

GEERTSEN CANYON - TREND STUDY NO. 3-18-11

Vegetation Type: Mountain Big Sagebrush

Range Type: Crucial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: [Mountain Gravelly Loam \(Mountain Big Sagebrush\), R047XA406UT](#)

Land Ownership: DWR

Elevation: 5,600 ft (1,707 m)

Aspect: Southwest

Slope: 25%

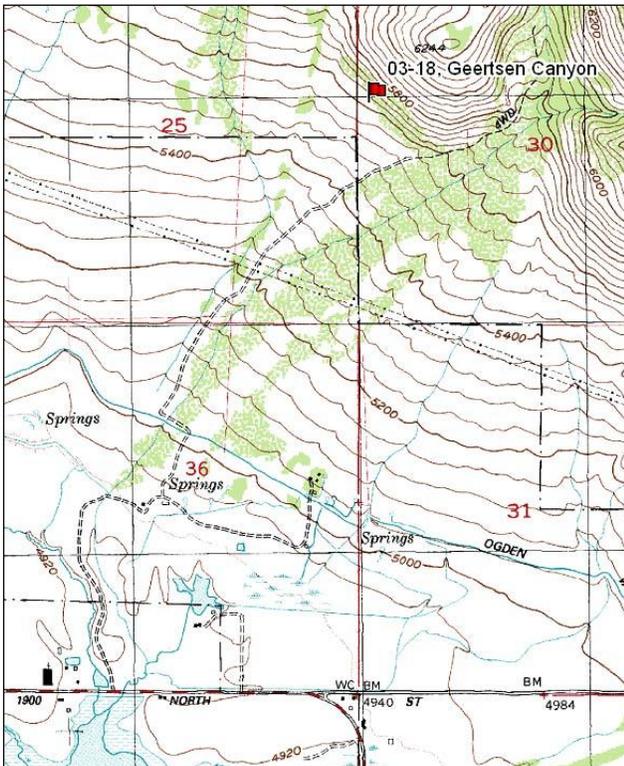
Transect bearing: 161° magnetic

Belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (71ft), line 4 (59ft). Rebar: belt 1 on 1ft., belt 2 on 0ft., belt 3 on 2ft., belt 5 on 3ft. No rebar on belt 4.

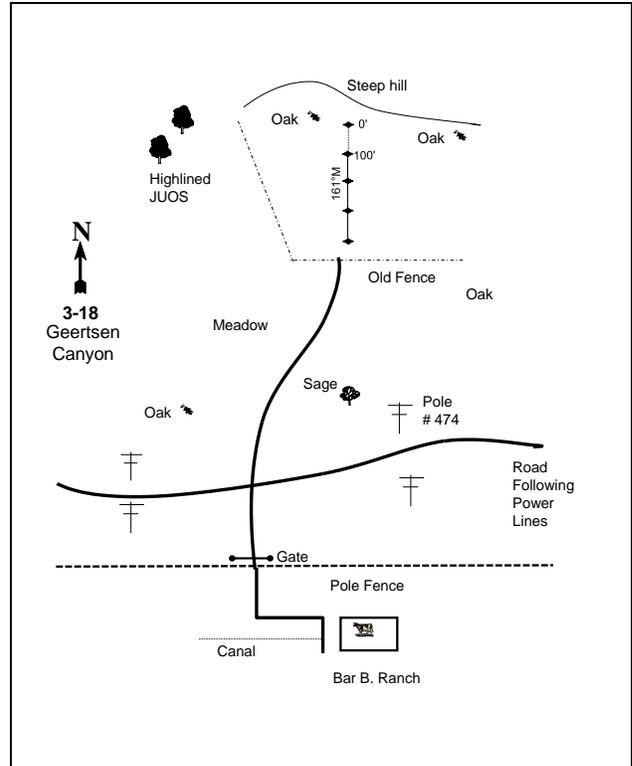
Directions:

From the intersection of 5500 East and 2200 North in Eden, go south for 0.35 miles, then turn left and go 0.75 miles east to the Huntsville Stake Center. Continue east 0.2 miles to the gate of Bar B Ranch. Turn left through the gate and go 0.9 miles north up the ranch road past a farm house on the left to another gate. Park here and walk through this gate 0.2 miles to a road along a canal. Turn left and walk 0.1 miles north to a dirt road, then turn right and go 0.55 miles to the high tension power lines. Just to the east is power pole # 474. From pole 474, walk 1/3 of a mile at 11 degrees magnetic to the 0-foot baseline stake. The 0-foot baseline is marked by a 4-foot rebar stake (tagged #7026) located 100 feet down from the oak edge and 100 feet southwest of a large maple. The baseline runs 161 degrees magnetic.

Map Name: Huntsville



Diagrammatic Sketch:



Township: 7N Range: 2E Section: 30

GPS: NAD 83, UTM 12S 434988 E 4574173 N

Site Information

Site Description: The study samples a mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and grass community located on a hillside north of the mouth of Geertsen Canyon. The study is located within the Wolf Creek conservation easement that is managed by the Division of Wildlife Resources (DWR) for wildlife and recreation. The Geertsen Hollow area is known for concentrations of wintering deer. The permanent nearby pellet group transect has measured high levels of use in the past. The average from 1980-85 was 39 deer days use/acre (97 ddu/ha), the highest on the herd unit (Jense et al. 1985). Two deer antlers and one large elk antler were found during the 1985 reading. Deer pellet groups were sampled in low abundance in 2001 and 2011, with moderate abundance in 2001. Elk pellet groups have been sampled in low abundance since 2001. A small herd of elk were on the site when it was read in 2011. The area has been heavily grazed by horses and cattle in the past, but sampled livestock sign has been low since 2001 (Table - Pellet Group Data). Wild turkeys were seen on the hike into the study in 2001.

Browse: Browse species are not a major component on the site, and provide limited forage. Mountain big sagebrush is the only key browse species, and sagebrush cover has ranged from just 2% to 3% since 1996 (Table - Browse Trends). The sagebrush population is comprised of a low density stand, with a rather prostrate growth form. Density has steadily decreased since 1996. Recruitment of young sagebrush plants was high at the outset of the study, but has been poor since 2001. Sagebrush recruitment may be difficult with the shallow, rocky soils, and with competition from weedy annuals. Utilization has been light to moderate over the course of the study. Decadence of sagebrush was high in 1990, moderate in 2006, but low in the other sample years. Poor vigor was high in 1990 and 2006, but has been low in the other sample years (Table - Browse Characteristics). Gambel oak (*Quercus gambelii*) and bigtooth maple (*Acer grandidentatum*) are found further up the slope and along the creek. Some of the oak and Utah juniper (*Juniperus osteosperma*) nearby have been high-lined.

Herbaceous Understory: The herbaceous vegetation accounts for most of the cover on the site, but composition is extremely poor with weedy species dominating the site. The weedy grass species bulbous bluegrass (*Poa bulbosa*) has been the most abundant species on the site since 1985. This species alone has accounted for more than 40% of the total vegetation cover since 1996. Other, more high-yielding, long-lived perennial species are few in abundance. These include bluebunch wheatgrass (*Agropyron spicatum*), thickspike wheatgrass (*A. dasystachyum*), Kentucky bluegrass (*Poa pratensis*), and Letterman needlegrass (*Stipa lettermani*). The annual species Japanese chess (*Bromus japonicus*) has been very abundant since 1996, but cheatgrass (*B. tectorum*) has been far less common. Forb composition is extremely poor. Many of the common forbs are considered weedy, although they may provide some big game forage in the spring. Weedy increasers include ragweed (*Ambrosia psilostachya*), pacific aster (*Aster chilensis*), storksbill (*Erodium cicutarium*), tarweed (*Madia glomerata*), curlycup gumweed (*Grindelia squarrosa*), yellow salsify (*Tragopogon dubius*), and moth mullen (*Verbascum blattaria*). The noxious weed dyer's woad (*Isatis tinctoria*) has been sampled in several sample years, but is present in small numbers (Table - Herbaceous Trends). It was reported in the summer of 1985 that caterpillars and grasshoppers did considerable damage to the herbaceous vegetation. In 1996, some of the yellow salsify was utilized, most likely by elk.

Soil: The soil is in the Yeates Hollow series, which occurs on alluvial fans, benches, and mountainsides. Parent material consists of colluvium and/or slope alluvium over residuum weathered from conglomerate. These soils are classified as deep, well drained, and slightly permeable (Soil Survey Staff 2011). The soil has a sandy clay loam to clay loam texture and is slightly acidic in reactivity (pH 6.2) (Table - Soil Analysis Data). Soils are extremely rocky on the surface and throughout the profile. Bare ground cover is low with a high amount of vegetation cover (Table - Basic Cover). The soil erosion condition has been classified as stable since 2001.

Trend Assessments

Browse:

- **1984 to 1990 - down (-2):** Density of mountain big sagebrush decreased 43% from 1,998 plants/acre to 1,132 plants/acre. Decadence increased from 10% to 77%, and poor vigor increased from 3% to 71%. Recruitment of young plants decreased from 27% to 12% of the population.
- **1990 to 1996 - up (+2):** Differences in density may be related to the larger sample area used in 1996; therefore, trend was determined using other parameters. Decadence of sagebrush decreased to 6%, and poor vigor decreased to 6%. Most of the sampled population were young plants, which comprised 61% of the population.
- **1996 to 2001 - down (-2):** Mountain big sagebrush density decreased 45% from 1,860 plants/acre to 1,020 plants/acre, though cover remained similar at around 3%. Most of the decrease in density was due to a substantial decrease in the recruitment of young plants, which was 0%. Decadence increased slightly to 16%, but poor vigor remained the same at 6%.
- **2001 to 2006 - slightly down (-1):** There was a small decrease in density of sagebrush to 980 plants/acre, and cover decreased to 2%. Decadence increased to 35%, and poor vigor increased to 41%. Recruitment of young plants remained low at just 4% of the population.
- **2006 to 2011 - down (-2):** Density of mountain big sagebrush decreased by 31% to 680 plants/acre, but cover increased to 3%. Decadence decreased to 12%, and poor vigor decreased to 15%. There was no new recruitment of young plants.

Grass:

- **1984 to 1990 - stable (0):** Perennial grasses, excluding bulbous bluegrass, are very rare on the site. The site is dominated by the weedy species bulbous bluegrass.
- **1990 to 1996 - stable (0):** There was an increase in the sum of nested frequency of perennial grasses, excluding bulbous bluegrass, but desirable perennial grasses remained rare and bulbous bluegrass continued to dominate the site.
- **1996 to 2001 - stable (0):** Perennial grasses, excluding bulbous bluegrass, remained rare on the site. Nested frequency of the weedy species bulbous bluegrass remained similar, but cover increased from 32% to 43%. There was a significant decrease in the nested frequency of the annual grass Japanese chess, and cover of annual grasses decreased from 8% to 3%.
- **2001 to 2006 - stable (0):** There was a slight increase in the sum of nested frequency or cover of perennial grasses, excluding bulbous bluegrass, and cover increased from 1% to 2%. However, desirable perennial grass species remained rare. Japanese chess increased significantly in nested frequency, and annual grass cover increased to 6%.
- **2006 to 2011 - stable (0):** The sum of nested frequency of perennial grasses, excluding bulbous bluegrass increased slightly, and cover increased to 3%. However, desirable perennial grass species are still a minor component. Bulbous bluegrass nested frequency remained similar, but cover decreased from 42% to 31%. This weedy species remained dominant on the site. There was a significant decrease in the nested frequency of Japanese chess, and annual grass cover decreased to 4%.

Forb:

- **1984 to 1990 - stable (0):** The sum of nested frequency of perennial forbs decreased 48%. However, much of the decrease was due to a decrease in weedy species with a significant decrease in the nested frequency of ragweed, and a large decrease in the nested frequency of pacific aster.
- **1990 to 1996 - slightly down (-1):** The perennial forb sum of nested frequency increased nearly three-fold, but the increase was almost entirely due to increases in the nested frequency of weedy species.
- **1996 to 2001 - slightly up (+1):** There was a 43% decrease in the sum of nested frequency of perennial forbs, and cover decreased from 11% to 7%. Most of the decrease is due to decreases in

weedy species. However, annual and perennial weedy species continue to dominate the forb component.

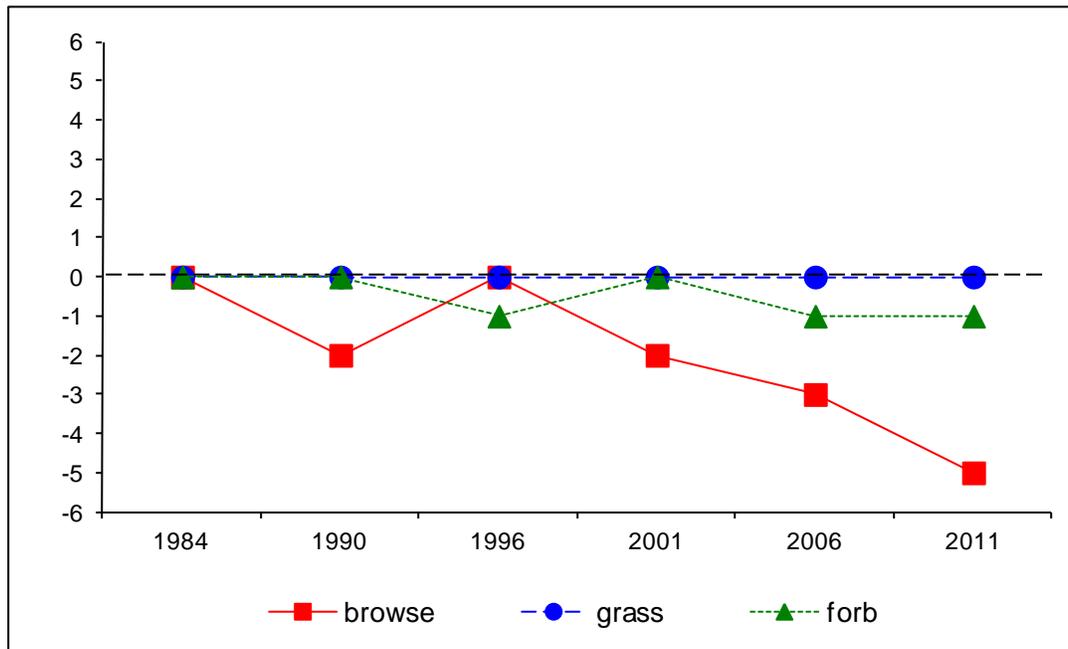
- **2001 to 2006 - slightly down (-1):** The sum of nested frequency of perennial forbs increased 54%, and cover increased to 22%. Increases in weedy species provided these increases.
- **2006 to 2011 - stable (0):** There was little change in the sum of nested frequency of perennial forbs, and cover remained similar at 21%. Weedy annual and perennial forb species continue to dominate the site.

DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --
Management unit 3, study no: 18

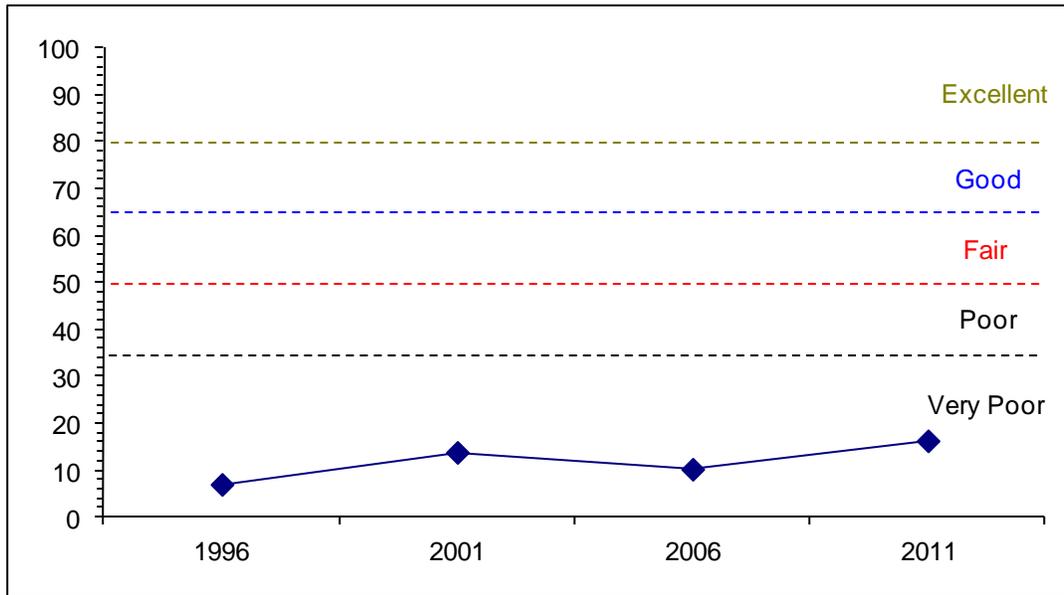
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover (-POBU)	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
96	2.8	0.0	0.0	2.4	-6.2	10.0	-2.0	7.0	Very Poor
01	3.6	0.0	0.0	2.8	-2.6	10.0	0.0	13.8	Very Poor
06	2.4	0.0	0.0	4.2	-4.3	10.0	-2.0	10.2	Very Poor
11	3.7	0.0	0.0	5.4	-2.8	10.0	0.0	16.3	Very Poor

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 3 Study no: 18



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL--
Management unit 3, Study no: 18



HERBACEOUS TRENDS--
Management unit 03, Study no: 18

Type	Species	Nested Frequency						Average Cover %			
		'85	'90	'96	'01	'06	'11	'96	'01	'06	'11
G	Agropyron dasystachyum	3	-	1	-	2	2	.00	-	.00	.03
G	Agropyron spicatum	-	11	2	5	8	6	.18	.44	.59	.09
G	Bromus inermis	-	-	-	-	5	5	-	-	.18	.03
G	Bromus japonicus (a)	-	-	c328	a211	b269	a216	8.00	3.34	5.65	3.07
G	Bromus tectorum (a)	-	-	a29	a9	ab25	b62	.29	.07	.11	.69
G	Danthonia californica	-	-	-	4	4	16	-	.06	.18	.40
G	Danthonia unispicata	-	-	-	-	4	4	-	-	.15	.04
G	Juncus sp.	-	-	-	-	-	3	-	-	-	.03
G	Melica bulbosa	-	-	-	-	4	-	-	-	.03	-
G	Poa bulbosa	366	355	365	361	354	357	32.20	42.65	41.71	31.01
G	Poa pratensis	a-	a-	a5	b15	ab11	a3	.03	.08	.06	.38
G	Poa secunda	5	14	14	18	10	8	.02	.40	.12	.04
G	Stipa lettermani	a-	a-	a28	a11	a18	b46	.96	.42	.74	1.64
Total for Annual Grasses		0	0	357	220	294	278	8.29	3.42	5.77	3.76
Total for Perennial Grasses		374	380	415	414	420	450	33.41	44.06	43.79	33.71
Total for Grasses		374	380	772	634	714	728	41.71	47.48	49.57	37.48
F	Achillea millefolium	a12	ab13	b32	ab14	a7	a1	.38	.31	.51	.03
F	Agoseris glauca	a1	a5	a3	a1	ab6	b20	.00	.00	.05	.17
F	Allium sp.	ab12	a-	a-	a-	a2	b17	-	-	.00	.05
F	Ambrosia psilostachya	b97	a11	b125	b102	c239	c254	2.45	1.58	9.12	14.55
F	Arabis sp.	-	-	-	-	-	3	-	-	-	.00
F	Artemisia ludoviciana	39	24	35	41	24	36	.79	1.74	1.08	.95
F	Aster chilensis	ab171	a121	b199	ab170	b205	b203	4.63	3.09	7.36	3.56

Type	Species	Nested Frequency					Average Cover %				
		'85	'90	'96	'01	'06	'11	'96	'01	'06	'11
F	<i>Astragalus beckwithii</i>	-	-	-	-	3	-	-	-	.18	-
F	<i>Calochortus nuttallii</i>	a-	a-	a-	a-	a-	b5	-	.00	-	.01
F	<i>Cirsium</i> sp.	-	-	2	-	-	-	.00	-	-	-
F	<i>Collomia linearis</i> (a)	-	-	10	6	1	-	.21	.04	.03	-
F	<i>Comandra pallida</i>	-	-	-	3	-	-	-	.03	-	-
F	<i>Crepis acuminata</i>	-	-	-	-	-	-	-	.03	-	-
F	<i>Epilobium brachycarpum</i> (a)	-	-	a-	b41	c163	b47	-	.10	1.10	.25
F	<i>Erigeron strigosus</i>	10	-	3	10	3	11	.03	.05	.15	.09
F	<i>Eriogonum umbellatum</i>	-	1	-	-	-	-	-	-	-	-
F	<i>Erodium cicutarium</i> (a)	b19	a-	b29	e301	c176	d216	.23	16.00	1.84	3.65
F	<i>Galium</i> sp.	-	-	-	-	2	3	-	-	.00	.03
F	<i>Grindelia squarrosa</i>	a-	a1	b30	a-	b40	b27	.50	-	1.54	.80
F	<i>Helianthus annuus</i> (a)	-	-	a-	a-	a3	b16	-	-	.00	.64
F	<i>Isatis tinctoria</i>	-	-	1	-	3	-	.06	-	.03	-
F	<i>Lactuca serriola</i> (a)	-	-	ab45	b66	a20	c118	.20	1.44	.27	1.38
F	<i>Lappula occidentalis</i> (a)	-	-	b19	a-	ab8	a3	.21	-	.02	.00
F	<i>Lomatium ambiguum</i>	a-	ab5	a1	ab6	b14	ab6	.00	.18	1.17	.09
F	<i>Machaeranthera canescens</i>	-	-	190	-	-	-	1.07	-	-	-
F	<i>Madia glomerata</i> (a)	-	-	b269	a55	b231	a92	3.99	.24	7.11	2.23
F	<i>Melilotus officinalis</i>	-	-	-	3	5	3	-	.03	.15	.00
F	<i>Navarretia intertexta</i> (a)	-	-	a-	a-	a2	b15	-	-	.00	.05
F	<i>Phlox longifolia</i>	-	-	-	2	-	-	-	.00	-	-
F	<i>Polygonum douglasii</i> (a)	-	-	2	-	3	-	.00	-	.00	-
F	<i>Ranunculus testiculatus</i> (a)	-	-	-	2	-	-	-	.00	-	-
F	<i>Rumex crispus</i>	-	-	2	1	-	3	.03	.04	-	.03
F	<i>Taraxacum officinale</i>	-	-	-	4	-	-	-	.01	-	-
F	<i>Tragopogon dubius</i> (a)	a26	a5	b126	a12	a33	a21	1.43	.11	.29	.12
F	Unknown forb-annual	b166	a-	a-	a-	a-	a-	-	-	-	-
F	<i>Verbascum blattaria</i>	a3	a-	b33	ab16	ab21	a5	.79	.20	.91	.41
F	<i>Veronica biloba</i> (a)	-	-	-	-	4	-	-	-	.33	-
F	<i>Viola</i> sp.	-	-	-	-	-	1	-	-	-	.00
Total for Annual Forbs		211	5	500	483	644	528	6.29	17.94	11.04	8.35
Total for Perennial Forbs		345	181	656	373	574	598	10.77	7.33	22.31	20.80
Total for Forbs		556	186	1156	856	1218	1126	17.06	25.28	33.35	29.15

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

BROWSE TRENDS--

Management unit 03, Study no: 18

Type	Species	Strip Frequency				Average Cover %			
		'96	'01	'06	'11	'96	'01	'06	'11
B	<i>Artemisia tridentata vaseyana</i>	41	30	26	22	2.25	2.86	1.93	2.97
B	<i>Gutierrezia sarothrae</i>	12	0	6	5	.24	-	.53	.30
Total for Browse		53	30	32	27	2.49	2.86	2.46	3.27

CANOPY COVER, LINE INTERCEPT--

Management unit 03, Study no: 18

Species	Percent Cover	
	'06	'11
Artemisia tridentata vaseyana	3.68	4.05
Gutierrezia sarothrae	.16	.16

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 03, Study no: 18

Species	Average leader growth (in)		
	'01	'06	'11
Artemisia tridentata vaseyana	2.5	2.9	1.6

BASIC COVER--

Management unit 03, Study no: 18

Cover Type	Average Cover %					
	'85	'90	'96	'01	'06	'11
Vegetation	16.75	7.75	62.06	70.66	73.15	63.86
Rock	11.25	10.25	11.92	13.47	16.10	15.65
Pavement	4.25	4.25	.96	.93	.66	2.20
Litter	48.50	65.50	35.29	32.29	19.60	17.26
Cryptogams	1.00	.25	.04	0	.23	.01
Bare Ground	18.25	12.00	1.08	1.07	1.68	10.83

SOIL ANALYSIS DATA --

Management unit 03, Study no: 18, Study Name: Geersten Canyon

Effective rooting depth (in)	pH	Clay-Loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
5.6	6.2	44.7	27.0	28.3	3.0	14.5	153.6	0.6

PELLET GROUP DATA--

Management unit 03, Study no: 18

Type	Quadrat Frequency			
	'96	'01	'06	'11
Rabbit	-	-	-	1
Elk	27	2	5	6
Deer	4	11	4	1
Cattle	4	7	4	1

Days use per acre (ha)		
'01	'06	'11
-	-	-
13 (31)	5 (13)	12 (30)
15 (36)	25 (61)	5 (13)
3 (7)	13 (32)	6 (14)

BROWSE CHARACTERISTICS--
Management unit 03, Study no: 18

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Amelanchier alnifolia</i>										
85	0	0	0	-	-	0	0	0	-/-	
90	0	0	0	-	-	0	0	0	-/-	
96	0	0	0	-	-	0	0	0	-/-	
01	0	0	0	-	-	0	0	0	-/-	
06	0	0	0	-	-	0	0	0	58/75	
11	0	0	0	-	-	0	0	0	68/91	
<i>Artemisia tridentata vaseyana</i>										
85	1998	27	63	10	66	3	0	3	19/22	
90	1132	12	12	77	-	24	0	71	12/16	
96	1860	61	32	6	140	22	3	6	18/38	
01	1020	0	84	16	-	57	2	6	17/24	
06	980	4	61	35	40	31	16	41	16/26	
11	680	0	88	12	-	38	18	15	17/34	
<i>Gutierrezia sarothrae</i>										
85	0	0	0	-	-	0	0	0	-/-	
90	0	0	0	-	-	0	0	0	-/-	
96	740	24	76	-	60	0	0	0	11/16	
01	0	0	0	-	-	0	0	0	-/-	
06	120	0	100	-	-	0	0	0	13/20	
11	180	0	100	-	-	0	0	0	12/15	
<i>Rosa woodsii</i>										
85	0	0	0	-	-	0	0	0	-/-	
90	0	0	0	-	-	0	0	0	-/-	
96	0	0	0	-	-	0	0	0	-/-	
01	0	0	0	-	-	0	0	0	-/-	
06	0	0	0	-	-	0	0	0	22/21	
11	0	0	0	-	-	0	0	0	15/15	