	4
	'88	-	-	2	-	-	-	-	-	-	2	-	-	-	133	7	7	2
	'95	13	4	-	-	-	-	-	-	-	17	-	-	-	340	10	12	17
	'00	3	2	6	-	-	-	-	-	-	11	-	-	-	220	5	9	11
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		40%			00%			00%			-40%							
'88		00%			67%			00%			+45%							
'95		22%			00%			00%			-39%							
'00		18%			55%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	332	Dec:	-				
											'88	199		-				
											'95	360		-				
											'00	220		-				
Chrysothamnus depressus																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	6	8	1
	'00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	-	-	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			+ 0%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	0	Dec:	-				
											'88	0		-				
											'95	40		-				
											'00	40		-				

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total		
		1	2	3	4		1	2			
Chrysothamnus nauseosus hololeucus											
Y	82	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	0		0
	95	2	-	-	-	-	-	-	40		2
	00	4	-	-	-	-	-	-	80		4
M	82	-	-	-	-	-	-	-	0	-	0
	88	-	-	-	-	-	-	-	0	-	0
	95	1	-	-	-	-	-	-	20	17	14
	00	10	-	-	-	-	-	-	200	9	14
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>			
'82		00%		00%		00%					
'88		00%		00%		00%					
'95		00%		00%		00%		+79%			
'00		00%		00%		00%					
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	-		
						'88	0		-		
						'95	60		-		
						'00	280		-		
Chrysothamnus viscidiflorus stenophyllus											
S	82	-	-	-	-	-	-	-	0		0
	88	6	-	-	-	-	-	-	400		6
	95	1	-	-	-	-	-	-	20		1
	00	1	-	-	-	-	-	-	20		1
Y	82	-	-	-	-	-	-	-	0		0
	88	11	-	-	3	-	-	-	933		14
	95	28	-	-	-	-	-	-	560		28
	00	5	-	-	-	-	-	-	100		5
M	82	29	-	-	-	-	-	-	1933	10	12
	88	13	3	2	-	-	-	-	1200	7	5
	95	130	2	-	-	-	-	-	2640	11	14
	00	141	-	-	1	-	-	-	2840	7	12
D	82	-	-	-	-	-	-	-	0		0
	88	13	8	-	-	-	-	-	1400		21
	95	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	20		1
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>			
'82		00%		00%		00%		+45%			
'88		21%		04%		09%		- 9%			
'95		01%		00%		00%		- 8%			
'00		00%		00%		00%					
Total Plants/Acre (excluding Dead & Seedlings)						'82	1933	Dec:	0%		
						'88	3533		40%		
						'95	3200		0%		
						'00	2960		1%		

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total				
		1	2	3	4		1	2					
<i>Eriogonum corymbosum</i>													
S	82	-	-	-	-	-	-	-	0		0		
	88	1	-	-	-	-	-	-	66		1		
	95	5	-	-	-	-	-	-	100		5		
	00	2	-	-	-	-	-	-	40		2		
Y	82	-	-	-	-	-	-	-	0		0		
	88	4	2	-	-	-	-	-	400		6		
	95	28	-	-	-	-	-	-	560		28		
	00	9	-	-	-	-	-	-	180		9		
M	82	21	14	-	3	-	-	-	2533	13	15	38	
	88	12	10	4	2	-	-	-	1866	14	13	28	
	95	117	-	-	3	-	-	-	2400	14	16	120	
	00	126	-	-	-	-	-	-	2520	12	16	126	
D	82	-	-	-	-	-	-	-	0		0		
	88	9	5	3	1	-	-	-	1200		18		
	95	-	-	-	-	-	-	-	0		0		
	00	3	-	-	-	-	-	-	60		3		
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>					
'82		37%		00%		16%		+27%					
'88		33%		13%		00%		-15%					
'95		00%		00%		00%		- 7%					
'00		00%		00%		.72%							
Total Plants/Acre (excluding Dead & Seedlings)										'82	2533	Dec:	0%
										'88	3466		35%
										'95	2960		0%
										'00	2760		2%
<i>Gutierrezia sarothrae</i>													
M	82	-	-	-	-	-	-	-	0	-	-	0	
	88	4	-	-	-	-	-	-	266	8	8	4	
	95	1	-	-	-	-	-	-	20	-	-	1	
	00	6	-	-	-	-	-	-	120	6	9	6	
D	82	-	-	-	-	-	-	-	0		0		
	88	2	-	-	-	-	-	-	133		2		
	95	-	-	-	-	-	-	-	0		0		
	00	-	-	-	-	-	-	-	0		0		
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>					
'82		00%		00%		00%							
'88		00%		00%		17%		-95%					
'95		00%		00%		00%		+83%					
'00		00%		00%		00%							
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	0%
										'88	399		33%
										'95	20		0%
										'00	120		0%

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Opuntia spp.																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	8	-	-	1	-	-	-	-	-	9	-	-	-	600		9	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	9	-	-	-	-	-	-	-	-	9	-	-	-	600	3	7	9
	88	4	-	-	-	-	-	-	-	-	4	-	-	-	266	4	10	4
	95	16	-	-	-	-	-	-	-	-	16	-	-	-	320	4	6	16
	00	14	-	-	-	-	-	-	-	-	14	-	-	-	280	3	3	14
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333		5	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%			+18%							
'88		00%			00%			00%			-51%							
'95		00%			00%			00%			-17%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	600	Dec:	0%			
												'88	732		45%			
												'95	360		0%			
												'00	300		7%			
Pinus edulis																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	20		-			

Trend Study 17-50-00

Study site name: Lower Santaquin Draw .

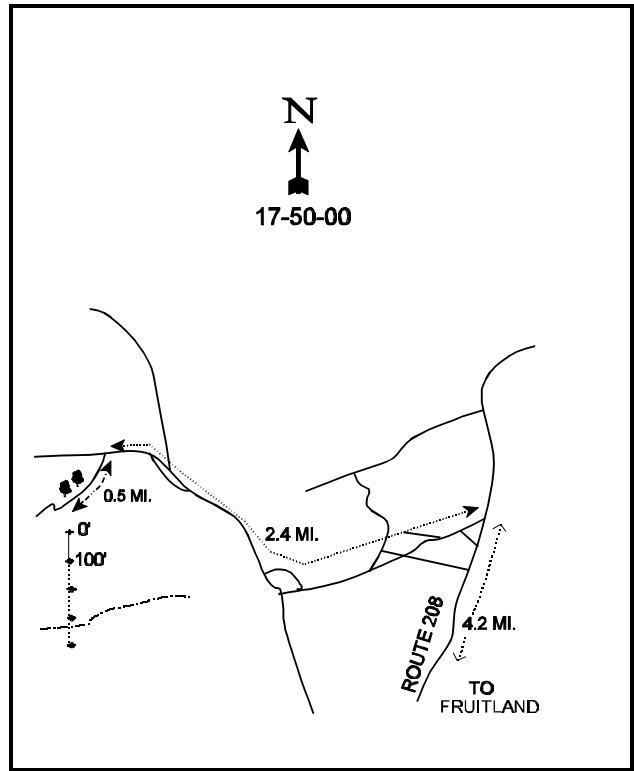
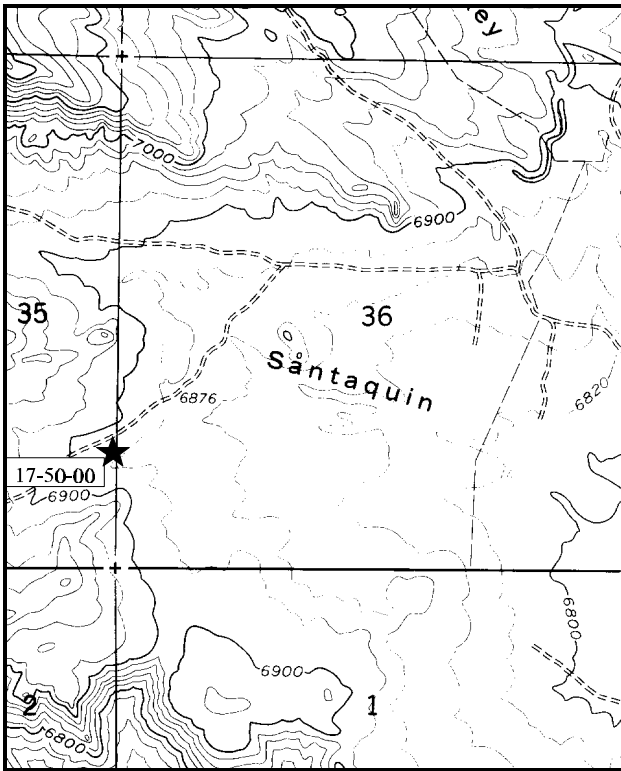
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 180°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 83ft), line 2 (38ft), line 3 (54ft), line 4 (79ft).

LOCATION DESCRIPTION

From Highway U.S. 40, take Route 208 towards Tabiona for 4.2 miles and turn west onto a dirt road. Go 2.4 miles on the main road towards Santaquin Draw. Take the road to the left for 0.5 miles to the next intersection to a group of junipers and a witness post. From the witness post the 0-foot stake is 30 feet to the south. The 0-foot stake is marked with browse tag number 7021.



Map Name: Tabiona

Diagrammatic Sketch

Township 2S , Range 8W , Section 35

UTM 4456389.022 N , 521682.562 E

DISCUSSION

Trend Study No. 17-50 (13-5)

The Lower Santaquin Draw trend study monitors a sagebrush-grass site on deer and elk winter range in Lower Santaquin Draw. Terrain is nearly level and elevation is approximately 6,880 feet. Low ridges covered with pinyon-juniper are within the immediate proximity of the study site. The surrounding woodland provides important escape and thermal cover. The area is obviously critical winter range as many antler sheds, winter-killed deer and pellet groups were observed during past readings. Numerous jackrabbit pellets and cattle pats were also observed during study establishment in 1982. Pellet group data taken along the study baseline in 2000 estimated 15 deer, 31 elk and 8 cow days use/acre (37 ddu/ha, 77 edu/ha and 20 cdu/ha). About half of the deer pellet groups appear to be from spring use with the other half from winter. About 75% of the elk pellet groups appear to be from fall/winter use with the rest from spring use.

Soils are alluvially deposited and deep but generally undifferentiated. Soil texture is a loam with few rocks on the surface or within the profile. Effective rooting depth is estimated at just over 10 inches. The soil would be expected to be much deeper however and penetrometer readings were limited by soil compaction and a hardpan. Ground cover is fair for this type with percent bare ground ranging from 33% to 45% since 1982. Soil on the site is very light textured and easily erodible. Sheet erosion is a factor, but it is greatly reduced by the levelness of the terrain and an adequate amount of vegetation and litter cover. However, stream courses in the area tend to be rather deep, steep-sided gullies, effectively lowering the immediate areas water table. There are active gullies around the site and a single 4-foot gully near the end of the baseline.

The key browse species consists of a moderately dense stand of Wyoming big sagebrush. This site, like the previous one, contain sagebrush with characteristics of both mountain and Wyoming big sagebrush. All sagebrush in this report are considered Wyoming big sagebrush. Total density has remained similar since 1982 at around 5,000 plants/acre. During the 1982 reading, 28% of the sagebrush was heavily hedged and 34% of the population displayed poor vigor. Percent decadence was reported at 25%. By 1988, percent decadence increased to 44% with more moderate use, yet improved vigor. Percent decadence declined to 8% in 1995 with heavy use reported on only 17% of the population. Use is similar in 2000, but due to the dry conditions, more sagebrush show poor vigor and percent decadence again increased to 22%. Decadent sagebrush classified as dying is currently ('00) 46% or approximately 500 plants/acre. The number of seedlings and young plants have declined since 1988, but numbers are adequate to maintain the population.

The only other palatable browse species includes a small but stable population of winterfat. Density has ranged from 866 plants/acre in 1982 to 1,100 in 2000. Use was moderate to heavy in 1982 and 1988, but mostly light in 1995. Use was moderate to heavy in 2000. Other less desirable browse occur in low numbers and consists of narrowleaf low rabbitbrush, broom snakeweed and pricklypear cactus.

The herbaceous understory is moderately abundant but only a few species are common. Grasses provided 44% of the vegetative cover in 1995 and 53% in 2000. Five grass species were found on the site in 1995 and 2000, but crested wheatgrass dominates the composition by making up respectively 95% and 98% of the grass cover. Forbs accounted for 15% of the vegetation cover in 1995 declining to only 8% in 2000. The forb composition is diverse, but only 3 species (timber poisonvetch, Hood's phlox and scarlet globemallow), provides 88% of the forb cover in 1995 and 96% in 2000. Sum of nested frequency of grasses and forbs slightly decreased in 2000 due to drought.

1982 APPARENT TREND ASSESSMENT

Overall, this area appears to be relatively stable. Soil trend may be down slightly due to continuous low level erosion and soil deposition, although the level terrain helps to minimize the effect. Vegetatively, Wyoming big sagebrush may be slowly expanding. Grasses are being heavily impacted by livestock, which is thought to favor the shrub component. Forbs are insignificant forage sources and are generally undesirable species. Undesirable shrubs include pricklypear and narrowleaf low rabbitbrush, neither of which should be allowed to increase much beyond their present level.

1988 TREND ASSESSMENT

Due to a slight decrease in litter cover, there was a slight increase in the percentage of bare soil in 1988. However, the level terrain limits erosion and trend for soil is still considered stable. The density of the key browse species, Wyoming big sagebrush, remained similar to that of 1982. Vigor has improved since 1982. Most mature plants were rated in form class 2, moderately hedged, rather than form class 3 (heavily hedged). However, a higher percentage (44%) of the sagebrush population was classified as decadent. There is still a substantial population of seedling and young Wyoming big sagebrush. Average sagebrush cover is 21% on the study site. Trend for grasses and forbs are up due to a significant increase in quadrat frequency. Crested wheatgrass, the most abundant grass, tripled its quadrat frequency since 1982. Scarlet globemallow also greatly increased in quadrat frequency (23 to 66).

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - up (5)

1995 TREND ASSESSMENT

Soil trend is up slightly. Percent bare ground declined from 38% to 33% and photos indicate a dramatic increase in herbaceous cover. Nested frequency of grasses and forbs have increased. Trend for sagebrush is slightly improved. Percent decadence has declined from 44% to 8%. It appears that many of the decadent plants surveyed in 1988 are now classified as healthy mature plants. The number of seedlings and young have declined but there are adequate numbers to maintain the population. The secondary browse, winterfat, also shows an improving trend. Heavy use is reduced, vigor is improved and percent decadency has decreased significantly from 15% to 2%. Trend for grasses is slightly up with a significant increase in the nested frequency of crested wheatgrass. Nested frequency of forbs increased slightly with 11 perennial species counted. Overall trend is up slightly.

TREND ASSESSMENT

soil - slightly up (4)

browse - slightly up (4)

herbaceous understory - up slightly (4)

2000 TREND ASSESSMENT

Trend for soil is stable. Relative percent cover of bare ground increased slightly while litter and vegetation cover declined slightly. However, cryptogamic cover increased and the ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground remained similar to 1995 levels. There is some erosion occurring, but it is minimized by the gentle terrain. Trend for the key browse species, Wyoming big sagebrush, is stable. Use is heavier than in 1995. The proportion of sagebrush in poor vigor has increased slightly and

percent decadence has increased from 8% to 22%. This is still relatively low for this type of site. Biotic potential (# of seedlings) and the proportion of young plants in the population have remained similar to 1995 levels and there appears to be enough young plants to maintain the population. Winterfat shows heavier use but a stable population. Trend for the herbaceous understory is considered stable. Sum of nested frequency of perennial grasses has declined slightly but the small decline in the nested frequency of the dominant species, crested wheatgrass, was not significant. Sum of nested frequency for perennial forbs also declined substantially, with a corresponding drop in cover. Since the nested frequency of the dominant herbaceous species, crested wheatgrass, did not decline significantly and the overall decline in sum of nested frequency for perennial grasses and forbs is relatively small, the overall herbaceous understory trend is considered stable.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --

Herd unit 17 , Study no: 50

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron cristatum	a307	b331	ab319	32	99	98	95	12.21	16.75
G	Agropyron dasystachyum	a-	b13	b9	1	-	5	5	.02	.05
G	Carex spp.	b37	a9	a10	8	16	4	5	.07	.10
G	Oryzopsis hymenoides	b15	ab9	a2	1	8	5	2	.22	.04
G	Stipa comata	a-	b13	b7	-	-	7	3	.30	.06
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		359	375	347	42	123	119	110	12.84	17.01
Total for Grasses		359	375	347	42	123	119	110	12.84	17.01
F	Allium spp.	-	2	-	-	-	1	-	.00	-
F	Arabis spp.	-	-	-	2	-	-	-	-	-
F	Astragalus convallarius	a4	b20	ab18	4	2	14	9	.78	.09
F	Astragalus tenellus	a-	b6	a-	-	-	5	-	.19	-
F	Calochortus nuttallii	-	3	-	-	-	2	-	.01	-
F	Cordylanthus kingii (a)	-	1	-	-	-	1	-	.01	-
F	Descurainia spp. (a)	-	1	-	-	-	1	-	.00	-
F	Draba spp. (a)	-	5	-	-	-	2	-	.01	-
F	Leucelene ericoides	a-	a-	b8	2	-	-	4	-	.04
F	Machaeranthera canescens	ab2	b10	a-	12	2	5	-	.02	-
F	Phlox hoodii	79	77	72	-	36	33	34	2.02	1.77
F	Phlox longifolia	20	25	10	1	8	11	4	.06	.02
F	Schoenocrambe linifolia	2	3	-	1	1	2	-	.01	-
F	Senecio multilobatus	1	-	-	-	1	-	-	-	-

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	<i>Sphaeralcea coccinea</i>	_b 143	_a 121	_a 109	23	66	55	47	.98	.65
F	<i>Tragopogon dubius</i>	-	-	1	-	-	-	1	-	.00
F	<i>Trifolium gymnocarpon</i>	_a 6	_b 20	_{ab} 11	7	3	9	4	.17	.02
Total for Annual Forbs		0	7	0	0	0	4	0	0.02	0
Total for Perennial Forbs		257	287	229	52	119	137	103	4.26	2.62
Total for Forbs		257	294	229	52	119	141	103	4.29	2.62

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

BROWSE TRENDS --

Herd unit 17 , Study no: 50

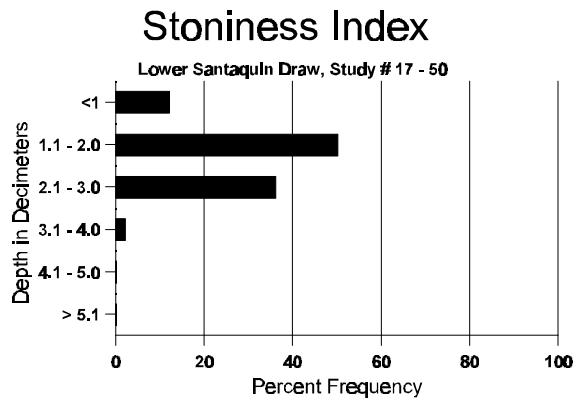
T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	<i>Artemisia tridentata wyomingensis</i>	87	80	10.30	9.44
B	<i>Ceratoides lanata</i>	35	34	.62	1.03
B	<i>Chrysothamnus depressus</i>	0	1	-	-
B	<i>Chrysothamnus nauseosus graveolens</i>	0	12	-	.69
B	<i>Chrysothamnus nauseosus hololeucus</i>	9	1	.33	.00
B	<i>Chrysothamnus viscidiflorus stenophyllus</i>	5	5	.31	.30
B	<i>Gutierrezia sarothrae</i>	3	1	.06	-
B	<i>Leptodactylon pungens</i>	3	0	.01	-
B	<i>Opuntia spp.</i>	28	34	.44	.76
B	<i>Pediocactus simpsonii</i>	0	2	-	.00
B	<i>Purshia tridentata</i>	0	0	-	.15
Total for Browse		170	170	12.09	12.38

BASIC COVER --
Herd unit 17 , Study no: 50

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	345	338	6.50	7.00	32.09	31.07
Rock	5	-	0	0	.15	0
Pavement	8	15	0	0	.01	.02
Litter	387	374	58.50	53.00	39.47	40.61
Cryptogams	112	188	0	1.75	1.44	4.18
Bare Ground	316	342	35.00	38.25	32.60	44.56

SOIL ANALYSIS DATA --
Herd Unit 17, Study # 50, Study Name: Lower Santaquin Draw

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
10.57	61.4 (15.35)	7.6	45.3	36.2	18.6	1.0	2.0	99.2	0.5



PELLET GROUP FREQUENCY --
Herd unit 17 , Study no: 50

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre	Days Use per Acre (ha)
Rabbit	4	15	400	N/A
Elk	17	28	52	4 (10)
Deer	29	15	1801	139 (342)
Cattle	-	4	104	8 (20)

BROWSE CHARACTERISTICS --

Herd unit 17 , Study no: 50

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata wyomingensis																		
S	'82	28	-	-	-	-	-	-	-	-	7	21	-	-	1866		28	
	'88	11	-	-	-	-	-	-	-	-	11	-	-	-	733		11	
	'95	9	-	-	-	-	-	-	-	-	9	-	-	-	180		9	
	'00	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5	
Y	'82	17	2	-	-	-	-	-	-	-	16	3	-	-	1266		19	
	'88	18	1	1	-	-	-	-	-	-	20	-	-	-	1333		20	
	'95	32	12	-	-	-	-	-	-	-	39	-	5	-	880		44	
	'00	20	18	-	-	-	-	-	-	-	38	-	-	-	760		38	
M	'82	7	17	14	-	-	-	-	-	-	18	13	7	-	2533	20 23	38	
	'88	5	14	3	-	-	-	-	-	-	21	1	-	-	1466	19 23	22	
	'95	10	148	40	3	4	-	-	-	-	205	-	-	-	4100	18 30	205	
	'00	23	96	38	-	1	-	-	-	-	149	2	7	-	3160	18 26	158	
D	'82	-	12	7	-	-	-	-	-	-	-	-	14	5	1266		19	
	'88	8	19	6	-	-	-	-	-	-	30	1	-	2	2200		33	
	'95	2	15	5	-	-	-	-	-	-	11	-	-	11	440		22	
	'00	13	14	20	2	5	1	-	-	-	30	-	-	25	1100		55	
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	500		25	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	420		21	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		41%			28%			34%			- 1%							
'88		45%			13%			03%			+ 8%							
'95		66%			17%			06%			- 7%							
'00		53%			24%			13%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	5065	Dec:	25%			
												'88	4999		44%			
												'95	5420		8%			
												'00	5020		22%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total					
		1	2	3	4								
Ceratoides lanata													
S	82	-	-	-	-	-	-	-	-	-	0		0
	88	1	-	-	-	-	-	-	-	-	1	-	1
	95	3	-	-	-	-	-	-	-	-	3	-	3
	00	-	-	-	-	-	-	-	-	-	0	-	0
Y	82	-	-	-	-	-	-	-	-	-	0		0
	88	5	3	1	-	-	-	-	-	-	8	-	9
	95	3	1	-	-	-	-	-	-	-	4	-	4
	00	2	-	-	-	-	-	-	-	-	2	-	2
M	82	3	6	1	-	-	-	-	-	-	9	-	10
	88	3	1	3	1	-	-	-	-	-	8	-	8
	95	43	3	1	-	-	-	-	-	-	46	-	47
	00	4	21	24	-	1	-	-	-	-	50	-	50
D	82	-	-	3	-	-	-	-	-	-	3	-	3
	88	2	-	1	-	-	-	-	-	-	2	-	3
	95	1	-	-	-	-	-	-	-	-	-	-	1
	00	-	2	-	-	-	1	-	-	-	1	-	3
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>					
'82		46%		31%		08%		+35%					
'88		20%		25%		10%		-22%					
'95		08%		02%		04%		+ 5%					
'00		44%		45%		04%							
Total Plants/Acre (excluding Dead & Seedlings)										'82	866	Dec:	23%
										'88	1333		15%
										'95	1040		2%
										'00	1100		5%
Chrysothamnus depressus													
M	82	-	-	-	-	-	-	-	-	-	0	-	0
	88	-	-	-	-	-	-	-	-	-	0	-	0
	95	-	-	-	-	-	-	-	-	-	0	-	0
	00	-	1	-	-	-	-	-	-	-	1	-	1
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>					
'82		00%		00%		00%							
'88		00%		00%		00%							
'95		00%		00%		00%							
'00		100%		00%		00%							
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-
										'88	0		-
										'95	0		-
										'00	20		-

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4		1	2				
Chrysothamnus nauseosus graveolens												
Y	82	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	40		2	
M	82	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	0	-	0	
	00	7	-	1	-	-	-	-	160	19	20	8
D	82	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	0		0	
	00	1	1	-	-	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%						
'88		00%		00%		00%						
'95		00%		00%		00%						
'00		08%		08%		08%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	0%			
						'88	0		0%			
						'95	0		0%			
						'00	240		17%			
Chrysothamnus nauseosus hololeucus												
Y	82	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	20		1	
	00	2	-	-	-	-	-	-	40		2	
M	82	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	0	-	0	
	95	8	-	-	-	-	-	-	160	20	21	8
	00	-	-	-	-	-	-	-	0	-	-	0
D	82	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%						
'88		00%		00%		00%						
'95		00%		00%		10%		-80%				
'00		00%		00%		00%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	0%			
						'88	0		0%			
						'95	200		10%			
						'00	40		0%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4		1	2				
<i>Chrysothamnus viscidiflorus stenophyllus</i>												
S	82	-	-	-	-	-	-	-	0	0		
	88	-	-	-	-	-	-	-	0	0		
	95	-	-	-	-	-	-	-	0	0		
	00	1	-	-	-	-	-	-	20	1		
Y	82	-	-	-	-	-	-	-	0	0		
	88	2	-	-	-	-	-	-	133	2		
	95	-	-	-	-	-	-	-	0	0		
	00	-	-	-	-	-	-	-	0	0		
M	82	1	-	-	1	-	-	-	133	14	9	2
	88	2	-	-	-	-	-	-	133	24	15	2
	95	15	-	-	-	-	-	-	300	13	17	15
	00	14	-	-	-	-	-	-	280	8	18	14
D	82	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	66			1
	95	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%		+60%				
'88		00%		00%		20%		-10%				
'95		00%		00%		00%		-7%				
'00		00%		00%		00%						
Total Plants/Acre (excluding Dead & Seedlings)							'82	133	Dec:	0%		
							'88	332		20%		
							'95	300		0%		
							'00	280		0%		
<i>Gutierrezia sarothrae</i>												
M	82	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	0	-	-	0
	95	4	-	-	-	-	-	-	80	5	6	4
	00	1	-	-	-	-	-	-	20	-	-	1
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%						
'88		00%		00%		00%						
'95		00%		00%		00%		-75%				
'00		00%		00%		00%						
Total Plants/Acre (excluding Dead & Seedlings)							'82	0	Dec:	-		
							'88	0		-		
							'95	80		-		
							'00	20		-		

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Leptodactylon pungens																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	2	-	-	-	-	-	-	-	-	-	-	-	40		2	
	00	3	-	-	-	-	-	-	-	-	-	-	-	60		3	
Y	82	9	-	-	-	-	-	-	-	-	-	-	-	600		9	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	2	-	-	1	-	-	-	-	-	-	-	-	60		3	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	21	-	-	-	-	-	-	-	-	-	-	-	1400	1 7	21	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	2 3	0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		00%			00%			00%									
'88		00%			00%			00%									
'95		00%			00%			00%									
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'82	2000	Dec:	-		
												'88	0		-		
												'95	60		-		
												'00	0		-		
Opuntia spp.																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	-	-	-	66		1	
	95	1	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	2	1	-	-	-	-	-	-	-	-	-	-	200		3	
	95	5	-	-	-	-	-	-	-	-	-	-	-	100		5	
	00	5	-	-	-	-	-	2	-	-	-	-	-	140		7	
M	82	8	-	-	-	-	-	-	-	-	-	-	-	533	3 7	8	
	88	5	-	-	-	-	-	-	-	-	-	-	-	333	3 8	5	
	95	40	-	-	-	-	-	-	-	-	-	-	-	800	5 11	40	
	00	46	-	-	1	-	-	-	-	-	-	-	-	940	4 9	47	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	5	-	-	-	-	-	-	-	-	-	-	-	333		5	
	95	2	-	-	-	-	-	-	-	-	-	-	-	40		2	
	00	5	-	-	-	-	-	-	-	-	-	-	-	100		5	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		00%			00%			00%			+38%						
'88		08%			00%			69%			+ 8%						
'95		00%			00%			02%			+20%						
'00		00%			00%			08%									
Total Plants/Acre (excluding Dead & Seedlings)												'82	533	Dec:	0%		
												'88	866		38%		
												'95	940		4%		
												'00	1180		8%		

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Pediocactus simpsonii																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	1	-	-	-	-	-	-	-	-	-	-	-	1	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			50%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	0		0%			
												'95	0		0%			
												'00	40		50%			
Sclerocactus																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	2	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	0		-			

Trend Study 17-51-00

Study site name: Santaquins Cabin .

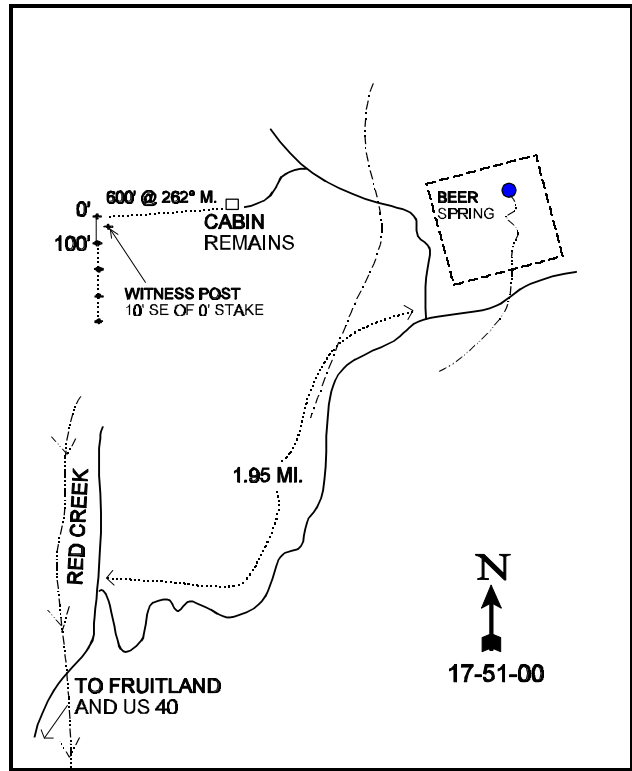
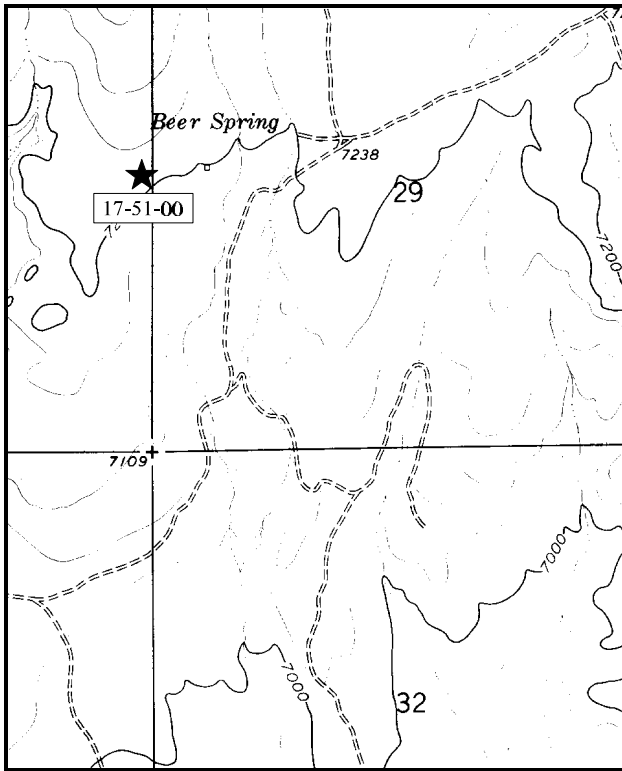
Range type: Chained, Seeded P-J .

Compass bearing: frequency baseline 159°M .

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (19 & 94ft), line 2 (29ft), line 3 (57ft), line 4 (71ft).

LOCATION DESCRIPTION

From US 40 in Fruitland, travel north up the Red Creek Road 1.8 miles to a 3-way fork. Take the middle fork and go 2.5 miles. After crossing Red Creek, turn right onto a dirt road. Go northeast up this road for 1.95 miles, keeping left at two major forks. At Beer Spring, turn left and go along the west side of the fenced spring to a wide, shallow wash. Cross the wash, then bear left onto a faint road. Follow it for about 100 yards to the remains of Santaquins cabin. From the cabin walk due west 600 feet, following the old line intercept study, to the 4th stake. From the 4th line-intercept stake, walk 11 paces south to the start of the baseline. The 0-foot baseline stake is marked with red browse tag #7022. The frequency baseline runs at a bearing of 159°M.



Map Name: Tabby Mountain

Diagrammatic Sketch

Township 2S ,Range 8W ,Section 29

UTM 4458484.716 N, 515236.456 E

DISCUSSION

Trend Study No. 17-51 (13-6)

This trend study is on winter range located near Santaquin's Cabin. The area is owned by the Utah Division of Wildlife Resources. The study site is placed on a chained and seeded pinyon-juniper area west of Beer Spring. Elevation is 7,200 feet and the terrain is essentially flat with a slight southeast aspect. This area is used heavily by wintering big game, especially deer. Cattle also use the area. Pellet group data from 2000 estimated 139 deer, 4 elk and 9 cow days use/acre (343 ddu/ha, 10 edu/ha and 22 cdu/ha).

Soils are fairly deep and fine textured with little rock on the surface or within the profile. Effective rooting depth is estimated at just over 11 inches due to a compacted horizon which starts about 8 inches below the surface. This does not appear to be a very restrictive rooting barrier however. Effective soil depth is variable with areas of bare soil having a soil depth of only 2 to 4 inches. Shrub interspaces generally have an effective rooting depth of 8 to 11 inches, while soil near the base of shrubs is normally 13 to 17 inches in depth. Soil texture is a sandy clay loam with a slightly alkaline soil reaction (pH of 7.7). Phosphorus is limited at just 3.3 ppm. Values less than 10 ppm can limit normal plant growth and development. There is some localized soil movement on bare areas but for the most part, erosion is minimal due to the abundant chaining litter and vegetation cover. A number of small, south flowing gullies traverse the area. These have stabilized since the chaining treatment. A disking treatment was done near the trend study and the last 150 feet of the baseline was within the disked area.

The key browse species on the chaining is Wyoming big sagebrush. There appears to be some sagebrush on the site which exhibit characteristics of basin big sagebrush (*Artemisia tridentata tridentata*) as well as hybrids of Wyoming big sagebrush (*Artemisia tridentata wyomingensis*) and basin big sagebrush. All sagebrush will be classified as Wyoming big sagebrush in this report. Density of sagebrush has declined since 1982, but the decline is due to the reduction of young plants which numbered 2,866 plants/acre in 1982 and only 440 in 2000. The number of mature plants and decadent plants combined have remained similar through the years. Percent decadence has remained low and is currently ('00) 8%. Utilization has been moderate with 23% of the population classified as heavily hedged in 1988, 16% in 1995 and only 4% in 2000. Vigor was considered poor on 11% of the population in 1988, but by 1995 it dropped to only 2%.

Small populations of white-stemmed rubber rabbitbrush and Parry rabbitbrush produce some additional forage. There appears to have been some confusion in identifying these two shrubs during past readings. During the 2000 reading, density of Parry rabbitbrush was estimated at 1,880 plants/acre, while only 260 larger white-stemmed rubber rabbitbrush were estimated. The shorter Parry rabbitbrush average only 5 inches in height. They display light to moderate use and good vigor. Several other shrubs occur on the site in small numbers.

The herbaceous understory is diverse with 11 perennial grass species and 20 forb species sampled in 1995. Crested, thickspike, intermediate wheatgrass and a sedge dominate the grass composition by providing 83% of the total grass cover in 1995 and 88% in 2000. Forbs are diverse but they do not provide very much forage. In 1995, forbs accounted for only 25% of the herbaceous cover. Due to drought conditions, they produced only 11% of the herbaceous cover in 2000. Common forbs include: loose flower milkvetch, alfalfa, Hood's phlox and scarlet globemallow.

1982 APPARENT TREND ASSESSMENT

Soil trend appears stable. The shrub component, especially Wyoming big sagebrush, appears to be on the increase. However, browse diversity could be better. This seems to be another of those seedings where direct seeding of desirable shrubs has largely failed. Interseeding may be a viable option. Grasses and forbs are providing needed watershed protection as well as livestock forage. The highly palatable alfalfa appears to be on the way out. Vegetative trend appears stable to improving.

1988 TREND ASSESSMENT

Vegetative cover hits were rare in 1988. Basal vegetative cover decreased from 9% to 2%. Since litter cover was constant, the percentage of bare soil exposed increased. Trend for soil is considered slightly down. The permanent photo-plots associated with the study on DWR land at Santaquin's Cabin will help to document the continued succession of this chaining. From the photos, there is an obvious increase in the size and prominence of woody species although cover is still very limited in the area. For some reason, the frequency baseline was established in an area with less sagebrush than is typical over the area as a whole. Along the baseline, sagebrush cover is 1%. On the density plots, sagebrush cover averages 17%. In 1982, a large number of seedling and young big sagebrush were counted. Total sagebrush density was 5,666 plants/acre. During the 1988 reading, no seedlings were found, but there were still a substantial number of young plants. However, the total sagebrush population was only 4,399 plants/acre with a decrease in the number of mature plants counted. Correlating with the data, photograph comparisons illustrate the increased size and degree of hedging on the sagebrush. Seven percent of the mature sagebrush were classified as heavily hedged in 1982. In 1988, 21% were in form class 3. The populations of increaser species; broom snakeweed, pricklypear, juniper and pinyon have only slightly increased. Browse trend is considered slightly down. Quadrat frequency of grasses increased slightly since 1982, while frequency of forbs declined. Overall, trend is stable for the herbaceous understory.

TREND ASSESSMENT

soil - slightly down (2)

browse - slightly down (2)

herbaceous understory - stable (3)

1995 TREND ASSESSMENT

Soil conditions have improved since 1988. Cover of bare ground declined from 42% to 28%, while litter cover continues to decline as chaining litter decomposes. Trend is slightly up for soil. The key browse species, Wyoming big sagebrush, has declined in overall density due to a reduction in the number of young plants in the population caused by drought conditions over the past several years. The number of shrubs displaying heavy use declined slightly, vigor improved and the number of decadent plants declined slightly from 9% to 7% of the population. Trend is considered stable at this time. Trend for the herbaceous understory is up slightly due to an increase in the sum of nested frequency of grasses which makes up 74% of the herbaceous cover. Frequency of forbs remained similar to 1988.

TREND ASSESSMENT

soil - up slightly (4)

browse - stable (3)

herbaceous understory - up slightly (4)

2000 TREND ASSESSMENT

Trend for soil is stable. Relative cover of bare ground declined slightly while litter cover increased slightly. Vegetative cover remained similar to 1995 estimates and the ratio of protective cover (vegetation, litter, cryptogams) to bare ground remained fairly stable. Trend for the key browse species, Wyoming big sagebrush, is stable. Use is mostly light to moderate, vigor good on most plants and percent decadence remains low. Young plants currently account for 19% of the population while biotic potential (# of seedlings) is 5%. Density of mature plants has declined slightly, but this is due to the disking treatment which effected 2 of the 5 density strips. Trend for the herbaceous understory is down slightly. Sum of nested frequency of perennial grasses and forbs have declined with a significant decline in the nested frequency of crested wheatgrass.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - down slightly (2)

HERBACEOUS TRENDS --

Herd unit 17 , Study no: 51

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron cristatum	ab172	b165	a136	44	65	53	49	3.85	7.93
G	Agropyron dasystachyum	152	113	134	27	57	36	43	3.99	4.32
G	Agropyron intermedium	a-	c86	b44	-	-	31	19	1.69	.93
G	Bromus inermis	b75	a43	a24	29	32	18	9	.78	.83
G	Carex spp.	a-	b60	b57	1	-	19	19	1.27	2.12
G	Elymus junceus	-	6	3	-	-	2	1	.06	.15
G	Festuca ovina	b32	a3	a-	9	15	2	-	.03	-
G	Oryzopsis hymenoides	b46	c67	a21	29	24	36	12	.86	.38
G	Poa secunda	-	4	1	-	-	2	1	.03	.00
G	Sitanion hystrix	11	16	10	-	6	9	5	.13	.25
G	Stipa comata	a-	b22	b23	-	-	10	9	.22	.43
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		488	585	453	139	199	218	167	12.94	17.36
Total for Grasses		488	585	453	139	199	218	167	12.94	17.36
F	Agoseris glauca	-	-	3	-	-	-	1	-	.00
F	Antennaria rosea	-	-	1	-	-	-	1	-	.00
F	Arabis spp.	-	-	-	3	-	-	-	-	-
F	Astragalus convallarius	a-	b6	b4	1	-	3	3	.06	.04
F	Astragalus tenellus	b91	a23	a13	40	38	10	7	.28	.20
F	Calochortus nuttallii	a-	b8	a-	-	-	5	-	.03	-
F	Chenopodium fremontii (a)	-	b13	a-	-	-	6	-	.05	-

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	<i>Chenopodium leptophyllum</i> (a)	-	3	-	-	-	1	-	.00	-
F	<i>Cirsium</i> spp.	1	2	1	1	1	2	1	.01	.03
F	<i>Cordylanthus kingii</i> (a)	-	_b 25	_a -	-	-	13	-	.28	-
F	<i>Cryptantha</i> spp.	-	-	3	11	-	-	1	-	.03
F	<i>Cymopterus</i> spp.	-	4	-	-	-	2	-	.01	-
F	<i>Descurainia pinnata</i> (a)	-	2	-	-	-	2	-	.01	-
F	<i>Erigeron</i> spp.	3	7	8	-	1	4	3	.04	.06
F	<i>Hackelia patens</i>	-	-	-	1	-	-	-	-	-
F	<i>Hedysarum boreale</i>	-	-	4	-	-	-	3	-	.09
F	<i>Haplopappus nuttallii</i>	-	-	-	4	-	-	-	-	-
F	<i>Lappula occidentalis</i> (a)	-	_b 18	_a -	-	-	7	-	.08	-
F	<i>Machaeranthera canescens</i>	_b 21	_a 7	_a 3	47	10	3	2	.06	.04
F	<i>Machaeranthera grindelioides</i>	_b 8	_a -	_a 1	-	5	-	1	.00	.00
F	<i>Medicago sativa</i>	_b 58	_a 28	_a 25	18	25	13	14	1.70	.56
F	<i>Pedicularis</i> spp	-	-	-	1	-	-	-	-	-
F	<i>Penstemon humilis</i>	-	8	15	-	-	5	7	.07	.20
F	<i>Penstemon</i> spp.	-	4	-	8	-	1	-	.00	-
F	<i>Phlox hoodii</i>	8	14	19	4	4	8	8	.61	.43
F	<i>Phlox longifolia</i>	-	1	-	-	-	1	-	.00	-
F	<i>Polygonum douglasii</i> (a)	-	_b 10	_a -	-	-	7	-	.03	-
F	<i>Potentilla</i> spp.	-	-	-	1	-	-	-	-	-
F	<i>Schoenocrambe linifolia</i>	3	3	-	4	1	1	-	.00	-
F	<i>Senecio multilobatus</i>	3	-	-	-	1	-	-	-	-
F	<i>Sisymbrium altissimum</i> (a)	-	2	-	-	-	1	-	.00	-
F	<i>Sphaeralcea coccinea</i>	_a 24	_b 73	_b 61	13	13	31	29	.85	.37
F	<i>Taraxacum officinale</i>	-	4	-	-	-	2	-	.01	-
F	<i>Tragopogon dubius</i>	1	-	-	-	1	-	-	-	-
F	<i>Trifolium gymnocarpon</i>	_a -	_b 12	_a -	1	-	5	-	.22	-
F	<i>Viola</i> spp.	-	-	-	4	-	-	-	-	-
F	Unknown forb-perennial	_b 4	_a -	_a -	-	4	-	-	-	-
Total for Annual Forbs		0	73	0	0	0	37	0	0.47	0
Total for Perennial Forbs		225	204	161	104	104	96	81	4.00	2.08
Total for Forbs		225	277	161	104	104	133	81	4.48	2.08

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

BROWSE TRENDS --

Herd unit 17 , Study no: 51

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata wyomingensis	74	56	9.66	8.36
B	Atriplex canescens	0	1	-	-
B	Chrysothamnus depressus	3	6	.16	.21
B	Chrysothamnus nauseosus graveolens	0	4	-	.15
B	Chrysothamnus nauseosus hololeucus	35	11	1.16	.06
B	Chrysothamnus parryi	0	19	-	1.02
B	Chrysothamnus viscidiflorus viscidiflorus	4	2	-	-
B	Eriogonum corymbosum	3	2	.15	.15
B	Gutierrezia sarothrae	13	15	.24	.24
B	Juniperus osteosperma	0	4	-	.03
B	Leptodactylon pungens	4	3	.15	.15
B	Opuntia spp.	6	8	.00	.18
B	Pediocactus simpsonii	1	0	.00	-
B	Pinus edulis	0	3	-	-
Total for Browse		143	134	11.54	10.57

BASIC COVER --

Herd unit 17 , Study no: 51

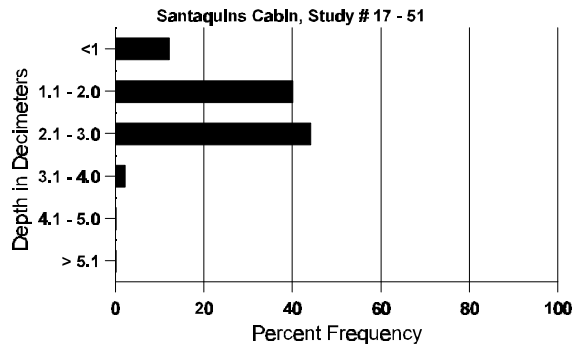
Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	347	314	8.50	2.25	29.18	35.20
Rock	19	9	0	.25	.04	.02
Pavement	61	112	0	0	.14	.80
Litter	393	383	56.00	55.75	44.87	59.80
Cryptogams	60	56	0	0	1.22	1.00
Bare Ground	280	274	35.50	41.75	27.60	32.01

SOIL ANALYSIS DATA --

Herd Unit 17, Study # 51, Study Name: Santaquins Cabin

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
11.62	55.6 (12.76)	737	49.6	27.1	23.3	3.0	3.3	134.4	0.8

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 17 , Study no: 51

Type	Quadrat Frequency	
	'95	'00
Rabbit	18	24
Elk	6	2
Deer	47	55
Cattle	-	4

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
00	00
400	N/A
52	4 (10)
1801	139 (343)
104	9 (22)

BROWSE CHARACTERISTICS --

Herd unit 17 , Study no: 51

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total				
		1	2	3	4		1	2					
<i>Artemisia tridentata wyomingensis</i>													
S	82	83	-	-	-	-	-	-	83	-	-	83	
	88	-	-	-	-	-	-	-	-	-	-	0	
	95	1	-	-	-	-	-	-	1	-	-	20	
	00	6	-	-	-	-	-	-	6	-	-	120	
Y	82	43	-	-	-	-	-	-	43	-	-	2866	
	88	9	17	6	-	-	-	-	32	-	-	2133	
	95	24	2	-	-	-	-	-	26	-	-	520	
	00	22	-	-	-	-	-	-	22	-	-	440	
M	82	28	11	3	-	-	-	-	37	5	-	2800	
	88	5	17	6	-	-	-	-	24	-	4	1866	
	95	39	57	18	1	-	-	-	115	-	-	2300	
	00	48	34	2	1	-	-	-	85	-	-	1700	
D	82	-	-	-	-	-	-	-	-	-	-	0	
	88	1	2	3	-	-	-	-	3	-	3	400	
	95	-	5	6	-	-	-	-	8	-	-	220	
	00	3	3	3	-	-	-	-	4	-	5	180	
X	82	-	-	-	-	-	-	-	-	-	-	0	
	88	-	-	-	-	-	-	-	-	-	-	0	
	95	-	-	-	-	-	-	-	-	-	-	320	
	00	-	-	-	-	-	-	-	-	-	-	240	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>% Change</u>					
'82		13%		04%		00%		-22%					
'88		55%		23%		11%		-31%					
'95		42%		16%		02%		-24%					
'00		32%		04%		04%							
Total Plants/Acre (excluding Dead & Seedlings)										'82	5666	Dec:	0%
										'88	4399		9%
										'95	3040		7%
										'00	2320		8%
<i>Atriplex canescens</i>													
M	82	-	-	-	-	-	-	-	-	-	-	0	
	88	-	-	-	-	-	-	-	-	-	-	0	
	95	-	-	-	-	-	-	-	-	-	-	0	
	00	1	-	-	-	-	-	-	1	-	-	20	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>% Change</u>					
'82		00%		00%		00%							
'88		00%		00%		00%							
'95		00%		00%		00%							
'00		00%		00%		00%							
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-
										'88	0		-
										'95	0		-
										'00	20		-

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4		1	2				
Chrysothamnus depressus												
M	82	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	0	-	-	0
	95	15	-	-	-	-	-	-	300	6	15	15
	00	5	5	2	-	-	-	-	240	1	5	12
D	82	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%						
'88		00%		00%		00%						
'95		00%		00%		00%		-13%				
'00		38%		15%		00%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	0%			
						'88	0		0%			
						'95	300		0%			
						'00	260		8%			
Chrysothamnus nauseosus graveolens												
M	82	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	0	-	-	0
	00	2	-	-	-	-	-	-	40	23	23	2
D	82	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	40			2
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%						
'88		00%		00%		00%						
'95		00%		00%		00%						
'00		00%		00%		25%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	0%			
						'88	0		0%			
						'95	0		0%			
						'00	80		50%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total							
		1	2	3	4										
Chrysothamnus nauseosus hololeucus															
Y	82	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	2	-	1	-	-	-	-	-	-	-	-	200		3
	95	11	-	-	-	-	-	-	-	-	-	-	220		11
	00	3	1	-	-	-	-	-	-	-	-	-	80		4
M	82	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	95	108	-	-	-	-	-	-	-	-	-	-	2160	14 14	108
	00	9	-	-	-	-	-	-	-	-	-	-	180	17 18	9
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>							
'82		00%		00%		00%									
'88		00%		33%		33%		+92%							
'95		00%		00%		00%		-89%							
'00		08%		00%		15%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-		
										'88	200		-		
										'95	2380		-		
										'00	260		-		
Chrysothamnus parryi															
Y	82	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	2	-	-	-	-	-	-	-	-	-	-	40		2
M	82	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	00	51	40	1	-	-	-	-	-	-	-	-	1840	5 8	92
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>							
'82		00%		00%		00%									
'88		00%		00%		00%									
'95		00%		00%		00%									
'00		43%		01%		00%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-		
										'88	0		-		
										'95	0		-		
										'00	1880		-		

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4		1	2				
Chrysothamnus viscidiflorus viscidiflorus												
Y	82	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	0		0	
M	82	1	-	-	-	-	-	-	66	6	10	1
	88	-	-	-	-	-	-	-	0	-	-	0
	95	3	-	-	-	-	-	-	60	11	15	3
	00	1	-	-	-	-	-	-	20	-	-	1
D	82	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%						
'88		00%		00%		00%						
'95		00%		00%		00%		-50%				
'00		00%		00%		50%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	66	Dec:	0%			
						'88	0		0%			
						'95	80		0%			
						'00	40		50%			
Eriogonum corymbosum												
Y	82	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	0		0	
M	82	1	-	-	-	-	-	-	66	15	16	1
	88	1	-	-	-	-	-	-	66	15	13	1
	95	3	-	-	-	-	-	-	60	16	30	3
	00	3	-	-	-	-	-	-	60	16	20	3
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%		+ 0%				
'88		00%		00%		00%		+18%				
'95		00%		00%		00%		-25%				
'00		00%		00%		00%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	66	Dec:	-			
						'88	66		-			
						'95	80		-			
						'00	60		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4		1	2				
<i>Gutierrezia sarothrae</i>												
Y	82	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	0	-	0	
	95	2	-	-	-	-	-	-	40	-	2	
	00	1	-	-	-	-	-	-	20	-	1	
M	82	-	-	-	-	-	-	-	0	-	0	
	88	3	-	-	-	-	-	-	200	6	9	3
	95	32	-	-	-	-	-	-	640	9	11	32
	00	42	-	-	-	-	-	-	840	4	6	42
X	82	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	0	-	0	
	00	1	-	-	-	-	-	-	20	-	1	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%						
'88		00%		00%		00%		+71%				
'95		00%		00%		00%		+21%				
'00		00%		00%		00%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	-			
						'88	200		-			
						'95	680		-			
						'00	860		-			
<i>Juniperus osteosperma</i>												
Y	82	-	-	-	-	-	-	-	0	-	0	
	88	1	-	-	-	-	-	-	66	-	1	
	95	-	-	-	-	-	-	-	0	-	0	
	00	3	-	-	-	-	-	-	60	-	3	
M	82	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	0	-	0	
	00	1	-	-	-	-	-	-	20	-	1	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%						
'88		00%		00%		00%						
'95		00%		00%		00%						
'00		00%		00%		00%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	-			
						'88	66		-			
						'95	0		-			
						'00	80		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Leptodactylon pungens																		
M	'82	8	-	-	-	-	-	-	-	-	8	-	-	-	533	2	7	8
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	8	-	-	-	-	-	-	-	-	8	-	-	-	160	6	7	8
	'00	12	-	-	-	-	-	-	-	-	12	-	-	-	240	3	6	12
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'82 00%			'82 00%			'82 00%										
		'88 00%			'88 00%			'88 00%										
		'95 00%			'95 00%			'95 00%			+33%							
		'00 00%			'00 00%			'00 00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	533	Dec:	-			
												'88	0		-			
												'95	160		-			
												'00	240		-			
Opuntia spp.																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	'82	14	-	-	-	-	-	-	-	-	14	-	-	-	933	3	13	14
	'88	21	-	-	-	-	-	-	-	-	21	-	-	-	1400	3	4	21
	'95	6	-	-	-	-	-	-	-	-	6	-	-	-	120	6	14	6
	'00	7	-	-	-	-	-	-	-	-	7	-	-	-	140	4	12	7
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'82 00%			'82 00%			'82 00%			+39%							
		'88 00%			'88 00%			'88 00%			-92%							
		'95 00%			'95 00%			'95 00%			+45%							
		'00 00%			'00 00%			'00 00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	933	Dec:	0%			
												'88	1533		0%			
												'95	120		0%			
												'00	220		9%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Pediocactus simpsonii</i>																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	1	2	1
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	20		-			
												'00	0		-			
<i>Pinus edulis</i>																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	66		-			
												'95	0		-			
												'00	60		-			
<i>Tetradymia canescens</i>																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	14	12	0
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	0		-			

Trend Study 17-52-00

Study site name: Cutoff .

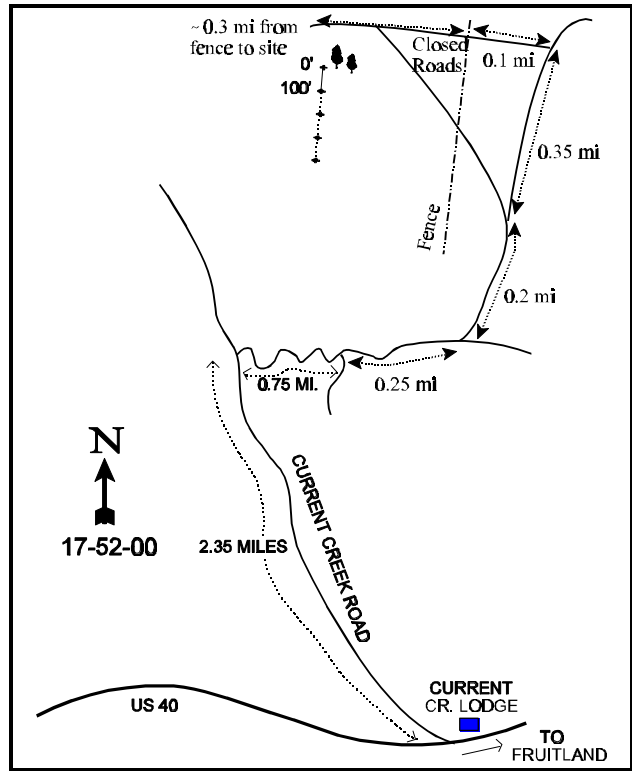
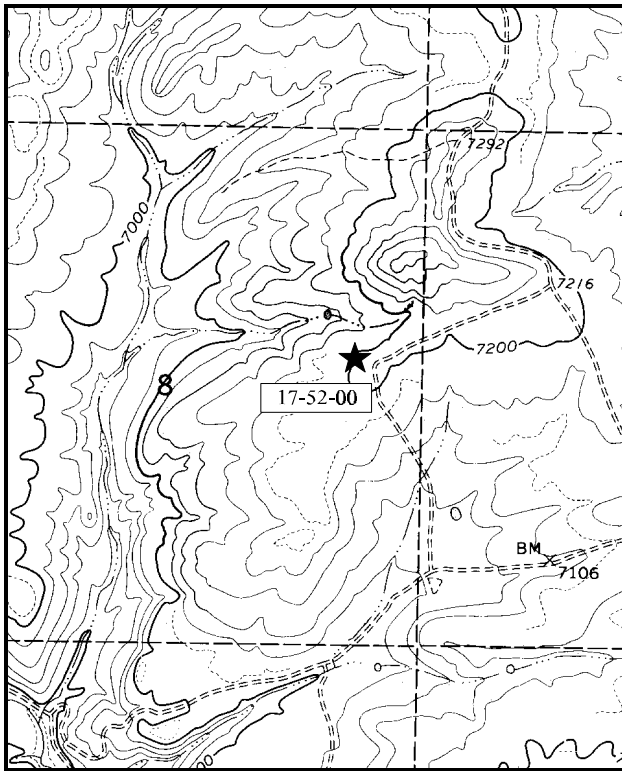
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 179°M .

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (6 & 90ft), line 2 (26ft), line 3 (57ft), line 4 (69ft).

LOCATION DESCRIPTION

From the intersection of Currant Creek Road and Highway U.S. 40, drive north on the Currant Creek Road for 2.3 miles. Turn right and go east 0.7 miles to an intersection. Turn left and drive north for 0.3 miles to a "T". At the "T", turn left and go 0.2 miles to a fork. Stay right for another 0.35 miles to another fork. Turn left and drive to the fence. Cross the fence and walk to the end of the road (about a third of a mile) to the west. The 0-foot baseline is 100 feet south of the end of the road. The 0-foot stake is about 30 feet north east of a mature pinyon pine.



Map Name: Deep Creek Canyon

Diagrammatic Sketch

Township 3S, Range 9W, Section 8

UTM 4453656.792 N, 506989.537 E

DISCUSSION

Trend Study No. 17-52 (13-7)

The Cutoff trend study is on Division of Wildlife Resources land which is classified as winter range. The area is immediately north of Currant Creek Lodge. The range type is sagebrush-grass with some mountain brush. Slope varies from 10% to 20% on a west aspect. Elevation is approximately 7,200 feet. Pellet group frequency data indicates the area is used heavily by deer. A pellet group transect read along the study site baseline in 2000 estimated 96 deer and 8 elk days use/acre (237 ddu/ha and 20 edu/ha). A few deer pellet groups appear to be from spring, but most are from winter use. There is also some sign of cattle grazing with all cattle pats sampled appearing to be from last year (1999).

Soils appear fairly deep but variable. Effective rooting depth is estimated at nearly 14 inches. There is little rock on the surface or within the profile. However, there are some exposed boulders near the beginning and end of the baseline. Overall soil depth is quite variable with deep soil penetrometer measurements of nearly 20 inches occurring near shrubs, while effective soil depth within the shrub interspaces is only 6 to 7 inches. Some areas also contain a calcium carbonate hardpan. Soil texture is a sandy loam with a neutral soil reaction (pH of 7.2). Phosphorus is limited at 5.9 ppm where values less than 10 ppm can limit normal plant growth and development. There is some erosion occurring especially on the steeper slopes near the beginning of the study baseline. There is evidence of past erosion in the form of soil pedestaling and gully formation. However, there appears to be sufficient protective ground cover to prevent serious erosion. On nearby steeper slopes, erosion is more serious and widespread than on the study site.

The key browse species is mountain big sagebrush which provided 74% of the browse cover in 1995 and 55% in 2000. There are also a variety of other browse species present including: serviceberry, true mountain mahogany, mountain low rabbitbrush and bitterbrush. Density for mountain big sagebrush was estimated at 1,866 plants/acre in 1982. Use was mostly light, vigor was good and percent decadency was 21%. By 1988, density increased to 2,199 plants/acre, but percent decadency rose to 70%. Use was light to moderate. This increase in decadency is the result of an over mature population, interspecific competition, combined with drought. During the 1995 reading, population density was estimated at 3,000 plants/acre. Use was heavy on 47% of the population and vigor was reduced on 21%. However, percent decadency declined to 39%. In 2000, density appeared fairly stable at 2,980 plants/acre. Use is very similar to 1995 levels with 53% of the plants sampled displaying heavy use (>60% of twigs browsed). Percent decadence has increased slightly to 45%. Seedlings are rare and young plants account for only 5% of the population. Drought conditions are affecting all of the shrubs on this site in 2000. Most shrubs produced little seed and limited annual growth.

Other preferred browse, serviceberry and true mountain mahogany, occur in small numbers but provide additional forage. Serviceberry shows mostly light hedging, but some mature individuals currently ('00) display heavy use. Mahogany has shown mostly moderate use during past readings. But now it shows mostly heavy utilization. Currently ('00), dwarf rabbitbrush shows moderate to heavy use while mountain low rabbitbrush is mostly unutilized.

Grasses and forbs combine to produce 60% of the vegetative cover in 1995 and 65% in 2000. Perennial grasses are diverse with thickspike wheatgrass, needle-and-thread, bluebunch wheatgrass, Indian ricegrass and mutton bluegrass being the most abundant. Forbs are abundant, but few useful species are present. Timber poisonvetch, king birdbeak and Hood's phlox produced 63% of the forb cover in 1995. Currently ('00), pussytoes, timber poisonvetch and Hood's phlox provide 81% of the forb cover.

1982 APPARENT TREND ASSESSMENT

Soil trend appears to be stable to declining. Soil movement, while not rapid, is still a long-term problem. Vegetation trend also appears to be in a state of decline, which could be reversed in a relatively short time. The most obvious problems involve browse composition and age structure and vigor of the key species. Prior to Division of Wildlife Resources acquisition in 1981, the area had been grazed by livestock during the summer and fall. A spring grazing program designed to enhance the browse component might prove beneficial if the increaser shrubs currently present can be held in check or even reduced.

1988 TREND ASSESSMENT

There was an increase in percent bare ground from 39% to 46%. Litter cover also declined but basal vegetative cover increased slightly and frequency of herbaceous vegetation increased. There is continued gully erosion evident on the site, but other soil trend indicators appear stable. Trend for soil is considered stable but in poor condition. A variety of browse are available, but mountain big sagebrush is the key and most abundant species. Density of sagebrush has increased slightly but so have the less desirable rabbitbrush species. For the sagebrush however, the most important change is in the age class composition. The mostly mature sagebrush population found in 1982 is now 70% decadent, not unusual for 1988. There are few young plants. The sagebrush is lightly to moderately hedged. Sagebrush cover averages 12%. The more palatable, but less common, shrubs such as true mountain mahogany, serviceberry and bitterbrush are also only lightly to moderately hedged. Although poorly sampled due to low numbers, more individuals of these species were counted in 1988 and all are vigorous. Young shrubs are common. Trend for browse is slightly down. In the understory, frequency of grasses and forbs has increased. Trend for grasses and forbs is slightly up.

TREND ASSESSMENT

soil - stable but in poor condition (3)

browse - slightly down due to increased decadency and reduced vigor of sagebrush (2)

herbaceous understory - slightly up (4)

1995 TREND ASSESSMENT

The soil trend is slightly up. The amount of exposed bare soil is down from 46% to 34%. Litter cover continued to decline slightly, but cover of cryptogamic crusts increased to over 5%. There are currently no active gullies on the site, but signs of past soil movement such as pedestaling are evident. Trend for browse is mixed for the key species, mountain big sagebrush. The number of mature plants is similar to that found in 1982 (1,400 to 1,340 plants/acre) and the number of decadent plants declined from 70% to 39%. On the negative side, heavy use increased. No heavy use was reported on sagebrush in 1982 or 1988. During the 1995 reading, 56% of the mature and decadent shrubs displayed heavy hedging. Those plants classified with poor vigor equaled 21%. In addition, 54% of the decadent plants (640 plants/acre) were classified as dying. Dead plants numbered 920 plants/acre indicating a die off in the past few years. Few seedlings are found, yet young plants are moderately abundant. It appears that the population may decline in the future but the resulting population will be younger, showing better health as long as use is not too extreme. Trend for browse is considered stable at this time. Trend for the herbaceous understory is slightly up with an increase in the sum of nested frequency of perennial grasses and forbs. Nested frequency of thickspike wheatgrass increased significantly while frequency of Indian ricegrass declined significantly. Overall, nested frequency of perennial grasses increased by 18%. Nested frequency for perennial forbs increased by 11%.

TREND ASSESSMENT

soil - slightly up (4)

browse - stable (3)

herbaceous understory - slightly up (4)

2000 TREND ASSESSMENT

Trend for soil is stable. Relative percent cover of bare ground and litter are unchanged, while vegetation cover has increased and cryptogamic cover has declined. Overall, the ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground has remained stable since 1995. Trend for the key browse species, mountain big sagebrush, is stable at this time. Use is similar to 1995 levels. Percent decadence is still relatively high at 45% but a smaller proportion are classified as dying (54% in 1995 and 27% in 2000). Reproduction is marginal with few seedlings encountered and young plants accounting for only 5% of the population. If recruitment does not improve, the population will likely decline. A return to normal precipitation patterns will do much to improve sagebrush health and reproduction. Trend for the herbaceous understory is slightly down. Sum of nested frequency of perennial grasses and forbs have declined by 10% and 14% respectively since 1995. Nested frequency of thickspike wheatgrass declined significantly while only about one-third of the grasses remained fairly stable. Nested frequency of perennial forbs declined slightly while nested frequency of annual forbs declined dramatically due to the dry conditions of 2000 (287 to 11).

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --

Herd unit 17 , Study no: 52

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	a181	b203	a163	54	67	70	61	2.23	2.68
G	Agropyron spicatum	a-	b32	b46	-	-	11	13	1.14	1.20
G	Bromus tectorum (a)	-	3	3	-	-	1	1	.00	.00
G	Carex spp.	a3	b46	b44	-	1	20	17	.27	.29
G	Elymus salina	a39	b67	a21	-	13	27	10	.99	.82
G	Oryzopsis hymenoides	b145	a79	a67	48	58	33	28	1.20	1.80
G	Poa fendleriana	b148	b118	a8	15	59	49	4	1.35	.21
G	Poa secunda	a-	b7	c199	5	-	3	81	.01	6.15
G	Sitanion hystrix	-	1	-	-	-	1	-	.00	-
G	Stipa comata	a-	c74	b14	14	-	29	5	2.25	.42
Total for Annual Grasses		0	3	3	0	0	1	1	0.00	0.00
Total for Perennial Grasses		516	627	562	136	198	243	219	9.48	13.59
Total for Grasses		516	630	565	136	198	244	220	9.48	13.60

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	<i>Agoseris glauca</i>	-	3	-	-	-	2	-	.01	-
F	<i>Allium</i> spp.	a-	b104	a-	-	-	45	-	.45	-
F	<i>Antennaria rosea</i>	68	48	60	18	30	21	21	.52	2.10
F	<i>Androsace septentrionalis</i> (a)	-	b35	a-	-	-	13	-	.14	-
F	<i>Arabis</i> spp.	6	5	9	3	4	5	5	.02	.22
F	<i>Artemisia dracunculus</i>	-	-	2	-	-	-	1	-	.00
F	<i>Astragalus convallarius</i>	a83	b139	b122	43	35	59	53	3.79	3.19
F	<i>Astragalus</i> spp.	4	3	8	2	2	2	3	.62	.44
F	<i>Castilleja chromosa</i>	a4	a4	b23	-	2	3	11	.07	.27
F	<i>Calochortus nuttallii</i>	-	3	2	-	-	1	1	.01	.00
F	<i>Chaenactis douglasii</i>	25	9	7	15	12	5	5	.02	.02
F	<i>Chenopodium fremontii</i> (a)	-	b6	a-	-	-	3	-	.01	-
F	<i>Chenopodium leptophyllum</i> (a)	-	b11	a-	-	-	6	-	.03	-
F	<i>Cirsium</i> spp.	2	-	2	-	1	-	1	-	.00
F	<i>Cordylanthus kingii</i> (a)	-	b81	a-	-	-	39	-	2.25	-
F	<i>Collinsia parviflora</i> (a)	-	b62	a-	-	-	25	-	.22	-
F	<i>Crepis acuminata</i>	a-	b9	ab2	-	-	5	1	.19	.00
F	<i>Cryptantha</i> spp.	b3	a-	a-	-	3	-	-	-	-
F	<i>Cymopterus</i> spp.	a-	b24	a4	-	-	13	1	.07	.00
F	<i>Descurainia</i> spp. (a)	-	b10	a-	-	-	4	-	.07	-
F	<i>Eriogonum cernuum</i> (a)	-	3	-	-	-	1	-	.01	-
F	<i>Erigeron pumilus</i>	a36	a27	b85	19	18	14	38	.07	.51
F	<i>Gayophytum ramosissimum</i> (a)	-	b7	a-	-	-	3	-	.06	-
F	<i>Hedysarum boreale</i>	a-	b30	a4	-	-	12	2	.61	.01
F	<i>Lappula occidentalis</i> (a)	-	b19	a-	-	-	10	-	.05	-
F	<i>Lithospermum ruderales</i>	1	3	2	-	1	2	1	.03	.03
F	<i>Machaeranthera canescens</i>	b151	a19	a12	51	66	11	6	.08	.08
F	<i>Orthocarpus tolmiei</i> (a)	-	-	3	20	-	-	1	-	.00
F	<i>Penstemon</i> spp.	-	2	1	9	-	1	1	.00	.01
F	<i>Phlox hoodii</i>	b142	a108	ab131	45	64	48	55	1.58	3.62
F	<i>Phlox longifolia</i>	a-	b30	b15	-	-	14	7	.12	.03
F	<i>Polygonum douglasii</i> (a)	-	b53	a8	-	-	22	3	.13	.04
F	<i>Schoenocrambe linifolia</i>	-	5	3	-	-	2	1	.01	.00
F	<i>Senecio multilobatus</i>	-	-	6	-	-	-	2	-	.03
F	<i>Sphaeralcea coccinea</i>	b55	a31	ab32	21	24	14	15	.45	.23
F	<i>Tragopogon</i> spp.	-	-	-	2	-	-	-	-	-
F	<i>Trifolium gymnocarpon</i>	a5	c50	b29	-	2	22	12	.24	.13

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
	Total for Annual Forbs	0	287	11	20	0	126	4	3.00	0.04
	Total for Perennial Forbs	585	656	561	228	264	301	243	9.00	10.99
	Total for Forbs	585	943	572	248	264	427	247	12.00	11.04

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

BROWSE TRENDS --

Herd unit 17 , Study no: 52

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	16	19	.82	2.40
B	Artemisia tridentata vaseyana	78	70	10.52	7.12
B	Ceratoides lanata	0	4	-	-
B	Cercocarpus montanus	7	8	.56	.68
B	Chrysothamnus depressus	28	29	1.13	.61
B	Chrysothamnus viscidiflorus lanceolatus	37	31	.31	.78
B	Eriogonum corymbosum	18	18	.30	.27
B	Opuntia fragilis	15	8	.14	.19
B	Pediocactus simpsonii	0	5	-	-
B	Tetradymia canescens	6	4	.33	.76
	Total for Browse	205	196	14.14	12.83

BASIC COVER --

Herd unit 17 , Study no: 52

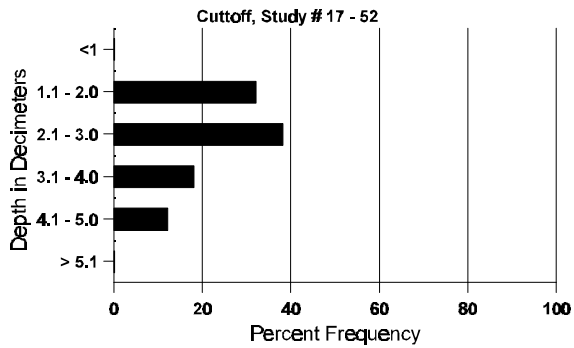
Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	353	350	11.50	13.00	32.34	37.61
Rock	14	26	.75	1.25	.20	.89
Pavement	91	99	.75	.25	.26	.62
Litter	389	367	45.00	38.50	35.52	40.88
Cryptogams	149	116	2.75	1.00	5.24	1.69
Bare Ground	326	336	39.25	46.00	34.07	38.95

SOIL ANALYSIS DATA --

Herd Unit 17, Study # 52, Study Name: Cutoff

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	%OM	PPM P	PPM K	dS/m
13.75	61.6 (14.57)	7.2	61.4	19.0	19.6	1.8	5.9	131.2	0.7

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 17 , Study no: 52

Type	Quadrat Frequency	
	'95	'00
Rabbit	25	38
Elk	3	14
Deer	44	33
Cattle	-	-

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
00	00
339	N/A
104	8 (20)
1244	96 (236)
35	3 (7)

BROWSE CHARACTERISTICS --

Herd unit 17 , Study no: 52

A Y G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier alnifolia																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	5	-	-	1	-	-	-	-	-	6	-	-	-	400		6	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200		3	
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
	00	12	-	-	1	-	-	1	-	-	14	-	-	-	280		14	
M	82	-	2	-	-	-	-	-	-	-	-	2	-	-	133	16	22	2
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	5	6	-	2	-	-	-	-	-	13	-	-	-	260	22	26	13
	00	3	-	2	1	1	2	2	-	-	11	-	-	-	220	28	31	11
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	-	-	-	1	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		100%			00%			00%			+34%							
'88		00%			00%			00%			+38%							
'95		38%			00%			00%			+38%							
'00		04%			15%			04%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	133	Dec:	0%			
												'88	200		0%			
												'95	320		0%			
												'00	520		4%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total							
		1	2	3	4		1	2								
Artemisia tridentata vaseyana																
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	1	-	-	-	-	-	-	-	1	-	-	-	20		1
	00	1	-	-	-	-	-	-	-	1	-	-	-	20		1
Y	82	1	-	-	-	-	-	-	-	1	-	-	-	66		1
	88	2	-	-	-	-	-	-	-	2	-	-	-	133		2
	95	21	3	-	-	-	-	-	-	24	-	-	-	480		24
	00	5	1	-	-	2	-	-	-	6	-	-	2	160		8
M	82	14	7	-	-	-	-	-	-	15	6	-	-	1400	18 26	21
	88	3	5	-	-	-	-	-	-	8	-	-	-	533	18 23	8
	95	10	25	31	1	-	-	-	-	67	-	-	-	1340	20 34	67
	00	10	27	25	-	-	11	1	-	74	-	-	-	1480	20 33	74
D	82	-	6	-	-	-	-	-	-	5	1	-	-	400		6
	88	15	8	-	-	-	-	-	-	15	-	-	8	1533		23
	95	4	13	40	1	1	-	-	-	27	-	-	32	1180		59
	00	13	7	33	-	4	10	-	-	48	-	1	18	1340		67
X	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	920		46
	00	-	-	-	-	-	-	-	-	-	-	-	-	620		31
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>								
'82		46%		00%		00%		+15%								
'88		39%		00%		24%		+27%								
'95		28%		47%		21%		- 1%								
'00		28%		53%		14%										
Total Plants/Acre (excluding Dead & Seedlings)										'82	1866	Dec:	21%			
										'88	2199		70%			
										'95	3000		39%			
										'00	2980		45%			
Ceratoides lanata																
M	82	1	-	-	-	-	-	-	-	1	-	-	-	66	14 9	1
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	6 8	0
	00	1	4	-	-	-	-	-	-	5	-	-	-	100	7 6	5
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	-	1	-	-	-	-	-	-	-	-	-	1	20		1
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>								
'82		00%		00%		00%										
'88		00%		00%		00%										
'95		00%		00%		00%										
'00		83%		00%		17%										
Total Plants/Acre (excluding Dead & Seedlings)										'82	66	Dec:	0%			
										'88	0		0%			
										'95	0		0%			
										'00	120		17%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4		1	2									
Cercocarpus montanus																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	6	-	-	-	-	-	-	6	-	-	-	400		6	
	95	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	1	-	-	-	-	-	-	1	-	-	-	20		1	
M	82	-	3	-	-	-	-	-	-	-	3	-	-	200	20	19	3
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	7	5	-	-	-	-	-	-	12	-	-	-	240	22	31	12
	00	-	-	6	-	2	3	-	-	11	-	-	-	220	32	32	11
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	1	-	-	-	-	-	-	1	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		100%			00%			00%			+50%						
'88		100%			00%			00%			-35%						
'95		38%			00%			00%			+ 0%						
'00		23%			77%			08%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	200	Dec:	0%				
										'88	400		0%				
										'95	260		0%				
										'00	260		8%				

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4		1	2									
Chrysothamnus depressus																	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	3	-	-	-	-	-	-	-	3	-	-	-	60		3	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	8	-	-	1	-	-	-	-	9	-	-	-	600	3	6	9
	95	123	-	-	-	-	-	-	-	123	-	-	-	2460	6	11	123
	00	57	24	22	2	16	2	-	-	123	-	-	-	2460	5	10	123
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	-	-	1	20		1	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>						<u>%Change</u>							
'82		00%	00%	00%													
'88		00%	00%	00%						+74%							
'95		00%	00%	00%						- 2%							
'00		32%	19%	.80%													
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	0%				
										'88	666		0%				
										'95	2520		0%				
										'00	2480		1%				
Chrysothamnus nauseosus																	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	0	7	15	0
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>						<u>%Change</u>							
'82		00%	00%	00%													
'88		00%	00%	00%													
'95		00%	00%	00%													
'00		00%	00%	00%													
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-				
										'88	0		-				
										'95	0		-				
										'00	0		-				

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total							
		1	2	3	4		1	2								
Chrysothamnus viscidiflorus lanceolatus																
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	5	-	-	-	-	-	-	-	5	-	-	-	333		5
	95	6	-	-	-	-	-	-	-	6	-	-	-	120		6
	00	1	-	-	-	-	-	-	-	1	-	-	-	20		1
M	82	23	-	-	-	-	-	-	-	23	-	-	-	1533	12 15	23
	88	36	-	-	1	-	-	-	-	37	-	-	-	2466	8 8	37
	95	62	-	-	6	-	-	-	-	68	-	-	-	1360	11 14	68
	00	73	4	-	4	-	-	-	-	80	-	1	-	1620	9 13	81
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	3	-	-	2	-	-	-	-	3	-	-	2	333		5
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0
X	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	-	-	-	-	-	-	-	-	-	-	-	-	60		3
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>				<u>%Change</u>						
'82		00%		00%		00%				+51%						
'88		00%		00%		04%				-53%						
'95		00%		00%		00%				+10%						
'00		05%		00%		01%										
Total Plants/Acre (excluding Dead & Seedlings)										'82	1533	Dec:	0%			
										'88	3132		11%			
										'95	1480		0%			
										'00	1640		0%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total							
		1	2	3	4		1	2								
Eriogonum corymbosum																
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	2	-	-	-	-	-	-	-	2	-	-	-	40		2
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	5	-	-	-	-	-	-	-	5	-	-	-	333		5
	95	8	-	-	-	-	-	-	-	8	-	-	-	160		8
	00	5	-	-	-	-	-	-	-	5	-	-	-	100		5
M	82	11	-	-	-	-	-	-	-	11	-	-	-	733	17 15	11
	88	2	-	-	-	-	-	-	-	2	-	-	-	133	13 11	2
	95	32	-	-	-	-	-	-	-	32	-	-	-	640	13 18	32
	00	14	4	-	1	-	-	-	-	19	-	-	-	380	11 15	19
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	4	-	-	-	-	-	-	-	4	-	-	-	266		4
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	12	-	-	-	-	-	-	-	11	-	-	1	240		12
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>				<u>%Change</u>						
'82		00%		00%		00%				- 0%						
'88		00%		00%		00%				+ 9%						
'95		00%		00%		00%				-10%						
'00		11%		00%		03%										
Total Plants/Acre (excluding Dead & Seedlings)										'82	733	Dec:	0%			
										'88	732		36%			
										'95	800		0%			
										'00	720		33%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4		1	2				
<i>Opuntia fragilis</i>												
S	82	-	-	-	-	-	-	-	0		0	
	88	8	-	-	-	-	-	-	533		8	
	95	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	0		0	
	88	5	-	-	-	-	-	-	333		5	
	95	3	-	-	-	-	-	-	60		3	
	00	-	-	-	-	-	-	-	0		0	
M	82	3	-	-	-	-	-	-	200	3	5	3
	88	4	-	-	-	-	3	-	466	1	2	7
	95	13	-	-	-	-	-	-	260	4	11	13
	00	20	-	-	-	-	-	-	400	2	6	20
D	82	-	-	-	-	-	-	-	0			0
	88	3	-	-	-	-	-	-	200			3
	95	1	-	-	-	-	-	-	20			1
	00	-	1	-	-	-	-	-	20			1
X	82	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	60			3
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%		+80%				
'88		00%		00%		00%		-66%				
'95		00%		00%		06%		+19%				
'00		05%		00%		05%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	200	Dec:	0%			
						'88	999		20%			
						'95	340		6%			
						'00	420		5%			
<i>Pediocactus simpsonii</i>												
M	82	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	0	-	-	0
	00	7	-	-	-	-	-	-	140	1	2	7
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
'82		00%		00%		00%						
'88		00%		00%		00%						
'95		00%		00%		00%						
'00		00%		00%		00%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	-			
						'88	0		-			
						'95	0		-			
						'00	140		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total						
		1	2	3	4		1	2							
<i>Purshia tridentata</i>															
M	'82	-	1	-	-	-	-	-	-	-	-	66	14	30	1
	'88	1	1	-	-	-	-	-	-	-	-	133	19	39	2
	'95	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'00	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>							
	'82	100%		00%		00%		+50%							
	'88	50%		00%		00%									
	'95	00%		00%		00%									
	'00	00%		00%		00%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	66	Dec:	-		
										'88	133		-		
										'95	0		-		
										'00	0		-		
<i>Symphoricarpos oreophilus</i>															
M	'82	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'00	-	-	-	-	-	-	-	-	-	-	0	10	32	0
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>							
	'82	00%		00%		00%									
	'88	00%		00%		00%									
	'95	00%		00%		00%									
	'00	00%		00%		00%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-		
										'88	0		-		
										'95	0		-		
										'00	0		-		
<i>Tetradymia canescens</i>															
M	'82	3	-	-	-	-	-	-	-	-	-	200	8	15	3
	'88	1	-	-	-	-	-	-	-	-	-	66	6	6	1
	'95	6	1	-	-	-	-	-	-	-	-	140	11	17	7
	'00	3	-	-	-	1	-	-	-	-	-	80	11	17	4
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>							
	'82	00%		00%		00%		-67%							
	'88	00%		00%		00%		+53%							
	'95	14%		00%		00%		-43%							
	'00	25%		00%		00%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	200	Dec:	-		
										'88	66		-		
										'95	140		-		
										'00	80		-		

Trend Study 17-53-00

Study site name: Two Bar Ranch .

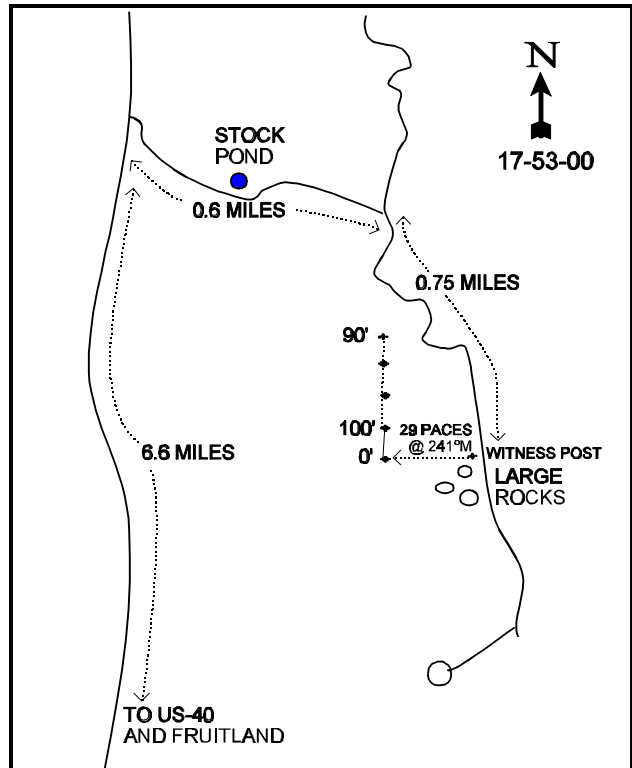
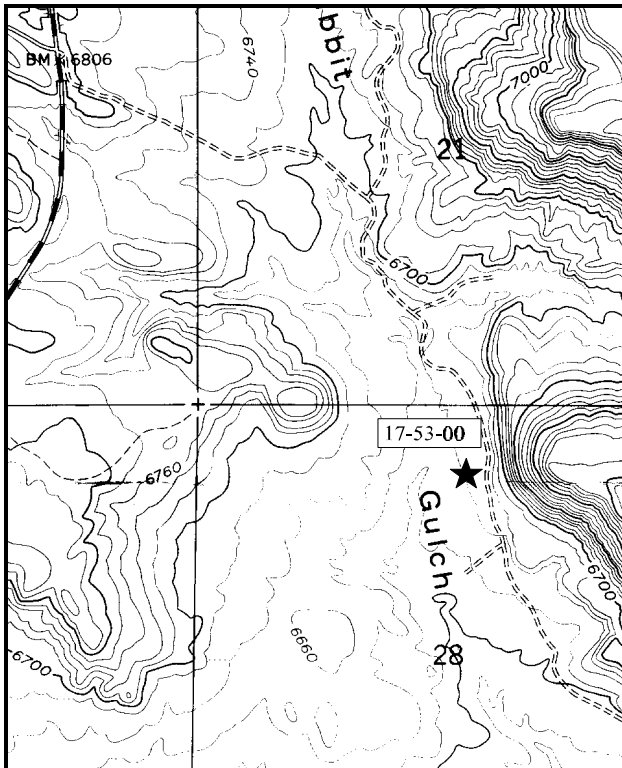
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 345°M .

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (9 & 85ft), line 2 (26ft), line 3 (45ft), line 4 (60ft).

LOCATION DESCRIPTION

From U.S. 40 five miles east of Fruitland, take Rt. 208 north towards Tabiona for 6.6 miles. Just after a small road cut, there is a road on the right. Turn right towards Rabbit Gulch and go 0.75 miles to an intersection. Turn right (south) and go another 0.75 miles down a gully-ridden road to two large rocks on the west side of the road. From the highest point of the first rock, the 0-foot baseline stake is 25 paces away bearing 241°M. The baseline runs to the north.



Map Name: Tabiona

Diagrammatic Sketch

Township 2S, Range 7W, Section 28

UTM 4459012.357 N, 527294.400 E

DISCUSSION

Trend Study No. 17-53 (13-8)

The Two Bar Ranch study is located on the upper part of Rabbit Gulch near the base of Blacktail Ridge. The study is within a large sagebrush flat with a gentle (5%) slope and an aspect to the west. Elevation is approximately 6,580 feet. This is the lowest elevation for a trend study on the unit. Thermal and escape cover for big game is limited within the sagebrush flat, but good cover is available in the pinyon-juniper woodland along the ridge east of the site. This entire area is considered critical deer winter range. There is evidence of substantial deer use on the site during past readings. Pellet group quadrat frequency data from 1995 indicated moderate numbers of deer and elk use this area. In 2000, a pellet group transect read along the study site baseline estimated 38 deer and 35 elk days use/acre (94 ddu/ha and 86 edu/ha).

Soils are alluvially deposited, moderately deep and somewhat sandy in texture. Effective rooting depth is estimated at just over 15 inches with deeper measurements limited only by soil compaction. There is little rock on the soil surface or within the profile. Soil texture is a sandy clay loam with a slightly alkaline soil reaction (pH of 7.7). Exposed bare ground was extensive and erosion was occurring at an accelerated rate in 1982, as evidenced by many small rills and gullies. Vegetation was sparse and generally inadequate to prevent soil movement. Conditions have improved slightly since then, but they are still only poor to fair and erosion is still a problem.

The key browse species is Wyoming big sagebrush, with shadscale being present but of secondary importance. Density of sagebrush has fluctuated considerably since 1982 when 2,533 sagebrush plants/acre were estimated. In 1988, that number increased by 74% to 9,865 plants/acre. However, the number of mature plants remained about the same in 1982 and 1988 (2,000 to 2,066 plants/acre). The large increase reported in 1988 was primarily the result of a significant rise in young plants which increased from 333 plants/acre in 1982 to 6,466 by 1988. The number of decadent plants also increased from 200 to 1,333 plants/acre, but due to the large number of young plants, percent decadency remained low at 14%. During the 1995 reading, the population declined to 5,080 plants/acre due to a decline in the young age class and number of decadent plants. Percent decadency remained similar at 15%. Use was also heavier in 1995. The population has remained stable at 5,080 plants/acre in 2000. Use is moderate to heavy, but due to the dry conditions, vigor is poor with 16% of the population. Percent decadence has increased to 33%. In addition, 43% (720 plants/acre) of the decadent plants appear to be dying. However, there seems to be enough seedlings and young to maintain the population at this time.

Shadscale are moderately abundant and currently ('00) provide 22% of the browse cover with a density of 4,020 plants/acre. Use is mostly light and vigor generally good.

The herbaceous understory is deficient. Four perennial grass species, thickspike wheatgrass, Indian ricegrass, squirreltail and needle-and-thread make up the bulk of the herbaceous cover (81% in 1995 and 91% in 2000). Perennial forbs are scarce with hoary aster, longleaf phlox and scarlet globemallow combining to produce most of the meager forb cover. Total forb cover was just barely over 1% in 1995 and just over one-half of 1% in 2000.

1982 APPARENT TREND ASSESSMENT

Currently, this area is rather poor quality winter range. Significant improvements are possible but will be difficult to achieve. Soil trend appears to be declining and must be reversed if any vegetative change is to occur. Vegetatively, the area appears stable but at a low level of plant species diversity. A principle management goal should be to improve species diversity among all classes of vegetation.

1988 TREND ASSESSMENT

There appears to have been a significant decrease in vegetative basal cover and litter cover. Although there was an increase in cryptogamic cover from 3 to 12%, there was an overall decrease in total protective ground cover in 1988 resulting in a large amount of bare soil (53%). Small gullies have expanded since the 1982 study, with accelerated soil loss continuing. Soil trend is down. Although the total number of sagebrush has increased by two and one-half times on the density plots, the density of mature plants and mean sagebrush occurrence are unchanged. There is a moderately dense stand of mature sagebrush (2,066 plants/acre) and consistent cover of 8%. More decadent plants, but also many more young plants were found in 1988. The degree of hedging has increased since 1982. Hedging on 48% of the available sagebrush is moderate, whereas most (87%) were rated as lightly hedged in 1982. Trend appears up due to the large numbers of seedling and young plants and a stable mature population. Trend for the herbaceous understory is stable but in poor condition. Quadrat frequency of grasses increased slightly while frequency of forbs declined.

TREND ASSESSMENT

soil - down (1)

browse - up (5)

herbaceous understory - stable but in poor condition (3)

1995 TREND ASSESSMENT

Soil conditions have improved but are still poor. Percent bare ground declined from 53% in 1988 to 34%. Litter cover remained similar and cryptogamic cover increased to 16%. In addition, sum of nested frequency for grasses increased providing improved soil protection. Trend for soil is up but still only in fair condition. The browse trend is stable. Past data suggest wide fluctuations in Wyoming big sagebrush density. However, percent decadency has remained similar to 1988 estimates (13% vs 14%) and there are adequate numbers of seedlings and young plants to maintain the population. The proportion of plants displaying heavy use has increased from 3% to 35%. This could cause an increase in decadence in the future as heavy use increases or if use is consistently high for several years. Trend for the herbaceous understory is slightly up for grasses and forbs but still deficient.

TREND ASSESSMENT

soil - up (5)

browse - stable (3)

herbaceous understory - slightly up but still deficient (4)

2000 TREND ASSESSMENT

Trend for soil is down slightly. Relative percent cover of bare ground has increased slightly while litter cover has declined slightly. In addition, the ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground has decreased slightly. There is still erosion occurring in the area with several active gullies around the site. Trend for the key browse species, Wyoming big sagebrush, appears stable. Density is identical to 1995 estimates and use is also similar. Drought is obviously effecting the health of the sagebrush however. The proportion of sagebrush displaying poor vigor has increased from 7% in 1995 to 16% in 2000. Percent decadence has also increased from 15% to 33%. In addition, 43% (720 plants/acre) of the decadent shrubs appear to be dying. Seedling and young recruitment is good however and appears sufficient to maintain the population at this time. A return to normal precipitation patterns will do much to improve sagebrush health. Trend for the herbaceous understory is stable for grasses and down slightly for forbs. Forbs are still very limited and currently produce less than 1% cover. Since grasses provide the majority of the herbaceous cover (about 95% of it), the overall herbaceous trend is stable.

TREND ASSESSMENT

soil - slightly down (2)

browse - stable (3)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --

Herd unit 17 , Study no: 53

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	a132	b173	ab156	11	45	59	56	2.55	3.42
G	Bromus tectorum (a)	-	1	-	-	-	1	-	.00	-
G	Carex spp.	b73	a38	a15	14	28	16	6	.23	.18
G	Oryzopsis hymenoides	ab40	b65	a31	57	19	28	16	1.10	.87
G	Sitanion hystrix	29	29	49	-	12	11	19	1.33	1.10
G	Sporobolus cryptandrus	-	2	-	-	-	1	-	.00	-
G	Stipa comata	a29	a51	b103	8	12	19	39	1.82	4.39
Total for Annual Grasses		0	1	0	0	0	1	0	0.00	0
Total for Perennial Grasses		303	358	354	90	116	134	136	7.06	9.97
Total for Grasses		303	359	354	90	116	135	136	7.07	9.97
F	Arabis spp.	a-	b7	ab3	-	-	3	1	.04	.00
F	Chenopodium fremontii (a)	-	3	-	-	-	2	-	.01	-
F	Chenopodium leptophyllum (a)	-	b6	a-	-	-	5	-	.02	-
F	Descurainia pinnata (a)	-	1	1	-	-	1	1	.00	.00
F	Draba spp. (a)	-	3	-	-	-	1	-	.00	-
F	Eriogonum cernuum (a)	-	2	-	-	-	2	-	.01	-
F	Lappula occidentalis (a)	-	b16	a-	-	-	7	-	.03	-
F	Lepidium spp. (a)	-	b24	a-	-	-	9	-	.12	-
F	Lychnis drummondii	1	-	-	22	1	-	-	-	-
F	Machaeranthera canescens	a6	b32	a1	10	2	15	1	.22	.03
F	Phlox longifolia	a3	b81	a7	-	2	34	3	.21	.06
F	Plantago patagonica (a)	-	b9	a-	-	-	4	-	.07	-
F	Schoenrambe linifolia	a2	b10	a1	-	1	6	1	.03	.03
F	Sphaeralcea coccinea	52	65	62	20	22	27	30	.45	.50
F	Townsendia incana	-	1	-	-	-	1	-	.03	-
Total for Annual Forbs		0	64	1	0	0	31	1	0.28	0.00
Total for Perennial Forbs		64	196	74	52	28	86	36	0.99	0.62
Total for Forbs		64	260	75	52	28	117	37	1.28	0.63

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

BROWSE TRENDS --
Herd unit 17 , Study no: 53

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata wyomingensis	93	82	11.23	13.25
B	Atriplex confertifolia	63	70	2.59	4.47
B	Ceratoides lanata	0	2	-	-
B	Chrysothamnus viscidiflorus viscidiflorus	1	1	-	-
B	Opuntia spp.	36	39	1.10	.97
B	Pinus edulis	0	4	.15	.38
B	Sarcobatus vermiculatus	16	14	1.28	1.25
B	Tetradymia spinosa	0	0	.00	-
Total for Browse		209	212	16.36	20.32

BASIC COVER --
Herd unit 17 , Study no: 53

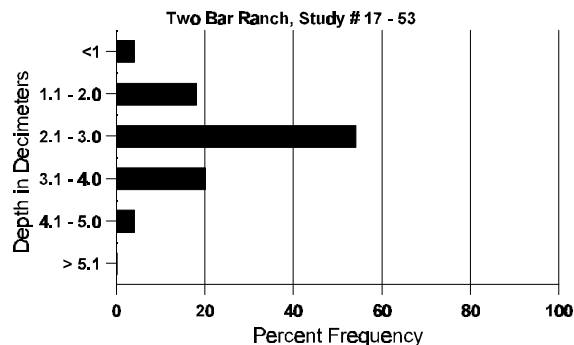
Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	323	312	5.50	2.00	26.45	30.25
Rock	21	5	0	1.00	.06	.15
Pavement	39	20	0	.50	.12	.09
Litter	393	351	45.25	31.50	29.09	27.65
Cryptogams	289	225	2.50	12.25	15.82	15.10
Bare Ground	339	318	46.75	52.75	33.79	45.52

SOIL ANALYSIS DATA --

Herd Unit 17, Study # 53, Study Name: Two Bar Ranch

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	% OM	PPM P	PPM K	dS/m
15.42	62.8 (16.14)	7.7	52.6	24.8	22.6	1.2	1.5	92.8	0.5

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 17 , Study no: 53

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre	Days Use per Acre (ha)
Rabbit	2	3	61	N/A
Elk	17	11	452	35 (86)
Deer	28	9	487	38 (93)

BROWSE CHARACTERISTICS --

Herd unit 17 , Study no: 53

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4			
Artemisia nova								
M	'82	-	-	-	-	-	-	0
	'88	-	-	-	-	-	-	0
	'95	-	-	-	-	-	11 23	0
	'00	-	-	-	-	-	-	0
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>
	'82	00%		00%		00%		
	'88	00%		00%		00%		
	'95	00%		00%		00%		
	'00	00%		00%		00%		
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec: -
						'88	0	-
						'95	0	-
						'00	0	-

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total				
		1	2	3	4							
Artemisia tridentata wyomingensis												
S	82	30	-	-	-	-	-	30		30		
	88	8	14	-	-	-	6	23	5	28		
	95	13	-	-	4	-	-	17	-	17		
	00	9	-	-	-	-	-	9	-	9		
Y	82	5	-	-	-	-	-	5	-	5		
	88	24	35	1	-	-	37	96	-	97		
	95	33	15	11	3	3	-	65	-	65		
	00	18	2	-	1	-	7	28	-	28		
M	82	27	3	-	-	-	-	27	3	30		
	88	18	12	1	-	-	-	30	1	31		
	95	4	84	62	-	1	-	150	-	151		
	00	40	58	42	1	-	1	138	-	142		
D	82	1	2	-	-	-	-	1	2	3		
	88	5	11	3	-	-	1	19	1	20		
	95	3	15	17	-	3	-	21	-	38		
	00	16	40	23	-	1	4	47	-	84		
X	82	-	-	-	-	-	-	-	-	0		
	88	-	-	-	-	-	-	-	-	0		
	95	-	-	-	-	-	-	-	-	1320		
	00	-	-	-	-	-	-	-	-	1240		
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>% Change</u>				
'82		13%		00%		00%		+74%				
'88		39%		03%		.67%		-49%				
'95		48%		35%		07%		+ 0%				
'00		40%		28%		16%						
Total Plants/Acre (excluding Dead & Seedlings)									'82	2533	Dec:	8%
									'88	9865		14%
									'95	5080		15%
									'00	5080		33%

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total				
		1	2	3	4		1	2					
<i>Atriplex confertifolia</i>													
S	82	17	-	-	-	-	-	-	17	-	17		
	88	5	-	-	-	-	-	-	5	-	5		
	95	-	-	-	-	-	-	-	0	-	0		
	00	3	-	-	-	-	-	-	3	-	3		
Y	82	19	-	-	-	-	-	-	19	-	19		
	88	12	1	-	-	-	2	-	15	-	15		
	95	30	-	-	1	-	-	-	31	-	31		
	00	17	-	-	8	-	-	-	25	-	25		
M	82	13	7	-	-	-	-	-	16	4	20		
	88	24	2	1	-	-	1	-	28	-	28		
	95	106	11	4	-	-	-	-	121	-	121		
	00	81	8	20	41	-	2	-	152	-	152		
D	82	-	-	-	-	-	-	-	0	-	0		
	88	5	3	-	-	-	-	-	8	-	8		
	95	2	-	-	-	-	-	-	2	-	2		
	00	12	9	2	-	-	1	-	20	-	24		
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>					
'82		18%		00%		00%		+24%					
'88		12%		02%		00%		- 9%					
'95		07%		03%		01%		+23%					
'00		08%		12%		02%							
Total Plants/Acre (excluding Dead & Seedlings)										'82	2599	Dec:	0%
										'88	3399		16%
										'95	3080		1%
										'00	4020		12%
<i>Ceratoides lanata</i>													
Y	82	-	-	-	-	-	-	-	0	-	0		
	88	-	-	-	-	-	-	-	0	-	0		
	95	-	-	-	-	-	-	-	0	-	0		
	00	-	-	-	1	-	-	-	1	-	1		
M	82	-	-	-	-	-	-	-	0	-	0		
	88	-	-	-	-	-	-	-	0	-	0		
	95	-	-	-	-	-	-	-	0	6	7		
	00	-	-	-	-	-	-	-	0	-	0		
D	82	-	-	-	-	-	-	-	0	-	0		
	88	-	-	-	-	-	-	-	0	-	0		
	95	-	-	-	-	-	-	-	0	-	0		
	00	1	-	-	-	-	-	-	1	-	1		
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>					
'82		00%		00%		00%							
'88		00%		00%		00%							
'95		00%		00%		00%							
'00		00%		00%		50%							
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	0%
										'88	0		0%
										'95	0		0%
										'00	40		50%

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4		1	2				
Chrysothamnus viscidiflorus viscidiflorus												
M	82	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	20	10	4	1
	00	1	-	-	-	-	-	-	20	9	18	1
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>				<u>%Change</u>				
'82		00%	00%	00%								
'88		00%	00%	00%								
'95		00%	00%	00%				+ 0%				
'00		00%	00%	00%								
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:				
						'88	0					
						'95	20					
						'00	20					
Opuntia spp.												
Y	82	-	-	-	-	-	-	-	0			0
	88	2	-	-	-	-	-	-	133			2
	95	1	-	-	-	-	-	-	20			1
	00	4	-	-	-	-	-	-	80			4
M	82	-	-	-	-	-	-	-	0	-	-	0
	88	29	-	-	-	-	-	-	1933	4	3	29
	95	53	-	-	1	-	-	-	1080	5	15	54
	00	63	-	-	2	-	-	-	1300	4	9	65
D	82	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	0			0
	95	8	-	-	-	-	-	-	160			8
	00	3	-	-	-	-	-	-	60			3
X	82	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	80			4
	00	-	-	-	-	-	-	-	60			3
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>				<u>%Change</u>				
'82		00%	00%	00%								
'88		00%	00%	00%				-39%				
'95		00%	00%	08%				+13%				
'00		00%	00%	08%								
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:				
						'88	2066					
						'95	1260		13%			
						'00	1440		4%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total							
		1	2	3	4		1	2								
Pinus edulis																
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	1	-	-	-	-	1	-	-	-	66		1
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	3	-	-	-	-	-	-	-	3	-	-	-	60		3
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	00	1	-	-	-	-	-	-	-	1	-	-	-	20	-	1
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>								
'82		00%		00%		00%										
'88		00%		00%		00%										
'95		00%		00%		00%										
'00		00%		00%		00%										
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-			
										'88	66		-			
										'95	0		-			
										'00	80		-			
Sarcobatus vermiculatus																
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	1	-	-	-	-	-	-	-	1	-	-	-	20		1
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	11	-	-	-	-	-	-	-	11	-	-	-	733		11
	95	19	-	-	-	-	-	-	-	19	-	-	-	380		19
	00	2	-	-	-	-	-	-	-	2	-	-	-	40		2
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	88	8	-	-	-	-	-	-	-	8	-	-	-	533	39 27	8
	95	16	-	-	-	-	-	-	-	16	-	-	-	320	47 38	16
	00	23	-	-	-	-	-	-	-	23	-	-	-	460	29 37	23
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	2	-	-	-	-	-	-	-	2	-	-	-	133		2
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>								
'82		00%		00%		00%										
'88		00%		00%		00%				-50%						
'95		00%		00%		00%				-29%						
'00		00%		00%		00%										
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	0%			
										'88	1399		10%			
										'95	700		0%			
										'00	500		0%			

Trend Study 17-54-00

Study site name: Peatross Ranch .

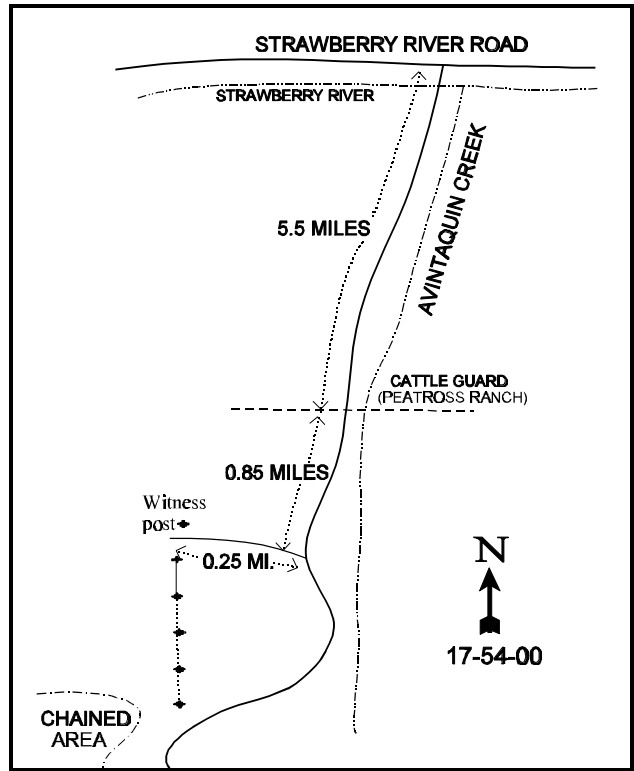
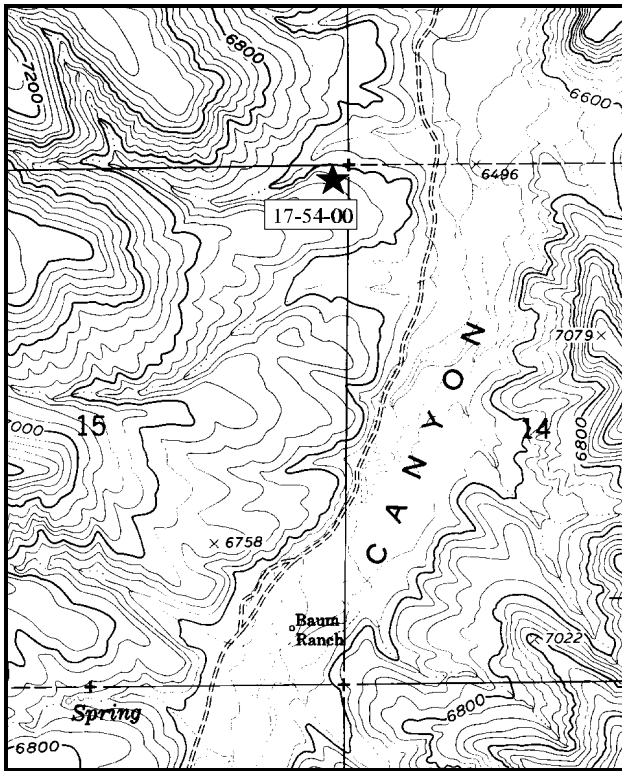
Range type: Pinyon-Juniper .

Compass bearing: frequency baseline 167°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the Strawberry Pinnacles, turn south off the Strawberry River Road. Cross Red Creek then bear left at the fork towards Avintaquin Canyon. Go south up Avintaquin canyon for about 5.3 miles to a fence and cattle guard. Proceed an additional 0.85 miles to a small canyon to the west. Walk up the faint road to the west for 0.25 miles to a witness post. From the witness post walk 200 yards at a bearing of 200°M to the 0-foot stake. The 0-foot stake is about 30 feet south of a trail that runs east-west. The baseline run up the hill in the P-J and is are marked by green steel fenceposts approximately 12-18 inches in height.



Map Name: Avintaquin Canyon

Diagrammatic Sketch

Township 5S, Range 8W, Section 15

UTM 4433508 N, 519130 E

DISCUSSION

Trend Study No. 17-54 (14-1)

The Peatross Ranch trend study is located approximately one-half mile north of the Peatross Ranch headquarters on private land in Avintaquin Canyon. The area is deer winter range at an elevation of 6,680 feet. The range type is pinyon-juniper woodland with a grass-mixed browse understory. Slope is approximately 30% and exposure is to the north. Grazing from both livestock and deer has been moderately heavy in the past. The site is intersected by cattle trails yet use by livestock appears heavier on top of the hill in a nearby chained area. Quadrat frequency of deer pellet groups was estimated at 35% in 1995. A pellet group transect read along the study site baseline in 2000 estimated 12 deer and 20 cow days use/acre (30 ddu/ha and 49 cdu/ha). One elk pellet group was also sampled.

Soils are loose and moderately deep. Effective rooting depth is estimated at over 17 inches. Soil texture is a clay loam with a neutral soil reaction (pH of 7.2). Phosphorus is limited at only 2.1 ppm. Values less than 10 ppm can limit normal plant growth and development. Limestone is the principal parent material. The soil is moderately rocky and soil movement is evident on the steeper terrain. A profile stoniness index shows rock to be uniformly distributed throughout the profile. Vegetative cover is almost evenly divided between grasses, forbs and browse.

Browse composition and density is poor. The site is dominated by pinyon and juniper trees. Canopy cover of pinyon and juniper was estimated at 31% in 1995 and 32% in 2000. Point-center quarter data from 2000 estimated 21 pinyon and 26 Utah and Rocky Mountain juniper trees/acre. Average diameter of pinyon is 6 inches while diameter of juniper averages nearly 14 inches.

Of the 8 understory browse species encountered, only mahogany and snowberry are palatable and in sufficient densities to provide some useful forage. The key browse species, true mountain mahogany, had a stunted, very heavily hedged appearance in 1988, which showed no evidence of seed production. During the 1995 reading, only a few larger plants were producing seed. Most plants average 2 feet in height. Density was at 999 plants/acre in 1982. Of these, 33% were heavily hedged. In 1988, 1,666 young plants/acre were estimated. It is likely that some of these young plants were actually, small stunted mature shrubs. Utilization was reported heavy on 76% of the mahogany in 1988, with poor vigor found in 4% of the population. A more balanced population was found in 1995 when 20 seedling, 60 young, 840 mature and 20 decadent plants/acre were estimated. A much larger, more representative sample was used in 1995. Dead plants, first counted in 1995, totaled only 40 plants/acre. This would indicate a fairly stable population. Utilization continued to be heavy with 63% of the mahogany displaying heavy use. Data from 2000 estimate a similar density to 1995 with similar use, good vigor and low decadence.

Snowberry has an estimated density of 760 plants/acre in 2000. They show only light use. Other, less desirable browse encountered on the site include: mountain low rabbitbrush, corymbed eriogonum, broom snakeweed and gray horsebrush.

The herbaceous understory accounted for 69% of the vegetative cover in 1995 and 63% in 2000. Nine perennial grass species were encountered in 2000. Dominant species include: bluebunch and slender wheatgrass, *Carex*, *Salina* wildrye, Indian ricegrass and needle-and-thread grass. The forb composition is diverse but dominated by less desirable species, stemless hymenoxys, mat penstemon and desert phlox.

1982 APPARENT TREND ASSESSMENT

Range trend appears to be declining in all categories. Loss of soil is unacceptably high, the browse species appear to be in a state of decline, undesirable shrubs are probably increasing and forb composition is unsatisfactory. Only the grass component seems fairly stable, but even it could be threatened by an increased presence of Salina wildrye. This plant dominates many similar sites in the Avintaquin Canyon area.

1988 TREND ASSESSMENT

Ground cover characteristics have declined slightly. Basal vegetative cover declined from 12% to 10% and percent bare ground increased from 11.5% to 16%. Trend for browse is slightly improved, but density and composition are still poor. The key browse species, true mountain mahogany, has increased in density but is more heavily hedged. There were some shifts in the grass composition. Slender wheatgrass and Salina wildrye are more prevalent. However, frequency of grass is unchanged since 1982. Frequency of forbs increased slightly although the increase can be attributed mainly to low value species such as stemless hymenoxys, desert phlox and rose pussytoes.

TREND ASSESSMENT

soil - down slightly (2)

browse - slightly improved but composition and density are still poor (4)

herbaceous understory - slightly improved but dominated by low value increasers (4)

1995 TREND ASSESSMENT

Ground cover characteristics have improved since 1988. Percent litter cover increased from 37% to 44% and percent bare ground declined from 16% to 14%. Trend for soil is slightly up. Browse trend for the key species, true mountain mahogany, is stable with only 2% decadency and heavy use reported on 63% of the population, down from 76% in 1988. One would not expect a much higher density for mahogany with pinyon-juniper canopy cover exceeding 30%. Trend for the herbaceous understory is down for both grasses and forbs. Sum of nested frequency for grasses declined by 28% since 1988 with 4 of the 8 perennial grasses sampled declining significantly in nested frequency. Sum nested frequency of perennial forbs also declined. Much of the herbaceous understory decline can be attributed to the prolonged drought and competition with the pinyon-juniper canopy cover.

TREND ASSESSMENT

soil - slightly up (4)

browse - stable (3)

herbaceous understory - down (1)

2000 TREND ASSESSMENT

Trend for soil is stable. Relative percent cover of bare ground, litter and vegetation have remained similar to 1995 estimates. In addition, the ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground is nearly the same. Trend for the key browse species, true mountain mahogany, is also stable. Use is heavy, vigor normal on most plants and percent decadence is low. The dominance of pinyon and juniper trees is one of the main negative aspects of this site. Overhead canopy cover is currently estimated at 32%. These trees will eventually crowd out the more desirable understory species. Trend for the herbaceous understory is mixed. Sum of nested frequency of perennial grasses has increased slightly due primarily to the presence of bluebunch wheatgrass which was not previously found. It appears that there were identification problems between bluebunch wheatgrass, Salina wildrye and slender wheatgrass in the past. Sum of nested frequency of perennial forbs declined. Overall the herbaceous trend is considered stable.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --

Herd unit 17 , Study no: 54

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	b62	a6	bb40	38	25	2	19	.03	.64
G	Agropyron spicatum	a-	a-	b113	-	-	-	43	-	4.10
G	Agropyron trachycaulum	c191	b119	a82	38	69	44	39	2.46	2.22
G	Carex spp.	b99	a75	a58	31	48	32	28	1.95	1.68
G	Elymus salina	53	81	70	-	19	30	23	1.48	.85
G	Koeleria cristata	b55	a28	a14	44	23	9	6	.44	.34
G	Oryzopsis hymenoides	b92	b64	a37	52	38	30	18	.58	.94
G	Poa fendleriana	a1	a-	b21	-	1	-	7	-	.13
G	Sitanion hystrix	-	2	-	-	-	2	-	.01	-
G	Stipa comata	b88	b86	a67	57	37	37	25	1.00	.91
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		641	461	502	260	260	186	208	7.97	11.84
Total for Grasses		641	461	502	260	260	186	208	7.97	11.84
F	Antennaria rosea	b78	a4	a14	11	37	3	8	.01	.14
F	Androsace septentrionalis (a)	-	10	2	-	-	5	1	.02	.00
F	Arabis spp.	-	1	-	-	-	1	-	.00	-
F	Astragalus convallarius	1	4	4	3	1	1	2	.01	.06
F	Astragalus purshii	b13	b7	a-	9	6	4	-	.04	-
F	Aster spp.	-	5	1	-	-	2	1	.03	.00
F	Castilleja chromosa	b19	b24	a4	-	11	12	3	.18	.06
F	Caulanthus crassicaulis	b12	a-	a-	-	5	-	-	-	-
F	Calochortus nuttallii	a-	b8	a-	-	-	4	-	.02	-
F	Chenopodium fremontii (a)	-	b15	a-	-	-	7	-	.25	-
F	Chenopodium leptophyllum (a)	-	2	-	-	-	2	-	.01	-
F	Cryptantha spp.	b60	ab45	a23	-	30	25	13	.30	.53
F	Descurainia pinnata (a)	-	b15	a3	-	-	6	1	.72	.00
F	Eriogonum alatum	-	3	-	-	-	1	-	.00	-
F	Erigeron pumilus	a-	a-	b16	20	-	-	10	-	.15
F	Eriogonum umbellatum	b20	ab13	a5	-	13	6	3	.08	.06

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	<i>Heterotheca villosa</i>	-	-	-	4	-	-	-	-	-
F	<i>Hymenoxys acaulis</i>	c100	b50	a30	42	41	21	16	2.42	.27
F	<i>Linum lewisii</i>	b26	b27	a10	13	12	13	4	.14	.02
F	<i>Machaeranthera canescens</i>	4	-	-	-	3	-	-	-	-
F	<i>Machaeranthera grindelioides</i>	18	31	29	8	10	17	21	.27	.15
F	<i>Penstemon caespitosus</i>	a-	c77	b36	-	-	35	19	1.12	.27
F	<i>Phlox austromontana</i>	b166	a108	a125	-	73	48	58	1.59	3.60
F	<i>Phlox longifolia</i>	3	3	-	-	1	2	-	.01	-
F	<i>Schoenocrambe linifolia</i>	-	3	-	-	-	1	-	.04	-
F	<i>Sphaeralcea coccinea</i>	b28	a3	a-	10	10	1	-	.00	-
F	<i>Taraxacum officinale</i>	1	3	-	1	1	3	-	.04	-
Total for Annual Forbs		0	42	5	0	0	20	2	1.01	0.00
Total for Perennial Forbs		549	419	297	221	254	200	158	6.38	5.34
Total for Forbs		549	461	302	221	254	220	160	7.39	5.35

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

BROWSE TRENDS --

Herd unit 17 , Study no: 54

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	<i>Artemisia tridentata vaseyana</i>	1	0	-	-
B	<i>Cercocarpus montanus</i>	29	28	1.96	1.02
B	<i>Chrysothamnus depressus</i>	27	11	.45	.51
B	<i>Chrysothamnus viscidiflorus lanceolatus</i>	16	12	.18	.25
B	<i>Eriogonum corymbosum</i>	56	45	2.43	2.29
B	<i>Eriogonum microthecum</i>	0	0	-	.01
B	<i>Gutierrezia sarothrae</i>	25	11	.08	.18
B	<i>Juniperus osteosperma</i>	0	4	.18	.63
B	<i>Pinus edulis</i>	0	5	1.02	4.74
B	<i>Symphoricarpos oreophilus</i>	11	10	.62	.28
B	<i>Tetradymia canescens</i>	8	8	.15	.15
Total for Browse		173	134	7.07	10.07

CANOPY COVER --
Herd unit 17 , Study no: 54

Species	Percent Cover
	'00
Juniperus osteosperma	20
Pinus edulis	12

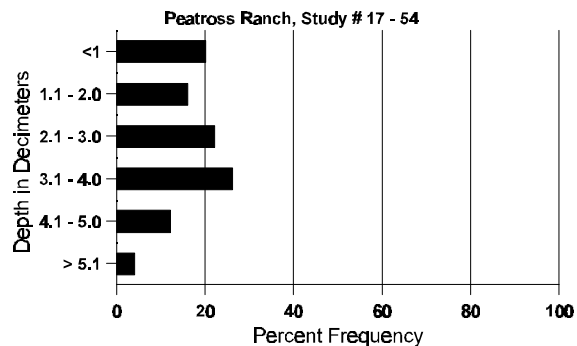
BASIC COVER --
Herd unit 17 , Study no: 54

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	316	345	12.25	10.25	21.96	28.42
Rock	265	246	4.00	6.25	12.46	14.16
Pavement	213	332	36.00	28.75	4.46	15.64
Litter	393	437	35.50	36.75	43.56	49.51
Cryptogams	10	-	.75	2.00	.53	0
Bare Ground	251	281	11.50	16.00	14.36	19.79

SOIL ANALYSIS DATA --
Herd Unit 17, Study # 54, Study Name: Peatross Ranch

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
17.21	57.4 (17.17)	7.2	31.3	36.2	32.6	3.9	2.1	140.8	0.9

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 17 , Study no: 54

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'95	'00	00	00
Rabbit	8	7	26	N/A
Elk	2	1	9	1 (2)
Deer	35	22	157	12 (30)
Cattle	1	1	235	20 (48)

BROWSE CHARACTERISTICS --

Herd unit 17 , Study no: 54

A G E	Y E A R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht. Cr.		
<i>Artemisia tridentata vaseyana</i>																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	14	8	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	20		-			
												'00	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cercocarpus montanus																		
S	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	'82	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	'88	3	3	19	-	-	-	-	-	-	24	-	1	-	1666		25	
	'95	2	-	1	-	-	-	-	-	-	3	-	-	-	60		3	
	'00	3	4	-	-	-	-	-	-	-	6	1	-	-	140		7	
M	'82	-	8	5	-	-	-	-	-	-	6	7	-	-	866	22 18	13	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0	
	'95	2	13	27	-	-	-	-	-	-	40	-	2	-	840	18 24	42	
	'00	7	5	25	-	-	11	-	-	-	46	1	1	-	960	24 27	48	
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	1	-	-	-	1	-	-	-	20		1	
	'00	-	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		53%			33%			00%			+40%							
'88		12%			76%			04%			-45%							
'95		28%			63%			04%			+18%							
'00		18%			64%			02%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	999	Dec:	0%			
												'88	1666		0%			
												'95	920		2%			
												'00	1120		2%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total		
		1	2	3	4		1	2			
Chrysothamnus depressus											
S	82	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	0		0
	95	4	-	-	-	-	-	-	4		4
	00	-	-	-	-	-	-	-	0		0
Y	82	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	0		0
	95	2	-	-	-	-	-	-	2		2
	00	1	-	-	-	-	-	-	1		1
M	82	-	-	-	-	-	-	-	0	-	0
	88	-	-	-	-	-	-	-	0	-	0
	95	62	-	-	2	-	-	-	64	6	64
	00	31	-	-	-	-	-	-	31	7	31
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>			
'82		00%		00%		00%					
'88		00%		00%		00%					
'95		00%		00%		00%		-52%			
'00		00%		00%		00%					
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:			
						'88	0				
						'95	1320				
						'00	640				
Chrysothamnus viscidiflorus lanceolatus											
Y	82	-	-	-	-	-	-	-	0		0
	88	2	-	-	-	-	-	-	2		2
	95	6	-	-	-	-	-	-	6		6
	00	2	-	-	-	-	-	-	2		2
M	82	-	-	-	-	-	-	-	0	-	0
	88	-	-	-	-	-	-	-	0	-	0
	95	28	-	-	-	-	-	-	28	11	28
	00	15	-	-	-	-	-	-	14	8	15
D	82	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	0		0
	95	1	-	-	-	-	-	-	1		1
	00	-	-	-	-	-	-	-	0		0
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>			
'82		00%		00%		00%					
'88		00%		00%		00%		+81%			
'95		00%		00%		00%		-51%			
'00		00%		00%		06%					
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	0%		
						'88	133		0%		
						'95	700		3%		
						'00	340		0%		

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Eriogonum corymbosum																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	95	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	16	-	-	-	-	-	-	-	-	13	-	3	-	1066		16	
	95	20	-	-	1	-	-	-	-	-	21	-	-	-	420		21	
	00	42	-	-	-	-	-	-	-	-	42	-	-	-	840		42	
M	82	38	-	-	-	-	-	-	-	-	38	-	-	-	2533	16 12	38	
	88	19	-	-	-	-	-	-	-	-	18	-	1	-	1266	13 9	19	
	95	82	1	-	1	-	-	-	-	-	84	-	-	-	1680	14 18	84	
	00	40	3	-	-	2	-	-	-	-	45	-	-	-	900	16 16	45	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	36	-	4	-	-	-	-	-	-	29	-	1	10	800		40	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%			- 3%							
'88		00%			00%			11%			-13%							
'95		.93%			00%			00%			+16%							
'00		04%			03%			09%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	2533	Dec:	0%			
												'88	2465		5%			
												'95	2140		2%			
												'00	2540		31%			

A G R E	Y R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333		5	
	95	21	-	-	-	-	-	-	-	-	21	-	-	-	420		21	
	00	2	-	-	-	-	-	-	-	-	-	2	-	-	40		2	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	88	30	-	1	-	-	-	-	-	-	31	-	-	-	2066	8	6	
	95	21	-	-	-	-	-	-	-	-	21	-	-	-	420	8	6	
	00	35	-	-	-	-	-	-	-	-	35	-	-	-	700	7	6	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			03%			00%			-65%							
'95		00%			00%			00%			-9%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	2465		3%			
												'95	860		2%			
												'00	780		5%			

A G R E	Y R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Juniperus osteosperma																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	88	2	1	-	-	-	-	-	-	-	3	-	-	-	200		3	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	82	9	-	-	-	-	-	-	-	-	9	-	-	-	600	50	30	9
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	2	-	-	-	-	-	-	1	-	3	-	-	-	60	-	-	3
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			-60%							
'88		25%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	666	Dec:	0%				
											'88	266		25%				
											'95	0		0%				
											'00	80		0%				
Juniperus scopulorum																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200		3	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	2	-	-	1	-	-	3	-	-	-	200	96	43	3
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	0	Dec:	-				
											'88	400		-				
											'95	0		-				
											'00	0		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Pinus edulis</i>																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	3	-	-	-	-	-	-	-	-	1	-	2	-	200		3	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	4	-	-	-	-	-	-	-	-	4	-	-	-	266		4	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8	
M	82	3	-	-	-	-	-	-	-	-	3	-	-	-	200	16	6	3
	88	-	-	-	-	-	-	1	-	-	1	-	-	-	66	217	118	1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+40%							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	200	Dec:	-			
												'88	332		-			
												'95	0		-			
												'00	160		-			
<i>Pseudotsuga menziesii</i>																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	0		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4		1	2	
Symphoricarpos oreophilus									
Y	82	5	-	-	-	-	-	-	5
	88	9	1	-	-	-	-	-	10
	95	28	-	-	-	-	-	-	28
	00	2	-	-	-	-	-	-	2
M	82	2	-	-	-	-	-	-	2
	88	-	-	-	-	-	-	-	0
	95	30	-	-	-	-	-	-	30
	00	34	1	-	-	-	-	-	35
D	82	-	-	-	-	-	-	-	0
	88	-	-	-	-	-	-	-	0
	95	-	-	-	-	-	-	-	0
	00	1	-	-	-	-	-	-	1
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>	
'82		00%		00%		00%		+30%	
'88		10%		00%		40%		+43%	
'95		00%		00%		00%		-34%	
'00		03%		00%		03%			
Total Plants/Acre (excluding Dead & Seedlings)						'82	466	Dec:	0%
						'88	666		0%
						'95	1160		0%
						'00	760		3%
Tetradymia canescens									
Y	82	-	-	-	-	-	-	-	0
	88	-	-	-	-	-	-	-	0
	95	-	-	-	-	-	-	-	0
	00	1	-	-	-	-	-	-	1
M	82	-	-	-	-	-	-	-	0
	88	-	-	-	-	-	-	-	0
	95	7	3	-	-	-	-	-	10
	00	7	-	-	-	-	-	-	7
D	82	-	-	-	-	-	-	-	0
	88	-	-	-	-	-	-	-	0
	95	-	-	-	-	-	-	-	0
	00	2	1	-	-	-	-	-	3
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>	
'82		00%		00%		00%			
'88		00%		00%		00%			
'95		30%		00%		00%		+ 9%	
'00		09%		00%		00%			
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	0%
						'88	0		0%
						'95	200		0%
						'00	220		27%

Trend Study 17-55-00

Study site name: Lower Horse Ridge .

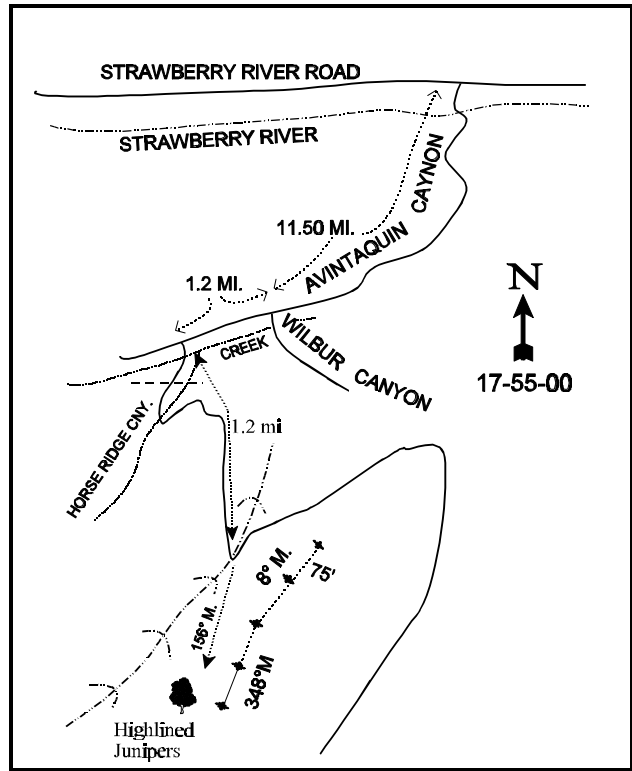
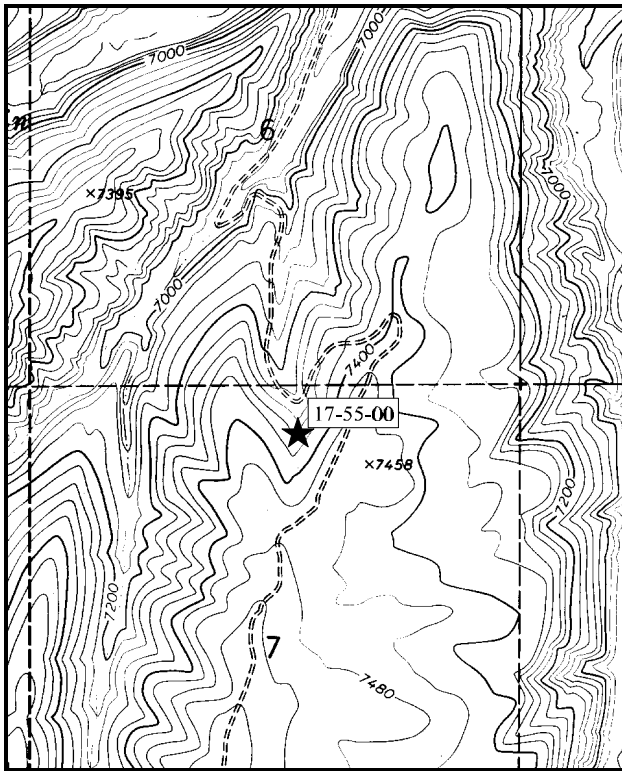
Range type: Mixed Mountain Brush .

Compass bearing: frequency baseline 348°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the Strawberry River Road, proceed south up Avintaquin Canyon 12.7 miles. Turn left here onto a road hidden in the trees and cross Avintaquin Creek. Go up Horse Ridge Canyon 0.4 miles to a fence. Continue up the ridge 0.8 miles to a sharp left bend in the road. From the bend and the gully bottom, walk 80 paces bearing SSW 156°M towards a couple of highlined junipers. The 0-foot baseline stake is 10 feet away from one of the highlined junipers. The study stakes are green steel fenceposts 12 to 18 inches in height.



Map Name: Gray Head Peak

Diagrammatic Sketch

Township 6S, Range 8W, Section 7

UTM 4425321.782 N, 514950.752 E

DISCUSSION

Trend Study No. 17-55 (14-2)

The Lower Horse Ridge trend study is located on big game winter range near the north end of Horse Ridge at about 7,360 feet in elevation. The land is owned and managed by the Division of Wildlife Resources in the Avintaquin Wildlife Management Area. The range type is a mixed mountain brush on a west-southwest exposure with a 30% to 40% slope. Judging from the number of pellet groups observed, both past and present, along with the high level of browse utilization, this site is likely a winter concentration area for deer. A pellet group transect read along the study site baseline in 2000 estimated 23 deer and 3 elk days use/acre (57 ddu/ha and 7 edu/ha). Quadrat frequency of deer pellets was much higher in 1995 suggesting a higher level of use at that time.

Soil is moderately deep with an effective rooting depth estimated at over 16 inches. Texture is a loam with considerable surface limestone rock. Rock and pavement are concentrated on the surface between bunch grass and shrub interspaces. Rock and gravel are also distributed throughout the soil profile. Phosphorus is limited at only 2.8 ppm. Values less than 10 ppm can limit normal plant growth and development. Soil pedestalling and terracing are evident on the slopes, although there is little bare ground exposed and erosion is minimal. Percent organic matter is fairly high at 4.9%.

Several browse species occupy the site but the key species consist of true mountain mahogany and mountain big sagebrush. These two species provided 50% of the total browse cover in 1995 and 56% in 2000. Mahogany has been consistently heavily utilized since 1982, yet the population appears stable with good recruitment of young (17%) and low decadence. Vigor was poor on 30% of the population in 1982. However, currently ('00) vigor is normal.

Mountain big sagebrush provides additional preferred forage on this winter range. Density was estimated at 532 plants/acre in 1982, 50% of which were decadent. Use was heavy on 63% of the population and poor vigor was expressed on 50% of the plants. During the 1988 reading, the age class structure remained basically the same except the young age class increased from 66 to 1,400 plants/acre. Use was light to moderate and vigor good on all but a few decadent plants. By 1995, overall density declined slightly due to a reduction in the number of young plants with prolonged drought. Density of mature plants increased while the number of decadent plants declined. Vigor was generally good and heavy use was reported on only 6% of the population. Data from 2000 shows a similar density but due to the dry conditions, poor vigor has increased and percent decadence has gone up from 8% to 25%.

Several other browse species occur on the site including: serviceberry, dwarf rabbitbrush, mountain low rabbitbrush, white rubber rabbitbrush, snowberry, gray horsebrush and broom snakeweed. A few Utah Rocky Mountain juniper and pinyon pine are scattered throughout the area. Point-center quarter data from 2000 estimated 55 Utah juniper, 7 Rocky mountain juniper and 20 pinyon trees/acre. Average diameter of Utah juniper and pinyon is about 5 inches, while diameter of Rocky mountain juniper is 6 inches.

The herbaceous understory is dominated by grasses which combined to produce 14% cover in 1995 and 16% in 2000. Two species, bluebunch wheatgrass and Salina wildrye, account for nearly 90% of the grass cover (1995 and 2000). Forbs are diverse and moderately abundant with 21 perennial species encountered in 1995. Combined they produced only 5% cover in 1995 and 3% in 2000. Common species include: bastard toadflax, Indian paintbrush and Pingue hymenoxys. Sum of nested frequency of perennial grasses and forbs decreased in 2000 due to drought.

1982 APPARENT TREND ASSESSMENT

Soil condition was considered poor. Short of mechanical treatment and seeding, there is probably little that can be done to quickly arrest the poor condition. Vegetative trend also appears to be declining. The key species, with the possible exception of mountain big sagebrush, are almost certainly in trouble. Another area of potential concern is the abundance of undesirable increasers and the apparent juniper and pinyon encroachment.

1988 TREND ASSESSMENT

Trend for soil is slightly up due to increased litter cover and a decline in percent bare ground. Eroding soil has been replaced by increased rock and pavement cover. Trend for browse is up. The 1982 report suggested that one of the key browse species, true mountain mahogany, was in a state of decline. The 1988 data indicate otherwise. It shows an increased density of seedlings and young. Utilization is still moderate to heavy, but the average height of the mature plants increased from 20" to 30" and vigor has improved. Few mahogany have grown beyond browsing reach. Mountain big sagebrush has also increased in density and displays a more moderately hedged growth form. Trend for the herbaceous understory is up. Grass cover was good in 1982 and remains so in 1988 with an increase in overall quadrat frequency. The number of forb species encountered on the frequency baseline increased from 13 to 22 species and quadrat frequency increased 34%. Bastard toadflax remains the most abundant species.

TREND ASSESSMENT

soil - slightly up (4)

browse - up (5)

herbaceous understory - up (5)

1995 TREND ASSESSMENT

Trend for soil is considered stable. Percent bare ground declined slightly, although percent litter cover also decreased and frequency of grasses and forbs declined since 1988. The browse trend is stable for the key species, true mountain mahogany. There are no decadent plants and vigor is good. Heavy use increased from 47% in 1988 to 65% by 1995. Recruitment of seedlings and young declined slightly but there are still sufficient numbers to maintain the population. Many mature plants are producing seed. Average height remains similar to 1988 estimates. Mountain big sagebrush also displays a stable trend with a decline in percent decadency from 14% to 8%. Use is light to moderate and vigor is generally good. One negative aspect to the sagebrush trend is the continued decline in height and crown of mature plants. Trend for the herbaceous understory is stable for grasses and down for forbs. Because grasses make up 75% of the herbaceous understory cover, overall trend is considered stable. Nested frequency of bluebunch wheatgrass and Salina wildrye increased significantly, while nested frequency of all other grasses declined. Sum of nested frequency for forbs declined by 26%.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable for grasses to slightly down for forbs, stable overall (3)

2000 TREND ASSESSMENT

Trend for soil is stable. Percent cover of bare ground has declined slightly while litter and vegetation cover increased slightly. The ratio of protective cover (vegetation, litter and cryptogams) to bare ground has remained unchanged. There is little erosion occurring on the site. Trend for the key browse species, true mountain mahogany, is also stable. Use is moderate to heavy, vigor is normal and percent decadence is only 1%. Young plants are common and account for 17% of the population. Mountain big sagebrush is of secondary importance. It also appears stable with a similar density compared to 1995. Use is light to moderate. Sagebrush does seem to be showing signs of stress due to drought however. Currently, 16% of the plants sampled were classified with poor vigor and percent decadence has increased from 8% to 25%. Trend for the herbaceous understory is down slightly due to drought. Sum of nested frequency of perennial grasses and forbs has declined 31%. Three of the 4 most abundant perennial grasses have declined significantly in nested frequency since 1995. Many of the perennial forbs have also declined significantly in nested frequency.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --

Herd unit 17 , Study no: 55

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron spicatum	_b 219	_a 230	_{ab} 190	44	87	82	69	7.10	11.46
G	Carex spp.	62	37	40	-	27	19	17	1.20	1.43
G	Elymus salina	_a 46	_c 140	_b 83	13	20	49	32	5.44	2.54
G	Oryzopsis hymenoides	_c 81	_b 49	_a 18	40	37	25	9	.58	.29
G	Poa fendleriana	-	3	3	-	-	1	1	.03	.15
G	Poa secunda	_b 68	_a 2	_a -	6	32	1	-	.03	-
	Total for Annual Grasses	0	0	0	0	0	0	0	0	0
	Total for Perennial Grasses	476	461	334	103	203	177	128	14.40	15.88
	Total for Grasses	476	461	334	103	203	177	128	14.40	15.88
F	Achillea millefolium	3	-	-	-	1	-	-	-	-
F	Androsace septentrionalis (a)	-	2	-	1	-	1	-	.00	-
F	Arabis spp.	_a -	_b 6	_{ab} 2	6	-	3	1	.06	.00
F	Aster chilensis	_b 86	_a 26	_a 13	-	34	13	6	.31	.05
F	Astragalus convallarius	_a 2	_b 15	_a -	28	1	10	-	.17	.00
F	Astragalus purshii	1	3	-	-	1	2	-	.01	-
F	Astragalus tenellus	4	-	-	-	1	-	-	-	-
F	Castilleja chromosa	33	33	44	16	17	16	19	.51	.44
F	Chenopodium leptophyllum (a)	-	_b 5	_a -	-	-	5	-	.02	-
F	Comandra pallida	_b 196	_a 137	_a 126	45	77	59	56	1.49	1.00

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	<i>Crepis acuminata</i>	4	-	1	-	2	-	1	-	.00
F	<i>Cryptantha</i> spp.	_a 9	_b 26	_a 4	25	3	11	2	.08	.06
F	<i>Delphinium nuttallianum</i>	1	-	-	-	1	-	-	-	-
F	<i>Descurainia pinnata</i> (a)	-	_b 10	_a -	-	-	5	-	.08	-
F	<i>Eriogonum alatum</i>	6	1	13	-	2	1	5	.03	.10
F	<i>Erigeron</i> spp.	-	1	4	-	-	1	2	.00	.01
F	<i>Hymenoxys richardsonii</i>	_b 51	_a 16	_a 31	5	25	9	14	.32	.92
F	<i>Ipomopsis aggregata</i>	4	-	-	1	2	-	-	-	-
F	<i>Linum lewisii</i>	_a 4	_b 24	_a 4	7	2	12	2	.12	.01
F	<i>Lithospermum</i> spp.	_b 26	_a 18	_a 7	-	19	9	3	.26	.21
F	<i>Machaeranthera canescens</i>	_c 37	_b 6	_a -	10	17	4	-	.07	-
F	<i>Machaeranthera grindelioides</i>	_a 14	_b 50	_a 17	-	6	25	9	.71	.14
F	<i>Penstemon caespitosus</i>	15	4	4	-	6	4	2	.02	.01
F	<i>Penstemon humilis</i>	_b 25	_b 18	_a 2	13	12	10	1	.07	.03
F	<i>Phlox austromontana</i>	_b 62	_b 43	_a 7	20	24	20	4	.35	.09
F	<i>Phlox longifolia</i>	-	5	4	-	-	2	2	.01	.01
F	<i>Potentilla gracilis</i>	-	2	1	-	-	1	1	.00	.00
F	<i>Senecio multilobatus</i>	18	7	4	4	8	4	2	.04	.01
F	<i>Taraxacum officinale</i>	-	5	-	-	-	2	-	.03	-
F	<i>Viguiera multiflora</i>	3	-	-	-	1	-	-	-	-
Total for Annual Forbs		0	17	0	0	0	11	0	0.10	0
Total for Perennial Forbs		604	446	288	181	262	218	132	4.71	3.14
Total for Forbs		604	463	288	181	262	229	132	4.82	3.14

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

BROWSE TRENDS --

Herd unit 17 , Study no: 55

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	<i>Amelanchier utahensis</i>	0	8	-	.48
B	<i>Artemisia frigida</i>	1	0	-	-
B	<i>Artemisia tridentata vaseyana</i>	34	34	1.06	2.26
B	<i>Cercocarpus montanus</i>	47	53	5.57	8.43
B	<i>Chrysothamnus depressus</i>	21	11	.36	.54
B	<i>Chrysothamnus nauseosus hololeucus</i>	1	3	-	-
B	<i>Chrysothamnus viscidiflorus lanceolatus</i>	39	38	.84	1.58

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Eriogonum corymbosum	38	18	1.76	.53
B	Gutierrezia sarothrae	56	18	1.14	.11
B	Juniperus osteosperma	0	3	.30	.30
B	Juniperus scopulorum	0	2	-	1.85
B	Pinus edulis	0	4	2.09	2.30
B	Rosa woodsii	0	4	-	.15
B	Symphoricarpos oreophilus	3	8	.03	.44
B	Tetradymia canescens	10	10	.09	.24
Total for Browse		250	214	13.26	19.25

CANOPY COVER --

Herd unit 17 , Study no: 55

Species	Percent Cover
	'00
Juniperus osteosperma	2
Pinus edulis	2

BASIC COVER --

Herd unit 17 , Study no: 55

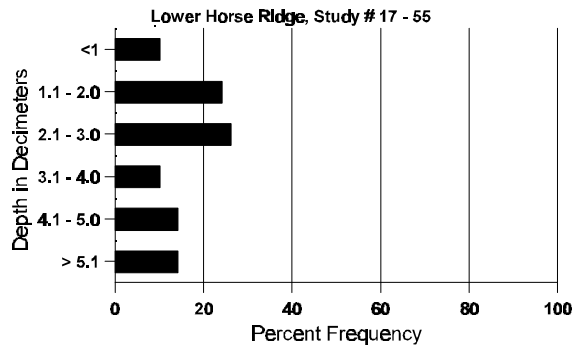
Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	332	311	7.00	6.00	34.53	37.02
Rock	244	190	3.75	7.75	11.69	6.51
Pavement	213	285	19.50	21.25	4.91	18.27
Litter	388	368	41.50	43.50	32.45	36.79
Cryptogams	7	4	0	0	.39	.01
Bare Ground	280	261	28.25	21.50	18.20	16.13

SOIL ANALYSIS DATA --

Herd Unit 17, Study # 55, Study Name: Lower Horse Ridge

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
16.28	58.8 (16.61)	7.3	27.3	46.2	26.6	4.9	2.8	336.0	1.8

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 17 , Study no: 55

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre 00	Days Use per Acre (ha) 00
Rabbit	6	5	200	N/A
Elk	2	1	35	3 (7)
Deer	26	11	305	23 (58)

BROWSE CHARACTERISTICS --

Herd unit 17 , Study no: 55

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4				
Amelanchier utahensis									
Y	82	-	-	-	-	-	-	0	0
	88	-	-	-	-	-	-	0	0
	95	-	-	-	-	-	-	0	0
	00	2	8	-	-	-	-	200	10
M	82	-	-	-	-	-	-	0	0
	88	-	-	-	-	-	-	0	0
	95	-	-	-	-	-	-	0	0
	00	-	4	7	-	3	-	280	14
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>	
		'82		00%		00%		00%	
		'88		00%		00%		00%	
		'95		00%		00%		00%	
		'00		50%		42%		00%	
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	-
						'88	0		-
						'95	0		-
						'00	480		-

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4			
<i>Artemisia frigida</i>								
Y	82	-	-	-	-	-	-	-
	88	-	-	-	-	-	-	-
	95	2	-	-	-	-	-	-
	00	-	-	-	-	-	-	-
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>
	'82	00%		00%		00%		
	'88	00%		00%		00%		
	'95	00%		00%		00%		
	'00	00%		00%		00%		
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec: -
						'88	0	-
						'95	40	-
						'00	0	-
<i>Artemisia tridentata vaseyana</i>								
S	82	11	1	-	-	-	-	-
	88	-	-	-	-	-	-	-
	95	1	-	-	-	-	-	-
	00	1	-	-	-	-	-	-
Y	82	-	1	-	-	-	-	-
	88	19	-	-	1	-	-	-
	95	16	2	2	4	-	-	-
	00	11	-	-	-	-	-	-
M	82	-	2	1	-	-	-	-
	88	3	-	-	1	-	-	-
	95	17	3	-	3	1	-	-
	00	20	10	1	-	-	-	-
D	82	-	-	4	-	-	-	-
	88	-	4	-	-	-	-	-
	95	2	1	1	-	-	-	-
	00	10	2	2	-	-	-	-
X	82	-	-	-	-	-	-	-
	88	-	-	-	-	-	-	-
	95	-	-	-	-	-	-	-
	00	-	-	-	-	-	-	-
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>
	'82	38%		63%		50%		+72%
	'88	14%		00%		03%		-46%
	'95	13%		06%		02%		+7%
	'00	21%		05%		16%		
Total Plants/Acre (excluding Dead & Seedlings)						'82	532	Dec: 50%
						'88	1932	14%
						'95	1040	8%
						'00	1120	25%

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cercocarpus montanus																		
S	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	3	-	-	-	-	-	-	-	-	3	-	-	-	200		3	
	'95	6	-	-	-	-	-	-	-	-	6	-	-	-	120		6	
	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	5	2	-	-	-	-	-	-	6	-	1	-	466		7	
	'95	3	5	2	1	-	-	-	-	-	11	-	-	-	220		11	
	'00	8	3	-	2	-	-	1	-	-	14	-	-	-	280		14	
M	'82	-	-	10	-	-	-	-	-	-	7	-	3	-	666	20	17	10
	'88	-	4	6	-	-	-	-	-	-	9	-	1	-	666	30	23	10
	'95	1	11	42	-	3	-	-	-	-	57	-	-	-	1140	30	33	57
	'00	19	17	15	-	2	14	-	-	-	66	1	-	-	1340	43	37	67
D	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
X	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	60		3	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			100%			30%			+41%							
'88		53%			47%			12%			+17%							
'95		28%			65%			00%			+17%							
'00		27%			35%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	666	Dec:	0%			
												'88	1132		0%			
												'95	1360		0%			
												'00	1640		1%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4												
Chrysothamnus depressus																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	2	-	-	-	-	-	-	-	2	-	-	-	133		2	
	95	4	-	-	-	-	-	-	-	4	-	-	-	80		4	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	2	2	-	-	-	-	-	-	3	-	1	-	266	4	6	4
	95	35	-	-	4	-	-	-	-	39	-	-	-	780	6	8	39
	00	20	-	1	-	-	-	-	-	21	-	-	-	420	4	7	21
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	2	-	-	-	-	-	-	-	-	-	-	2	40		2	
	00	-	1	-	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>									
'82		00%		00%		00%											
'88		29%		00%		14%		+48%									
'95		00%		00%		04%		-51%									
'00		05%		05%		00%											
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	0%				
										'88	465		14%				
										'95	900		4%				
										'00	440		5%				
Chrysothamnus nauseosus hololeucus																	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	2	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	24	21	0
	00	2	-	-	-	-	-	-	-	2	-	-	-	40	7	10	2
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>									
'82		00%		00%		00%											
'88		00%		00%		00%											
'95		00%		00%		00%		+33%									
'00		00%		00%		00%											
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-				
										'88	0		-				
										'95	40		-				
										'00	60		-				

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total							
		1	2	3	4		1	2								
Chrysothamnus viscidiflorus lanceolatus																
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	-	1	-	-	-	20		1
Y	82	4	-	-	-	-	-	-	-	4	-	-	-	266		4
	88	5	1	-	-	-	-	-	-	5	-	1	-	400		6
	95	5	-	-	-	-	-	-	-	5	-	-	-	100		5
	00	7	-	-	-	-	-	-	-	7	-	-	-	140		7
M	82	27	4	-	-	-	-	-	-	31	-	-	-	2066	10 11	31
	88	66	8	1	-	-	-	-	-	71	-	4	-	5000	9 9	75
	95	118	-	-	3	-	-	-	-	121	-	-	-	2420	11 13	121
	00	91	-	-	-	-	-	-	-	91	-	-	-	1820	10 11	91
D	82	5	2	1	-	-	-	-	-	-	1	7	-	533		8
	88	5	3	-	-	-	-	-	-	7	-	1	-	533		8
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	10	-	-	-	-	-	-	-	10	-	-	-	200		10
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>				<u>%Change</u>						
'82		14%		02%		16%				+52%						
'88		13%		01%		07%				-58%						
'95		00%		00%		00%				-14%						
'00		00%		00%		00%										
Total Plants/Acre (excluding Dead & Seedlings)										'82	2865	Dec:	19%			
										'88	5933		9%			
										'95	2520		0%			
										'00	2160		9%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4		1	2									
Eriogonum corymbosum																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	5	-	-	-	-	-	-	-	5	-	-	-	333		5	
	95	14	-	-	1	-	-	-	-	15	-	-	-	300		15	
	00	-	-	-	1	-	-	-	-	1	-	-	-	20		1	
M	82	4	-	-	-	-	-	-	-	3	-	1	-	266	16	11	4
	88	5	-	-	-	-	-	-	-	5	-	-	-	333	11	11	5
	95	34	7	-	-	-	-	-	-	41	-	-	-	820	12	16	41
	00	8	3	4	1	1	-	-	-	17	-	-	-	340	14	18	17
D	82	2	-	-	-	-	-	-	-	1	-	-	1	133		2	
	88	3	1	-	-	-	-	-	-	2	-	2	-	266		4	
	95	-	-	-	1	-	-	-	-	1	-	-	-	20		1	
	00	3	-	1	-	1	-	-	-	4	-	-	1	100		5	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		00%			00%			33%			+57%						
'88		07%			00%			14%			+18%						
'95		12%			00%			00%			-60%						
'00		22%			22%			04%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	399	Dec:	33%				
										'88	932		29%				
										'95	1140		2%				
										'00	460		22%				

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Gutierrezia sarothrae																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	2	-	-	-	-	-	-	-	-	-	-	-	133		2	
	88	10	-	-	-	-	-	-	-	-	-	-	-	666		10	
	95	18	-	-	-	-	-	-	-	-	-	-	-	360		18	
	00	11	-	-	-	-	-	-	-	-	-	-	-	220		11	
M	82	37	-	-	-	-	-	-	-	-	-	-	-	2466	8 10	37	
	88	77	-	-	-	-	-	-	-	-	-	-	-	5133	6 4	77	
	95	162	-	-	-	-	-	-	-	-	-	-	-	3240	9 9	162	
	00	36	-	-	-	-	-	-	-	-	-	-	-	720	4 4	36	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	5	-	-	-	-	-	-	-	-	-	-	-	333		5	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'82		00%			00%			00%			+58%						
'88		00%			00%			00%			-41%						
'95		00%			00%			00%			-74%						
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'82	2599	Dec:	0%		
												'88	6132		5%		
												'95	3600		0%		
												'00	940		0%		
Juniperus osteosperma																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	-	-	1	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	1	-	-	-	-	-	-	-	-	-	-	1	66		1	
	88	-	1	-	-	-	-	-	-	-	-	-	1	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	1	-	-	-	-	-	-	-	3	60		3	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'82		00%			00%			00%			+ 0%						
'88		100%			00%			00%									
'95		00%			00%			00%									
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'82	66	Dec:	-		
												'88	66		-		
												'95	0		-		
												'00	60		-		

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Juniperus scopulorum																		
M	'82	1	-	-	-	-	-	-	-	-	1	-	-	-	66	67	45	1
	'88	-	-	-	-	1	-	-	-	-	1	-	-	-	66	122	35	1
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	-	-	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
		'82 00%			'82 00%			'82 00%			+ 0%							
		'88 100%			'88 00%			'88 00%										
		'95 00%			'95 00%			'95 00%										
		'00 00%			'00 00%			'00 00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	66	Dec:	-				
											'88	66		-				
											'95	0		-				
											'00	40		-				
Pinus edulis																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'00	1	-	-	1	-	-	-	-	-	2	-	-	-	40			2
M	'82	1	-	-	-	-	-	-	-	-	1	-	-	-	66	63	44	1
	'88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	79	55	1
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	-	-	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
		'82 00%			'82 00%			'82 00%			+ 0%							
		'88 00%			'88 00%			'88 00%										
		'95 00%			'95 00%			'95 00%										
		'00 00%			'00 00%			'00 00%										
Total Plants/Acre (excluding Dead & Seedlings)											'82	66	Dec:	-				
											'88	66		-				
											'95	0		-				
											'00	80		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Rosa woodsii																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'00	8	-	-	-	-	-	-	-	-	8	-	-	-	160	19 29	8	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	180		-			
Symphoricarpos oreophilus																		
Y	'82	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	'88	-	4	-	-	-	-	-	-	-	4	-	-	-	266		4	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	'82	-	-	1	-	-	-	-	-	-	-	1	-	-	66	7 9	1	
	'88	2	-	-	-	-	-	-	-	-	2	-	-	-	133	11 10	2	
	'95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	12 17	3	
	'00	14	-	-	2	-	-	-	-	-	15	-	1	-	320	16 16	16	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			33%			00%			+50%							
'88		67%			00%			00%			-85%							
'95		00%			00%			00%			+81%							
'00		00%			00%			06%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	199	Dec:	-			
												'88	399		-			
												'95	60		-			
												'00	320		-			

A G R E	Y R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Tetradymia canescens																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	4	-	-	-	-	-	-	-	-	4	-	-	-	266		4	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	1	-	-	-	-	-	-	-	1	-	-	-	66	6	10	
	95	7	1	-	-	-	-	-	-	-	8	-	-	-	160	9	11	
	00	7	-	-	-	-	-	-	-	-	7	-	-	-	140	10	9	
D	82	-	-	-	-	-	1	-	-	-	1	-	-	-	66		1	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	2	-	-	-	-	-	-	3	-	-	1	80		4	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			100%			00%			+80%							
'88		20%			00%			00%			-40%							
'95		10%			00%			00%			+33%							
'00		00%			13%			07%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	66	Dec:	100%			
												'88	332		0%			
												'95	200		0%			
												'00	300		27%			

Trend Study 17-56-00

Study site name: Sam's Canyon.

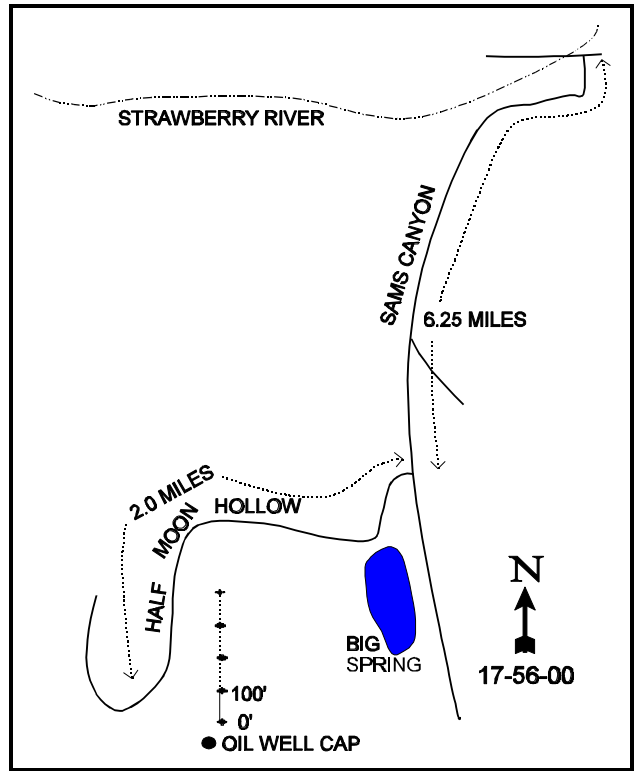
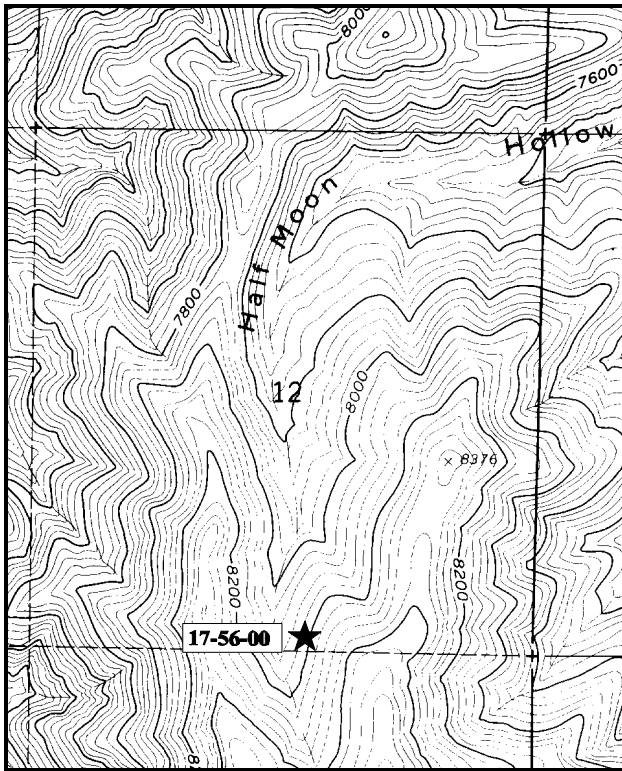
Range type: Mixed Mountain Brush.

Compass bearing: frequency baseline 0°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the intersection of the Strawberry River Road and U.S. 40 near Starvation Reservoir, go west up the Strawberry River for 8.5 miles. Before the bridge, turn left. From the Strawberry River Road, go 6.25 miles up Sam's Canyon. Turn right into Half Moon Hollow (about 0.2 miles before Big Spring). Follow the old, rabbitbrush-covered road (which may impassable to vehicles due to washouts and tall brush) about 2 miles up the canyon to when the road turns sharply right and goes up a dugway. The old drilling platform there is hardly noticeable, just a brush-covered flat spot in the bottom of the canyon. The well cap is 15" tall. From the capped well, the 0-foot baseline stake (marked with browse tag #7080) is 44 paces bearing 40°. The baseline runs north across the slope. The first density plot is located a few paces north of the 100-foot baseline stake.



Map Name: Sam's Canyon

Diagrammatic Sketch

Township 5S Range 8W , Section 12

DISCUSSION

Trend Study No. 17-56 (14-3)

***This site was not read in 2000 because the access road was washed out several miles from the site. Text from the 1995 "Utah Big Game Range Trend Studies" report has been retained. Consult the 1995 report for maps and data tables.

The Sam's Canyon study is located at the head of Half Moon Hollow, a tributary of Sam's Canyon. The study site is within Ute Indian Reservation lands. The range type is intermediate between black sagebrush and mixed mountain brush. However, black sagebrush tends to give the area its vegetative aspect as it provides the most cover of any browse species (32%). Elevation is relatively high (8,350 feet), but the site is on an exposed western slope of about 35%, so winter snow usually does not accumulate.

Soils are limestone derived and very rocky on the surface. Subsurface soil tends to be unconsolidated with a high clay content. Very little organic matter is present. Most of the finer surface soil particles have long since been eroded away. Erosion pavement and rock, cover a considerable amount of the ground surface.

Several species of browse offer forage for wildlife but true mountain mahogany would be considered one of the key species. Mahogany appears to be in good condition with respect to age structure and vigor. The average mature shrub measures only 2½ feet in height and is all available. Utilization has been extremely heavy in the past. In 1982, 69% of the mature shrubs displayed heavy use (>60% of stems browsed). By 1988, 62% of the plants were heavily utilized. Use was more moderate in 1995 with only 16% of the mahogany classified as heavily browsed and 54% moderately utilized. Vigor is good and no decadent plants were encountered in 1995. Reproductive potential and the proportion of young plants in the population have continued to decline, but there still appears to be sufficient numbers to maintain the population. The large number of young plants and reduced number of mature plants sampled in 1988 appears to be a classification problem and not a major shift in age structure.

Secondary browse species include: serviceberry, black sagebrush and small numbers of mountain big sagebrush. Mature serviceberry average about 3 feet in height and are considered all available to wildlife. These shrubs have also been heavily utilized in the past but now exhibit mostly light hedging. Vigor is good and percent decadency low at 2%. A healthy, moderately dense stand of black sagebrush occupies the site. It provides the most ground cover of all the browse species (32%) compared to 29% for mahogany. Density has gone down since 1988, but most of the loss was from the young age class which is not unusual with long periods of drought. Heavy use and percent decadency have declined.

The herbaceous understory accounts for 33% of the vegetation cover on the site. Bluebunch wheatgrass dominates the grass composition by producing 59% of the grass cover. A sedge and Salina wildrye are also abundant. Forb density and production is sparse, even though diversity is high with 23 perennial species encountered in 1995. Most species are low-growing forms of low to medium forage value. The most common species include: sego lily, cryptantha and sulfur eriogonum.

1982 APPARENT TREND ASSESSMENT

Soil trend appears to be in a state of decline. Erosion and soil loss prevent any significant litter buildup and make seedling establishment difficult over much of the area. Vegetative trend, however, appears more stable. The browse component, although heavily utilized, is in fair vigor and seems to be maintaining itself. Herbaceous diversity and density are moderately good considering the ongoing erosion. This condition should not be expected to improve without direct management intervention.

1988 TREND ASSESSMENT

Few changes are evident on this high elevation winter range. Ground cover percentages are unchanged and overall soil erosion does not appear as severe as described in 1982. Photograph comparisons indicate an obvious increase in the size and vigor of the key browse species. Data from the density plots show very little increase in true mountain mahogany, although young plants comprise 82% of the population. Black sagebrush has shown the greatest increase and was rated as being moderately hedged as opposed to heavily hedged in 1982. Other browse species provide moderate amounts of forage with their status remaining unchanged. Unpalatable increaser shrubs have not expanded significantly. Trend for browse is considered stable. Grass abundance has increased largely due to an increase in Salina wildrye from a quadrat frequency of 1% to 36%. Quadrat frequency of bluebunch also increased from 55% to 82%. Sixteen species of forbs were found, yet their density remains relatively low.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - up for grasses and down for forbs, stable overall (3)

1995 TREND ASSESSMENT

Trend for soil is stable. Even though percent bare ground has increased slightly, there appears to be no movement of soil and bare ground still is below 10%. Trend for browse is up with reduced heavy use, good vigor and low decadency rates of the preferred browse species, true mountain mahogany, serviceberry and black sagebrush. Unpalatable increasers do not appear to have expanding populations. Trend for the herbaceous understory appears stable.

TREND ASSESSMENT

soil - stable (3)

browse - up (5)

herbaceous understory - stable (3)

Trend Study 17-57-00

Study site name: Skitzzy Canyon .

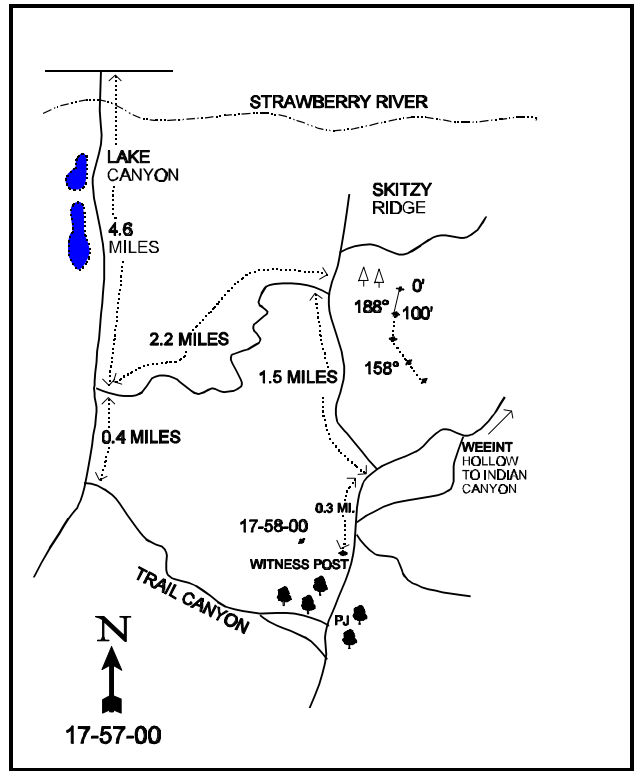
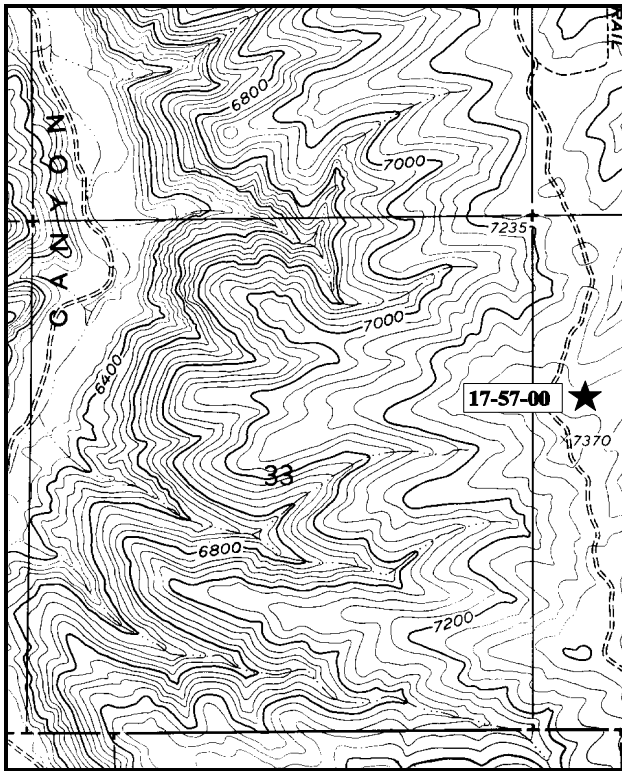
Range type: Chained, Seeded P-J .

Compass bearing: frequency baseline 188°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). Belt 2 rebar @ 5ft.

LOCATION DESCRIPTION

From the Strawberry River, take the Lake Canyon Road (3239 West) south for 4.6 miles to a road which goes up the canyon to the east. Turn left and drive approximately 2.2 miles up to a “T” intersection at the top of the ridge. [Skitzzy Ridge can also be reached via Trail Canyon the next (south) side canyon of Lake Canyon, or from Indian Canyon along the Weeint Hollow road]. At the top, look east into the chaining for two large conifers (Douglas firs). The 0-foot baseline stake is located to the east of the two trees. The baseline is marked by green, steel fenceposts approximately 12-18 inches in height.



Map Name: Buck Knoll

Diagrammatic Sketch

Township 4S, Range 6W, Section 34

UTM 4437809.805 N, 537851.536 E

DISCUSSION

Trend Study No. 17-57 (14-4)

This trend study is located on a pinyon-juniper chaining in Skitzzy Canyon. The area is considered deer and elk winter range. The site has an elevation of 7,300 feet. Management for this area is with the Utah Division of Wildlife Resources. The study site is located on a ridge top where terrain is essentially level. The land slopes gently to the north-northeast, draining into Skitzzy Canyon. Prior to treatment in 1977-78, the site was dominated by Utah Juniper and Colorado pinyon. Currently ('00), surviving and released pinyon and juniper trees have an estimated density of 44 trees/acre. The area is used heavily by elk and to a lesser extent by deer and livestock. Pellet group data from 2000 estimated 90 elk, 7 deer and 9 cow days use/acre (222 edu/ha, 17 ddu/ha and 22 cdu/ha). Deer pellet groups were recent while all cow pats were from the previous year (1999). About half of the elk pellet groups encountered were from spring.

Soils are relatively shallow and rocky, but stabilized as a result of excellent herbaceous vegetative cover. Effective rooting depth is estimated at just over 10 inches with much of the rock encountered in the top 4 inches of the soil profile. Soil texture is a sandy loam with a slightly alkaline soil reaction (pH of 7.8). Percent organic matter is very high at 8.4%. Erosion and soil loss prior to treatment was heavy, which resulted in some areas of pavement and bare ground. Much of this has since filled in with herbaceous vegetation and the rate of erosion being controlled.

Browse is a minor component of this chaining with no shrubs being encountered during the 1982 reading. By 1988, only a few black sagebrush and mountain big sagebrush were sampled. In 1995, the most numerous shrub was black sagebrush with an estimated density of 540 plants/acre. Age class distribution indicated an increasing population. Mountain big sagebrush had an estimated density of only 100 plants/acre. Use of these sagebrush species was mostly light. Density of black sagebrush continues to increase. During the 2000 reading, density was estimated at 820 plants/acre. The number of seedlings and young declined considerably, but the population will most likely slowly increase in the future. Density of mountain big sagebrush has declined slightly since 1995. Use of this more preferred sagebrush was moderate to heavy. Other preferred browse species occur on the site but did not fall within the shrub density strips. These include true mountain mahogany and antelope bitterbrush.

Grasses dominate the site by providing 73% of the total vegetation cover in 1995 and 76% in 2000. The grass composition is very diverse with 14 species encountered in 1995 and 12 species sampled in 2000. Crested wheatgrass is the most numerous species. It provided 65% of the grass cover in 1995 and 64% in 2000. Smooth brome and Russian wildrye are also fairly common. Forbs are also diverse but they are not abundant. The only common forb is looseflower milkvetch which provided 58% of the forb cover in 1995 and 79% in 2000. Seeded alfalfa was sampled in 1995 and 2000, indicating that it has persisted on the treatment.

1982 APPARENT TREND ASSESSMENT

This area was chained in 1977-78. Since the chaining the soil trend definitely appears to be improving. The development of vegetative cover and litter buildup has acted to reduce erosion and soil loss. The site supports a good herbaceous component but the current composition is not the most favorable for deer winter range. In time, shrub density will eventually increase through natural colonization of native species. However, if high value shrubs are desired more quickly, interseeding or transplanting would be required.

1988 TREND ASSESSMENT

Soil trend is considered slightly down due to a decline in basal vegetative cover and litter cover, combined with an increase in percent bare ground (7% to 12%). Erosion is not a problem however due to the gentle terrain and good distribution of vegetation and litter cover. Since the chaining treatment in 1977, there has been surprisingly little change in the browse component on this area. As in the 1982 study, there were only a few individual browse plants encountered. Many young shrubs were observed throughout the area, but were not common enough to be sampled. The general view photographs show a slight increase in the prominence of woody species, but grasses still dominate the site. Trend for browse is considered slightly up but density is still very low. Trend for the herbaceous understory is slightly up. Quadrat frequency of grasses increased while frequency of forbs remained similar to 1982.

TREND ASSESSMENT

soil - slightly down (2)

browse - slightly up but density is limited (4)

herbaceous understory - slightly up (4)

1995 TREND ASSESSMENT

Some ground cover characteristics have improved since 1988. Litter cover declined from 68% to 54%, but percent bare ground also declined from 12% to 7%. Browse is still limited, yet it has continually increased in density. Black sagebrush has increased to 540 plants/acre, 52% of which are young plants. Trend is considered slightly up. Trend for herbaceous understory is stable. Sum nested frequency of grasses and forbs have remained similar to those of 1988.

TREND ASSESSMENT

soil - slightly up (4)

browse - slightly up but density is limited (4)

herbaceous understory - stable (3)

2000 TREND ASSESSMENT

Trend for soil is stable with similar ground cover characteristics compared to 1995. There is no significant erosion occurring due to the excellent herbaceous understory and litter cover. Trend for browse is slightly up and continuing to slowly increase. Density is still poor however. Trend for the herbaceous understory is stable. Sum of nested frequency of perennial grasses declined slightly but the dominant grass species, crested wheatgrass, smooth brome and Russian wildrye have remained stable. Sum of nested frequency of perennial forbs also declined slightly but forbs currently provide only 11% of the herbaceous cover.

TREND ASSESSMENT

soil - stable (3)

browse - slightly up but density is limited (4)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 17 , Study no: 57

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron cristatum	a ¹ 59	b ² 59	261	45	64	87	86	11.42	13.32
G	Agropyron intermedium	48	56	61	6	19	25	27	.61	1.12
G	Agropyron trachycaulum	7	16	4	5	3	6	1	.64	.00
G	Bouteloua gracilis	1	-	-	1	1	-	-	-	-
G	Bromus inermis	60	74	72	14	23	28	29	1.89	2.04
G	Carex spp.	b ⁴ 0	ab ² 0	a ⁸	5	16	7	7	.13	.06
G	Dactylis glomerata	-	1	-	5	-	1	-	.00	-
G	Elymus cinereus	4	17	9	3	2	6	3	.62	.74
G	Elymus junceus	23	19	38	7	11	10	16	1.10	1.44
G	Elymus salina	-	-	6	-	-	-	2	-	1.23
G	Festuca ovina	a ⁻	a ¹	b ² 0	-	-	1	8	.03	.21
G	Oryzopsis hymenoides	-	4	-	4	-	2	-	.18	-
G	Poa fendleriana	-	3	2	-	-	1	2	.03	.03
G	Poa secunda	a ⁻	c ³ 2	b ⁴	15	-	14	3	.25	.04
G	Sitanion hystrix	c ¹ 01	b ¹ 2	a ⁻	40	43	8	-	.04	-
G	Stipa lettermani	b ¹ 22	a ⁴ 7	a ³ 4	35	56	22	15	.58	.45
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		565	561	519	185	238	218	199	17.56	20.72
Total for Grasses		565	561	519	185	238	218	199	17.56	20.72
F	Androsace septentrionalis (a)	-	b ⁴ 0	a ²	-	-	19	1	.12	.00
F	Antennaria rosea	-	-	-	1	-	-	-	-	-
F	Arabis spp.	a ³	ab ¹ 2	b ¹ 9	-	2	7	9	.03	.04
F	Astragalus convallarius	12	4	-	1	5	2	-	.04	-
F	Astragalus miser	-	15	17	-	-	8	9	.57	.48
F	Astragalus tenellus	b ⁴ 5	a ¹ 7	a ¹ 6	17	19	9	9	3.78	2.28
F	Calochortus nuttallii	-	-	-	1	-	-	-	-	-
F	Chaenactis douglasii	-	5	3	5	-	2	1	.01	.00
F	Descurainia pinnata (a)	-	b ⁸	a ⁻	-	-	4	-	.02	-
F	Eriogonum alatum	15	12	3	7	8	8	2	.14	.03
F	Erigeron flagellaris	-	-	-	1	-	-	-	-	-
F	Erigeron eatonii	3	2	-	-	1	1	-	.00	-
F	Eriogonum umbellatum	-	-	4	-	-	-	1	-	.00
F	Gayophytum ramosissimum (a)	-	3	-	-	-	2	-	.01	-
F	Grindelia squarrosa	-	3	-	1	-	1	-	.00	-
F	Hedysarum boreale	-	1	-	-	-	1	-	.15	-
F	Ipomopsis aggregata	1	6	-	1	1	2	-	.01	-

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Linum lewisii	-	3	-	1	-	1	-	.00	-
F	Medicago sativa	-	7	3	1	-	2	2	.56	.21
F	Penstemon caespitosus	1	-	-	-	1	-	-	-	-
F	Penstemon pachyphyllus	-	5	-	-	-	2	-	.01	-
F	Sisymbrium altissimum (a)	-	3	-	-	-	1	-	.00	-
F	Trifolium spp.	-	-	-	2	-	-	-	-	-
Total for Annual Forbs		0	54	2	0	0	26	1	0.15	0.00
Total for Perennial Forbs		80	92	65	39	37	46	33	5.34	3.07
Total for Forbs		80	146	67	39	37	72	34	5.50	3.07

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

BROWSE TRENDS --

Herd unit 17 , Study no: 57

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia nova	12	15	.64	1.18
B	Artemisia tridentata vaseyana	5	4	.21	.84
B	Chrysothamnus nauseosus	1	0	-	-
B	Chrysothamnus viscidiflorus lanceolatus	0	1	-	-
B	Juniperus osteosperma	0	2	.03	.78
B	Pinus edulis	0	3	.03	.81
Total for Browse		18	25	0.91	3.61

CANOPY COVER --

Herd unit 17 , Study no: 57

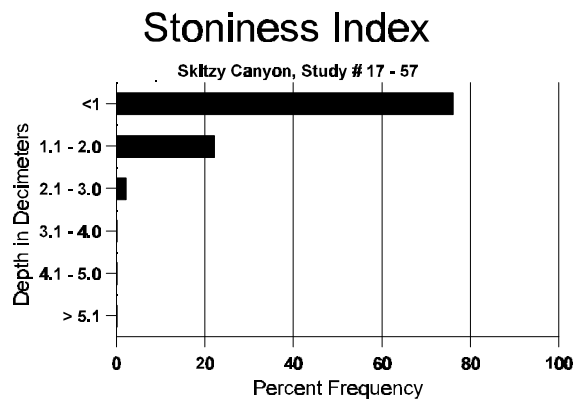
Species	Percent Cover
	'00
Pinus edulis	.60

BASIC COVER --
Herd unit 17 , Study no: 57

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	325	327	7.50	4.75	26.94	29.00
Rock	237	130	3.25	4.50	12.60	5.57
Pavement	208	214	18.25	10.50	6.38	13.64
Litter	390	386	63.50	68.00	54.15	54.83
Cryptogams	13	66	.75	0	.05	.78
Bare Ground	154	164	6.75	12.25	6.84	7.07

SOIL ANALYSIS DATA --
Herd Unit 17, Study # 57, Study Name: Skitzzy Canyon

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
10.49	59.4 (14.25)	7.8	61.3	20.2	18.6	8.4	62.0	252.8	1.6



PELLET GROUP FREQUENCY --
Herd unit 17 , Study no: 57

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre	Days Use per Acre (ha)
Rabbit	7	6	9	N/A
Horse	3	1	-	-
Elk	42	57	1175	90 (223)
Deer	6	5	87	7 (17)
Cattle	1	2	113	9 (23)

BROWSE CHARACTERISTICS --

Herd unit 17 , Study no: 57

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total	
		1	2	3	4					
Artemisia nova										
S	82	-	-	-	-	-	-	-	0	0
	88	-	-	-	-	-	-	-	0	0
	95	15	-	-	-	-	-	-	300	15
	00	2	-	-	-	-	-	-	40	2
Y	82	-	-	-	-	-	-	-	0	0
	88	-	-	-	-	-	-	-	0	0
	95	9	5	-	-	-	-	-	280	14
	00	5	-	-	-	-	-	-	100	5
M	82	-	-	-	-	-	-	-	0	0
	88	2	-	-	-	-	-	-	133	8 11 2
	95	5	8	-	-	-	-	-	260	17 32 13
	00	20	4	-	-	-	-	-	480	14 27 24
D	82	-	-	-	-	-	-	-	0	0
	88	-	-	-	-	-	-	-	0	0
	95	-	-	-	-	-	-	-	0	0
	00	9	1	-	2	-	-	-	240	12
X	82	-	-	-	-	-	-	-	0	0
	88	-	-	-	-	-	-	-	0	0
	95	-	-	-	-	-	-	-	20	1
	00	-	-	-	-	-	-	-	20	1
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>% Change</u>		
'82		00%		00%		00%				
'88		00%		00%		00%		+75%		
'95		48%		00%		00%		+34%		
'00		12%		00%		00%				
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	0%	
						'88	133		0%	
						'95	540		0%	
						'00	820		29%	

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total		
		1	2	3	4		1	2			
Artemisia tridentata vaseyana											
Y	82	-	-	-	-	-	-	-	0	-	0
	88	-	-	-	-	-	-	-	0	-	0
	95	2	-	-	-	-	-	-	40	-	2
	00	1	-	-	-	-	-	-	20	-	1
M	82	-	-	-	-	-	-	-	0	-	0
	88	1	-	-	-	-	-	-	66	15	10
	95	2	1	-	-	-	-	-	60	27	42
	00	-	1	1	-	-	-	-	40	23	38
D	82	-	-	-	-	-	-	-	0	-	0
	88	-	-	-	-	-	-	-	0	-	0
	95	-	-	-	-	-	-	-	0	-	0
	00	1	-	-	-	-	-	-	20	-	1
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>			
'82		00%		00%		00%					
'88		00%		00%		00%		+34%			
'95		20%		00%		00%		-20%			
'00		25%		25%		00%					
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	0%		
						'88	66		0%		
						'95	100		0%		
						'00	80		25%		
Cercocarpus montanus											
M	82	-	-	-	-	-	-	-	0	-	0
	88	-	-	-	-	-	-	-	0	-	0
	95	-	-	-	-	-	-	-	0	22	39
	00	-	-	-	-	-	-	-	0	-	0
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>			
'82		00%		00%		00%					
'88		00%		00%		00%					
'95		00%		00%		00%					
'00		00%		00%		00%					
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	-		
						'88	0		-		
						'95	0		-		
						'00	0		-		

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4		1	2				
Chrysothamnus nauseosus												
M	'82	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	0	-	-	0
	'95	1	-	-	-	-	-	-	20	31	33	1
	'00	-	-	-	-	-	-	-	0	34	45	0
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
		'82 00%		'82 00%		'82 00%						
		'88 00%		'88 00%		'88 00%						
		'95 00%		'95 00%		'95 00%						
		'00 00%		'00 00%		'00 00%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:				
						'88	0					
						'95	20					
						'00	0					
Chrysothamnus viscidiflorus lanceolatus												
M	'82	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	0	-	-	0
	'00	-	-	-	-	-	-	-	0	36	58	0
D	'82	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	0			0
	'95	-	-	-	-	-	-	-	0			0
	'00	1	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
		'82 00%		'82 00%		'82 00%						
		'88 00%		'88 00%		'88 00%						
		'95 00%		'95 00%		'95 00%						
		'00 00%		'00 00%		'00 00%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:	0%			
						'88	0		0%			
						'95	0		0%			
						'00	20		100%			
Chrysothamnus viscidiflorus viscidiflorus												
M	'82	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	0	28	41	0
	'00	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>				
		'82 00%		'82 00%		'82 00%						
		'88 00%		'88 00%		'88 00%						
		'95 00%		'95 00%		'95 00%						
		'00 00%		'00 00%		'00 00%						
Total Plants/Acre (excluding Dead & Seedlings)						'82	0	Dec:				
						'88	0					
						'95	0					
						'00	0					

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Juniperus osteosperma																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	40		-			
Pinus edulis																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66	41	24	1
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20	-	-	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+ 0%							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	66	Dec:	-			
												'88	66		-			
												'95	0		-			
												'00	60		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4		1	2				
Purshia tridentata												
M	'82	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	0	-	-	0
	'95	-	-	-	-	-	-	-	0	17	30	0
	'00	-	-	-	-	-	-	-	0	39	36	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>		<u>%Change</u>		
	'82	00%			00%			00%				
	'88	00%			00%			00%				
	'95	00%			00%			00%				
	'00	00%			00%			00%				
Total Plants/Acre (excluding Dead & Seedlings)								'82	0	Dec:	-	
								'88	0		-	
								'95	0		-	
								'00	0		-	

Trend Study 17-58-00

Study site name: Buck Knoll .

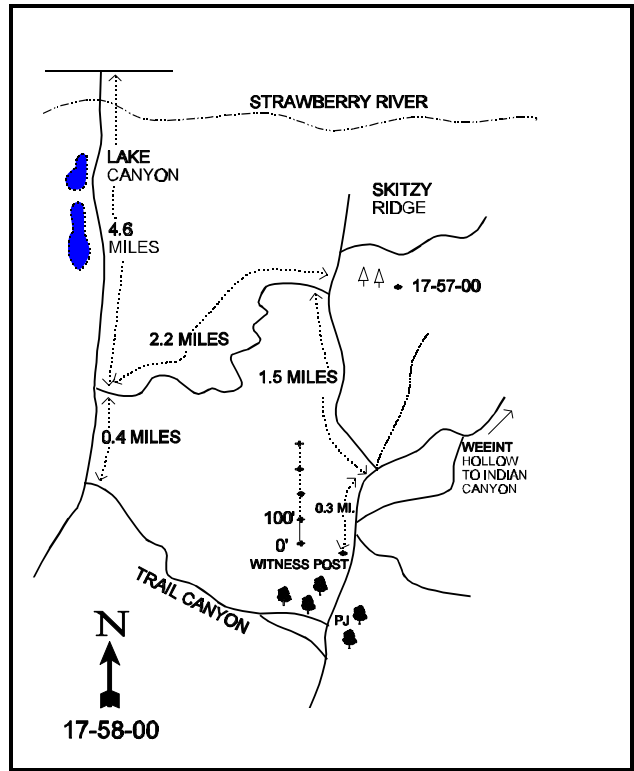
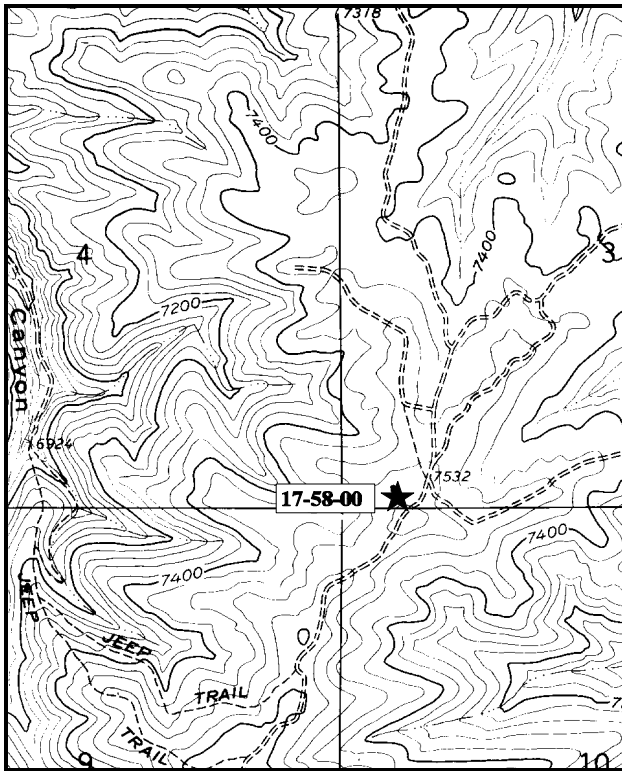
Range type: Chained, Seeded P-J .

Compass bearing: frequency baseline 345°M .

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the Strawberry River, take the Lake Canyon Road (3239 West) south for 4.6 miles to a road which goes up the side canyon to the east. Turn left and go up the side canyon and switchbacks for 2.2 miles to an intersection at the top of the ridge (location of study 17-57-00). Turn right and drive south 1.5 miles to an intersection. Turn right and go 0.25 miles to a fork. Bear right and proceed up the hill 0.05 miles to the witness post, a short green fencepost on the right side of the road. From the witness post, the 0-foot baseline stake is 30 paces west (290°M) down the hill.



Map Name: Buck Knoll

Diagrammatic Sketch

Township 5S, Range 6W, Section 3

UTM 4435265.976 N, 538195.019 E

DISCUSSION

Trend Study No. 17-58 (14-5)

The Buck Knoll range trend study is located on a Utah Division of Wildlife Resources chaining and seeding. It is approximately one and one-half miles southwest of study #17-57 at an elevation of 7,500 feet. This site is close (within 100 yards) to the untreated juniper-pinyon woodland edge and is on a gentle (10% to 20%) west facing slope. The area currently supports a mixed browse community with a good herbaceous understory. Pellet group data from 2000 estimated 6 deer, 26 elk and 3 cow days use/acre (15 ddu/ha, 64 edu/ha and 7 cdu/ha). Most pellet groups appear to be from winter use.

The soil is relatively shallow with an effective rooting depth estimated at nearly 13 inches. Texture is a clay loam with a slightly alkaline soil reaction (pH of 7.4). Rock and pavement are common on the surface and in the soil profile. Many of the rocks in the profile contain calcium carbonate deposits. Phosphorus within the soil is limited at 5.1 ppm. Values less than 10 ppm can limit normal plant growth and development. There is some localized soil movement but erosion is not severe. Regardless, the soil condition is still vastly better than in the nearby untreated juniper-pinyon woodland.

Browse is more abundant on this site than at Skitzzy Canyon (17-57), but it is still well below optimum for a deer winter range. The key management species consist of a small stand of true mountain mahogany which have numbered around 600 plants/acre since 1988. Currently ('00), mahogany provides 35% of the total shrub cover with a mostly mature population of 620 plants/acre. These shrubs are about 4 to 6 feet in height and exhibit light to moderate utilization. Vigor is good but some plants had yellowing leaves due to the very dry conditions of 2000. Use was severe in 1982 when 71% of the mahogany was heavily hedged. Use was moderate to heavy in 1995. Secondary browse which provide additional forage consist of small numbers of black sagebrush, mountain big sagebrush, rubber rabbitbrush, antelope bitterbrush and elderberry.

The herbaceous understory is dominated by a variety of grasses which combine to produce 60% of the vegetation cover in 1995 and 56% in 2000. The grass composition is similar to the Skitzzy Canyon site, but crested wheatgrass is not nearly as dominant. Crested wheatgrass currently ('00) provides 23% of the grass cover. Salina wildrye is also abundant and it also provides 23% of the grass cover. Intermediate wheatgrass, Russian wildrye and Indian ricegrass are also common. Forbs are diverse but not numerous. Twenty-eight species were encountered in 1995, combined they produced less than 3% cover. Only 22 forbs were sampled in 2000 and due to the dry conditions they produced less than 1% total cover. The more common species are native species like hoary aster, mat penstemon and common twinpod.

1982 APPARENT TREND ASSESSMENT

Soil condition is fair and improving as a result of increased herbaceous cover and litter accumulation since the chaining. Vegetatively, the area is dominated by grasses, but contains a small number of desirable shrubs as well as an undesirable invader, broom snakeweed. Both can be expected to increase, although probably at different rates. Broom snakeweed will likely become more abundant in the immediate future.

1988 TREND ASSESSMENT

As was the case with study 17-57, this chained site shows little sign of change since 1982. Ground cover characteristics remain basically unchanged. Browse species are more prominent on this site than at Skitzzy Canyon. Other than a slight increase in grass and forb frequency and shrub density, the data from the two years is very similar. Observations based on photo point comparisons suggest an increase in the size of big sagebrush and less grass production in 1988. The expected rapid increase in broom snakeweed has not occurred. The

population of true mountain mahogany is mostly comprised of young plants (78%), but density has not significantly increased in the last six years. Use of the palatable browse species (mahogany, bitterbrush and mountain big sagebrush) is light.

TREND ASSESSMENT

soil - stable (3)

browse - slightly up (4)

herbaceous understory - slightly up (4)

1995 TREND ASSESSMENT

Ground cover characteristics are similar to those in 1988. Protective ground cover is good and erosion is not a problem. Browse trend is stable but density is still well below what would be needed for a good deer winter range. The herbaceous understory displays a stable trend with sum of nested frequency being slightly down for grasses but up for forbs. Grass composition has changed. Nested frequency of crested wheatgrass, intermediate wheatgrass, smooth brome and mutton bluegrass declined significantly while nested frequency of Russian wildrye, Indian ricegrass, bottlebrush squirreltail and needle-and-thread increased.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

2000 TREND ASSESSMENT

Trend for soil is down slightly. Relative percent cover of bare ground has increased slightly while litter cover declined. In addition, the ratio of protective cover (vegetation, litter and cryptogams) to bare ground declined slightly. Sum of nested frequency of perennial grasses and forbs also decreased by 33% in 2000 due to the dry conditions. There is some localized soil movement but erosion is not a problem on the site at this time. Trend for browse is stable for the key species, true mountain mahogany. Density has remained similar to 1995, use is light to moderate and vigor normal. One positive aspect is that young recruitment has improved and numerous seedlings were sampled in 2000 (1,080 seedlings/acre). On the negative side, density of the green-stem rubber rabbitbrush, broom snakeweed and pinyon and juniper trees have increased. These less desirable shrubs and trees currently provide 45% of the browse cover. Trend for the herbaceous understory is down for grasses and forbs. Sum of nested frequency of perennial grasses has declined with a significant decline in the nested frequency of crested wheatgrass, Indian ricegrass, bottlebrush squirreltail and needle-and-thread. The only grass to increase significantly was Salina wildrye. Nested frequency of perennial forbs declined by 54% and cover dropped from 3% to less than 1%.

TREND ASSESSMENT

soil - down slightly (2)

browse - stable for mahogany (3)

herbaceous understory - down (1)

HERBACEOUS TRENDS --
Herd unit 17 , Study no: 58

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron cristatum	_b 217	_a 111	94	53	74	39	35	5.14	3.99
G	Agropyron dasystachyum	8	11	16	17	3	4	6	.42	.25
G	Agropyron intermedium	_b 48	_a 7	_a 29	16	20	3	10	.16	1.46
G	Bouteloua gracilis	-	-	-	1	-	-	-	-	-
G	Bromus inermis	_b 23	_a 3	_a 4	8	9	1	2	.03	.01
G	Carex spp.	18	24	6	14	10	9	3	.38	.21
G	Elymus cinereus	11	8	1	7	5	2	1	.41	.38
G	Elymus junceus	31	40	34	-	12	17	15	2.00	1.95
G	Elymus salina	_a 47	_a 38	_b 89	8	17	15	31	1.82	4.09
G	Oryzopsis hymenoides	_a 39	_b 89	_a 40	23	20	38	16	3.67	1.95
G	Poa fendleriana	_b 33	_a 9	_a 13	1	18	4	6	.07	.39
G	Poa pratensis	_a -	_b 14	_{ab} 7	-	-	5	2	.17	1.70
G	Poa secunda	_a -	_c 24	_b 12	-	-	11	5	.25	.07
G	Sitanion hystrix	_a 43	_b 83	_a 28	2	17	33	12	.61	.45
G	Sporobolus cryptandrus	-	3	-	-	-	1	-	.00	-
G	Stipa comata	_a 8	_b 44	_a 14	1	4	17	6	1.64	.65
G	Unknown grass - perennial	2	-	-	1	1	-	-	-	-
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		528	508	387	152	210	199	150	16.79	17.58
Total for Grasses		528	508	387	152	210	199	150	16.79	17.58
F	Agoseris glauca	-	-	-	-	-	-	-	.15	-
F	Antennaria rosea	_a -	_a -	_b 7	4	-	-	4	-	.02
F	Androsace septentrionalis (a)	-	_b 23	_a 2	-	-	10	1	.10	.00
F	Arabis drummondi	6	13	1	1	3	5	1	.02	.00
F	Arenaria fendleri	-	1	5	2	-	1	2	.00	.03
F	Astragalus argophyllus	_b 13	_b 8	_a 2	-	5	3	1	.04	.00
F	Astragalus miser	_b 35	_b 17	_a -	17	16	8	-	.24	-
F	Balsamorhiza sagittata	1	-	-	-	1	-	-	-	-
F	Caulanthus crassicaulis	-	2	-	-	-	1	-	.00	-
F	Calochortus nuttallii	-	2	-	-	-	1	-	.00	-
F	Chaenactis douglasii	_a -	_b 18	_a 3	-	-	9	1	.04	.00
F	Chenopodium fremontii (a)	-	_b 26	_a -	-	-	13	-	.11	-
F	Chamaechaenactis scaposa	6	-	-	-	2	-	-	-	-
F	Cirsium spp.	-	-	-	1	-	-	-	-	-
F	Cryptantha spp.	_b 8	_b 19	_a -	3	5	7	-	.25	-
F	Descurainia pinnata (a)	-	_b 29	_a -	-	-	16	-	.22	-

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	<i>Eriogonum alatum</i>	a ⁻	b ¹⁷	b ⁷	7	-	7	4	.22	.02
F	<i>Erigeron eatonii</i>	a ⁻	a ⁻	b ¹⁰	-	-	-	5	-	.07
F	<i>Gilia</i> spp. (a)	-	1	1	-	-	1	1	.00	.00
F	<i>Hedysarum boreale</i>	-	1	6	-	-	1	3	.03	.04
F	<i>Hymenoxys acaulis</i>	b ³³	ab ¹⁵	a ¹	2	13	7	1	.08	.00
F	<i>Ipomopsis aggregata</i>	a ⁻	b ¹²	a ¹	-	-	5	1	.02	.00
F	<i>Lappula occidentalis</i> (a)	-	b ⁷³	a ³	-	-	33	2	.52	.01
F	<i>Lesquerella</i> spp.	b ¹⁸	ab ¹²	a ³	7	9	8	2	.04	.01
F	<i>Linum lewisii</i>	16	14	11	33	8	7	6	.08	.10
F	<i>Machaeranthera grindelioides</i>	17	18	15	-	7	10	8	.32	.11
F	<i>Melilotus officiale</i>	-	-	-	1	-	-	-	-	-
F	<i>Penstemon caespitosus</i>	ab ¹³	b ³¹	a ¹⁰	-	7	12	6	.06	.10
F	<i>Physaria acutifolia</i>	a ⁻	b ¹⁰	b ¹⁵	-	-	4	8	.04	.04
F	<i>Phlox</i> spp.	b ¹¹	a ⁻	a ⁻	-	5	-	-	-	-
F	<i>Schoenrambe linifolia</i>	-	4	-	2	-	2	-	.01	-
F	<i>Senecio canus</i>	11	4	3	-	6	2	2	.03	.01
F	<i>Sphaeralcea coccinea</i>	-	1	4	-	-	1	2	.00	.15
F	<i>Taraxacum officinale</i>	a ⁻	b ¹³	ab ³	-	-	5	2	.02	.01
F	<i>Townsendia incana</i>	4	-	3	-	2	-	1	-	.03
F	<i>Tragopogon dubius</i>	a ⁻	b ⁹	a ⁻	-	-	5	-	.02	-
F	<i>Trifolium</i> spp.	4	-	-	-	1	-	-	-	-
Total for Annual Forbs		0	152	6	0	0	73	4	0.96	0.01
Total for Perennial Forbs		196	241	110	81	90	111	60	1.82	0.79
Total for Forbs		196	393	116	81	90	184	64	2.79	0.81

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

BROWSE TRENDS --

Herd unit 17 , Study no: 58

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	<i>Artemisia nova</i>	1	0	-	-
B	<i>Artemisia tridentata vaseyana</i>	2	3	.18	.76
B	<i>Cercocarpus montanus</i>	22	22	3.10	4.49
B	<i>Chrysothamnus nauseosus</i>	16	16	2.04	1.63
B	<i>Chrysothamnus nauseosus hololeucus</i>	1	10	.56	1.12
B	<i>Chrysothamnus viscidiflorus lanceolatus</i>	3	4	-	.18

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Eriogonum corymbosum	2	1	.15	.38
B	Gutierrezia sarothrae	28	18	.53	.63
B	Juniperus osteosperma	0	6	.56	.53
B	Leptodactylon pungens	0	1	-	.03
B	Pinus edulis	0	5	1.16	3.05
B	Purshia tridentata	0	1	-	.15
Total for Browse		75	87	8.31	12.97

CANOPY COVER --
Herd unit 17 , Study no: 58

Species	Percent Cover
	'00
Cercocarpus montanus	.80
Juniperus osteosperma	1
Pinus edulis	3

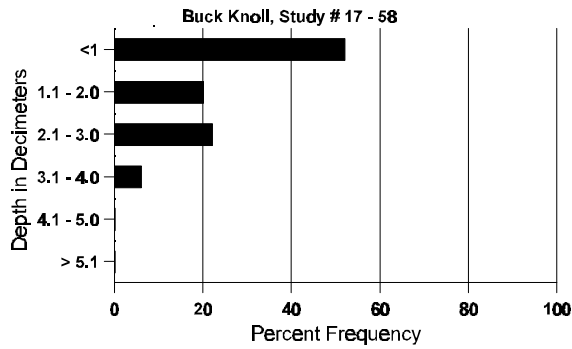
BASIC COVER --
Herd unit 17 , Study no: 58

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	327	295	8.25	8.50	25.78	33.96
Rock	198	128	2.25	2.50	7.89	2.73
Pavement	243	247	18.00	18.25	8.38	11.82
Litter	389	385	57.50	59.00	55.12	54.79
Cryptogams	11	16	0	.25	.24	.22
Bare Ground	210	219	14.00	11.50	10.93	14.94

SOIL ANALYSIS DATA --
Herd Unit 17, Study # 58, Study Name: Buck Knoll

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
12.87	57.6 (15.67)	7.4	24.9	47.8	28.3	5.3	5.1	92.8	0.9

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 17 , Study no: 58

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre	Days Use per Acre (ha)
			00	00
Rabbit	5	16	122	N/A
Horse	5	1	-	-
Elk	12	18	339	26 (65)
Deer	7	9	78	6 (15)
Cattle	-	-	35	3 (7)

BROWSE CHARACTERISTICS --

Herd unit 17 , Study no: 58

A G R E	Y	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht. Cr.		
Artemisia nova																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'95	-	1	-	-	-	-	-	-	-	1	-	-	-	20	11	20	1
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	7	11	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		50%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	40		-			
												'00	0		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4		1	2									
Artemisia tridentata vaseyana																	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	3	-	-	-	-	-	-	-	3	-	-	-	60		3	
M	82	-	1	-	-	-	-	-	-	1	-	-	-	66	12	6	1
	88	1	-	-	-	-	-	-	-	1	-	-	-	66	31	24	1
	95	2	-	-	-	-	-	-	-	2	-	-	-	40	30	46	2
	00	2	-	-	-	-	-	-	-	2	-	-	-	40	33	46	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		100%			00%			00%			+ 0%						
'88		00%			00%			00%			-39%						
'95		00%			00%			00%			+60%						
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	66	Dec:	-				
										'88	66		-				
										'95	40		-				
										'00	100		-				
Cercocarpus montanus																	
S	82	1	-	-	-	-	-	-	-	1	-	-	-	66		1	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	54	-	-	-	-	-	-	-	54	-	-	-	1080		54	
Y	82	-	2	3	-	-	-	-	-	5	-	-	-	333		5	
	88	7	-	-	-	-	-	-	-	7	-	-	-	466		7	
	95	4	-	-	-	-	-	-	-	4	-	-	-	80		4	
	00	6	1	-	-	-	-	-	-	7	-	-	-	140		7	
M	82	-	-	1	-	-	-	-	-	1	-	-	-	66	25	33	1
	88	2	-	-	-	-	-	-	-	2	-	-	-	133	44	53	2
	95	2	18	5	-	-	-	-	-	25	-	-	-	500	47	49	25
	00	4	7	-	10	3	-	-	-	18	6	-	-	480	45	47	24
D	82	-	-	1	-	-	-	-	-	-	-	1	-	66		1	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		29%			71%			14%			+22%						
'88		00%			00%			00%			- 3%						
'95		62%			17%			00%			+ 6%						
'00		35%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)										'82	465	Dec:	14%				
										'88	599		0%				
										'95	580		0%				
										'00	620		0%				

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total							
		1	2	3	4		1	2								
Chrysothamnus nauseosus																
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	-	1	-	-	-	20		1
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	1	-	-	-	-	-	-	-	1	-	-	-	20		1
	00	18	-	-	-	-	-	-	-	18	-	-	-	360		18
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-
	95	26	12	-	-	-	-	-	-	38	-	-	-	760	31	42
	00	29	-	-	-	-	-	-	-	29	-	-	-	580	23	29
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	13	-	-	-	-	-	-	-	7	-	-	6	260		13
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>								
'82		00%		00%		00%										
'88		00%		00%		00%										
'95		31%		00%		00%		+35%								
'00		00%		00%		10%										
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	0%			
										'88	0		0%			
										'95	780		0%			
										'00	1200		22%			
Chrysothamnus nauseosus hololeucus																
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	15	-	-	-	-	-	-	-	15	-	-	-	300		15
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-
	95	1	-	-	-	-	-	-	-	1	-	-	-	20	28	26
	00	31	-	-	-	-	-	-	-	31	-	-	-	620	4	5
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	-	1	-	-	-	20		1
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>								
'82		00%		00%		00%										
'88		00%		00%		00%										
'95		00%		00%		00%		+98%								
'00		00%		00%		00%										
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	0%			
										'88	0		0%			
										'95	20		0%			
										'00	940		2%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus viscidiflorus lanceolatus																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'88	1	-	-	1	-	-	-	-	-	2	-	-	-	133	6	4	
	'95	5	-	-	-	-	-	-	-	-	5	-	-	-	100	10	15	
	'00	8	1	-	-	-	-	-	-	-	9	-	-	-	180	12	22	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%			-10%							
'95		00%			00%			00%			+33%							
'00		11%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	133		-			
												'95	120		-			
												'00	180		-			
Ephedra viridis																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	21	40	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	0		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total							
		1	2	3	4		1	2								
<i>Eriogonum corymbosum</i>																
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	2	-	-	-	-	-	-	-	2	-	-	-	40		2
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	95	1	-	-	-	-	-	-	-	1	-	-	-	20	16 21	1
	00	-	2	-	-	-	-	-	-	2	-	-	-	40	15 20	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>					
'82		00%			00%			00%								
'88		00%			00%			00%								
'95		00%			00%			00%			-33%					
'00		100%			00%			00%								
Total Plants/Acre (excluding Dead & Seedlings)										'82	0	Dec:	-			
										'88	0		-			
										'95	60		-			
										'00	40		-			
<i>Gutierrezia sarothrae</i>																
S	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	14	-	-	-	-	-	-	-	14	-	-	-	280		14
	00	1	-	-	-	-	-	-	-	1	-	-	-	20		1
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	39	-	-	-	-	-	-	-	39	-	-	-	780		39
	00	10	-	-	-	-	-	-	-	10	-	-	-	200		10
M	82	9	-	-	-	-	-	-	-	9	-	-	-	600	11 19	9
	88	30	-	-	-	-	-	-	-	30	-	-	-	2000	7 4	30
	95	51	-	-	-	-	-	-	-	51	-	-	-	1020	8 8	51
	00	128	-	-	-	-	-	-	-	128	-	-	-	2560	5 4	128
D	82	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	5	-	-	-	-	-	-	-	5	-	-	-	333		5
	95	1	-	-	-	-	-	-	-	-	-	-	1	20		1
	00	-	-	-	-	-	-	-	-	-	-	-	-	0		0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>					
'82		00%			00%			00%			+74%					
'88		00%			00%			00%			-22%					
'95		00%			00%			01%			+34%					
'00		00%			00%			00%								
Total Plants/Acre (excluding Dead & Seedlings)										'82	600	Dec:	0%			
										'88	2333		14%			
										'95	1820		1%			
										'00	2760		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Juniperus osteosperma																	
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	'00	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	'00	-	-	-	1	-	-	-	-	-	1	-	-	-	20	-	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'82		00%			00%			00%									
'88		00%			00%			00%									
'95		00%			00%			00%									
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-		
												'88	0		-		
												'95	0		-		
												'00	120		-		
Leptodactylon pungens																	
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	'95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	'00	-	1	-	-	-	-	-	-	-	1	-	-	-	20	5	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>						
'82		00%			00%			00%									
'88		00%			00%			00%									
'95		00%			00%			00%									
'00		100%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-		
												'88	0		-		
												'95	0		-		
												'00	20		-		

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total						
		1	2	3	4									
Pinus edulis														
S	82	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2		2	
Y	82	1	-	-	-	-	-	-	-	-	66		1	
	88	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	1	-	-	-	3		3	
M	82	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	-	-	0	-	0	
	00	2	-	-	1	-	-	-	-	-	3	-	3	
X	82	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>						
'82		00%		00%		100%		+ 0%						
'88		00%		00%		00%								
'95		00%		00%		00%								
'00		00%		00%		00%								
Total Plants/Acre (excluding Dead & Seedlings)										'82	66	Dec:	-	
										'88	66		-	
										'95	0		-	
										'00	120		-	
Purshia tridentata														
Y	82	1	-	-	-	-	-	-	-	-	66		1	
	88	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	0		0	
M	82	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	1	-	-	-	-	-	-	-	66	8	6	1
	95	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	1	-	-	-	-	-	1	42	23	1
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>						
'82		00%		00%		00%		+ 0%						
'88		100%		00%		00%								
'95		00%		00%		00%								
'00		100%		00%		00%								
Total Plants/Acre (excluding Dead & Seedlings)										'82	66	Dec:	-	
										'88	66		-	
										'95	0		-	
										'00	20		-	

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Sambucus cerulea																		
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	'88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	0	61	64	0	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	0	46	53	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
	'82	00%			00%			00%										
	'88	00%			00%			00%										
	'95	00%			00%			00%										
	'00	00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	0		-			

Trend Study 17-59-00

Study site name: Emma Park.

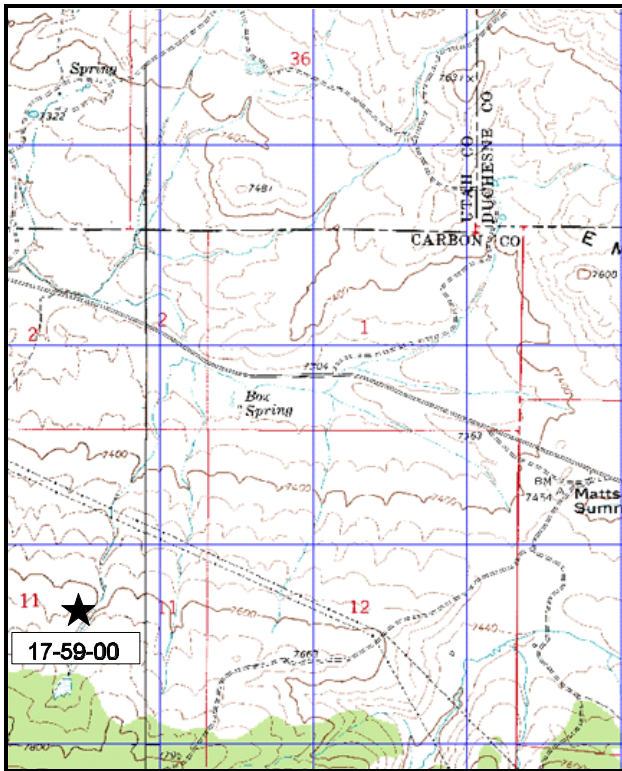
Range type: Big Sagebrush.

Compass bearing: frequency baseline 186°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

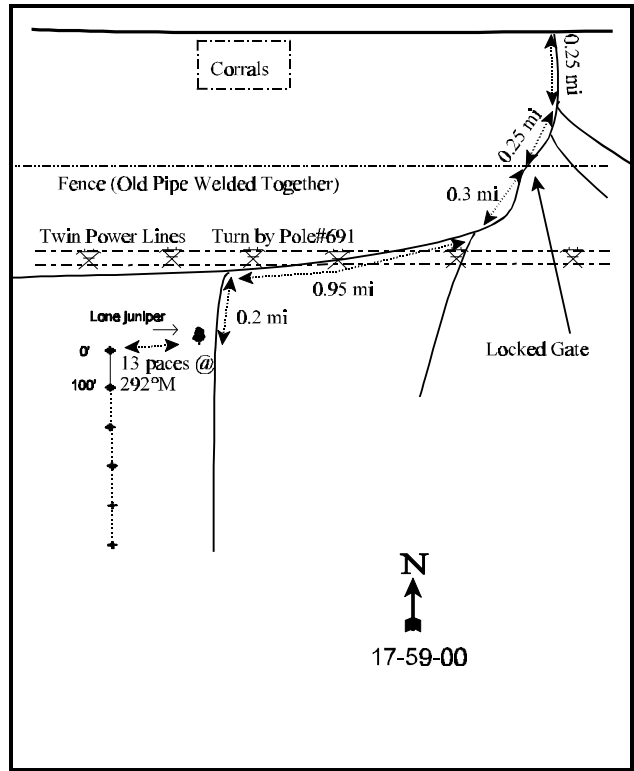
LOCATION DESCRIPTION

Traveling south on Highway 6 take a left on the road that leads to Kyune and travel 5.75 miles. Turn right and go 0.25 miles. Veer right for 0.15 miles to a fork. Continue right for 0.1 miles to a locked gate. Go through the gate for 0.3 miles. Veer right and go 0.95 miles following the power lines. Turn left for 0.2 miles to a high lined juniper. The 0 foot stake is 13 paces away @ 292°M.



Map Name: Kyune

Township 12S, Range 9E, Section 11



Diagrammatic Sketch

UTM. 4405280.754 N, 510327.007 E

DISCUSSION

Trend Study No. 17-59 (32-19)

The Emma Park study site was established in 1994 and was selected because of the perceived increase of winter use by elk in the area. It is located on one of the many moderately north sloping ridges in the area that drain into Horse Creek, which in turn drains southwest into the Price River. The elevation of the site is about 7,400 feet. The site is located within the sagebrush-grass type. Species diversity is very high with 56 species found on the inventoried transects. Deer appear to be using this area as transitional and summer range. Deer were seen on site during the 2000 reading. Quadrat frequency of elk and deer pellet groups was fairly high in 1994 at 25% and 19% respectively. Perhaps due to the mild winter of 1999-2000, quadrat frequency of elk and deer pellet groups dropped to 6% and 8%. A pellet group transect read along the study site baseline in 2000 estimates 13 elk, 15 deer and 20 cow days use/acre (32 edu/ha, 37 ddu/ha and 50 cdu/ha). Cattle use the area during the summer as part of the Price Canyon East allotment which is used by 108 cattle from May 17 to November 15. Rabbit pellets were also common.

Soil on the site is moderately deep with an effective rooting depth estimated at just over 14 inches. The soil has a clay loam texture and a neutral soil reaction (pH of 7.0). Small rocks are common on the surface and within the profile in some areas, but the soil is deeper and relatively rock free in areas where soil has accumulated over time. Rocky areas support far fewer and smaller shrubs, while the deeper soil along the end of the baseline supports very large and robust sagebrush. There is little current evidence of erosion, but historically the area exhibits signs of heavy soil loss.

Nine species of shrubs were sampled on the site in 2000. Mountain big sagebrush is the dominant shrub with a density of 4,640 plants/acre in 1994 and 4,600 in 2000. It provides an average of 72% of the total browse cover with a cover value of 22% in 1994 and 19% in 2000. In areas with deeper soil, some of the sagebrush appears to be basin big sagebrush (*Artemisia tridentata tridentata*). These plants are very tall and robust with a height of 5 feet and a crown of nearly 4 feet. Most of the sagebrush sampled are considered to be mountain big sagebrush (*Artemisia tridentata vaseyana*) although there appears to be some hybridizing between the two subspecies. Use of the sagebrush is mostly light and vigor good. Percent decadence is low and reproduction good. The high cover of sagebrush combined with grazing pressure appears to be suppressing the herbaceous understory to some extent. At this elevation, open areas should produce much more abundant grass and forb cover.

Other desirable shrubs include some moderate to heavy browsed serviceberry and a few scattered heavily hedged bitterbrush. Stickyleaf low rabbitbrush and Oregon grape are abundant understory shrubs. They are unutilized and appear to have stable, mostly mature populations.

The herbaceous understory is moderately abundant and diverse. It contributed 34% of the total vegetative cover in 1994 and 43% in 2000. More than half of this cover is made up by forbs. The herbaceous species could provide good transition range forage in the fall and spring. Salina wildrye, thickspike wheatgrass, Letterman needlegrass, Kentucky bluegrass and mutton bluegrass are all fairly abundant. It appears that most of the thickspike was misidentified as Salina wildrye in 1994 and Kentucky bluegrass was misidentified as mutton bluegrass. Kentucky bluegrass appeared to be heavily utilized in 2000.

Forbs are diverse with several preferred species sampled. The most common species is desert phlox which provided 46% of the forb cover in 2000. Looseleaf milkvetch and lobeleaf groundsel are also abundant.

1994 APPARENT TREND ASSESSMENT

The soil appears stable because of excellent vegetative cover, good litter cover and a low percentage of bare ground. The browse also appears stable with good vigor and productivity. The herbaceous understory is abundant and diverse with good species diversity and excellent cover values.

2000 TREND ASSESSMENT

Trend for soil is stable with abundant vegetation and litter cover to provide adequate protection from erosion. Trend for the key browse, mountain big sagebrush is also stable. Population density is not changed but the number of decadent plants has declined. Use is mostly light to moderate, vigor is good and reproduction adequate to maintain the stand. Trend for the herbaceous understory is up slightly due to an increase in the sum of nested frequency of grasses and forbs. A reduction in sagebrush cover would further increase production of the herbaceous understory.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - up slightly (4)

HERBACEOUS TRENDS --

Herd unit 17 , Study no: 59

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'94	'00	'94	'00	'94	'00
G	Agropyron dasystachyum	8	*101	4	35	.21	1.11
G	Bromus anomalus	6	7	2	3	.01	.04
G	Bromus tectorum (a)	3	9	1	3	.00	.09
G	Carex spp.	9	*46	3	18	.18	.72
G	Elymus salina	242	*86	74	26	5.72	2.36
G	Koeleria cristata	-	1	-	1	-	.03
G	Poa fendleriana	132	*85	45	29	.90	1.50
G	Poa secunda	-	12	-	4	-	.07
G	Poa pratensis	-	*111	-	31	-	2.58
G	Stipa lettermani	32	*70	12	32	.28	1.19
Total for Annual Grasses		3	9	1	3	0.00	0.08
Total for Perennial Grasses		429	519	140	179	7.31	9.63
Total for Grasses		432	528	141	182	7.32	9.72
F	Achillea millefolium	34	*61	14	24	.17	.73
F	Antennaria parvifolia	3	*23	2	10	.06	.32
F	Androsace septentrionalis (a)	2	6	1	3	.00	.01
F	Arabis drummondi	12	*3	6	1	.03	.00
F	Aster chilensis	33	*15	9	5	.14	.19

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'94	'00	'94	'00	'94	'00
		F	<i>Astragalus convallarius</i>	25	*5	14	3
F	<i>Astragalus tenellus</i>	60	77	28	33	1.14	.57
F	<i>Astragalus</i> spp.	9	-	3	-	.06	-
F	<i>Astragalus utahensis</i>	-	*6	-	4	-	.07
F	<i>Castilleja linariaefolia</i>	7	3	3	1	.16	.00
F	<i>Calochortus nuttallii</i>	3	-	1	-	.00	-
F	<i>Chenopodium album</i> (a)	1	-	1	-	.00	-
F	<i>Chaenactis douglasii</i>	7	6	3	5	.01	.05
F	<i>Cirsium</i> spp.	-	2	-	1	-	.00
F	<i>Comandra pallida</i>	14	*39	6	16	.03	.25
F	<i>Collinsia parviflora</i> (a)	44	*-	19	-	.19	-
F	<i>Crepis acuminata</i>	3	-	2	-	.41	-
F	<i>Erigeron eatonii</i>	65	*34	26	13	.42	.14
F	<i>Erigeron flagellaris</i>	1	4	1	2	.00	.01
F	<i>Eriogonum umbellatum</i>	3	4	1	2	.03	.06
F	<i>Gayophytum ramosissimum</i> (a)	3	2	1	1	.00	.00
F	<i>Gilia</i> spp. (a)	2	-	2	-	.01	-
F	<i>Hedysarum boreale</i>	-	3	-	1	-	.03
F	<i>Helianthella uniflora</i>	1	24	1	10	.00	.37
F	<i>Ipomopsis aggregata</i>	-	2	-	1	-	.00
F	<i>Lomatium</i> spp.	-	2	-	1	-	.00
F	<i>Lupinus argenteus</i>	35	35	14	17	.21	.59
F	<i>Lychnis drummondii</i>	1	6	1	2	.00	.41
F	<i>Machaeranthera canescens</i>	5	-	3	-	.01	-
F	<i>Orthocarpus</i> spp. (a)	-	1	-	1	-	.00
F	<i>Penstemon caespitosus</i>	13	24	5	9	.07	.19
F	<i>Penstemon humilis</i>	11	13	5	4	.10	.04
F	<i>Penstemon watsonii</i>	23	19	9	10	.41	.20
F	<i>Phlox austromontana</i>	142	156	43	49	3.72	5.16
F	<i>Phlox longifolia</i>	3	1	1	1	.00	.00
F	<i>Polygonum douglasii</i> (a)	10	-	5	-	.02	-
F	<i>Potentilla gracilis</i>	4	*11	2	7	.01	.08
F	<i>Schoenrambe linifolia</i>	2	2	1	2	.00	.01
F	<i>Senecio integerrimus</i>	9	8	5	4	.03	.07
F	<i>Senecio multilobatus</i>	15	*103	8	43	.04	1.37

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'94	'00	'94	'00	'94	'00
F	<i>Sphaeralcea coccinea</i>	3	-	1	-	.00	-
F	<i>Taraxacum officinale</i>	6	*31	3	11	.01	.18
F	<i>Thalictrum fendleri</i>	3	8	2	3	.06	.06
F	<i>Zigadenus paniculatus</i>	1	-	1	-	.00	-
Total for Annual Forbs		62	9	29	5	0.24	0.02
Total for Perennial Forbs		556	730	224	295	7.70	11.31
Total for Forbs		618	739	253	300	7.94	11.34

* Indicates significant difference at $\alpha = 0.10$

BROWSE TRENDS --

Herd unit 17 , Study no: 59

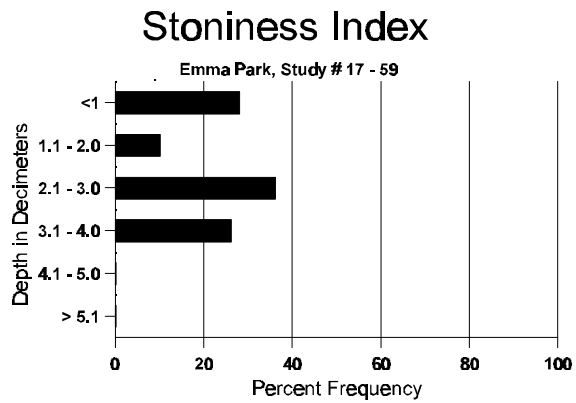
Type	Species	Strip Frequency		Average Cover %	
		'94	'00	'94	'00
B	<i>Amelanchier utahensis</i>	9	8	.18	.33
B	<i>Artemisia tridentata tridentata</i>	0	3	-	.68
B	<i>Artemisia tridentata vaseyana</i>	88	93	21.89	19.21
B	<i>Cercocarpus montanus</i>	1	0	.03	-
B	<i>Chrysothamnus depressus</i>	4	8	.19	.27
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	74	64	3.73	4.61
B	<i>Gutierrezia sarothrae</i>	3	4	.00	.03
B	<i>Mahonia repens</i>	22	23	.65	1.06
B	<i>Purshia tridentata</i>	0	1	-	-
B	<i>Ribes spp.</i>	0	1	-	-
B	<i>Rosa woodsii</i>	3	3	.00	.03
B	<i>Symphoricarpos oreophilus</i>	28	24	2.66	2.14
B	<i>Tetradymia canescens</i>	1	2	-	.00
Total for Browse		233	234	29.34	28.37

BASIC COVER --
Herd unit 17 , Study no: 59

Cover Type	Nested Frequency		Average Cover %	
	'94	'00	'94	'00
Vegetation	413	430	43.04	50.81
Rock	212	134	5.51	6.91
Pavement	143	206	1.48	7.57
Litter	481	469	47.61	59.09
Cryptogams	66	30	.60	1.20
Bare Ground	303	230	14.02	18.48

SOIL ANALYSIS DATA --
Herd Unit 17, Study # 59, Study Name: Emma Park

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
14.44	49.2 (14.88)	7.0	29.4	31.1	39.3	4.0	10.6	137.6	0.8



PELLET GROUP FREQUENCY --

Herd unit 17 , Study no: 59

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'94	'00	00	00
Rabbit	16	24	292	N/A
Moose	2	-	-	-
Elk	25	6	165	13 (31)
Deer	19	8	191	15 (36)
Cattle	6	2	244	20 (50)

BROWSE CHARACTERISTICS --

Herd unit 17 , Study no: 59

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Amelanchier utahensis																		
Y	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	2	3	-	-	-	-	-	-	-	4	-	1	-	100			5
M	94	3	-	3	1	-	-	-	-	-	5	-	1	1	140	16	11	7
	00	-	1	-	1	-	1	1	-	-	3	-	1	-	80	15	17	4
D	94	-	-	-	-	1	1	-	-	-	2	-	-	-	40			2
	00	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1
X	94	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'94		10%			40%			20%			+ 0%							
'00		40%			10%			30%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	200	Dec:	20%			
												'00	200		10%			
Artemisia tridentata tridentata																		
M	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	2	-	-	-	-	-	-	1	-	3	-	-	-	60	61	45	3
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'94		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	0	Dec:	-			
												'00	60		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Artemisia tridentata vaseyana</i>																		
S	94	-	-	-	1	-	-	-	-	-	1	-	-	-	40		2	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
Y	94	24	-	-	2	-	-	-	-	-	26	-	-	-	520		26	
	00	39	-	-	-	-	-	-	-	-	39	-	-	-	780		39	
M	94	129	16	-	4	-	-	-	-	-	148	1	-	-	2980	28 34	149	
	00	118	34	-	13	-	-	-	-	-	165	-	-	-	3300	28 35	165	
D	94	51	2	3	1	-	-	-	-	-	42	3	-	12	1140		57	
	00	21	5	-	-	-	-	-	-	-	16	-	-	10	520		26	
X	94	-	-	-	-	-	-	-	-	-	-	-	-	-	720		36	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	580		29	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'94		08%			01%			05%			- 1%							
'00		17%			00%			04%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	4640	Dec:	25%			
												'00	4600		11%			
<i>Cercocarpus montanus</i>																		
M	94	-	1	-	-	-	-	-	-	-	-	-	-	1	20	9 12	1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'94		100%			00%			100%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	20	Dec:	-			
												'00	0		-			
<i>Chrysothamnus depressus</i>																		
M	94	5	1	-	3	-	-	-	-	-	9	-	-	-	180	4 10	9	
	00	14	1	-	-	-	-	-	-	-	15	-	-	-	300	3 7	15	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'94		11%			00%			00%			+40%							
'00		07%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	180	Dec:	-			
												'00	300		-			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Chrysothamnus viscidiflorus viscidiflorus</i>																		
Y	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	5	-	-	2	-	-	-	-	-	7	-	-	-	140		7	
M	94	198	-	-	31	-	-	9	-	-	237	-	-	1	4760	11	13	238
	00	166	1	-	16	-	-	3	-	-	186	-	-	-	3720	9	13	186
D	94	1	-	-	1	-	-	-	-	-	1	-	-	1	40		2	
	00	7	-	-	-	-	-	-	-	-	6	-	-	1	140		7	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'94		00%			00%			.83%			-17%							
'00		.50%			00%			.50%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	4800	Dec:	1%			
												'00	4000		4%			
<i>Gutierrezia sarothrae</i>																		
Y	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	94	4	-	-	-	-	-	-	-	-	4	-	-	-	80	6	9	4
	00	12	-	-	-	-	-	-	-	-	12	-	-	-	240	4	7	12
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'94		00%			00%			00%			+50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	120	Dec:	-			
												'00	240		-			
<i>Mahonia repens</i>																		
Y	94	27	-	-	8	-	-	-	-	-	35	-	-	-	700		35	
	00	48	-	-	1	-	-	-	-	-	49	-	-	-	980		49	
M	94	167	-	-	11	-	-	-	-	-	178	-	-	-	3560	3	4	178
	00	205	-	-	24	-	-	41	-	-	270	-	-	-	5400	3	4	270
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'94		00%			00%			00%			+33%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	4260	Dec:	-			
												'00	6380		-			

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Purshia tridentata</i>																		
M	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	17	30	0
	00	-	-	2	-	-	-	-	-	-	2	-	-	-	40	20	50	2
X	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'94		00%			00%			00%										
'00		00%			100%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	0	Dec:	-			
												'00	40		-			
<i>Ribes spp.</i>																		
Y	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'94		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	0	Dec:	-			
												'00	20		-			
<i>Rosa woodsii</i>																		
Y	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	94	5	-	-	2	-	-	-	-	-	7	-	-	-	140	7	7	7
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	19	8	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'94		00%			00%			00%			-43%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	140	Dec:	-			
												'00	80		-			
<i>Symphoricarpos oreophilus</i>																		
Y	94	-	-	-	6	-	-	-	-	-	6	-	-	-	120			6
	00	8	-	-	1	-	-	-	-	-	8	-	1	-	180			9
M	94	48	3	1	10	-	-	2	-	-	64	-	-	-	1280	18	25	64
	00	18	1	-	18	-	-	-	-	-	37	-	-	-	740	15	17	37
D	94	-	1	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'94		06%			01%			00%			-35%							
'00		02%			00%			02%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	1420	Dec:	1%			
												'00	920		0%			

A G R E	Y R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Tetradymia canescens																		
Y	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'00	2	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
M	94	-	-	-	-	-	-	-	-	-	-	-	-	0	4	4	0	
	'00	2	-	-	-	-	-	-	-	-	-	-	-	40	-	-	2	
D	94	-	2	-	-	-	-	-	-	-	-	-	2	40			2	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'94		100%			00%			100%			+50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	40	Dec:	100%			
												'00	80		0%			

SUMMARY

DEER HERD UNIT - 17 (13 & 14) - WASATCH MOUNTAINS

The portion of Wildlife Management Unit 17 read in 2000 contains the old deer herd units 13 - Currant Creek and 14 - Avintaquin. There are a total of 12 trend studies, 6 from the Currant Creek portion and 5 from the Avintaquin. One trend study was established at Emma Park which is on the south end of Unit 17 just north of U.S.-6. All trend studies in the Currant Creek and Avintaquin units were established in 1982 and reread in 1988, 1995 and 2000. In 2000, two studies, Blacktail Ridge (17-48) and Sam's Canyon (17-56) were not read because access roads were impassible for trucks.

The Currant Creek trend studies read in 2000 sample winter ranges, 4 Wyoming big sagebrush sites at Grey Wolf Mountain (17-49), Lower Santaquin Draw (17-50), Santaquin's Cabin (17-51) and Two Bar Ranch (17-53) and one mountain big sagebrush area at Cutoff (17-52). Browse trends are stable on all sites. Herbaceous trends are slightly down at Grey Wolf Mountain, Santaquin's Cabin and Cutoff.

The Avintaquin trend studies read in 2000 sample 4 winter range sites. One trend study samples a pinyon-juniper site at Peatross Ranch (17-54). There are two trend studies on pinyon-juniper chainings at Skitzzy Canyon (17-57) and Buck Knoll (17-58) and one study on a mountain brush site at Lower Horse Ridge (17-55). Browse trends are stable on all sites except for Skitzzy Canyon which displays a slightly upward browse trend. Browse are still in low numbers on this chaining but they are increasing. Herbaceous trends are stable at Peatross Ranch and Skitzzy Canyon but slightly down at Lower Horse Ridge and down at Buck Knoll.

TREND SUMMARY

	Category	1982	1988	1995	2000
Blacktail Ridge 17-48	soil	est	5	3	NR
	browse	est	1	4	NR
	herbaceous understory	est	5	2	NR
Grey Wolf Mountain 17-49	soil	est	3	3	4
	browse	est	5	3	3
	herbaceous understory	est	4	4	2
Lower Santaquin Draw 17-50	soil	est	3	4	3
	browse	est	3	4	3
	herbaceous understory	est	5	4	3
Santaquin's Cabin 17-51	soil	est	2	4	3
	browse	est	2	3	3
	herbaceous understory	est	3	4	2
Cutoff 17-52	soil	est	3	4	3
	browse	est	2	3	3
	herbaceous understory	est	4	4	2

(1) = down, (2) = slightly down, (3) = stable, (4) = slightly up, (5) = up
 est = site established, NA = data not available, NR = site not read

	Category	1982	1988	1995	2000
Two Bar Ranch 17-53	soil	est	1	5	2
	browse	est	5	3	3
	herbaceous understory	est	3	4	3
Peatross Ranch 17-54	soil	est	2	4	3
	browse	est	4	3	3
	herbaceous understory	est	4	1	3
Lower Horse Ridge 17-55	soil	est	4	3	3
	browse	est	5	3	3
	herbaceous understory	est	5	3	2
Sam's Canyon 17-56	soil	est	3	3	NR
	browse	est	3	5	NR
	herbaceous understory	est	3	3	NR
Skitz Canyon 17-57	soil	est	2	4	3
	browse	est	4	4	4
	herbaceous understory	est	4	3	3
Buck Knoll 17-58	soil	est	3	3	2
	browse	est	4	3	3
	herbaceous understory	est	4	3	1
Emma Park 17-59	soil			est	3
	browse			est	3
	herbaceous understory			est	4

(1) = down, (2) = slightly down, (3) = stable, (4) = slightly up, (5) = up
est = site established, NA = data not available, NR = site not read

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