

MOSBY MOUNTAIN SOUTH - TREND STUDY NO. 9-19-10

Vegetation Type: Mountain Big Sagebrush

Range Type: Crucial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: [Upland Stony Loam \(Mountain big sagebrush\), R047XC336UT](#)

Land Ownership: BLM

Elevation: 8000 ft. (2439 m)

Aspect: Southeast

Slope: 2%-3%

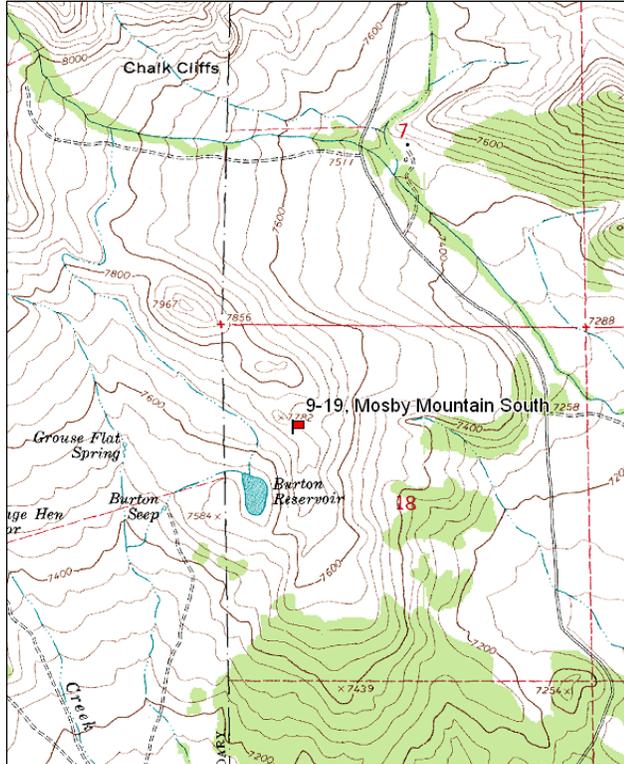
Transect bearing: 167° magnetic

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

Directions:

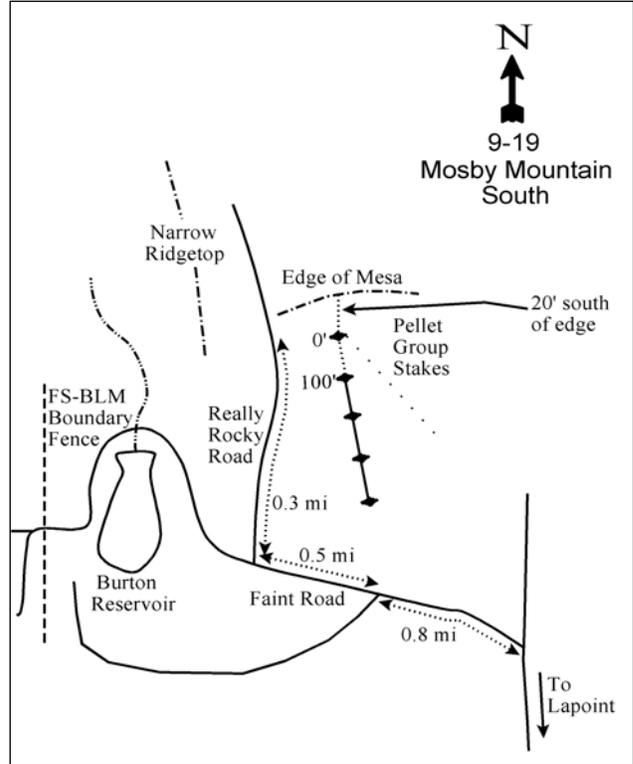
Just east of Lapoint, turn north onto Paradise Park Rd from highway 121. Go 6.9 miles to a fork, keep left toward Mosby Mountain. Proceed 4.8 miles and turn left onto a dirt road heading west. Go 0.15 miles to a 3-way intersection, bear left on the main road. Continue 0.45 miles to a fork, stay left. 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, bent, and twisted fencepost is the 0-foot baseline stake. It is marked by browse tag #7870.

Map Name: Lake Mountain



Township: 3S Range: 19E Section: 18

Diagrammatic Sketch:



GPS: NAD 83, UTM 12T 598210 E 4490354 N

MOSBY MOUNTAIN SOUTH - TREND STUDY NO. 9-19

Site Information

Site Description: The study is located on a narrow ridge top which drops off sharply to Burton Reservoir on the west. To the east is a sagebrush (*Artemisia spp.*), pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) filled valley. A large fire burned the entire area after the initial reading in 1988 and the majority of the sagebrush was eradicated. Springs are common in the area and most have been developed for cattle. According to U.S. Forest Service personnel, the area is an important wintering range for several hundred elk. Grazing in the area is managed by the Bureau of Land Management (BLM) as part of the Mosby allotment. Cattle were present on the site in 2000, however it was noted that most of the cattle were distributed close to the reservoir about a half mile away. Pellet group transect data has estimated light to moderately light use by elk, deer and cattle since 2000. Grouse use appears to be common with increasing numbers of pellets sampled since 2000 (Table - Pellet Group Data).

Browse: Mountain big sagebrush (*Artemisia tridentata ssp. vaseyana*) is the dominant browse species on the site and was comprised of a very dense stand at the outset of the study in 1988. The fire removed much of the mountain big sagebrush from the site and the population has stabilized at a low density from 1995 to 2005. Density of mountain big sagebrush increased substantially in 2010 with a large increase in the recruitment of young plants. Utilization of sagebrush has been mostly moderate over the course of the study, but heavy use was noted in 2010 (Table - Browse Characteristics). Cover of mountain big sagebrush has steadily increased since 1995 (Table - Browse Trends). Black sagebrush was also fairly abundant in 1988, prior to the fire, but has maintained a very small population since then. Utilization of black sagebrush has been mostly light, but all of the black sagebrush plants displayed heavy use in 2010. Bitterbrush (*Purshia tridentata*) and serviceberry (*Amelanchier utahensis*) plants are scattered throughout the area in relatively low densities. Bitterbrush is slightly more abundant than serviceberry, but both species have displayed heavy use over the course of the study (Table - Browse Characteristics).

Herbaceous Understory: Grasses are fairly diverse, but are dominated by three species: crested wheatgrass (*Agropyron cristatum*), needle-and-thread (*Stipa comata*) and the annual species cheatgrass (*Bromus tectorum*). Crested wheatgrass has increased steadily in nested frequency and cover on the site since 1995. Cheatgrass has fluctuated on the site, but was prevalent in 1995 and 2005. Other perennial species found in limited abundance on the site include thickspike wheatgrass (*Agropyron dasystachyum*), intermediate wheatgrass (*A. intermedium*), bluebunch wheatgrass (*A. spicatum*), mutton bluegrass (*Poa fendleriana*) and bottlebrush squirreltail (*Sitanion hystrix*). Perennial forbs are moderately diverse, but only hairy goldaster (*Heterotheca villosa*) and silvery lupine (*Lupinus argenteus*) are common. These two species provide the majority of the forb cover (Table - Herbaceous Trends).

Soil: The soil is very rocky and has a sandy loam texture with a neutral soil reaction (pH of 6.6) (Table - Soil Analysis Data). Rocks of all sizes are distributed continuously over the surface. They are cobble type rocks from alluvial deposits from the Uinta Mountains. Rock cover on the site is high leaving little bare ground cover. There was a considerable amount of litter in 1988, but litter cover declined after the fire and has remained moderately low (Table - Basic Cover). The soil erosion condition was classified as stable in 2005 and 2010.

Trend Assessments

Browse:

- **1988 to 1995 - down (-2):** A wildfire removed much of the browse from the site.
- **1995 to 2000 - stable (0):** There was little change in the density of any of the preferred browse species. Decadence of mountain big sagebrush decreased from 30% to 5%, but there was no new recruitment of young plants. Cover of mountain big sagebrush increased slightly from 2% to 3%.

- **2000 to 2005 - stable (0):** The density of preferred browse species remained similar, though cover of mountain big sagebrush increased to 6%. Recruitment of young mountain big sagebrush plants also increased to 11%, but decadence also increased to 14%.
- **2005 to 2010 - up (+2):** The density of mountain big sagebrush increased three-fold from 1,320 plants/acre to 4,440 plants/acre and cover increased to 8%. Much of the increase in density was due to a large increase in the recruitment of young plants to 42% of the population. Decadence of mountain big sagebrush decreased to 5%.

Grass:

- **1988 to 1995 - up (+2):** The sum of nested frequency of perennial grasses increased by 39%.
- **1995 to 2000 - slightly down (-1):** The perennial grass sum of nested frequency decreased by 17% despite an increase in cover from 13% to 19%.
- **2000 to 2005 - up (+2):** There was a 44% increase in the sum of nested frequency of perennial grasses and cover increased to 23%.
- **2005 to 2010 - slightly down (-1):** The perennial grass sum of nested frequency decreased by 16% and cover decreased to 16%.

Forb:

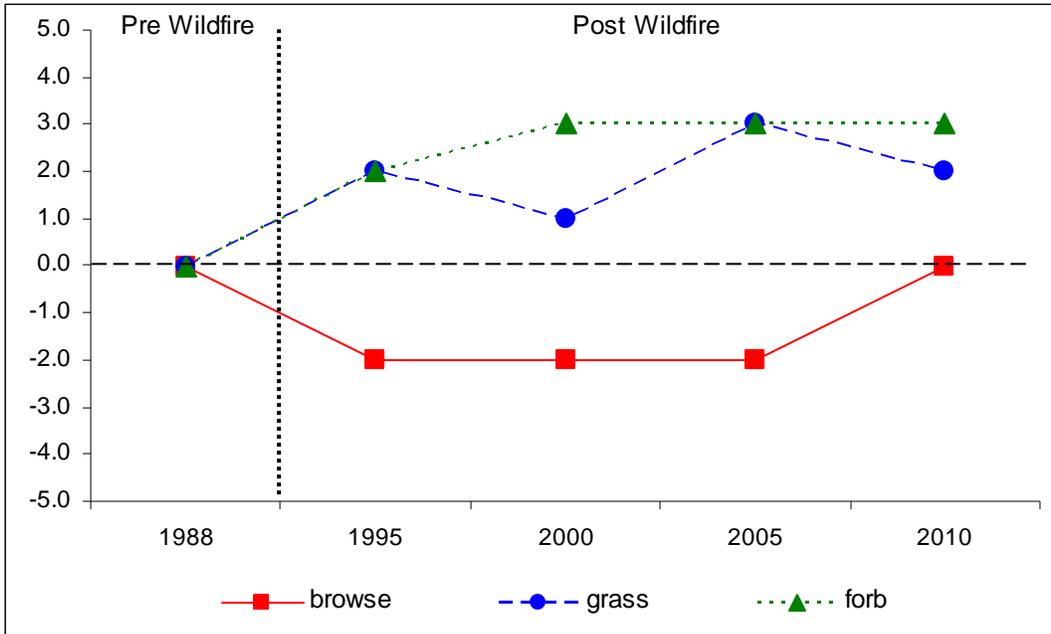
- **1988 to 1995 - up (+2):** The perennial forb sum of nested frequency increased two-fold.
- **1995 to 2000 - slightly up (+1):** The sum of nested frequency of perennial forbs increased by 14% and cover increased from 7% to 10%.
- **2000 to 2005 - stable (0):** The sum of nested frequency of perennial forbs remained similar, though cover increased slightly to 12%.
- **2005 to 2010 - stable (0):** There was little change in the sum of nested frequency of perennial forbs despite a large decrease in cover to 5%. The decrease in cover was due to a substantial decrease in the cover of hairy goldaster and silvery lupine.

DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --
Management unit 9, study no: 19

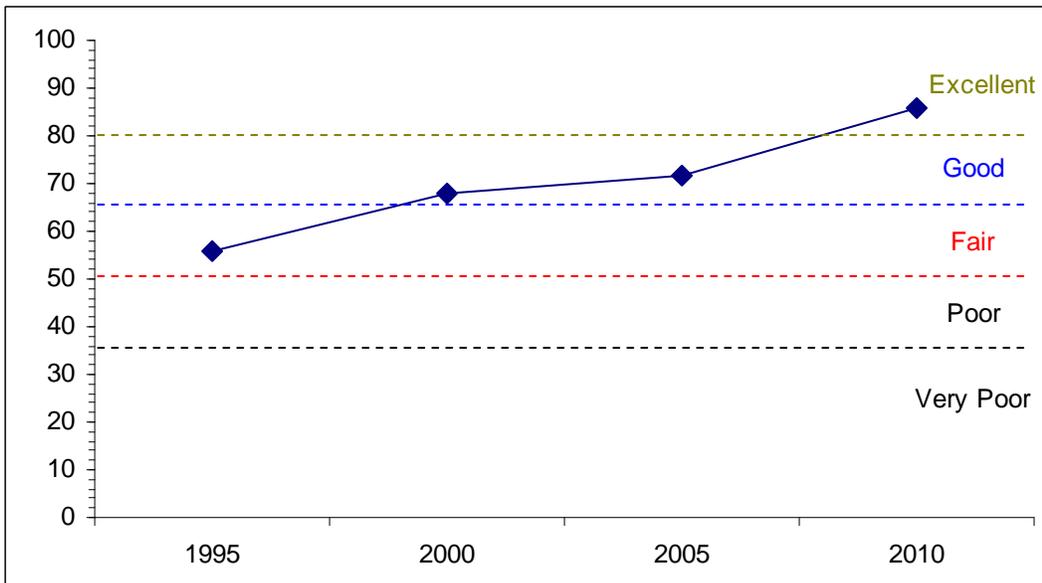
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
95	7.7	11.3	2.9	26.5	-2.7	10.0	0.0	55.8	Fair
00	10.8	14.4	2.8	30.0	0.0	10.0	0.0	68.0	Good
05	16.8	12.8	4.5	30.0	-2.5	10.0	0.0	71.5	Good
10	20.8	14.3	12.2	30.0	-0.5	9.3	0.0	86.0	Excellent

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
 Management unit 9, Study no: 19



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL--
 Management unit 9, Study no: 19



HERBACEOUS TRENDS--
Management unit 09, Study no: 19

T y P e	Species	Nested Frequency					Average Cover %			
		'88	'95	'00	'05	'10	'95	'00	'05	'10
G	Agropyron cristatum	a-	b144	b159	b175	c225	3.26	5.83	6.80	8.48
G	Agropyron dasystachyum	a-	c74	ab4	c48	b14	1.99	.04	.56	.03
G	Agropyron intermedium	a-	bc32	a2	ab13	c34	.32	.00	.31	.43
G	Agropyron spicatum	d93	bc31	b16	c56	a-	.61	.36	2.08	-
G	Bouteloua gracilis	b27	a3	a-	a-	a6	.03	-	-	.18
G	Bromus japonicus (a)	-	-	-	2	3	-	-	.00	.00
G	Bromus tectorum (a)	-	d298	a5	c239	b141	3.60	.03	3.37	.70
G	Carex sp.	7	9	11	7	10	.02	.10	.06	.02
G	Festuca ovina	-	-	-	3	-	-	-	.03	-
G	Koeleria cristata	-	-	-	7	5	-	-	.36	.06
G	Oryzopsis hymenoides	-	-	-	-	-	-	-	.00	-
G	Poa fendleriana	a-	ab4	b22	c43	c40	.03	.30	1.29	.71
G	Poa pratensis	ab25	b40	a5	a5	a8	.88	.18	.06	.18
G	Poa secunda	b66	a2	a18	a5	a11	.00	.30	.04	.12
G	Sitanion hystrix	c155	a40	a18	b98	a38	.31	.51	2.39	.50
G	Sporobolus cryptandrus	-	2	7	-	-	.00	.04	-	-
G	Stipa comata	a31	b181	b205	b211	b174	5.77	11.26	8.69	5.10
Total for Annual Grasses		0	298	5	241	144	3.60	0.03	3.38	0.71
Total for Perennial Grasses		404	562	467	671	565	13.25	18.95	22.70	15.85
Total for Grasses		404	860	472	912	709	16.86	18.99	26.08	16.56
F	Agoseris glauca	-	-	-	6	2	-	-	.03	.00
F	Allium sp.	a-	a5	a-	b19	ab8	.01	-	.07	.02
F	Arabis sp.	ab7	a3	a2	b13	a-	.00	.03	.08	-
F	Artemisia ludoviciana	-	-	3	-	-	-	.15	-	-
F	Aster sp.	a-	ab4	b10	a-	a-	.01	.10	-	-
F	Astragalus purshii	8	-	-	-	-	-	-	-	-
F	Balsamorhiza hookeri	-	3	-	1	4	.04	-	.15	.03
F	Calochortus nuttallii	-	-	-	-	2	-	-	-	.00
F	Castilleja linariaefolia	-	-	-	2	5	-	-	.03	.06
F	Chenopodium leptophyllum(a)	-	b14	a-	a-	a-	.02	-	-	-
F	Collinsia parviflora (a)	-	a8	a2	b30	a8	.01	.00	.13	.01
F	Collomia linearis (a)	-	c29	a-	b9	a-	.07	-	.02	-
F	Comandra pallida	3	-	1	4	9	-	.03	.03	.04
F	Cryptantha sp.	-	1	-	-	4	.00	-	-	.01
F	Cymopterus sp.	-	-	-	3	-	-	-	.03	-
F	Descurainia pinnata (a)	-	8	-	-	-	.01	-	-	-
F	Draba sp. (a)	-	1	-	6	-	.03	-	.01	-
F	Erigeron divergens	-	-	-	7	5	-	-	.12	.06
F	Erigeron eatonii	-	-	-	1	-	-	-	.00	-
F	Erigeron flagellaris	-	1	2	2	-	.03	.03	.03	-
F	Eriogonum racemosum	25	6	3	9	14	.16	.06	.10	.25
F	Heterotheca villosa	a18	b142	b171	b143	b146	4.69	6.92	7.59	3.15
F	Hymenoxys acaulis	2	1	-	-	-	.00	-	-	-

Type	Species	Nested Frequency					Average Cover %			
		'88	'95	'00	'05	'10	'95	'00	'05	'10
F	Lappula occidentalis (a)	-	3	-	1	-	.01	-	.00	-
F	Lepidium densiflorum (a)	-	_b 44	_a 2	_a 7	_a -	.15	.03	.02	-
F	Lithospermum sp.	-	-	4	-	-	-	.01	-	-
F	Lomatium sp.	-	-	-	6	3	-	-	.09	.00
F	Lupinus argenteus	_a 13	_b 41	_c 72	_{ab} 37	_b 37	1.75	2.72	3.26	.73
F	Machaeranthera grindelioides	-	-	-	1	2	-	-	.03	.03
F	Oenothera pallida	1	-	-	-	-	-	-	-	-
F	Penstemon sp.	5	5	-	4	5	.04	-	.06	.06
F	Petradoria pumila	8	3	-	4	1	.15	-	.06	.03
F	Phlox longifolia	9	-	-	-	-	-	-	-	-
F	Polygonum douglasii (a)	-	_c 29	_a -	_b 10	_a 2	.07	-	.02	.01
F	Sedum lanceolatum	1	-	-	-	-	-	-	-	-
F	Senecio multilobatus	1	4	8	3	3	.01	.06	.06	.03
F	Sphaeralcea coccinea	5	11	2	11	11	.09	.01	.08	.10
F	Taraxacum officinale	-	3	-	3	-	.01	-	.03	-
F	Tragopogon dubius	_a -	_b 10	_a -	_a 1	_a 2	.06	-	.01	.00
Total for Annual Forbs		0	136	4	63	10	0.39	0.03	0.22	0.02
Total for Perennial Forbs		106	243	278	280	263	7.09	10.14	12.00	4.67
Total for Forbs		106	379	282	343	273	7.49	10.18	12.23	4.69

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

BROWSE TRENDS--

Management unit 09, Study no: 19

Type	Species	Strip Frequency				Average Cover %			
		'95	'00	'05	'10	'95	'00	'05	'10
B	Amelanchier utahensis	10	11	8	9	1.94	2.63	3.87	4.69
B	Artemisia nova	7	4	5	8	.18	.03	.53	.15
B	Artemisia tridentata vaseyana	33	34	43	71	2.27	3.00	6.06	7.56
B	Ceanothus fendleri	0	0	1	0	-	-	-	-
B	Chrysothamnus nauseosus graveolens	0	0	0	1	-	.03	-	.53
B	Chrysothamnus viscidiflorus lanceolatus	3	0	2	1	.15	-	-	-
B	Eriogonum heracleoides	3	6	4	5	.66	.41	.38	.18
B	Gutierrezia sarothrae	12	23	32	31	.31	.63	.76	1.09
B	Opuntia sp.	19	24	38	44	.41	.41	.49	.84
B	Pediocactus simpsonii	6	3	1	9	.45	.03	.03	.03
B	Purshia tridentata	14	19	18	18	1.16	2.05	1.81	2.75
Total for Browse		107	124	152	197	7.55	9.25	13.94	17.85

CANOPY COVER, LINE INTERCEPT--

Management unit 09, Study no: 19

Species	Percent Cover	
	'05	'10
Amelanchier utahensis	4.46	5.28
Artemisia nova	.26	.81
Artemisia tridentata vaseyana	7.01	11.89
Chrysothamnus nauseosus graveolens	-	.15
Eriogonum heracleoides	.13	.13
Gutierrezia sarothrae	1.31	.75
Opuntia sp.	.43	1.31
Pediocactus simpsonii	-	.06
Purshia tridentata	2.41	3.36

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 09, Study no: 19

Species	Average leader growth (in)	
	'05	'10
Amelanchier utahensis	3.5	2.5
Artemisia tridentata vaseyana	1.9	1.7
Purshia tridentata	2.7	2.4

BASIC COVER--

Management unit 09, Study no: 19

Cover Type	Average Cover %				
	'88	'95	'00	'05	'10
Vegetation	7.50	40.06	42.06	50.70	39.57
Rock	16.50	26.87	26.17	30.12	25.98
Pavement	1.00	2.96	5.90	3.72	5.55
Litter	67.00	46.25	37.31	20.71	38.86
Cryptogams	0	.12	.15	.01	.07
Bare Ground	8.00	3.95	10.04	7.76	10.04

SOIL ANALYSIS DATA --

Management unit 9, Study no: 19, Study Name: Mosby Mountain South

Effective rooting depth (in)	pH	sandy loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
6.8	6.6	72.0	13.4	14.6	8.0	19.6	208.0	0.6

PELLET GROUP DATA--

Management unit 09, Study no: 19

Type	Quadrat Frequency			
	'95	'00	'05	'10
Rabbit	3	13	42	6
Grouse	-	1	4	2
Elk	30	12	10	3
Deer	19	6	16	16
Cattle	1	7	10	9

Days use per acre (ha)		
'00	'05	'10
-	-	-
35/acre	53/acre	78/acre
15 (37)	4 (10)	6 (15)
7 (17)	22 (55)	29 (71)
9 (22)	22 (54)	8 (20)

BROWSE CHARACTERISTICS--
Management unit 09, Study no: 19

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Amelanchier utahensis</i>										
88	599	100	0	-	-	22	67	44	-/-	
95	220	0	100	-	-	64	18	9	25/34	
00	220	0	100	-	-	45	18	0	27/47	
05	180	11	89	-	-	44	44	0	31/57	
10	180	11	89	-	20	11	89	0	34/54	
<i>Artemisia nova</i>										
88	2864	35	9	56	199	47	5	5	12/20	
95	240	17	67	17	-	67	33	0	7/18	
00	120	0	100	0	-	17	33	0	18/28	
05	180	0	89	11	-	11	0	11	11/21	
10	280	0	100	0	-	0	100	0	9/22	
<i>Artemisia tridentata vaseyana</i>										
88	7531	32	35	34	199	47	4	2	14/21	
95	1380	10	59	30	-	72	3	1	10/16	
00	1280	0	95	5	60	36	5	2	14/23	
05	1320	11	76	14	440	29	3	6	18/32	
10	4440	42	53	5	20	17	23	3	16/29	
<i>Ceanothus fendleri</i>										
88	0	0	0	-	-	0	0	0	-/-	
95	0	0	0	-	-	0	0	0	9/31	
00	0	0	0	-	-	0	0	0	10/41	
05	20	0	100	-	-	0	0	0	6/10	
10	0	0	0	-	-	0	0	0	7/22	
<i>Chrysothamnus nauseosus graveolens</i>										
88	0	0	0	-	-	0	0	0	-/-	
95	0	0	0	-	-	0	0	0	24/24	
00	0	0	0	-	-	0	0	0	27/41	
05	0	0	0	-	-	0	0	0	26/36	
10	20	0	100	-	-	0	0	0	30/42	
<i>Chrysothamnus viscidiflorus lanceolatus</i>										
88	0	0	0	0	-	0	0	0	-/-	
95	60	0	100	0	-	0	0	0	12/17	
00	0	0	0	0	-	0	0	0	7/17	
05	40	0	50	50	-	0	0	0	10/13	
10	20	0	100	0	-	0	100	0	6/12	

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<i>Eriogonum heracleoides</i>									
88	0	0	0	-	-	0	0	0	-/-
95	140	0	100	-	-	0	0	0	5/22
00	180	0	100	-	-	11	0	0	3/17
05	100	0	100	-	-	0	0	0	3/22
10	180	0	100	-	20	0	0	0	3/8
<i>Gutierrezia sarothrae</i>									
88	1999	0	97	3	-	0	0	0	6/6
95	440	5	95	0	40	0	0	0	7/9
00	1980	0	100	0	-	0	0	0	6/8
05	2260	1	96	3	-	.88	0	.88	8/9
10	1620	17	81	1	-	0	0	1	7/10
<i>Opuntia sp.</i>									
88	1732	96	4	0	599	0	0	8	2/10
95	580	24	76	0	-	0	0	0	3/10
00	800	8	90	3	-	0	0	0	2/10
05	1220	30	64	7	-	0	0	3	2/9
10	1420	7	93	0	-	0	0	0	2/11
<i>Pediocactus simpsonii</i>									
88	0	0	0	-	-	0	0	0	-/-
95	120	33	67	-	-	0	0	0	2/3
00	60	0	100	-	-	0	0	0	1/3
05	20	0	100	-	-	0	0	0	2/2
10	240	0	100	-	-	0	0	0	1/4
<i>Purshia tridentata</i>									
88	466	29	71	-	-	0	86	0	12/43
95	320	6	94	-	20	44	44	0	7/26
00	380	21	79	-	-	11	84	0	7/33
05	420	0	100	-	-	5	95	0	9/39
10	420	0	100	-	-	0	95	5	8/41
<i>Symphoricarpos oreophilus</i>									
88	0	0	0	-	-	0	0	0	-/-
95	0	0	0	-	-	0	0	0	-/-
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	-/-
10	0	0	0	-	-	0	0	0	3/11