Trend Study 28-4-08

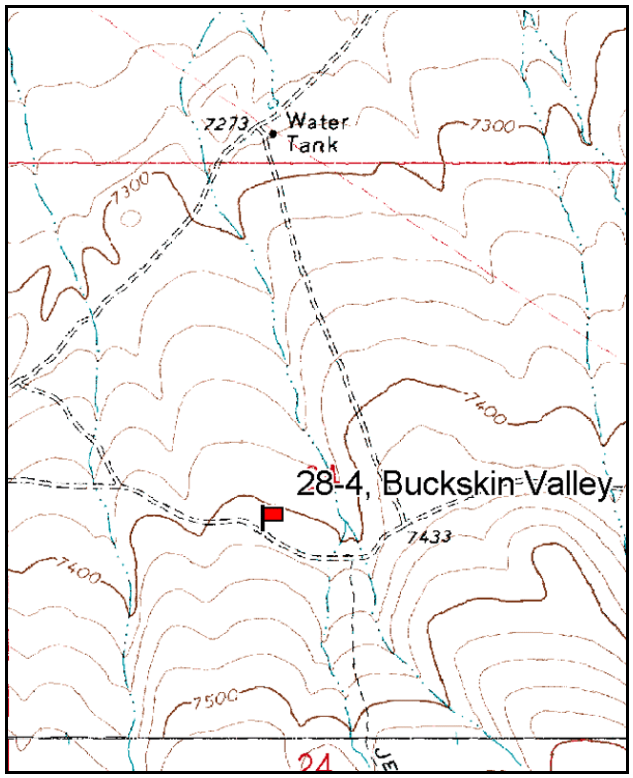
Study site name: Buckskin Valley . Vegetation type: Mixed Mountain Brush .

Compass bearing: frequency baseline 182 degrees magnetic.

Frequency belt placement: line 1 (11 & 71ft), line 2 (34ft), line 3 (59ft), line 4 (95ft). Rebar: belt 4 on 10ft.

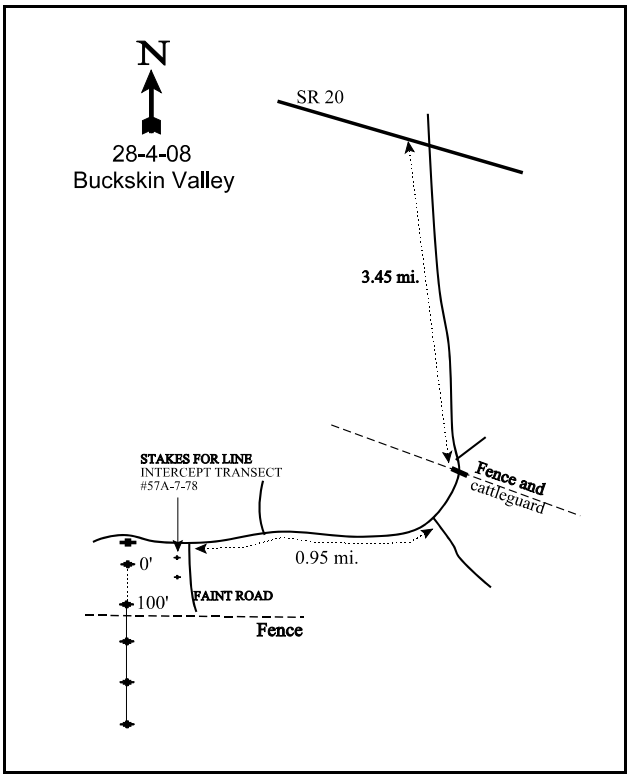
LOCATION DESCRIPTION

From SR 20 just west of mile marker 7, turn south onto the Buckskin Valley road. Travel 3.45 miles to a cattleguard. Just beyond the fence and cattleguard, bear right and proceed west 0.95 miles to an intersection where a very faint road goes to the south. About 60 feet west of this intersection is the witness post on the south (left) side of the road. The 0-foot stake is 6 feet southeast of the witness post. The 0-foot stake is a 2 foot tall green fencepost marked by a red browse tag #9005. The frequency baseline runs south-southwest from here. The old line-intercept transect 57A-7-78 is marked by a red-painted steel fencepost 10 feet east of this study.



Map Name: Burnt Peak

Township 32S , Range 7W , Section 24



Diagrammatic Sketch

GPS: NAD 83, UTM 12S 359445 E, 4207552 N

DISCUSSION

Buckskin Valley - Trend Study No. 28-4

Study Information

Buckskin Valley, located on the northern end of the unit, is important big game transitional range and winter range in mild winters [elevation: 7,400 feet (2,256 m), slope: 5%, aspect: northeast]. This study samples a mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) dominated community. The lower areas have been extensively treated by the BLM to enhance livestock grazing. The area where the transect is located, in the upper part of the valley, is a cattle-sheep allotment used for late spring grazing, although cattle were on the site during the 1992 reading in early August. A pellet group transect read on the study site in 1998 estimated 49 deer days use/acre (121 ddu/ha) and 7 cow days use/acre (17 cdu/ha). Pellet group transect data collected in 2003 estimated 51 deer, 1 cow, and 12 sheep days use/acre (126 ddu/ha, 2 cdu/ha, and 30 sdu/ha). Pellet data from 2008 estimated 43 deer days use/acre (106 ddu/ha), 1 elk day use/acre (3 edu/ha)and 6 cow days use/acre (14 cdu/ha).

Soils

Soil analysis indicates a loam texture with a moderately acidic pH (5.9). The effective rooting depth was estimated at just over 14 inches (36 cm). The soil is dark in color and rocks are fairly common on the surface. There is evidence of compaction and crusting due to the relatively high clay content (26%). Since 1992, relative combined vegetation and litter cover has been 68%-76% , and relative combined rock and pavement cover has been 3%-5%. Relative bare ground cover has been moderate ranging from 19%-29% since 1992. However, the erosion condition was classified as stable rating in 2003 and 2008.

Browse

The preferred shrubs on the site include dense stand of mountain big sagebrush and antelope bitterbrush (*Purshia tridentata*). Density of sagebrush declined from its high in 1992 of 8,980 plants/acre to an average of around 5,000 plants/acre from 1998 to 2008. The population is overly mature with moderate to high decadence in all years. The proportion of the population made up of seedling and young plants has been low in all readings. Utilization of sagebrush was moderate to heavy in 1987 and 1992, moderate in 1998, and mostly light in 2003 and 2008. Sagebrush vigor has been normal on the majority of the population in all years.

Interspersed in the dense sagebrush canopy are highly preferred bitterbrush plants. Bitterbrush density declined from its high in 1992 of 3,080 plants/acre to and average of around 1,800 plants/acre from 1998 to 2008. Young plants were very abundant in 1987 and 1992 as they made up 50% and 34% of the population, respectively. The proportion of young in the population steadily declined since 1992 at 15% in 1998, 3% in 2003, and no young plants were sampled in 2008. Moderate to heavy use on bitterbrush has occurred in all sample years as a result of use by big game and sheep. Other browse species that occur in low densities include Gambel oak (*Quercus gambelii*), snowberry (*Symphoricarpos oreophilus*), and prickly pear cactus (*Opuntia sp.*).

Herbaceous Understory

Sheltered by the dense shrub overstory is a variety of fairly abundant herbaceous species. Western wheatgrass (*Agropyron smithii*), bottlebrush squirreltail (*Sitanion hystrix*), Letterman needlegrass (*Stipa lettermani*), mutton bluegrass (*Poa fendleriana*), and Kentucky bluegrass (*Poa pratensis*) are the predominant perennial grasses. Cheatgrass (*Bromus tectorum*) is also fairly abundant and was sampled in over half of the quadrats in 1998, 2003, and 2008, a significant increase since 1992. Cheatgrass does not pose a serious fire hazard yet, but with further increases it could. Western wheatgrass is the most abundant grass followed by cheatgrass. Forbs have had high diversity and abundance on this site in all readings, but showed a moderate decline in sum of nested frequency and average cover in 2003 with drought. The most abundant perennial forbs included milkvetch (*Astragalus sp.*), douglas chaenactis (*Chaenactis douglasii*), Wheeler's thistle (*Cirium wheeleri.*),

redroot eriogonum (*Eriogonum racemosum*), silvery lupine (*Lupinus argenteus*), longleaf phlox (*Phlox longifolia*), clover (*Trifolium* sp.), and foothill death camas (*Zigadenus paniculatus*). The annual, blue-eyed Mary (*Collinsia parviflora*), was very abundant in 1998, 2003, and 2008. This species accounted for 69% of the total forb cover in 2003 and 35% in 2008. Foothill death camas was the only other forb with notable cover.

1992 TREND ASSESSMENT

Browse trend is considered slightly down. Density differences may be related to the larger sample area used in 1992, therefore, the trend for browse was determined using other parameters. Decadence of mountain big sagebrush increased from 36% in 1987 to 56%, and plants displaying poor vigor increased from 7% in 1987 to 16%. Recruitment of young plants declined from 11% of the population in 1987 to 3%. Antelope bitterbrush decadence increased to 10%, but vigor remained good. Recruitment of young bitterbrush declined from 50% in 1987 to 34%. The trend for grasses is slightly up. Grasses account for 18% of the total vegetation cover. The sum of nested frequency of perennial grasses increased by 23% from 1987. Mutton bluegrass (*Poa fendleriana*) and needle-and-thread grass (*Stipa comata*) increased significantly in nested frequency from 1987. Trend for forbs is stable. There was little change in the sum of nested frequency of perennial forbs.

winter range condition (DCI) - fair-good (63) Mid-level potential scale
browse - slightly down (-1) grass - slightly up (+1) forb - stable (0)

1998 TREND ASSESSMENT

The browse trend is stable. Density of mountain big sagebrush has declined 43% from 1992 to 5,160 plants/acre, but it appears as though the population has thinned itself. Cover has remained similar to 1992. Many of the decadent plants from the 1992 survey have died. Sagebrush decadence declined to 26%, and plants displaying poor vigor declined to 8%. Recruitment of young sagebrush plants remained poor. The antelope bitterbrush density declined 38% since 1992 to 1,900 plants/acre, but cover increased to 8%. Bitterbrush decadence declined to 3%, and vigor remained good. Recruitment of young bitterbrush plants declined to 15% of the population. The trend for grasses is slightly down. The sum of nested frequency of perennial grasses decreased 16%, and cover of perennial grasses declined slightly. There was a significant decrease in the nested frequency of needle-and-thread grass, while cheatgrass has significantly increased in nested frequency since 1992. The trend for forbs is slightly down. The sum of nested frequency of perennial forbs decreased by 30%, though cover of perennial forbs remained similar to 1992. There was a significant decrease in the nested frequency of longleaf phlox.

winter range condition (DCI) - fair-good (63) Mid-level potential scale
browse - slightly down (-1) grass - slightly down (-1) forb - slightly down (-1)

2003 TREND ASSESSMENT

Trend for browse is slightly down. The density of mountain big sagebrush remained similar to 1998 levels at 4,620 plants/acre. Sagebrush decadence increased to 44% and plants displaying poor vigor increased to 13%. Recruitment of young sagebrush plants declined to only 1% of the population. The density of bitterbrush remained similar to 1998 levels at 1,860 plants/acre. Decadence of bitterbrush increased to 24%, but vigor remained good in the population. Recruitment of young bitterbrush declined to 3%. Trend for the grasses and forbs is down. Parameter of perennial grasses and perennial forbs nearly mirrored one another. Sum of nested frequency of both perennial grasses and forbs declined by 41%, and production of both perennial grasses and forbs declined from 6% total cover in 1998 to 3%. There was a significant decrease in nested frequency of Letterman needlegrass, Kentucky bluegrass, and longleaf phlox.

winter range condition (DCI) - poor (44) Mid-level potential scale
browse - slightly down (-1) grass - down (-2) forb - (-2)

2008 TREND ASSESSMENT

The trend for browse is slightly down. The density of mountain big sagebrush increased by 22% since 2003 to 5,620 plants/acre. Decadence of sagebrush increased to 51% and plants displaying poor vigor increased to 17% of the population. Recruitment of young sagebrush improved slightly, but is still low. Line-intercept canopy cover of sagebrush decreased from 35% in 2003 to 31%. Bitterbrush density has remained similar to 2003 at 1,760 plants/acre, but decadence increased to 32%. Vigor of bitterbrush remained good, but recruitment was poor with few bitterbrush seedlings and no young plants sampled. Trend for both grasses and forbs is up. The sum of nested frequency of perennial grasses increased by 47%, and production of perennial grasses increased to 6% of the total cover. There was a significant increase in the nested frequency of western wheatgrass and Kentucky bluegrass, and a significant decrease in the nested frequency of bottlebrush squirreltail. Sum of nested frequency of perennial forbs increased more than two-fold, and production of perennial forbs increased to 8% of the total cover.

winter range condition (DCI) - fair (52) Mid-level potential scale
browse - slightly down (-1) grass - up (+2) forb - up (+2)

HERBACEOUS TRENDS --
Management unit 28 , Study no: 4

Type	Species	Nested Frequency					Average Cover %			
		'87	'92	'98	'03	'08	'92	'98	'03	'08
G	Agropyron cristatum	-	-	6	-	7	-	.06	-	.07
G	Agropyron smithii	bc173	bc185	ab136	a103	c186	4.03	1.58	.94	3.70
G	Agropyron spicatum	-	-	2	3	-	-	.00	.03	-
G	Bromus ciliatus	-	2	-	-	-	.01	-	-	-
G	Bromus tectorum (a)	-	a42	b167	b143	b171	.11	2.90	1.62	2.71
G	Poa fendleriana	a37	b47	ab33	a13	a18	1.52	.95	.40	.32
G	Poa pratensis	a-	a-	c44	b14	c55	-	2.20	.28	1.69
G	Poa secunda	-	3	2	-	6	.01	.01	-	.04
G	Sitanion hystrix	c119	c115	bc89	b64	a23	2.17	1.43	.78	.36
G	Stipa comata	a5	b31	a2	a3	a3	.18	.01	.03	.03
G	Stipa lettermani	a-	b28	b33	a6	a4	.51	.22	.18	.18
Total for Annual Grasses		0	42	167	143	171	0.10	2.90	1.62	2.71
Total for Perennial Grasses		334	411	347	206	302	8.46	6.47	2.66	6.40
Total for Grasses		334	453	514	349	473	8.57	9.37	4.29	9.11
F	Agoseris glauca	a-	a-	a4	a6	b25	-	.04	.07	.53
F	Allium sp.	-	3	1	-	5	.00	.00	-	.01
F	Arabis holboellii	b44	b27	a2	a-	a6	.06	.01	-	.01
F	Astragalus convallarius	1	8	5	10	8	.67	.06	.12	.07
F	Astragalus panguicensis	a6	ab9	b27	a-	a-	.03	.36	-	-
F	Astragalus sp.	ab15	b16	a1	a-	b22	.07	.09	-	.70
F	Balsamorhiza sagittata	-	-	2	-	2	-	.00	-	.15
F	Calochortus nuttallii	2	-	5	4	10	-	.01	.01	.07
F	Chaenactis douglasii	c84	b32	ab12	a-	a-	.17	.02	-	-

Type	Species	Nested Frequency					Average Cover %			
		'87	'92	'98	'03	'08	'92	'98	'03	'08
F	Cirsium wheeleri	$_{c}$35	$_{bc}$24	$_{ab}$16	$_{a}$1	$_{a}$4	.38	.41	.01	.20
F	Cordylanthus kingii (a)	-	-	-	4	-	-	-	.03	-
F	Comandra pallida	5	7	6	12	8	.03	.03	.07	.10
F	Collinsia parviflora (a)	-	$_{a}$115	$_{b}$262	$_{c}$330	$_{b}$302	.55	2.22	9.04	4.51
F	Crepis acuminata	-	9	6	5	11	.04	.05	.07	.25
F	Cryptantha sp.	-	-	-	1	1	-	-	.00	.00
F	Delphinium nuttallianum	-	-	-	-	21	-	-	-	.08
F	Erigeron eatonii	11	-	-	1	-	-	-	.00	-
F	Erigeron sp.	-	-	2	-	-	-	.00	-	-
F	Eriogonum racemosum	$_{b}$41	$_{b}$32	$_{ab}$24	$_{a}$8	$_{ab}$22	.28	.14	.05	.15
F	Eriogonum umbellatum	19	18	8	3	10	.07	.09	.01	.07
F	Gayophytum ramosissimum(a)	-	-	-	7	12	-	-	.01	.02
F	Ipomopsis aggregata	2	-	-	-	-	-	-	-	-
F	Lappula occidentalis (a)	-	-	-	2	12	-	-	.00	.02
F	Linum lewisii	-	-	2	-	2	-	.03	-	.03
F	Lithospermum sp.	-	-	3	-	-	-	.03	-	-
F	Lomatium sp.	$_{a}$-	$_{b}$9	$_{a}$-	$_{a}$-	$_{c}$58	.03	-	.00	.46
F	Lupinus argenteus	$_{ab}$31	$_{ab}$45	$_{b}$55	$_{ab}$35	$_{a}$23	1.42	3.22	1.65	.88
F	Machaeranthera canescens	$_{b}$36	$_{a}$4	$_{a}$2	$_{a}$-	$_{a}$-	.04	.00	-	-
F	Microsteris gracilis (a)	-	$_{b}$112	$_{a}$61	$_{b}$138	$_{a}$47	.44	.26	1.08	.20
F	Navarretia intertexta (a)	-	-	-	2	1	-	-	.03	.00
F	Penstemon sp.	-	-	-	2	2	-	-	.03	.00
F	Phlox longifolia	$_{b}$118	$_{c}$177	$_{b}$115	$_{a}$53	$_{b}$100	1.02	.97	.24	.90
F	Polygonum douglasii (a)	-	-	4	-	5	-	.04	-	.01
F	Ranunculus testiculatus (a)	-	-	-	-	3	-	-	-	.00
F	Senecio douglasii	4	-	-	-	-	-	-	-	-
F	Senecio multilobatus	$_{b}$18	$_{a}$1	$_{a}$1	$_{a}$-	$_{a}$-	.00	.00	-	-
F	Sphaeralcea coccinea	8	4	4	3	-	.01	.01	.00	-
F	Taraxacum officinale	6	1	-	-	-	.03	-	-	-
F	Tragopogon dubius	8	2	7	-	-	.00	.04	-	-
F	Trifolium sp.	$_{a}$16	$_{b}$42	$_{b}$43	$_{ab}$30	$_{b}$66	.15	.31	.11	.84
F	Zigadenus paniculatus	$_{a}$7	$_{b}$38	$_{a}$5	$_{b}$37	$_{c}$77	.82	.04	.37	2.59
Total for Annual Forbs		0	227	327	483	382	0.99	2.53	10.21	4.78
Total for Perennial Forbs		517	508	358	211	483	5.38	6.02	2.86	8.15
Total for Forbs		517	735	685	694	865	6.37	8.55	13.08	12.94

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

BROWSE TRENDS --
Management unit 28 , Study no: 4

Type	Species	Strip Frequency				Average Cover %			
		'92	'98	'03	'08	'92	'98	'03	'08
B	Artemisia tridentata vaseyana	98	94	92	89	24.29	24.87	27.41	18.91
B	Chrysothamnus depressus	1	0	0	0	.00	-	-	-
B	Chrysothamnus viscidiflorus viscidiflorus	2	0	0	0	.00	-	-	.00
B	Juniperus scopulorum	1	1	1	0	.00	.03	.53	.63
B	Mahonia repens	0	0	1	1	-	-	.03	.00
B	Opuntia sp.	44	28	24	36	1.29	1.03	.57	1.89
B	Purshia tridentata	79	65	61	55	5.57	8.25	6.44	4.64
B	Quercus gambelii	2	3	6	2	1.62	.56	.41	.03
B	Symphoricarpos oreophilus	17	17	18	16	.77	3.24	1.67	2.47
Total for Browse		244	208	203	199	33.56	38.00	37.07	28.59

CANOPY COVER, LINE INTERCEPT --
Management unit 28 , Study no: 4

Species	Percent Cover	
	'03	'08
Artemisia tridentata vaseyana	34.73	30.66
Juniperus scopulorum	.70	.86
Opuntia sp.	.33	1.39
Purshia tridentata	6.55	8.25
Quercus gambelii	1.00	.78
Symphoricarpos oreophilus	1.61	2.98

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 28 , Study no: 4

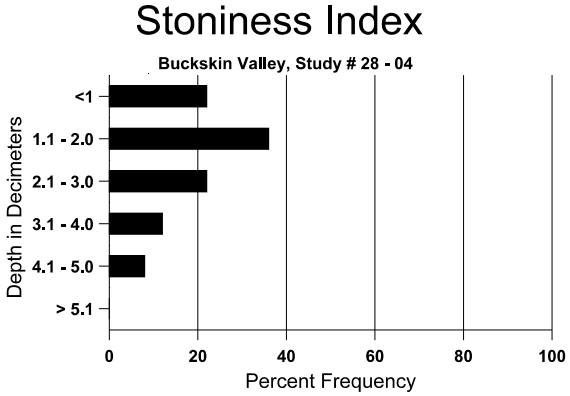
Species	Average leader growth (in)	
	'03	'08
Artemisia tridentata vaseyana	1.5	1.4
Purshia tridentata	2.0	0.5

BASIC COVER --
Management unit 28 , Study no: 4

Cover Type	Average Cover %				
	'87	'92	'98	'03	'08
Vegetation	7.50	42.98	50.00	48.48	44.65
Rock	5.50	5.53	4.95	3.54	4.16
Pavement	1.00	1.26	1.68	.55	.91
Litter	74.50	59.12	66.59	53.09	57.17
Cryptogams	2.25	1.64	.98	.21	.46
Bare Ground	9.25	14.50	16.27	18.33	19.09

SOIL ANALYSIS DATA --
Management unit 28, Study no: 4, Study Name: Buckskin Valley

Effective rooting depth (in)	Temp °F (depth)	pH	loam			%0M	PPM P	PPM K	ds/m
			%sand	%silt	%clay				
14.3	50.4 (15.7)	5.9	44.2	30.0	25.8	3.8	22.7	236.8	0.4



PELLET GROUP DATA --
Management unit 28 , Study no: 4

Type	Quadrat Frequency			
	'92	'98	'03	'08
Sheep	-	1	6	-
Rabbit	44	22	37	69
Elk	-	1	-	-
Deer	28	37	20	26
Cattle	-	2	1	4

Days use per acre (ha)		
'98	'03	'08
-	12 (30)	-
-	-	-
-	-	1 (3)
49 (121)	51 (126)	43 (106)
7 (17)	1 (2)	6 (14)

BROWSE CHARACTERISTICS --
Management unit 28 , Study no: 4

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Artemisia tridentata vaseyana												
87	**8732**	66	933	4666	3133	-	53	20	36	2	7	26/28
92	**8980**	160	300	3660	5020	-	49	32	56	9	16	-/-
98	**5160**	200	200	3640	1320	1160	40	5	26	6	8	29/37
03	**4620**	-	40	2560	2020	1360	10	3	44	11	13	35/37
08	**5620**	460	140	2620	2860	2020	5	2	51	17	17	33/35
Cercocarpus ledifolius												
87	**0**	-	-	-	-	-	0	0	-	-	0	-/-
92	**0**	20	-	-	-	-	0	0	-	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	-	0	-/-
08	**0**	-	-	-	-	-	0	0	-	-	0	-/-
Chrysothamnus depressus												
87	**0**	-	-	-	-	-	0	0	-	-	0	-/-
92	**20**	-	-	20	-	-	0	0	-	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	-	0	8/28
03	**0**	-	-	-	-	-	0	0	-	-	0	-/-
08	**0**	-	-	-	-	-	0	0	-	-	0	-/-
Chrysothamnus viscidiflorus viscidiflorus												
87	**0**	-	-	-	-	-	0	0	-	-	0	-/-
92	**40**	-	40	-	-	-	0	0	-	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	-	0	-/-
08	**0**	60	-	-	-	-	0	0	-	-	0	6/10
Juniperus scopulorum												
87	**0**	-	-	-	-	-	0	0	-	-	0	-/-
92	**20**	-	20	-	-	-	100	0	-	-	0	-/-
98	**20**	-	-	20	-	-	0	0	-	-	0	-/-
03	**20**	-	-	20	-	-	0	0	-	-	0	-/-
08	**0**	-	-	-	-	-	0	0	-	-	0	-/-

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Mahonia repens												
87	**0**	-	-	-	-	-	0	0	0	-	0	-/-
92	**0**	-	-	-	-	-	0	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	0	-	0	-/-
03	**20**	-	-	20	-	-	0	0	0	-	0	3/4
08	**20**	-	-	-	20	-	0	0	100	100	100	3/6
Opuntia sp.												
87	**1132**	199	466	666	-	-	18	0	0	-	53	3/4
92	**2140**	100	820	1120	200	-	0	2	9	4	20	-/-
98	**740**	-	120	560	60	-	0	3	8	5	5	6/13
03	**840**	-	40	660	140	-	0	2	17	2	5	7/14
08	**980**	60	-	880	100	-	0	2	10	6	14	6/17
Purshia tridentata												
87	**1732**	866	866	866	-	-	19	73	0	-	0	22/31
92	**3080**	140	1060	1700	320	-	34	53	10	-	3	-/-
98	**1900**	180	280	1560	60	40	36	47	3	1	2	22/35
03	**1860**	-	60	1360	440	60	13	72	24	3	3	22/35
08	**1760**	140	-	1200	560	100	22	57	32	3	3	22/33
Quercus gambelii												
87	**133**	66	133	-	-	-	50	0	0	-	0	-/-
92	**460**	120	100	320	40	-	43	0	9	9	9	-/-
98	**400**	20	40	360	-	-	0	0	0	-	0	75/39
03	**380**	-	180	-	200	40	0	0	53	-	0	58/32
08	**200**	-	140	20	40	80	0	0	20	10	10	55/16
Symphoricarpos oreophilus												
87	**599**	-	466	133	-	-	22	0	0	-	0	20/19
92	**700**	100	200	480	20	-	57	11	3	-	9	-/-
98	**720**	-	120	600	-	-	33	0	0	-	0	14/25
03	**980**	-	20	960	-	-	6	29	0	-	0	11/18
08	**780**	80	80	700	-	-	3	8	0	-	0	13/20