

SEEP HOLLOW - TREND STUDY NO. 9-20-10

Vegetation Type: Mountain Brush

Range Type: Crucial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: Not Available

Land Ownership: Ute Tribe

Elevation: 7947 ft. (2423 m)

Aspect: East

Slope: 28%

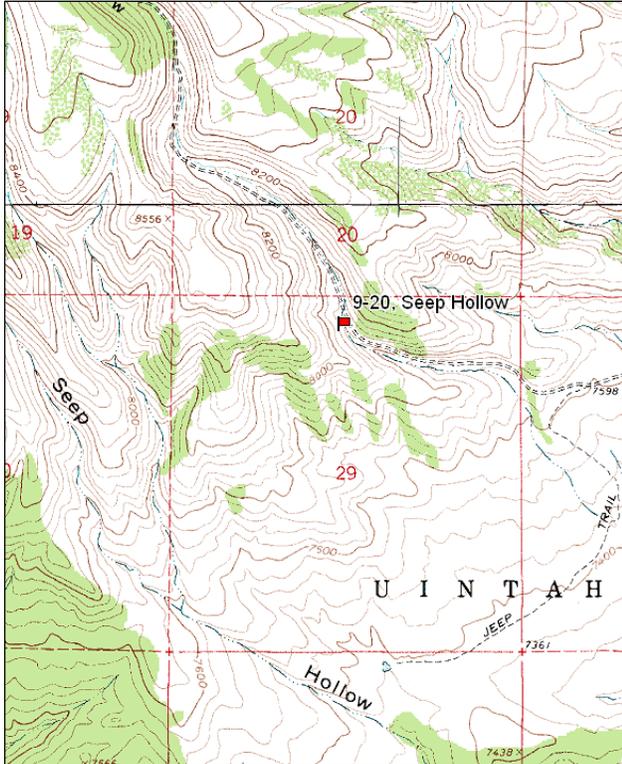
Transect bearing: 0'-100': 329° magnetic, 100'-200': 311° magnetic, 200'-400': 330° magnetic

Belt placement: line 1 (7 & 86ft), line 2 (25ft) (line is 34ft long), line 3 (59ft), line 4 (39ft) (line is 42ft long).
No rebar marking belt placement.

Directions:

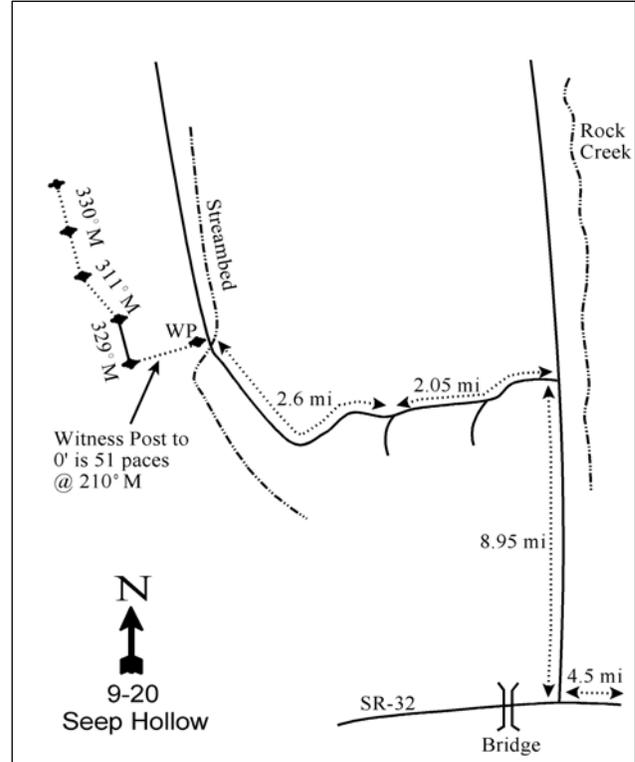
From highway SR 87, turn west onto highway SR 32 and travel 3.4 miles to Rock Creek Road, which is just east of mile marker 59 and the bridge over the Duchesne River. Turn right (north) onto Rock Creek Road and go north for 8.95 miles to a road on the left. Turn and travel west 2.05 miles to a fork. 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 51 paces away at the heading of 210°M.

Map Name: Blacktail Mountain



Township: 1S Range: 6W Section: 29

Diagrammatic Sketch:



GPS: NAD 83, UTM 12T 535043 E 4468886 N

SEEP HOLLOW - TREND STUDY NO. 9-20

Site Information

Site Description: The study samples a mountain brush community on Ute Indian Tribal land in the Seep Hollow-Dry Mountain Hollow area. The site may not be accessible to wildlife during severe winters. Pellet group transect data estimated moderate use by deer in 2000 and 2010 with very heavy use in 2005. Estimated elk use was light in 2000 and 2010 with heavy use in 2005 (Table - Pellet Group Data).

Browse: Browse species are diverse and dominate the site, providing over half of the total vegetation cover since 1995. Key species include serviceberry (*Amelanchier utahensis*), mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), true mountain mahogany (*Cercocarpus montanus*) and bitterbrush (*Purshia tridentata*). Serviceberry provides the highest cover of any of the browse species on the site (Table - Browse Trends). Serviceberry is comprised of a fairly dense population of moderately large plants that has increased since 1995. A small portion of the mature serviceberry plants are classified as unavailable to deer due to height. The serviceberry population is a mixture of young and mature plants that have displayed mostly light use throughout the study years. Mountain big sagebrush is comprised of a mostly mature population with light to moderate use. Decadence of sagebrush has fluctuated throughout the study, but was generally high. Poor vigor was also high in 2000 and 2005, but has been low in all other sample years. Recruitment of young sagebrush plants has been poor over the course of the study. True mountain mahogany has a small population of mostly mature plants, though recruitment of young plants has been generally good. Utilization of mahogany was moderate at the outset of the study, but has been heavy since 2000. Bitterbrush has steadily increased in density since the outset of the study in 1982. The population is predominately mature with only a few young or decadent plants. Utilization is moderate to heavy with good vigor. Most bitterbrush plants display a prostrate growth form (Table - Browse Characteristics).

Herbaceous Understory: The herbaceous understory is dominated by native perennial grasses. Bluebunch wheatgrass (*Agropyron spicatum*), needle-and-thread (*Stipa comata*) and mutton bluegrass (*Poa fendleriana*) are the most common species. Other species that occur less frequently include thickspike wheatgrass (*Agropyron dasystachyum*), sedge (*Carex* sp.), Sandberg bluegrass (*Poa secunda*) and bottlebrush squirreltail (*Sitanion hystrix*). Cheatgrass (*Bromus tectorum*) was sampled on the site, but remains fairly uncommon. Forbs are fairly diverse, but are not particularly abundant. The only marginally common perennial forb species were desert parsley (*Lomatium* sp.) and tapertip hawksbeard (*Crepis acuminata*). Annual forbs were abundant in 1995 and 2005, but have been rare in other sample years (Table - Herbaceous Trends).

Soil: Soils are sandy loam in texture with a neutral soil reaction (pH 6.7) (Table - Soil Analysis Data). The soil surface is very rocky with rocks ranging in size from a few inches to more than a foot in diameter. Excluding rock cover, litter and vegetation cover are excellent and considering steepness of the slope, erosion is minimal. Bare ground is quite low with the abundant vegetation, litter and rock cover (Table - Basic Cover). Several inactive gullies are located on, and around the site. The soil erosion condition was classified as stable in 2005 and 2010.

Trend Assessments

Browse:

- **1982 to 1988 - stable (0):** There was a slight decrease in the densities of serviceberry and true mountain mahogany, but a slight increase in the densities of mountain big sagebrush and bitterbrush. Decadence of mountain big sagebrush increased from 15% to 32%, but poor vigor of mahogany decreased from 25% to 0%.
- **1988 to 1995 - stable (0):** Differences in density may be related to the larger sample area used in 1995; therefore, trend was determined using other parameters. Decadence of mountain big sagebrush decreased to 14%, but recruitment of young plants decreased from 15% to just 1% of the population.

- **1995 to 2000 - stable (0):** The density of serviceberry increased by 52% from 920 plants/acre to 1,400 plants/acre and cover increased from 9% to 13%. However, decadence of mountain big sagebrush increased to 26% and poor vigor increased from 6% to 28%.
- **2000 to 2005 - stable (0):** The density of serviceberry increased by 50% to 2,100 plants/acre, though cover remained similar with much of the increase coming from an increase in the recruitment of young plants. Density of mountain big sagebrush decreased by 32% from 2,340 plants/acre to 1,600 plants/acre and cover decreased from 7% to 5%. Decadence of sagebrush increased to 45% and poor vigor increased to 33%.
- **2005 to 2010 - slightly up (+1):** Serviceberry density decreased slightly, but cover increased slightly and mountain big sagebrush density increased slightly. Decadence of mountain big sagebrush decreased to 12% and poor vigor decreased to 10%. Recruitment of young sagebrush plants increased from 4% to 11%. Density and cover of bitterbrush have also steadily increased over the course of the study.

Grass:

- **1982 to 1988 - no trend (NT):** Only quadrat frequency data for grasses are available from 1982, so no trend was given.
- **1988 to 1995 - slightly up (+1):** The perennial grass sum of nested frequency increased by 16%.
- **1995 to 2000 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 15%, though cover increased from 12% to 16%.
- **2000 to 2005 - stable (0):** There was little change in the sum of nested frequency or cover of perennial grasses.
- **2005 to 2010 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 11% despite an increase in cover to 17%.

Forb:

- **1982 to 1988 - no trend (NT):** Only quadrat frequency data for forbs are available from 1982, so no trend was given.
- **1988 to 1995 - up (+2):** There was a two-fold increase in the sum of nested frequency of perennial forbs.
- **1995 to 2000 - down (-2):** The sum of nested frequency of perennial forbs decreased by 32%, though it did not decrease to 1988 levels. Perennial forb cover decreased from 4% to 3%.
- **2000 to 2005 - up (+2):** The perennial forb sum of nested frequency returned to 1995 levels, and cover increased to 7%.
- **2005 to 2010 - slightly down (-1):** The sum of nested frequency of perennial forbs decreased by 16% and cover decreased to 4%.

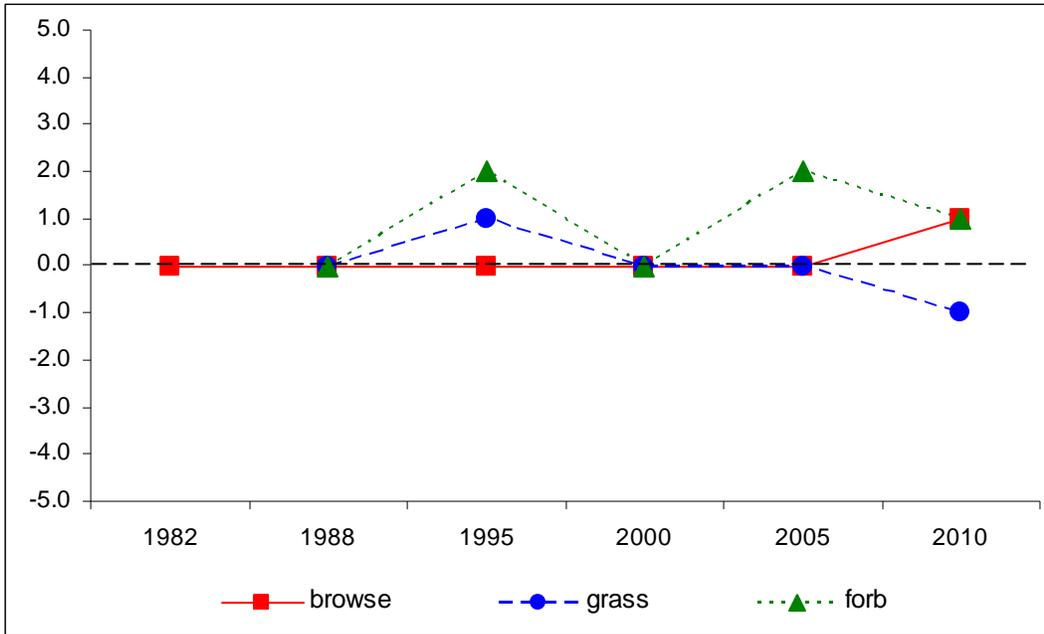
DEER DESIRABLE COMPONENTS INDEX - HIGH POTENTIAL SCALE --

Management unit 9, study no: 20

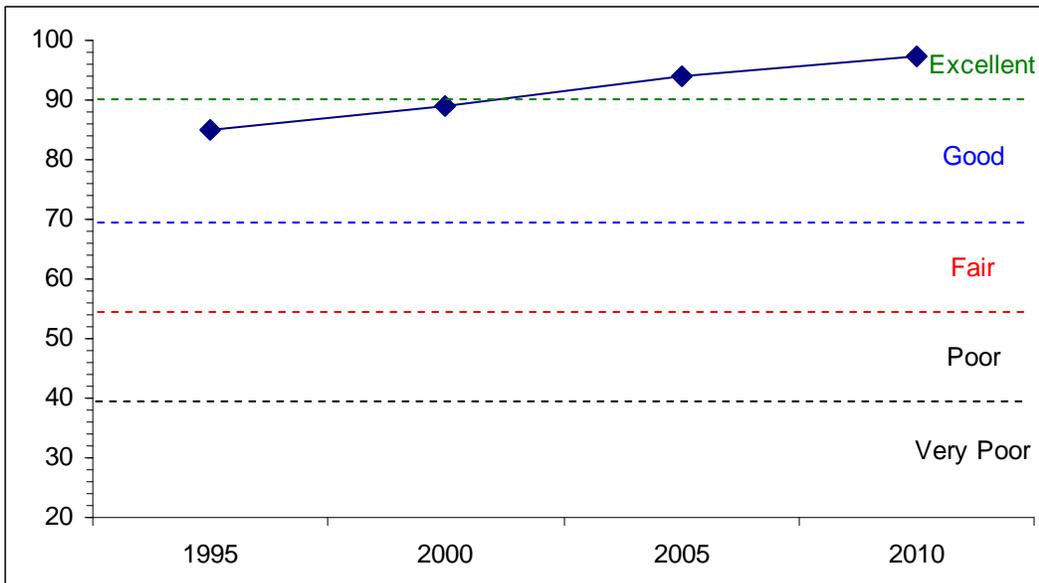
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
95	30.0	13.6	8.6	24.0	-0.1	8.7	0.0	84.9	Good
00	30.0	12.9	9.8	30.0	0.0	6.3	0.0	89.0	Good-Excellent
05	30.0	10.3	13.9	30.0	-0.3	10.0	0.0	94.0	Excellent
10	30.0	14.4	15.0	30.0	-0.1	7.9	0.0	97.3	Excellent

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 9, Study no: 20



DEER DESIRABLE COMPONENTS INDEX TREND, HIGH POTENTIAL--
Management unit 9, Study no: 20



HERBACEOUS TRENDS--
Management unit 09, Study no: 20

T y p e	Species	Nested Frequency					Average Cover %			
		'88	'95	'00	'05	'10	'95	'00	'05	'10
G	<i>Agropyron dasystachyum</i>	b82	b66	a22	a20	b63	.93	.19	.14	1.68
G	<i>Agropyron spicatum</i>	bc157	bc160	b122	c202	a71	2.94	4.10	6.57	2.78
G	<i>Bromus tectorum</i> (a)	-	ab14	a2	b38	b24	.08	.00	.36	.07
G	<i>Carex</i> sp.	a21	b58	a32	a28	a21	1.12	.96	.41	.78
G	<i>Koeleria cristata</i>	9	2	9	2	3	.04	.36	.03	.03
G	<i>Oryzopsis hymenoides</i>	b13	ab1	ab1	a-	a-	.03	.03	-	-
G	<i>Poa fendleriana</i>	b122	b124	b142	a72	a59	2.27	4.82	2.38	1.87
G	<i>Poa secunda</i>	a15	ab23	ab35	b52	ab41	.48	.51	.96	.34
G	<i>Sitanion hystrix</i>	a-	ab11	ab5	ab5	b9	.08	.03	.19	.31
G	<i>Stipa comata</i>	a68	a119	a109	a116	b178	4.09	5.21	4.32	9.44
Total for Annual Grasses		0	14	2	38	24	0.07	0.00	0.36	0.07
Total for Perennial Grasses		487	564	477	497	445	12.01	16.23	15.02	17.26
Total for Grasses		487	578	479	535	469	12.09	16.24	15.38	17.34
F	<i>Allium</i> sp.	-	3	-	3	3	.00	-	.01	.03
F	<i>Antennaria rosea</i>	-	11	4	7	-	.07	.06	.04	-
F	<i>Arabis</i> sp.	ab2	a-	a-	b10	a-	-	-	.07	-
F	<i>Artemisia ludoviciana</i>	-	4	3	3	3	.18	.15	.15	.03
F	<i>Astragalus</i> sp.	-	5	1	3	8	.01	.00	.00	.06
F	<i>Balsamorhiza sagittata</i>	-	1	2	2	2	.15	.03	.53	.18
F	<i>Calochortus nuttallii</i>	a-	ab13	a-	b18	a1	.04	-	.05	.00
F	<i>Castilleja linariaefolia</i>	b17	ab5	b13	a-	a-	.06	.52	-	-
F	<i>Chenopodium leptophyllum</i> (a)	-	2	-	-	-	.01	-	-	-
F	<i>Cirsium</i> sp.	7	7	2	3	-	.21	.15	.01	.00
F	<i>Collinsia parviflora</i> (a)	-	b244	a12	b227	a7	1.53	.04	1.94	.01
F	<i>Collomia linearis</i> (a)	-	c119	a-	c119	b17	.62	-	.40	.07
F	<i>Comandra pallida</i>	34	29	28	22	33	.21	.26	.13	.22
F	<i>Crepis acuminata</i>	a-	ab19	a7	b25	ab15	.21	.07	.80	.26
F	<i>Cryptantha</i> sp.	7	-	-	1	11	-	-	.00	.16
F	<i>Descurainia pinnata</i> (a)	-	b11	a-	ab3	a-	.05	-	.03	-
F	<i>Draba</i> sp. (a)	-	b67	a-	a6	a-	.20	-	.03	-
F	<i>Erigeron eatonii</i>	-	1	-	2	6	.00	-	.15	.03
F	<i>Erigeron flagellaris</i>	a4	a4	a4	a6	b29	.04	.18	.53	.34
F	<i>Eriogonum racemosum</i>	-	7	3	2	3	.04	.03	.03	.06
F	<i>Eriogonum umbellatum</i>	-	-	7	-	4	-	.15	-	.03
F	<i>Gayophytum ramosissimum</i> (a)	-	5	-	3	1	.01	-	.00	.00
F	<i>Hackelia patens</i>	-	-	-	1	-	-	-	.00	-
F	<i>Heterotheca villosa</i>	-	-	8	-	3	-	.16	-	.03
F	<i>Heuchera parvifolia</i>	a-	b41	b24	b36	b40	.93	.37	.60	.33
F	<i>Lappula occidentalis</i> (a)	-	3	-	2	-	.01	-	.00	-
F	<i>Lithospermum ruderales</i>	-	5	4	6	4	.21	.06	.33	.04
F	<i>Lomatium</i> sp.	a20	b83	ab49	c87	a24	1.55	.39	2.46	.64
F	<i>Lupinus argenteus</i>	-	-	3	1	8	-	.03	.41	.33
F	<i>Penstemon procerus</i>	a-	b11	b8	a-	a-	.12	.36	-	-

T y P e	Species	Nested Frequency					Average Cover %			
		'88	'95	'00	'05	'10	'95	'00	'05	'10
F	Penstemon sp.	ab11	ab3	a-	b14	b14	.15	-	.42	.62
F	Petradoria pumila	-	3	1	-	-	.03	.03	-	-
F	Phlox longifolia	-	-	-	2	1	-	-	.06	.00
F	Polygonum douglasii (a)	-	b20	a-	b15	b10	.05	-	.03	.10
F	Schoenocrambe linifolia	-	-	-	5	5	-	.03	.03	.06
F	Sedum lanceolatum	-	4	-	-	2	.01	-	-	.00
F	Senecio integerrimus	b13	b12	b12	b17	a-	.05	.05	.44	-
F	Senecio multilobatus	a-	a-	ab3	ab1	b10	-	.00	.00	.10
F	Sphaeralcea coccinea	-	2	2	3	3	.03	.00	.03	.15
F	Stellaria jamesiana	-	4	-	-	-	.01	-	-	-
F	Taraxacum officinale	-	-	-	-	1	-	-	-	.15
F	Tragopogon dubius	-	-	-	-	1	-	-	-	.03
Total for Annual Forbs		0	471	12	375	35	2.48	0.04	2.45	0.19
Total for Perennial Forbs		115	277	188	280	234	4.36	3.15	7.35	3.96
Total for Forbs		115	748	200	655	269	6.84	3.19	9.80	4.15

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

BROWSE TRENDS--

Management unit 09, Study no: 20

T y P e	Species	Strip Frequency				Average Cover %			
		'95	'00	'05	'10	'95	'00	'05	'10
B	Amelanchier utahensis	30	37	36	39	9.44	12.58	10.85	13.33
B	Artemisia tridentata vaseyana	76	72	48	55	8.63	6.60	4.52	4.73
B	Cercocarpus montanus	24	19	27	26	5.23	5.76	3.91	4.80
B	Chrysothamnus viscidiflorus lanceolatus	37	28	40	44	.88	1.20	1.43	2.79
B	Eriogonum heracleoides	51	50	53	49	2.42	2.65	2.00	2.52
B	Mahonia repens	2	6	4	7	.00	.22	.30	.24
B	Opuntia sp.	24	18	25	23	.37	.25	.58	.65
B	Pediocactus simpsonii	3	0	2	1	.03	-	.03	-
B	Pinus edulis	0	4	7	4	1.04	.56	.78	.78
B	Prunus virginiana	0	0	1	1	.03	-	-	.15
B	Purshia tridentata	20	28	25	29	2.42	4.71	3.28	5.02
B	Symphoricarpos oreophilus	46	42	46	47	3.95	4.66	4.33	3.62
B	Tetradymia canescens	0	0	1	0	-	-	-	-
Total for Browse		313	304	315	325	34.46	39.23	32.05	38.68

CANOPY COVER, LINE INTERCEPT--

Management unit 09, Study no: 20

Species	Percent Cover	
	'05	'10
Amelanchier utahensis	21.43	20.35
Artemisia tridentata vaseyana	5.83	7.98
Cercocarpus montanus	6.30	7.26
Chrysothamnus viscidiflorus lanceolatus	2.91	3.45
Eriogonum heracleoides	2.21	2.59
Mahonia repens	.05	.11
Opuntia sp.	.18	.31
Pinus edulis	1.86	1.63
Purshia tridentata	5.91	8.19
Symphoricarpos oreophilus	10.58	8.18

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 09, Study no: 20

Species	Average leader growth (in)	
	'05	'10
Amelanchier utahensis	4.1	3.4
Artemisia tridentata vaseyana	1.9	2.2
Cercocarpus montanus	4.6	4.3
Purshia tridentata	2.6	2.6

BASIC COVER--

Management unit 09, Study no: 20

Cover Type	Average Cover %					
	'82	'88	'95	'00	'05	'10
Vegetation	8.50	7.50	43.34	58.95	48.67	60.59
Rock	10.50	14.00	14.42	14.38	14.96	13.56
Pavement	0	0	.07	1.13	.59	.14
Litter	64.25	64.25	60.95	66.43	51.56	48.68
Cryptogams	1.25	0	.33	1.05	.45	.42
Bare Ground	15.50	14.25	4.36	9.90	8.44	5.97

SOIL ANALYSIS DATA --

Management unit 9, Study no: 20, Study Name: Seep Hollow

Effective rooting depth (in)	pH	sandy loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
8.4	6.7	73.3	16.2	10.6	4.7	9.6	102.4	0.7

PELLET GROUP DATA--

Management unit 09, Study no: 20

Type	Quadrat Frequency			
	'95	'00	'05	'10
Rabbit	5	3	8	1
Elk	9	9	14	7
Deer	27	15	28	11

Days use per acre (ha)		
'00	'05	'10
-	-	-
15 (37)	54 (134)	17 (41)
44 (107)	92 (227)	38 (93)

BROWSE CHARACTERISTICS--
Management unit 09, Study no: 20

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<i>Amelanchier utahensis</i>									
82	799	58	42	0	-	17	0	0	16/14
88	465	86	14	0	-	14	0	0	56/32
95	920	30	70	0	40	35	2	0	58/75
00	1400	40	59	1	-	24	3	0	52/63
05	2100	49	50	2	60	17	6	.95	47/49
10	1500	49	51	0	-	12	3	0	46/52
<i>Artemisia tridentata vaseyana</i>									
82	2665	0	85	15	-	18	5	13	19/24
88	2731	15	54	32	-	49	2	5	17/22
95	2440	1	85	14	-	51	2	6	21/31
00	2340	3	71	26	20	11	3	28	22/28
05	1600	4	51	45	120	26	9	33	23/33
10	1840	11	77	12	60	28	29	10	21/32
<i>Cercocarpus montanus</i>									
82	533	0	100	0	-	38	0	25	33/21
88	466	29	71	0	66	100	0	0	28/39
95	680	24	76	0	-	59	9	0	44/47
00	500	8	88	4	40	28	48	4	36/38
05	700	14	60	26	20	3	83	3	44/48
10	760	18	82	0	400	16	34	0	47/50
<i>Chrysothamnus viscidiflorus lanceolatus</i>									
82	733	0	100	0	-	0	0	0	11/9
88	1331	20	60	20	-	10	0	0	11/11
95	1060	2	98	0	-	0	0	0	15/16
00	860	0	95	5	-	0	0	5	14/13
05	1260	6	92	2	-	0	0	0	15/19
10	1340	1	97	1	-	0	0	0	18/21
<i>Eriogonum heracleoides</i>									
82	1933	0	100	0	-	0	0	0	13/10
88	3065	59	41	0	-	0	0	30	5/7
95	2720	14	86	0	-	0	0	0	8/15
00	2660	2	95	2	-	0	0	2	6/9
05	2440	2	98	0	-	.81	0	0	6/13
10	2340	0	100	0	60	5	.85	.85	7/13

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Mahonia repens										
82	1066	0	100	-	-	0	0	0	4/6	
88	2866	88	12	-	133	0	0	7	3/5	
95	280	0	100	-	-	0	0	0	5/7	
00	340	6	94	-	-	0	0	0	4/5	
05	320	0	100	-	-	0	0	0	3/5	
10	820	78	22	-	-	0	0	0	4/4	
Opuntia sp.										
82	1332	35	65	0	-	0	0	0	4/8	
88	2465	59	41	0	66	0	0	14	4/9	
95	960	4	92	4	20	0	0	0	3/8	
00	620	13	87	0	-	0	0	0	2/5	
05	1040	6	94	0	-	0	0	2	4/11	
10	620	6	94	0	-	0	0	0	3/10	
Pediocactus simpsonii										
82	0	0	0	-	-	0	0	0	-/-	
88	0	0	0	-	-	0	0	0	-/-	
95	60	0	100	-	-	0	0	0	2/4	
00	0	0	0	-	-	0	0	0	-/-	
05	40	0	100	-	-	0	0	0	4/6	
10	20	0	100	-	-	0	0	0	3/4	
Pinus edulis										
82	66	0	100	-	-	0	0	0	69/59	
88	66	0	100	-	-	0	0	0	83/47	
95	0	0	0	-	-	0	0	0	-/-	
00	80	75	25	-	-	0	0	0	-/-	
05	140	71	29	-	-	0	0	0	-/-	
10	80	75	25	-	20	0	0	0	-/-	
Prunus virginiana										
82	0	0	0	-	-	0	0	0	-/-	
88	0	0	0	-	-	0	0	0	-/-	
95	0	0	0	-	-	0	0	0	-/-	
00	0	0	0	-	-	0	0	0	-/-	
05	20	100	0	-	-	0	0	0	24/32	
10	20	100	0	-	-	0	0	0	26/29	
Purshia tridentata										
82	333	0	100	0	-	80	0	0	12/16	
88	465	14	72	14	-	57	0	0	24/21	
95	540	11	89	0	-	44	0	0	16/37	
00	720	3	97	0	20	31	22	0	17/44	
05	840	7	86	7	-	31	33	2	17/40	
10	1040	10	90	0	-	25	35	0	18/38	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Symphoricarpos oreophilus</i>										
82	1598	12	79	8	-	4	0	8	16/27	
88	932	71	14	14	-	36	0	0	28/22	
95	2340	17	83	0	40	0	0	0	16/30	
00	2360	14	85	2	20	0	0	0	13/21	
05	3900	19	80	1	-	0	0	0	18/28	
10	3560	16	83	1	20	3	0	0	16/23	
<i>Tetradymia canescens</i>										
82	0	0	0	-	-	0	0	0	-/-	
88	0	0	0	-	-	0	0	0	-/-	
95	0	0	0	-	-	0	0	0	-/-	
00	0	0	0	-	-	0	0	0	-/-	
05	40	0	100	-	-	0	0	0	-/-	
10	0	0	0	-	-	0	0	0	12/7	