

EMMA PARK - TREND STUDY NO. 17-59-10

Vegetation Type: Mountain Big Sagebrush

Range Type: Crucial Deer Summer (Fawning habitat), Crucial Elk Summer

NRCS Ecological Site Description: [Mountain Shallow Loam \(Mountain Big Sagebrush\), R047XA446UT](#)

Land Ownership: Private

Elevation: 7470 ft. (2277 m)

Aspect: North

Slope: 8%

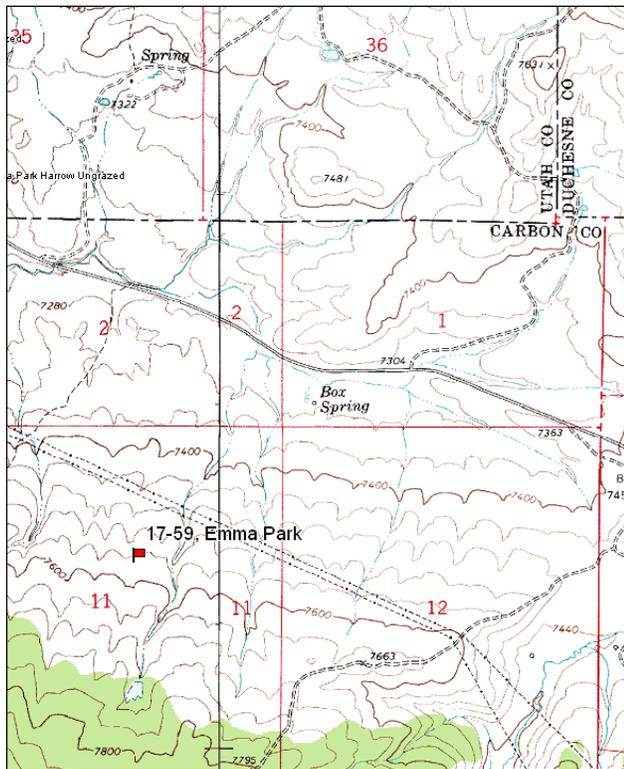
Transect bearing: 186° magnetic

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

Directions:

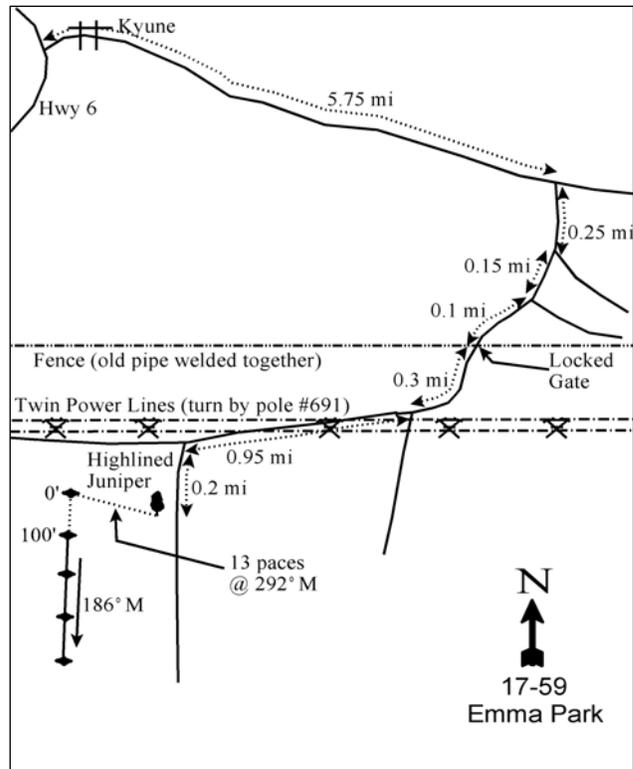
Traveling south on Highway 6 take a left on the road that leads to Kyune and travel 5.75 miles. Turn right and go 0.25 miles. Veer right for 0.15 miles to a fork. Continue right for 0.1 miles to a locked gate. Go through the gate for 0.3 miles. Veer right and go 0.95 miles following the power lines. Turn left for 0.2 miles to a high lined juniper. The 0-foot stake is 13 paces away at 292°M.

Map Name: Kyune



Township: 12S Range: 9E Section: 11

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 510257 E 4405484 N

Site Information

Site Description: The study is located on private land 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 study is within a big sagebrush (*Artemisia tridentata*) and grass community with high species diversity. Deer appear to be using this area as transitional and summer range. Deer were seen on site during the 2000 reading. Pellet group transect data has estimated use by deer, elk and cattle to be light since 2000 (Table - Pellet Group Data).

Browse: A mixture of a dense stand of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and a small population of basin big sagebrush (*A. tridentata* ssp. *tridentata*) are the key browse species. Most of the sagebrush sampled is considered to be mountain big sagebrush, although there appears to be some hybridizing between the two subspecies. Mountain big sagebrush provides most of the browse cover on the site (Table - Browse Trends). The mountain big sagebrush population is primarily comprised of large mature plants that have exhibited mostly light to moderate use. Decadence and poor vigor of mountain big sagebrush have been moderate, but both were high in 2005. Recruitment of young mountain big sagebrush plants was good at the outset of the study in 1994, but has been low since 2005. Other desirable shrubs include some moderate to heavily browsed serviceberry (*Amelanchier utahensis*) and a few scattered heavily hedged antelope bitterbrush (*Purshia tridentata*). Stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) and Oregon grape (*Mahonia repens*) are abundant understory shrubs. They are not utilized and appear to have stable mature populations (Table - Browse Characteristics).

Herbaceous Understory: Grasses on the site are diverse and fairly abundant, but are likely limited due to the high browse cover. Salina wildrye (*Elymus salina*) is the most abundant grass species, but other prevalent species include thickspike wheatgrass (*Agropyron dasystachyum*), Kentucky bluegrass (*Poa pratensis*), mutton bluegrass (*P. fendleriana*) and Letterman needlegrass (*Stipa lettermani*). Forbs are diverse and abundant, with several preferred species sampled. The most common species is desert phlox (*Phlox austromontana*) which dominates the forb composition in cover. Other abundant forb species include dandelion (*Taraxacum officinale*), silver lupine (*Lupinus argenteus*) and lobeleaf groundsel (*Senecio multilobatus*) (Table - Herbaceous Trends).

Soil: The soil has a clay loam texture and a neutral soil reaction (pH 7.0) (Table - Soil Analysis Data). Bare ground cover is low with high amounts of vegetation and litter cover. Small rocks are common on the surface and rock and pavement cover are moderate on the site (Table - Basic Cover). 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. The soil erosion condition was classified as slight in 2005 and 2010 because of moderate and frequent pedestals around shrubs and perennial grasses, soil, litter and surface rock movement, and flow patterns between perennial species.

Trend Assessments

Browse:

- **1994 to 2000 - stable (0):** There was little change in the density or cover of the primary browse species, mountain big sagebrush. Decadence of mountain big sagebrush decreased from 25% to 11%.
- **2000 to 2005 - down (-2):** The density of mountain big sagebrush decreased by 17% from 4,600 plants/acre to 3,820 plants/acre and cover decreased from 19% to 13%. There was an increase in decadence to 41% and poor vigor increased from 4% to 25%. Recruitment of young mountain big sagebrush plants decreased from 17% to 2% of the population.
- **2005 to 2010 - slightly up (+1):** Mountain big sagebrush density and cover remained similar, but decadence decreased to 13% and poor vigor decreased to 18%. Recruitment of young mountain big sagebrush increased slightly, but remained poor at 7% of the population.

Grass:

- **1994 to 2000 - up (+2):** The sum of nested frequency of perennial grasses increased by 21% and cover increased from 7% to 10%.
- **2000 to 2005 - stable (0):** There was little change in the sum of nested frequency or cover of perennial grasses.
- **2005 to 2010 - stable (0):** The perennial grass sum of nested frequency remained similar, but cover increased from 9% to 15%.

Forb:

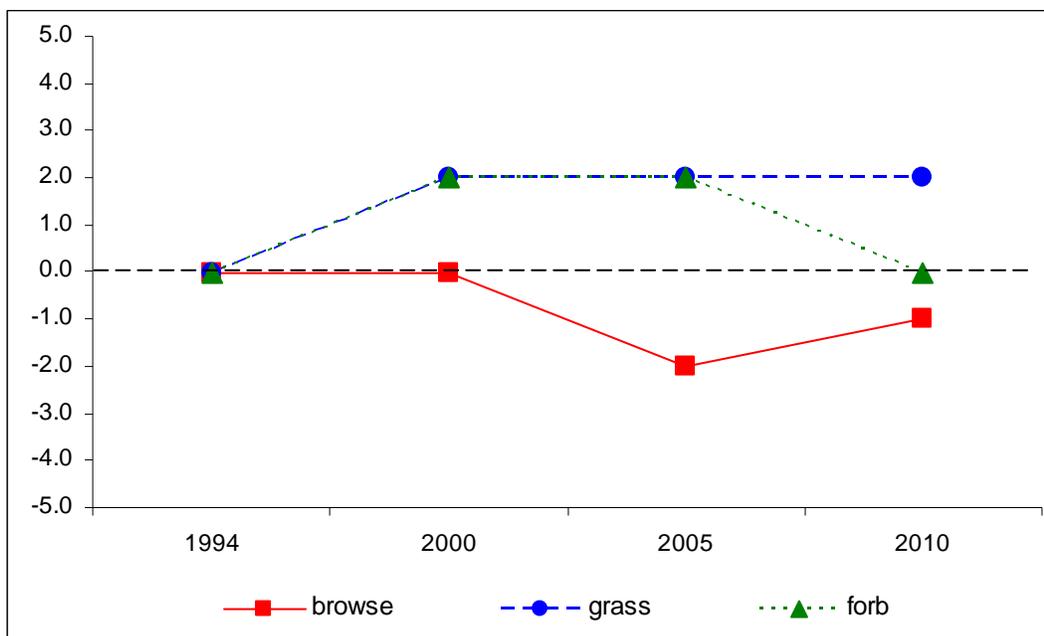
- **1994 to 2000 - up (+2):** The perennial forb sum of nested frequency increased by 31% and cover increased from 8% to 11%.
- **2000 to 2005 - stable (0):** The sum of nested frequency and cover of perennial forbs remained similar.
- **2005 to 2010 - down (-2):** There was a 22% decrease in the sum of nested frequency of perennial forbs. Cover of perennial forbs increased from 12% to 17%, but most of the increase was due to a large increase in the cover of desert phlox, which provides little forage value.

DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --
Management unit 17, study no: 59

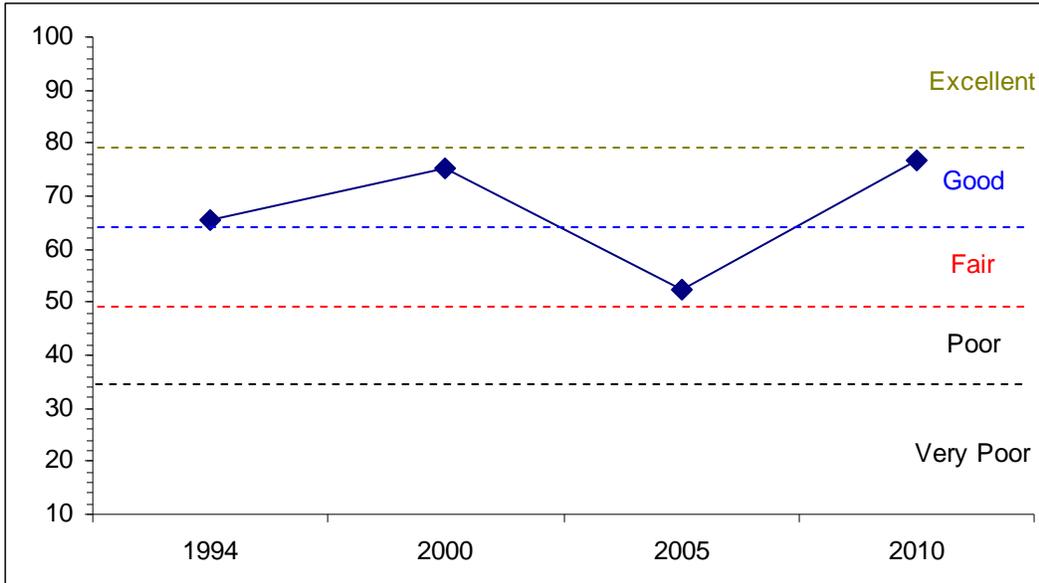
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
94	27.9	7.6	5.4	14.6	0.0	10.0	0.0	65.6	Fair-Good
00	25.7	11.9	8.4	19.3	-0.1	10.0	0.0	75.2	Good
05	19.7	4.2	1.0	17.6	0.0	10.0	0.0	52.5	Fair
10	21.5	11.9	3.6	29.7	0.0	10.0	0.0	76.7	Good

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 17, Study no: 59



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL--
 Management unit 17, Study no: 59



HERBACEOUS TRENDS--
 Management unit 17, Study no: 59

Type	Species	Nested Frequency				Average Cover %			
		'94	'00	'05	'10	'94	'00	'05	'10
G	Agropyron dasystachyum	a8	c101	b48	a144	.21	1.11	.38	2.40
G	Agropyron trachycaulum	a-	a-	b14	ab2	-	-	.10	.06
G	Bromus anomalus	ab6	ab7	b11	a-	.01	.04	.06	-
G	Bromus tectorum (a)	3	9	-	3	.00	.09	.00	.00
G	Carex sp.	a9	c46	ab20	bc31	.18	.72	.21	.42
G	Elymus salina	c242	a86	ab207	b159	5.72	2.36	4.31	8.52
G	Koeleria cristata	a-	a1	b54	a9	-	.03	.32	.16
G	Poa fendleriana	b132	a85	a41	a39	.90	1.50	.26	.29
G	Poa pratensis	a-	b111	b78	b86	-	2.58	2.38	2.42
G	Poa secunda	a-	ab12	b25	b20	-	.07	.28	.26
G	Stipa columbiana	-	-	4	-	-	-	.18	-
G	Stipa lettermani	a32	b70	a27	a14	.28	1.19	.29	.30
Total for Annual Grasses		3	9	0	3	0.00	0.08	0.00	0.00
Total for Perennial Grasses		429	519	529	504	7.31	9.63	8.80	14.86
Total for Grasses		432	528	529	507	7.32	9.72	8.80	14.87
F	Achillea millefolium	a34	b61	a24	a16	.17	.73	.33	.11
F	Agoseris glauca	-	-	3	-	-	-	.00	-
F	Allium sp.	-	-	4	-	-	-	.01	-
F	Androsace septentrionalis (a)	a2	a6	b46	a8	.00	.01	.12	.02
F	Antennaria parvifolia	a3	b23	b27	ab19	.06	.32	.20	.14
F	Arabis drummondii	b12	ab3	c48	a-	.03	.00	.14	-
F	Aster chilensis	b33	ab15	ab15	a4	.14	.19	.25	.30
F	Astragalus convallarius	b25	a5	ab23	a11	.26	.07	.11	.10
F	Astragalus sp.	ab9	a-	b9	a-	.06	-	.07	-

Type	Species	Nested Frequency				Average Cover %			
		'94	'00	'05	'10	'94	'00	'05	'10
F	<i>Astragalus tenellus</i>	b60	b77	a25	a13	1.14	.57	.11	.09
F	<i>Astragalus utahensis</i>	a-	ab6	b12	b16	-	.07	.05	.52
F	<i>Calochortus nuttallii</i>	a3	a-	b26	a-	.00	-	.07	-
F	<i>Castilleja linariaefolia</i>	7	3	5	1	.16	.00	.04	.00
F	<i>Chaenactis douglasii</i>	7	6	2	3	.01	.05	.00	.00
F	<i>Chenopodium album</i> (a)	1	-	1	-	.00	-	.00	-
F	<i>Cirsium</i> sp.	-	2	-	-	-	.00	-	-
F	<i>Collinsia parviflora</i> (a)	b44	a-	a5	a1	.19	-	.01	.00
F	<i>Comandra pallida</i>	a14	bc39	ab20	c53	.03	.25	.08	.59
F	<i>Crepis acuminata</i>	ab3	a-	b8	ab5	.41	-	.05	.04
F	<i>Descurainia pinnata</i> (a)	-	-	-	2	-	-	-	.01
F	<i>Erigeron eatonii</i>	ab65	a34	b72	ab45	.42	.14	.26	.32
F	<i>Erigeron flagellaris</i>	a1	a4	b22	b24	.00	.01	.14	.17
F	<i>Eriogonum umbellatum</i>	3	4	4	2	.03	.06	.15	.03
F	<i>Gayophytum ramosissimum</i> (a)	3	2	-	-	.00	.00	-	-
F	<i>Gilia</i> sp. (a)	2	-	-	-	.01	-	-	-
F	<i>Hedysarum boreale</i>	a-	a3	a1	b44	-	.03	.03	.36
F	<i>Helianthella uniflora</i>	a1	b24	a3	a-	.00	.37	.41	-
F	<i>Ipomopsis aggregata</i>	-	2	5	-	-	.00	.03	-
F	<i>Lomatium</i> sp.	-	2	-	3	-	.00	-	.00
F	<i>Lupinus argenteus</i>	35	35	23	31	.21	.59	1.14	.51
F	<i>Lychnis drummondii</i>	1	6	-	2	.00	.41	-	.00
F	<i>Machaeranthera canescens</i>	5	-	9	3	.01	-	.05	.03
F	<i>Orthocarpus tolmiei</i> (a)	a-	a1	c110	b26	-	.00	1.21	.27
F	<i>Penstemon caespitosus</i>	13	24	6	16	.07	.19	.01	.07
F	<i>Penstemon humilis</i>	b11	ab13	a-	a-	.10	.04	-	-
F	<i>Penstemon watsonii</i>	23	19	7	14	.41	.20	.23	.14
F	<i>Phlox austromontana</i>	a142	ab156	b199	b199	3.72	5.16	6.25	12.26
F	<i>Phlox longifolia</i>	3	1	3	4	.00	.00	.00	.04
F	<i>Polygonum douglasii</i> (a)	b10	a-	ab5	ab6	.02	-	.02	.01
F	<i>Potentilla gracilis</i>	a4	ab11	bc25	c29	.01	.08	.09	.33
F	<i>Schoenocrambe linifolia</i>	2	2	3	6	.00	.01	.03	.01
F	<i>Senecio integerrimus</i>	9	8	6	3	.03	.07	.04	.00
F	<i>Senecio multilobatus</i>	a15	b103	b77	a20	.04	1.37	.55	.26
F	<i>Sphaeralcea coccinea</i>	3	-	-	1	.00	-	-	.00
F	<i>Taraxacum officinale</i>	a6	bc31	c42	ab16	.01	.18	1.23	.14
F	<i>Thalictrum fendleri</i>	3	8	3	-	.06	.06	.15	-
F	<i>Zigadenus paniculatus</i>	a1	a-	b9	a-	.00	-	.03	-
Total for Annual Forbs		62	9	167	43	0.24	0.02	1.37	0.31
Total for Perennial Forbs		556	730	770	603	7.70	11.31	12.43	16.64
Total for Forbs		618	739	937	646	7.94	11.34	13.80	16.96

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

BROWSE TRENDS--

Management unit 17, Study no: 59

Type	Species	Strip Frequency				Average Cover %			
		'94	'00	'05	'10	'94	'00	'05	'10
B	Amelanchier utahensis	9	8	12	14	.18	.33	.21	.62
B	Artemisia tridentata tridentata	0	3	11	12	-	.68	2.20	2.57
B	Artemisia tridentata vaseyana	88	93	85	85	21.89	19.21	12.86	13.38
B	Cercocarpus montanus	1	0	0	2	.03	-	-	.15
B	Chrysothamnus depressus	4	8	14	4	.19	.27	.45	.18
B	Chrysothamnus viscidiflorus viscidiflorus	74	64	60	67	3.73	4.61	3.49	4.63
B	Gutierrezia sarothrae	3	4	4	0	.00	.03	.03	-
B	Mahonia repens	22	23	15	12	.65	1.06	.85	.51
B	Opuntia sp.	0	0	0	1	-	-	-	-
B	Purshia tridentata	0	1	1	1	-	-	-	.00
B	Ribes sp.	0	1	0	1	-	-	-	.15
B	Rosa woodsii	3	3	0	2	.00	.03	-	.00
B	Symphoricarpos oreophilus	28	24	7	12	2.66	2.14	.24	.48
B	Tetradymia canescens	1	2	2	2	-	.00	-	-
Total for Browse		233	234	211	215	29.34	28.37	20.36	22.70

CANOPY COVER, LINE INTERCEPT--

Management unit 17, Study no: 59

Species	Percent Cover	
	'05	'10
Amelanchier utahensis	.91	.36
Artemisia tridentata tridentata	4.51	3.68
Artemisia tridentata vaseyana	17.75	20.38
Chrysothamnus depressus	.53	.41
Chrysothamnus viscidiflorus viscidiflorus	5.33	5.11
Gutierrezia sarothrae	.01	-
Mahonia repens	.30	.08
Purshia tridentata	.08	.21
Ribes sp.	-	.11
Rosa woodsii	-	.11
Symphoricarpos oreophilus	.48	.91
Tetradymia canescens	.08	.05

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 17, Study no: 59

Species	Average leader growth (in)	
	'05	'10
Artemisia tridentata vaseyana	1.6	1.3
Purshia tridentata	4.0	-

BASIC COVER--

Management unit 17, Study no: 59

Cover Type	Average Cover %			
	'94	'00	'05	'10
Vegetation	43.04	50.81	37.15	48.68
Rock	5.51	6.91	4.99	6.34
Pavement	1.48	7.57	4.17	3.91
Litter	47.61	59.09	41.79	47.73
Cryptogams	.60	1.20	.35	.15
Bare Ground	14.02	18.48	21.44	15.73

SOIL ANALYSIS DATA --

Management unit 17, Study no: 59, Study Name: Emma Park

Effective rooting depth (in)	pH	sandy loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
14.4	7.0	29.4	31.1	39.3	4.0	10.6	137.6	0.8

PELLET GROUP DATA--

Management unit 17, Study no: 59

Type	Quadrat Frequency				Days use per acre (ha)		
	'94	'00	'05	'10	'00	'05	'10
Rabbit	16	24	10	4	-	-	-
Moose	2	2	-	-	-	-	-
Grouse	-	-	-	1	-	-	-
Elk	25	6	13	1	13 (31)	24 (60)	9 (23)
Deer	19	8	6	11	15 (36)	11 (28)	19 (46)
Cattle	6	2	3	2	20 (50)	19 (47)	11 (27)

BROWSE CHARACTERISTICS--

Management unit 17, Study no: 59

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
Amelanchier utahensis									
94	200	10	70	20	-	10	40	20	16/11
00	200	50	40	10	-	40	10	30	15/17
05	260	23	69	8	20	38	54	0	15/17
10	320	31	63	6	20	6	50	13	14/16
Artemisia tridentata tridentata									
94	0	0	0	0	-	0	0	0	-/-
00	60	0	100	0	-	0	0	0	61/45
05	380	0	84	16	-	21	11	5	58/54
10	280	0	100	0	-	50	0	0	59/75
Artemisia tridentata vaseyana									
94	4640	11	64	25	40	8	1	5	28/34
00	4600	17	72	11	80	17	0	4	28/35
05	3820	2	57	41	-	28	7	25	24/31
10	4000	7	81	13	20	46	4	18	25/33

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
Cercocarpus montanus									
94	20	0	100	-	-	100	0	100	9/12
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	-/-
10	40	50	50	-	-	50	50	0	20/24
Chrysothamnus depressus									
94	180	0	100	0	-	11	0	0	4/10
00	300	0	100	0	-	7	0	0	3/7
05	880	0	95	5	-	18	0	5	6/12
10	360	6	94	0	-	0	0	0	6/13
Chrysothamnus viscidiflorus viscidiflorus									
94	4800	0	99	1	-	0	0	.83	11/13
00	4000	4	93	4	-	.50	0	.50	9/13
05	3540	0	98	2	80	0	0	1	11/18
10	3740	1	99	0	-	5	1	0	11/16
Gutierrezia sarothrae									
94	120	33	67	-	-	0	0	0	6/9
00	240	0	100	-	-	0	0	0	4/7
05	260	0	100	-	-	0	0	0	6/10
10	0	0	0	-	-	0	0	0	-/-
Mahonia repens									
94	4260	16	84	-	-	0	0	0	3/4
00	6380	15	85	-	-	0	0	0	3/4
05	4000	0	100	-	-	0	0	0	2/3
10	920	70	30	-	60	0	0	0	3/6
Opuntia sp.									
94	0	0	0	-	-	0	0	0	-/-
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	-/-
10	60	0	100	-	-	0	0	0	-/-
Purshia tridentata									
94	0	0	0	-	-	0	0	0	17/30
00	40	0	100	-	-	0	100	0	20/50
05	40	0	100	-	-	0	100	0	-/-
10	20	0	100	-	-	0	100	0	11/19
Ribes sp.									
94	0	0	0	-	-	0	0	0	-/-
00	20	100	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	-/-
10	80	0	100	-	-	0	0	0	10/9

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Rosa woodsii</i>										
94	140	0	100	-	-	0	0	0	7/7	
00	80	50	50	-	-	0	0	0	19/8	
05	0	0	0	-	-	0	0	0	-/-	
10	60	0	100	-	-	0	0	0	9/14	
<i>Symphoricarpos oreophilus</i>										
94	1420	8	90	1	-	6	1	0	18/25	
00	920	20	80	0	-	2	0	2	15/17	
05	200	0	50	50	-	0	0	50	23/24	
10	520	42	58	0	-	0	0	8	12/14	
<i>Tetradymia canescens</i>										
94	40	0	0	100	-	100	0	100	4/4	
00	80	50	50	0	-	0	0	0	-/-	
05	60	0	100	0	-	0	0	0	6/10	
10	60	0	100	0	-	0	0	0	9/12	