

Trend Study 25C-3-08

Study site name: Happy Valley .

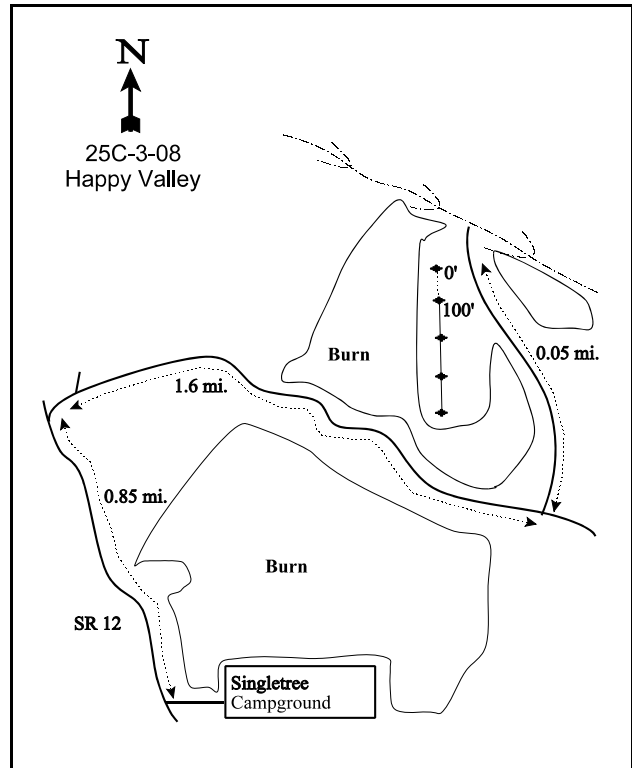
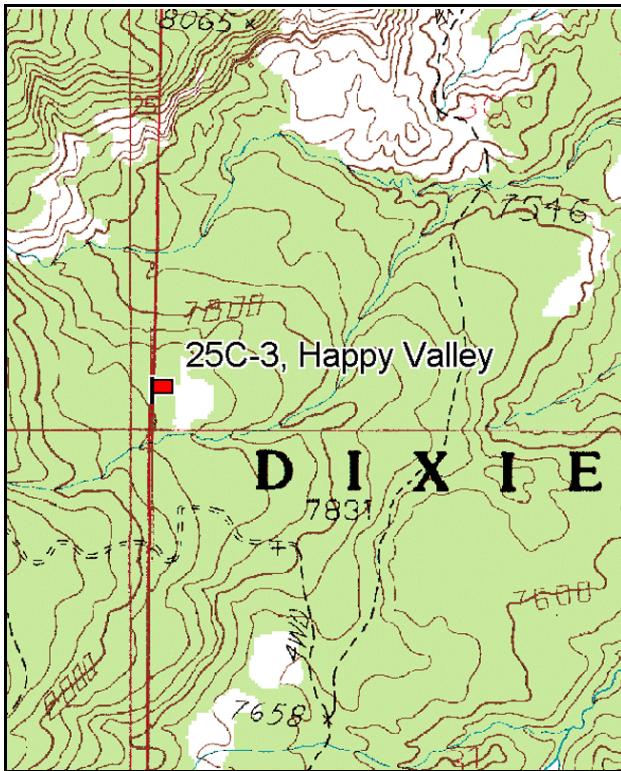
Vegetation type: Logged Ponderosa Pine .

Compass bearing: frequency baseline 170 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). Rebar: belt 2 and 5 on 1ft.

LOCATION DESCRIPTION

From the entrance to Singletree Campground on SR12, drive 0.85 miles north to the turnoff to Happy Valley. Turn east and go 1.6 miles staying on the main road until a minor fork. Turn left onto a faint two-track road and go 0.05 miles to a ponderosa pine and a rebar witness stake located 15 feet off the left side of the road. The baseline starts 75 feet west of the witness post and then runs south. The 0-foot baseline stake is marked with browse tag #7066.



Map Name: Grover

Diagrammatic Sketch

Township 30S, Range 6E, Section 26

GPS: NAD 83, UTM 12S 471802 E, 4224454 N

DISCUSSION

Happy Valley - Trend Study No. 25C-3

Study Information

This study is located in a ponderosa pine (*Pinus ponderosa*) area that burned in late June of 1984 and is located near the upper limits of normal winter range [elevation: 7,900 feet (2,408 m), slope: 15%-34%, aspect: east]. The fire killed the majority of the ponderosa on the site, but many of the large mature trees survived. A salvage operation by the Forest Service removed some trees and a nearby area was planted with ponderosa seedlings. Deer use was estimated to be light in 1998 (7 ddu/acre:11 ddu/ha), heavy in 2003 (61 ddu/acre:151 ddu/ha), and moderate in 2008 (34 ddu/acre:83 ddu/ha). Elk use was estimated to be minimal with an average use of 3 days use/acre (8 edu/ha) since 1998. Cattle use was estimated to be light in 1998, 2003, and 2008 (15 cdu/acre:37 cdu/ha, 14 cdu/acre:35 cdu/ha, and 11 cdu/acre:27 cdu/ha, respectively). Cattle had been on the site just prior to the 2003 reading and cattle use was heavy at the bottom of the hill near the 0 foot stake.

Soil

Soil texture is a sandy loam which is neutral in reaction (pH 6.5). Soil at the site is moderately deep with an estimated effective rooting depth of about 12 inches. The ground is very rocky with scattered large rocks accounting for about 25% of the ground cover. Rock is also common in the soil profile with most concentrated in the top 8 inches. Organic matter is relatively high at 3.3%. Burned wood, downed trees, and pine needles comprise the bulk of the litter. The relative combined vegetation and litter cover ranged from 60%-64% from 1994 to 2008. Relative combined rock and pavement cover ranged from 26%-30% from 1994 to 2008. Bare ground has decreased from 14% in 1994 to 6% in 2008. Bare spots show some signs of erosion as do the roads and other disturbed areas, but overall erosion is not a problem on this site. The erosion condition class was rated as stable in 2003 and 2008.

Browse

Ponderosa pine is still a prominent species. Tree density, using the point-quarter method, was estimated at 25 pine trees/acre with an average basal diameter of 6.75 inches in 1994. By 1998, tree density had increased to 140 trees/acre with an average basal diameter of 4.7 inches. Density remained stable in 2003 at 140 trees/acre but average diameter increased to 5.8 inches. Line-intercept canopy cover varies on the site, but averaged 13.5% in 2003. Density continued to remain stable in 2008 at about 140 trees/acre, but the average diameter increased again to 9.6 inches. Half of the trees sampled in 2003 and 2008 were greater than 12 feet in height. There are also a few scattered Utah juniper (*Juniperus osteosperma*), pinyon pine (*Pinus edulis*), and Douglas fir (*Pseudotsuga menziesii*) trees on the site.

The understory is currently dominated by a variety of browse species including antelope bitterbrush (*Purshia tridentata*), several species of rabbitbrush (*Chrysothamnus* spp.), broom snakeweed (*Gutierrezia sarothrae*), and Harriman yucca (*Yucca harrimaniae*). There are several other species which occur in limited numbers. Only bitterbrush occurs in sufficient numbers and is palatable enough to be considered a key species. Fire damage to the low-spreading ecotype of bitterbrush appears to be variable as there was an estimated 1,666 plants/acre estimated in 1985. Most of these were young (88%) but 200 mature plants/acre were estimated. Density of bitterbrush was estimated at 1,520 plants/acre in 2008, and it appears to be slowly increasing. Cover of bitterbrush increased slightly between 1994 and 1998, then nearly doubled by 2003 to 9%. Strip frequency has also increased with each reading. Vigor has been good during all readings and decadence has remained very low. A few additional preferred shrubs occur on the site. These include small numbers of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), black sagebrush (*Artemisia nova*), true mountain mahogany (*Cercocarpus montanus*), and elderberry (*Sambucus racemosa*).

Several increaser species, including four species of rabbitbrush, gray horsebrush (*Tretradymia canescens*), and broom snakeweed, are found in the disturbed area. Broom snakeweed increased dramatically from 866

plants/acre in 1985 to 7,280 by 1994. Its density has declined 63% to 3,700 plants/acre in 1998, 3,340 plants/acre in 2003, and 2,720 in 2008. Rubber rabbitbrush (*Chrysothamnus nauseosus* ssp. *nauseosus*), Parry rabbitbrush (*C. parryi*), dwarf rabbitbrush (*C. depressus*), and narrowleaf low rabbitbrush (*C. viscidiflorus* ssp. *stenophyllus*) are found on the site in low to moderate numbers.

Herbaceous Understory

Perennial grasses are diverse and provided 40% of the total vegetative cover and 68% of the herbaceous cover in 1998. Common species include the following: bottlebrush squirreltail (*Sitanion hystrix*), mutton bluegrass (*Poa fendleriana*), blue grama (*Bouteloua gracilis*), Indian ricegrass (*Oryzopsis hymenoides*) and a sedge (*Carex* sp.). Most grasses showed little use, although the sedge did show some moderate use. Cattle use was not noted in 1985, but spring use was evident in 1991 and cattle had heavily utilized many grasses in 2003. Forbs also show good diversity. Diversity of all herbaceous species is lower up the hill where the ponderosa pine trees are more dominant. Most forbs occur only occasionally and most of the forb cover is provided by redroot eriogonum (*Eriogonum racemosum*) and Louisiana sagebrush (*Artemisia ludoviciana*).

1991 TREND ASSESSMENT

The trend for browse is slightly down. The fire has opened up the once almost closed community to many invader species, which include the following: rabbitbrush, gray horsebrush, broom snakeweed, and yucca. These have all increased since the fire with the exception of bitterbrush. Bitterbrush has declined slightly because most ecotypes do not re-sprout after fire and it will take time for it to fully recover. The grass trend is up with an increase in the sum of nested frequency of perennial grasses. The trend for forbs is up with a large increase in the sum of nested frequency of perennial forbs. The composition of both grasses and forbs is diverse.

browse - slightly down (-1) grass - up (+2) forb - up (+2)

1994 TREND ASSESSMENT

The only abundant and desirable browse species is antelope bitterbrush. The new shrub density estimation procedure, which uses a larger sample size, estimated 940 mostly mature plants/acre. This lower estimate is due to a reduction in the number of young plants sampled. Density of mature plants actually increased from 466 to 900 plants/acre. No seedlings were encountered and only 2% of the population consists of young plants. On the positive side, decadence is low and the proportion of plants heavily hedged declined from 45% in 1991 to only 11%. The site is still dominated by broom snakeweed and rabbitbrush. Trend for browse is slightly down with the increased and continued dominance of increaser species. The Desirable Components Index (DCI) rating was lower for this year because preferred browse species comprised less than 5% of the total cover. The trend for grasses is stable with the sum of nested frequencies for perennial grasses remaining constant since 1991. The trend for forbs is down, with the sum of nested frequency of perennial forbs declining by 48%. Some of this change in composition can be explained by the very dry spring and summer of 1994.

winter range condition (DCI) - fair (54) Mid-level potential scale
browse - slightly down (-1) grass - stable (0) forb - down (-2)

1998 TREND ASSESSMENT

Trend for the key browse species, bitterbrush, is stable. Density declined but strip frequency and average cover increased slightly. It appears that there was some difficulty in differentiating individual bitterbrush plants. On the positive side, vigor was normal and there were no decadent plants sampled. Young recruitment also improved as 8% of the population now consists of young plants. Another positive sign is the reduction in the population density of broom snakeweed and various rabbitbrush species. Several new browse species were identified on the site in small numbers including mountain big sagebrush, true mountain mahogany, dwarf rabbitbrush, wax currant (*Ribes cereum* ssp. *cereum*) and elderberry. Trend for the grasses is up with and

increase in the sum of nested frequency of perennial grasses and an increase in total cover of perennial grasses. The trend for forbs is slightly up also, with a slight increase in the sum of nested frequency of perennial forbs and an increase in total cover of perennial forbs.

winter range condition (DCI) - fair-good (66) Mid-level potential scale
browse - stable (0) grass - up (+2) forb - slightly up (+1)

2003 TREND ASSESSMENT

Trend for the key browse, bitterbrush, is up. Density has increased 31% and average cover increased nearly two fold. Strip frequency also increased. Average vigor is normal on most plants and there are few decadent plants. Bitterbrush were not producing many flowers, but annual leader growth was fair in 2003, averaging 2.9 inches. Increaser shrubs, rubber rabbitbrush, Parry rabbitbrush, dwarf rabbitbrush, narrowleaf low rabbitbrush, broom snakeweed, and yucca, have remained similar in total cover and strip frequency since 1998. Overstory cover of ponderosa pine has also remained stable. Overall, the browse trend is up. Trend for the grasses is down slightly. Sum of nested frequency of perennial grasses declined slightly. Most of the dominant grasses had little change or increased with the exception of Indian ricegrass and bottlebrush squirreltail. Composition is changing as the warm season grass, blue grama, now provides a larger portion of the total grass cover compared to 1998 (27% to 47%). Nested frequency of cool season species, Indian ricegrass and bottlebrush squirreltail, have declined significantly. The trend for forbs is down slightly. Sum of nested frequency of perennial forbs has also declined slightly. Total cover of perennial grasses declined 25% while cover of perennial forbs declined 45%.

winter range condition (DCI) - fair (62) Mid-level potential scale
browse - up (+2) grass - slightly down (-1) forb - slightly down (-1)

2008 TREND ASSESSMENT

The trend for browse is slightly up. The density of the primary browse species, bitterbrush, continued to increase by 28% from 2003. Vigor is good and decadence remains low. Recruitment of young plants was good as well. There is also a small (240 plants/acre), but growing population of black sagebrush on the site. There is a continued reduction in the broom snakeweed population from 3,340 plants/acre in 2003 to 2,720 plants/acre in 2008, down from 7,280 plants/acre in 1994. Most of the rabbitbrush species density remained relatively stable. The trend for grasses was stable. There was little change in the sum of nested frequency for perennial grasses and production remained fairly stable. The trend for forbs is slightly down with a decrease in the sum of nested frequency and production of perennial forbs.

winter range condition (DCI) - fair (59) Mid-level potential level
browse - slightly up (+1) grass - stable (0) forb - slightly down (-1)

HERBACEOUS TRENDS --
Management unit 25C, Study no: 3

T y p e	Species	Nested Frequency						Average Cover %			
		'85	'91	'94	'98	'03	'08	'94	'98	'03	'08
G	Agropyron cristatum	a-	a-	a5	ab15	ab12	b26	.21	.42	.19	.30
G	Agropyron intermedium	-	3	6	5	8	4	.04	.03	.02	.01
G	Bouteloua gracilis	a51	ab66	ab61	bc97	cd119	d150	2.81	4.43	5.84	6.31
G	Bromus inermis	-	-	-	-	-	4	-	-	-	.38
G	Bromus tectorum (a)	-	-	1	14	1	-	.00	.33	.01	-
G	Carex sp.	a23	ab67	b64	b69	b62	b63	.96	1.41	.83	.68
G	Oryzopsis hymenoides	a3	abc18	bc29	c43	ab17	abc23	2.22	1.81	.22	.39
G	Poa fendleriana	a48	a85	b98	c147	c155	b102	2.85	5.17	4.18	2.73
G	Sitanion hystrix	a62	ab90	a62	b108	a56	ab82	.57	2.12	.42	.83
G	Sporobolus cryptandrus	b42	ab27	b29	ab19	b33	a4	.77	.42	.58	.15
G	Stipa comata	a5	a3	b36	a15	a9	a8	.87	.55	.05	.09
Total for Annual Grasses		0	0	1	14	1	0	0.00	0.33	0.00	0
Total for Perennial Grasses		234	359	390	518	471	466	11.33	16.38	12.36	11.91
Total for Grasses		234	359	391	532	472	466	11.33	16.72	12.38	11.91
F	Alyssum alyssoides (a)	-	-	-	-	2	-	-	-	.03	-
F	Allium sp.	a-	a-	a1	ab10	b12	ab6	.00	.10	.05	.04
F	Antennaria parvifolia	11	5	3	3	4	5	.15	.04	.06	.18
F	Arabis demissa	a1	b42	a-	a3	a-	a-	-	.00	-	-
F	Artemisia dracunculus	-	-	-	-	1	-	-	-	.00	-
F	Artemisia ludoviciana	a81	ab121	ab110	b144	ab108	ab111	3.82	4.50	2.04	1.42
F	Aster chilensis	-	-	-	-	-	3	-	-	-	.03
F	Astragalus convallarius	b13	a-	a-	a-	a-	a-	-	-	-	-
F	Astragalus sp.	-	-	7	-	1	5	.09	-	.03	.01
F	Chenopodium album (a)	-	-	5	-	9	-	.01	-	.04	-
F	Chaenactis douglasii	2	-	-	-	-	-	-	-	-	-
F	Cirsium sp.	-	-	-	3	-	-	-	.00	-	-
F	Cryptantha sp.	a-	b105	a6	a-	a2	a1	.02	-	.00	.00
F	Cymopterus sp.	-	-	-	2	-	-	-	.03	-	-
F	Descurainia pinnata (a)	-	-	-	5	2	-	-	.04	.01	-
F	Eriogonum alatum	3	1	3	6	1	-	.03	.03	.00	-
F	Eriogonum cernuum (a)	-	-	2	-	-	3	.00	-	-	.00
F	Erigeron divergens	-	-	-	-	-	3	-	-	-	.03
F	Erigeron eatonii	10	7	6	6	1	7	.01	.04	.00	.05
F	Erigeron flagellaris	-	-	-	-	5	-	-	-	.15	-

Type	Species	Nested Frequency						Average Cover %			
		'85	'91	'94	'98	'03	'08	'94	'98	'03	'08
F	<i>Erigeron pumilus</i>	-	2	3	8	2	-	.00	.01	.03	-
F	<i>Eriogonum racemosum</i>	_{ab} 65	_c 118	_{ab} 63	_{bc} 85	_{abc} 75	_a 43	.35	1.52	.68	.20
F	<i>Eriogonum umbellatum</i>	-	-	-	-	-	2	-	-	-	.03
F	<i>Gilia</i> sp. (a)	-	-	-	3	-	-	-	.03	-	-
F	<i>Hedysarum boreale</i>	-	-	3	5	1	1	.06	.33	.03	.03
F	<i>Hymenoxys acaulis</i>	-	3	-	1	-	-	-	.03	-	-
F	<i>Hymenoxys richardsonii</i>	_a 8	_b 32	_{ab} 18	_a 9	_a 11	_a 7	.67	.25	.27	.21
F	<i>Lappula occidentalis</i> (a)	-	-	_a 7	_b 18	_{ab} 9	_a -	.01	.04	.07	-
F	<i>Lepidium</i> sp. (a)	-	-	_a -	_b 13	_a -	_a -	-	.03	-	-
F	<i>Linum kingii</i>	-	-	-	-	-	2	-	-	-	.00
F	<i>Lithospermum</i> sp.	-	-	-	-	1	-	-	-	.00	-
F	<i>Lotus utahensis</i>	-	-	-	2	-	-	-	.00	-	-
F	<i>Lupinus argenteus</i>	_{ab} 5	_a -	_{ab} 7	_{ab} 2	_a -	_b 10	.04	.03	-	.07
F	<i>Lygodesmia spinosa</i>	_{ab} 5	_{ab} 6	_{ab} 10	_{ab} 5	_b 15	_a 2	.48	.16	.66	.03
F	<i>Machaeranthera grindelioides</i>	-	-	-	2	-	-	-	.15	-	-
F	<i>Penstemon comarrhenus</i>	2	-	-	-	2	10	-	-	.01	.05
F	<i>Penstemon</i> sp.	_a 1	_b 20	_a -	_a -	_a -	_a -	-	-	-	-
F	<i>Phlox longifolia</i>	-	-	-	3	2	-	-	.00	.00	-
F	<i>Polygonum douglasii</i> (a)	-	-	-	3	1	-	-	.01	.00	-
F	<i>Potentilla gracilis</i>	-	6	5	2	11	-	.01	.03	.05	-
F	<i>Senecio</i> sp.	_b 17	_a -	_a -	_a -	_a -	_a -	-	-	-	-
F	<i>Sphaeralcea coccinea</i>	10	12	7	15	4	3	.02	.29	.04	.03
F	<i>Tragopogon dubius</i>	-	-	-	1	-	-	-	.00	-	-
F	Unknown forb-perennial	2	-	-	-	-	-	-	-	-	-
Total for Annual Forbs		0	0	14	42	23	3	0.03	0.16	0.15	0.00
Total for Perennial Forbs		236	480	252	317	259	221	5.80	7.60	4.17	2.44
Total for Forbs		236	480	266	359	282	224	5.83	7.76	4.33	2.45

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

BROWSE TRENDS --
Management unit 25C, Study no: 3

Type	Species	Strip Frequency				Average Cover %			
		'94	'98	'03	'08	'94	'98	'03	'08
B	<i>Artemisia nova</i>	4	2	4	4	.03	.00	.18	.16
B	<i>Artemisia tridentata vaseyana</i>	0	0	0	0	-	.15	-	-
B	<i>Cercocarpus montanus</i>	0	1	0	0	-	.03	-	-
B	<i>Chrysothamnus depressus</i>	0	7	4	3	-	.34	.06	.03
B	<i>Chrysothamnus nauseosus</i>	28	20	13	15	.73	.82	2.72	1.91
B	<i>Chrysothamnus parryi</i>	5	9	12	11	.15	.21	.24	0.0
B	<i>Chrysothamnus viscidiflorus stenophyllus</i>	17	17	18	9	1.57	2.08	.64	.21
B	<i>Gutierrezia sarothrae</i>	70	56	59	60	1.87	1.45	.70	.63
B	<i>Opuntia sp.</i>	4	1	1	0	.00	.03	.00	-
B	<i>Pediocactus simpsonii</i>	0	0	1	1	-	-	.00	.03
B	<i>Pinus edulis</i>	0	0	0	0	.01	-	-	-
B	<i>Pinus ponderosa</i>	0	10	10	10	1.48	3.84	3.73	2.51
B	<i>Purshia tridentata</i>	22	28	37	51	4.10	4.51	8.85	8.52
B	<i>Ribes sp.</i>	0	0	0	0	-	.03	-	-
B	<i>Sambucus racemosa</i>	3	1	2	2	.00	.03	.00	.03
B	<i>Tetradymia canescens</i>	6	9	12	4	.15	.33	.38	.00
B	<i>Yucca harrimaniae</i>	15	19	20	20	2.90	2.58	3.66	2.91
Total for Browse		174	180	193	190	13.01	16.46	21.19	16.97

CANOPY COVER, LINE INTERCEPT --
 Management unit 25C, Study no: 3

Species	Percent Cover		
	'98	'03	'08
Artemisia nova	-	.21	.26
Chrysothamnus nauseosus	-	2.33	2.28
Chrysothamnus parryi	-	.05	.03
Chrysothamnus viscidiflorus stenophyllus	-	.36	.45
Gutierrezia sarothrae	-	1.85	1.28
Pediocactus simpsonii	-	-	.06
Pinus ponderosa	6.19	13.48	17.31
Purshia tridentata	-	7.19	9.28
Sambucus racemosa	-	.25	.15
Tetradymia canescens	-	.06	.06
Yucca harrimaniae	-	3.20	3.03

KEY BROWSE ANNUAL LEADER GROWTH --
 Management unit 25C, Study no: 3

Species	Average leader growth (in)	
	'03	'08
Purshia tridentata	2.9	2.2

POINT-QUARTER TREE DATA --
 Management unit 25C, Study no: 3

Species	Trees per Acre		
	'98	'03	'08
Juniper osteosperma	20	<18	<18
Pinus ponderosa	140	140	141

Average diameter (in)		
'98	'03	'08
1.4	-	-
4.7	5.8	9.6

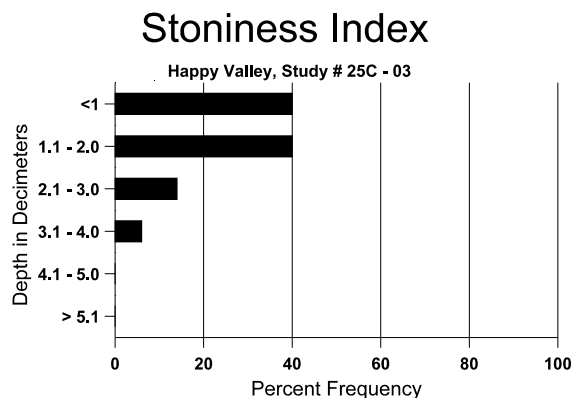
BASIC COVER --
 Management unit 25C, Study no: 3

Cover Type	Average Cover %					
	'85	'91	'94	'98	'03	'08
Vegetation	7.00	7.50	25.82	39.38	35.17	36.27
Rock	18.50	27.75	23.07	30.28	26.31	28.25
Pavement	11.25	4.75	1.36	8.40	5.92	5.53
Litter	26.75	40.00	30.78	39.38	39.93	34.52
Cryptogams	0	0	0	.29	0	0
Bare Ground	36.50	20.00	13.10	15.55	8.84	7.16

SOIL ANALYSIS DATA --

Management unit 25C, Study no: 3, Study Name: Happy Valley

Effective rooting depth (in)	Temp °F (depth)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
			% sand	% silt	% clay				
11.7	61.3 (12.2)	6.5	56.0	21.4	22.6	3.3	21.4	153.6	0.7



PELLET GROUP DATA --

Management unit 25C, Study no: 3

Type	Quadrat Frequency			
	'94	'98	'03	'08
Rabbit	4	4	9	36
Elk	2	4	1	4
Deer	14	16	37	32
Cattle	-	4	6	6

Days use per acre (ha)		
'98	'03	'08
-	-	-
1 (2)	5 (12)	4 (10)
11 (27)	61 (150)	34 (83)
15 (37)	14 (34)	11 (27)

BROWSE CHARACTERISTICS --

Management unit 25C, Study no: 3

		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 nova												
85	0	-	-	-	-	-	0	0	0	-	0	-/-
91	0	-	-	-	-	-	0	0	0	-	0	-/-
94	80	-	-	80	-	20	0	0	0	-	0	11/18
98	60	-	-	60	-	-	0	0	0	-	0	15/22
03	160	-	20	140	-	-	0	0	0	-	0	8/25
08	240	80	80	120	40	-	58	8	17	8	8	7/17

		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												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	8/8
98	0	-	-	-	-	-	0	0	-	-	0	11/9
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	-/-
Cercocarpus montanus												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	12/15
98	20	-	-	20	-	-	100	0	-	-	0	13/24
03	0	-	-	-	-	-	0	0	-	-	0	10/17
08	0	-	-	-	-	-	0	0	-	-	0	9/22
Chrysothamnus depressus												
85	0	-	-	-	-	-	0	0	0	-	0	-/-
91	0	-	-	-	-	-	0	0	0	-	0	-/-
94	0	-	-	-	-	-	0	0	0	-	0	-/-
98	140	-	20	120	-	-	57	0	0	-	0	7/14
03	100	-	-	100	-	-	40	60	0	-	0	2/7
08	80	40	20	20	40	-	25	50	50	25	25	2/6
Chrysothamnus nauseosus												
85	0	-	-	-	-	-	0	0	0	-	0	-/-
91	2731	5333	2599	66	66	-	12	10	2	-	0	8/6
94	860	20	40	800	20	-	0	0	2	-	0	16/17
98	600	-	40	540	20	-	0	0	3	3	3	29/31
03	300	-	-	200	100	20	13	7	33	-	0	25/25
08	400	40	20	300	80	20	15	0	20	10	10	34/30
Chrysothamnus parryi												
85	0	-	-	-	-	-	0	0	0	-	0	-/-
91	66	-	66	-	-	-	0	0	0	-	0	-/-
94	180	-	-	180	-	-	44	44	0	-	0	4/11
98	220	-	40	180	-	-	0	0	0	-	0	9/15
03	440	-	20	300	120	-	68	14	27	-	0	8/11
08	420	-	80	320	20	-	14	14	5	-	19	7/7

		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)
<i>Chrysothamnus viscidiflorus stenophyllus</i>												
85	465	66	199	266	-	-	0	0	0	-	0	9/7
91	199	133	133	-	66	-	0	0	33	10	33	-/-
94	940	-	20	880	40	-	13	0	4	-	0	12/27
98	360	-	-	340	20	-	22	11	6	-	0	7/22
03	800	20	120	640	40	-	38	18	5	-	0	12/17
08	400	-	-	60	340	20	10	80	85	55	65	15/18
<i>Gutierrezia sarothrae</i>												
85	865	799	266	599	-	-	0	0	0	-	0	9/7
91	5531	1066	666	4599	266	-	2	0	5	.36	2	10/12
94	7280	460	1980	5040	260	1320	0	0	4	1	1	6/6
98	3700	440	220	3480	-	20	0	0	0	-	0	9/8
03	3340	-	200	3100	40	-	0	0	1	-	0	7/7
08	2720	180	520	2080	120	80	0	0	4	4	4	7/7
<i>Opuntia sp.</i>												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	320	-	20	300	-	-	0	0	-	-	0	2/7
98	20	-	-	20	-	-	0	0	-	-	0	2/4
03	20	-	-	20	-	-	0	0	-	-	0	2/7
08	0	-	-	-	-	-	0	0	-	-	0	2/5
<i>Pediocactus simpsonii</i>												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	20	-	-	20	-	-	0	0	-	-	0	2/2
08	20	-	-	20	-	-	0	0	-	-	0	2/4
<i>Pinus ponderosa</i>												
85	133	66	-	133	-	-	0	0	0	-	100	69/79
91	398	66	199	133	66	-	0	17	17	5	17	234/89
94	0	-	-	-	-	-	0	0	0	-	0	-/-
98	200	40	180	20	-	40	0	0	0	-	0	-/-
03	200	-	140	60	-	-	0	0	0	-	0	-/-
08	200	-	60	140	-	-	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)
<i>Purshia tridentata</i>												
85	1665	466	1466	199	-	-	12	8	0	-	4	10/19
91	1465	-	866	466	133	-	36	45	9	-	5	5/15
94	940	-	20	900	20	20	32	11	2	2	2	14/41
98	760	40	60	700	-	-	45	37	0	-	0	17/49
03	1100	-	40	980	80	-	20	80	7	2	2	17/47
08	1520	20	100	1340	80	20	51	30	5	1	1	14/38
<i>Quercus gambelii</i>												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	40/75
03	0	-	-	-	-	-	0	0	-	-	0	27/15
08	0	-	-	-	-	-	0	0	-	-	0	28/22
<i>Ribes sp.</i>												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Sambucus racemosa</i>												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	140	-	-	140	-	-	0	0	-	-	0	23/22
98	20	-	-	20	-	-	0	0	-	-	0	25/32
03	40	-	20	20	-	-	0	50	-	-	0	20/30
08	40	-	20	20	-	-	0	50	-	-	0	19/24
<i>Tetradymia canescens</i>												
85	66	-	66	-	-	-	0	0	0	-	0	-/-
91	132	-	66	66	-	-	50	0	0	-	0	6/9
94	120	-	20	100	-	-	33	0	0	-	0	7/13
98	200	20	20	180	-	-	30	0	0	-	0	9/14
03	260	-	40	180	40	-	38	38	15	8	8	7/11
08	80	-	-	40	40	-	0	50	50	-	0	5/7

		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)
<i>Yucca harrimaniae</i>												
85	1332	399	1133	199	-	-	0	0	0	-	0	8/9
91	2332	333	1999	333	-	-	0	0	0	-	0	9/15
94	1580	-	40	1540	-	-	0	0	0	-	0	13/22
98	1520	-	240	1240	40	-	0	0	3	1	1	14/23
03	1400	-	620	760	20	40	0	0	1	1	1	14/20
08	1860	-	420	1320	120	160	0	0	6	-	1	10/16