

Trend Study 25C-17-08

Study site name: Varney-Griffin Chaining.

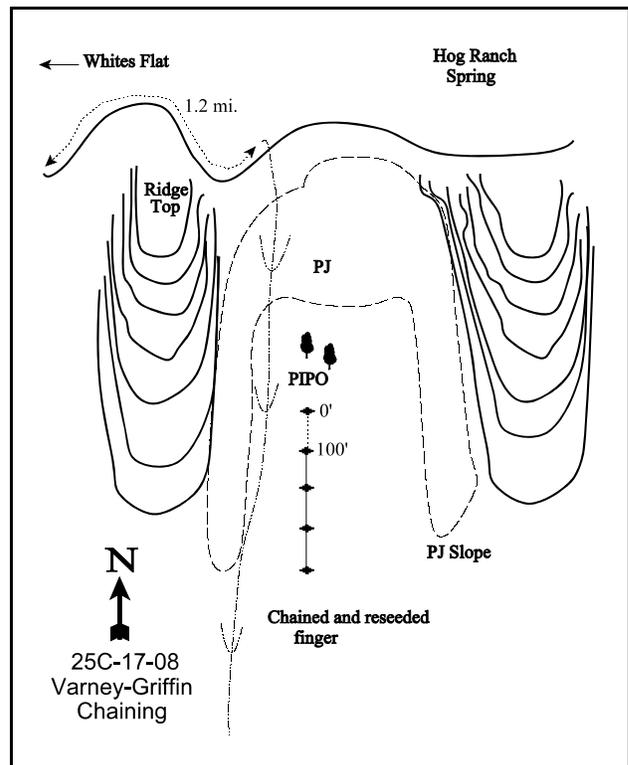
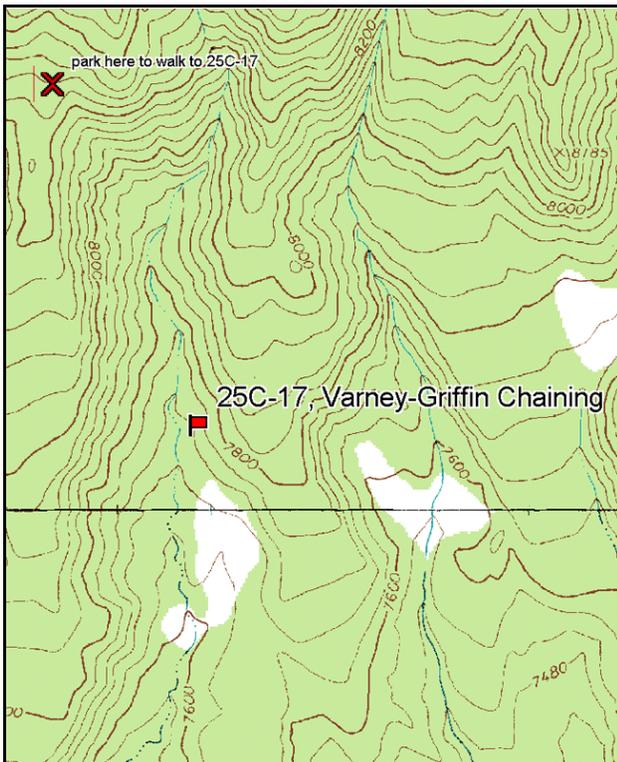
Vegetation type: Chained-Seeded P-J.

Compass bearing: frequency baseline 182 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). No rebar.

LOCATION DESCRIPTION

North Creek Road begins at mile marker 55 off of SR12. From North Creek Reservoir, continue north on the main road for 2 miles to a fork. Turn right, go 2 miles to Whites Flat. Continue towards Hog Ranch Spring for 1.2 miles. Stop where the road curves across a large ridgetop. Walk along the east edge of this flat-topped ridge to where you can see the chaining in the drainage below. Hike down the side of the ridge toward the chaining. The study area is in the north end of this chained drainage. The study is marked by browse tag #7146.



Map Name: Wide Hollow

Diagrammatic Sketch

Township 34S, Range 1E, Section
Unsurveyed (app. SE 1/4, 1)

GPS: NAD 83, UTM 12S434869 E, 4192437 N

DISCUSSION

Varney-Griffin Chaining - Trend Study No. 25C-17

Study Information

This study is on a 1,100 acre chaining project completed in 1981 with the transect located in the upper end of the chaining in a narrow valley surrounded by mature pinyon pine (*Pinus edulis*), juniper (*Juniperus osteosperma*), and ponderosa pine (*Pinus ponderosa*) [elevation: 7,720 feet (2,353 m), slope: 5%-10%, aspect: west]. The chained foothills were seeded to grasses, bitterbrush (*Purshia tridentata*), and fourwing saltbush (*Atriplex canescens*). A lop and scatter treatment to remove pinyon and juniper was done sometime between 2003 and 2008, but many young plants were still sampled on the site in 2008. The area did not receive much deer use in past years, but it had the potential to be excellent winter and spring range for deer and elk. By 1998, wildlife use had increased on the site. Deer use was estimated to be moderate in 1998 (26 ddu/acre:64 ddu/ha), and minimal in 2003 and 2008 with only one pellet group encountered in each of those years. Elk use was moderately heavy in 1998 (40 edu/acre:99 edu/ha), increased to heavy use in 2003 (71 edu/acre:175 edu/ha), and decreased to moderately heavy use again in 2008 (39 edu/acre:96 edu/ha). Cattle use was estimated to be moderate in 1998 (23 cdu/acre:57 cdu/ha), and light to minimal in 2003 and 2008 (2 cdu/acre:5 cdu/ha and 5 cdu/acre:13 cdu/ha, respectively). High use from rabbits was noted in 2008.

Soil

The soil is a moderately deep sandy loam with little rock on the surface or within the profile. Effective rooting depth was estimated at barely 10 inches due to the compact nature of the soil which prohibited deeper soil penetrometer readings. There does not appear to be any rooting restrictions. Soil texture is a sandy loam which is slightly acidic in reaction (pH 6.1). The soil is loose and friable on the surface, permitting the establishment of a dense stand of perennial grass. There is some localized soil movement, but erosion is limited by the excellent herbaceous ground cover. More soil erosion was evident in 2003 and 2008 due to a decline in herbaceous cover. There was considerable evidence of overland flow, rills, and gullies due primarily to runoff from nearby slopes. The soil condition class was determined to be slight in 2003 and 2008.

Browse

Seeded grasses currently dominate the site but some browse plants are scattered throughout the chaining. Preferred species include mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and bitterbrush. Density of bitterbrush is low, estimated at only 33 plants/acre in 1987 and 1991, and increasing to 80 plants/acre in 2003, and 160 plants/acre in 2008. There were no seedling or young bitterbrush encountered during any reading except for 2008. Bitterbrush displayed heavy use on all plants sampled in 1987 and 1991, but moderate to heavy use in 2003 and 2008.

66 plants/acre of sagebrush were estimated during the 1987 and 1991 readings, but the larger sample used in 1998 estimated 820 plants/acre, that has increased to 1,420 plants/acre in 2008. These plants are mostly lightly hedged and in good vigor. The number of plants that were decadent increased to 27% in 2008 from 15% in 2003. Recruitment of young plants was good in 1998 and 2008.

The most numerous browse species is broom snakeweed (*Gutierrezia sarothrae*) which has invaded the site. Population estimates in 1987 numbered 2,999 plants/acre. That number decreased by 81% to only 566 plants/acre in 1991. However, the population rebounded to 1,400 in 1998 and 2,720 by 2003, but decreased to just 380 plants/acre in 2008. Stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) is also fairly abundant and increased dramatically from 1998 with 180 plants/acre to 1,740 plants/acre in 2003, but decreased to 140 plants/acre in 2008.

Surviving pinyon pine trees have also been released since the initial treatment. Four inch seedlings were quite common in 1987 at an estimated density of 233 plants/acre. There are also a few young juniper and ponderosa pine trees. There was a lop and scatter treatment on pinyon and juniper sometime between the 2003 and 2008 sampling which removed many of the larger trees, but there were many smaller trees sampled in 2008 with

little change in density. The estimated density of pinyon pine has increased from 54 trees/acre in 1998, to 104 trees/acre in 2003, and 114 trees/acre in 2008. The average diameter of pinyon pine has decreased from 2.9 inches in 1998 to 1.3 inches in 2008. All of the trees sampled in 2008 were shorter than 4 feet. The estimated density of juniper increased from 22 trees/acre in 1998 to 30 tree/acre in 2003, then decreased again to 24 trees/acre in 2008. Average diameter of juniper decreased from 4.9 inches in 1998 to 3.5 inches in 2003, and then increased again to 4.5 inches in 2008. Other browse occurring in the area include Gambel oak (*Quercus gambelii*), rubber rabbitbrush (*Chrysothamnus nauseosus*), gray horsebrush (*Tetradymia canescens*), and serviceberry (*Amelanchier utahensis*).

Herbaceous Understory

The herbaceous understory is abundant and dominated by seeded perennial grasses which provided 88% of the grass cover in 1998, but decreased to 38% of the grass cover in 2008. Crested wheatgrass (*Agropyron cristatum*) is the most abundant, but the rhizomatous smooth brome (*Bromus inermis*) and intermediate wheatgrass (*Agropyron intermedium*) are also prominent. Blue grama (*Bouteloua gracilis*), a warm season grass, is the second most dominant grass while other native grasses are scattered over the site. The grasses appear to be effectively competing with the browse seedlings. Seeded forbs, sweet clover (*Melilotus* sp.) and alfalfa (*Medicago* sp.), were observed on the site but not sampled. Eighteen forb species occurred in the frequency belts in 1987 and 1991. Twenty-six perennial and annual species were encountered in 1998, but decreased to 14 and 16 species in 2003 and 2008, respectively. The most notable species are silvery lupine (*Lupinus argenteus*) and bastard toadflax (*Comandra pallida*). Only light use is evident on the herbaceous plants.

1991 TREND ASSESSMENT

Trend for browse on this site is stable, but poor at this time. There has been no change in densities for two key species, mountain big sagebrush and antelope bitterbrush. The broom snakeweed population has gone down by 81%, from almost 3,000 to 566 plants/acre. The herbaceous understory is still in excellent condition, and trend for grasses is stable with no change in the sum of nested frequency for perennial grasses. The trend for forbs is slightly down with a decrease in the sum of nested frequency for perennial forbs. Many of the forbs are not present in very high frequencies.

browse - stable (0)

grass - stable (0)

forb - slightly down (-1)

1998 TREND ASSESSMENT

Trend for browse is up with an increase in density of the two key species, bitterbrush and mountain big sagebrush. Both species show good vigor and low decadence. Sagebrush also displays improved reproduction, with good numbers of seedlings and young plants. Trend for the grasses is stable. The nested frequency of perennial grasses is down slightly, but the decline is mainly due to a significant decline in the nested frequency of blue grama, a warm season increaser. Frequency of intermediate wheatgrass also declined, but not significantly. Nested frequency of crested wheatgrass and smooth brome increased slightly. The trend for forbs is slightly up. The sum of nested frequency of perennial forbs increased slightly and the number of species encountered increased from 18 species in 1991 to 25 species. Forbs provide only 18% of the herbaceous vegetation cover on the site. The only forb to increase significantly was silvery lupine, which is the dominant forb.

winter range condition (DCI) - good (74) Mid-level potential scale

browse - up (+2)

grass - stable (0)

forb - slightly up (+1)

2003 TREND ASSESSMENT

Trend for browse is stable but still limited in numbers. Mountain big sagebrush remained similar in density. Vigor remains good and decadence low. Bitterbrush is still limited in number. Bitterbrush is moderately to heavily browsed with some plants displaying poor vigor and 25% of the population is decadent. Density of bitterbrush increased to 80 plants/acre, but some of the increase may be due to the difficulty identifying individual plants which have an average crown diameter of nearly 5 feet. Pinyon trees are increasing on the

site. Point-quarter data estimated 104 trees/acre with 55% of those classified as seedlings. The trend for grasses is down. The sum of nested frequency of perennial grasses declined dramatically. The frequency of all three seeded species, crested wheatgrass, intermediate wheatgrass, and smooth brome, decreased significantly. The frequency of the primary native grasses, blue grama and needle-and-thread grass, remained stable. Perennial grass cover declined 4 fold from 24% cover in 1998 to only 5.4% cover. The trend for forbs is stable. The sum of nested frequency of perennial forbs increased slightly, but was fairly stable, as was cover.

winter range condition (DCI) - poor-fair (50) Mid-level potential scale
browse - stable (0) grass - down (-2) forb - stable (0)

2008 TREND ASSESSMENT

Trend for the primary browse species, mountain big sagebrush and bitterbrush, is slightly up. The density of sagebrush has nearly doubled to 1,420 plants/acre. Vigor remained good. The number of decadent plants increased from 15% in 2003 to 27%, but is still considered normal. Recruitment of young sagebrush plants was good. Density of bitterbrush doubled as well, but is still low, to 160 plants/acre. Vigor and decadence levels were satisfactory. Recruitment was good with 2008 being the first year that young plants were encountered in the population. The trend for grasses is slightly up. There was a slight increase in the sum of nested frequency for perennial grasses, but the biggest change is in composition. The warm season increaser, blue grama, has become more dominant than the seeded species, smooth brome, since 1998. Blue grama production and cover is similar to that of crested wheatgrass. The native species, needle-and-thread grass, has also increased in frequency and production since 1998. The trend for forbs is slightly down. The sum of nested frequency of perennial forbs has decreased slightly and the number of species encountered has decreased from 25 species in 1998 to 16 species.

winter range condition (DCI) - fair (58) Mid-level potential scale
browse - slightly up (+1) grass - slightly up (+1) forb - slightly down (-1)

HERBACEOUS TRENDS --
Management unit 25C, Study no: 17

T y p e	Species	Nested Frequency					Average Cover %		
		'87	'91	'98	'03	'08	'98	'03	'08
G	<i>Agropyron cristatum</i>	_b 219	_b 214	_b 228	_a 128	_a 102	13.38	3.07	2.67
G	<i>Agropyron intermedium</i>	_c 145	_b 103	_b 69	_a 14	_a 26	1.14	.10	.38
G	<i>Bouteloua gracilis</i>	_b 144	_b 128	_a 39	_a 49	_a 63	.82	.97	2.25
G	<i>Bromus inermis</i>	_b 122	_c 174	_c 188	_a 30	_a 39	6.52	.34	.87
G	<i>Carex sp.</i>	_a -	_a 5	_b 29	_a 3	_b 29	.46	.03	.42
G	<i>Elymus salina</i>	_a -	_a 7	_a 4	_a -	_b 32	.15	-	.66
G	<i>Oryzopsis hymenoides</i>	11	5	3	-	-	.00	-	-
G	<i>Poa fendleriana</i>	_a 10	_a 4	_{ab} 23	_a 13	_b 40	.78	.51	.89
G	<i>Sitanion hystrix</i>	_b 9	_{ab} 2	_a 3	_a -	_a 3	.00	-	.03
G	<i>Sporobolus cryptandrus</i>	_a -	_{ab} 12	_a 2	_a -	_b 25	.00	-	.64
G	<i>Stipa comata</i>	_{ab} 59	_b 56	_{ab} 28	_a 25	_{ab} 37	.43	.36	1.44
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		719	710	616	262	396	23.74	5.41	10.27
Total for Grasses		719	710	616	262	396	23.74	5.41	10.27
F	<i>Alyssum alyssoides</i> (a)	-	-	_b 25	_a -	_a -	.06	-	-
F	<i>Androsace septentrionalis</i> (a)	-	-	8	-	-	.04	-	-
F	<i>Arabis sp.</i>	-	1	-	-	3	-	-	.00
F	<i>Artemisia ludoviciana</i>	4	3	2	-	-	.15	-	-
F	<i>Astragalus sp.</i>	2	2	6	2	9	.04	.00	.05
F	<i>Chaenactis douglasii</i>	-	-	1	-	-	.00	-	-
F	<i>Chenopodium fremontii</i> (a)	-	-	-	2	3	-	.00	.00
F	<i>Chenopodium leptophyllum</i> (a)	-	-	_a -	_b 14	_a 3	-	.53	.00
F	<i>Comandra pallida</i>	29	22	39	29	25	1.08	.21	.48
F	<i>Cryptantha sp.</i>	_b 10	_{ab} 6	_b 7	_a -	_a -	.02	-	-
F	<i>Dalea spp</i>	-	-	-	1	-	-	.00	-
F	<i>Descurainia pinnata</i> (a)	6	-	1	-	-	.00	-	-
F	<i>Erigeron sp.</i>	-	6	8	-	2	.04	-	.00
F	<i>Eriogonum racemosum</i>	4	4	10	12	7	.08	.05	.09
F	<i>Eriogonum umbellatum</i>	6	5	5	2	5	.04	.03	.03
F	<i>Gilia sp.</i> (a)	1	-	-	-	-	-	-	-
F	<i>Ipomopsis aggregata</i>	-	-	5	-	1	.16	-	.00
F	<i>Lappula occidentalis</i> (a)	-	-	_{ab} 1	_b 11	_a -	.00	.36	-
F	<i>Lesquerella rectipes</i>	_b 18	_{ab} 12	_{ab} 8	_a -	_a -	.04	-	-
F	<i>Lotus utahensis</i>	-	-	1	-	-	.15	-	-
F	<i>Lupinus argenteus</i>	_{ab} 58	_a 27	_b 63	_a 33	_b 69	2.91	1.07	1.08
F	<i>Lychnis drummondii</i>	-	-	2	-	3	.03	-	.03

Type	Species	Nested Frequency					Average Cover %		
		'87	'91	'98	'03	'08	'98	'03	'08
		F	<i>Machaeranthera canescens</i>	_b 11	_a -	_{ab} 4	_a -	_a -	.00
F	<i>Medicago sativa</i>	-	-	-	-	-	.00	-	-
F	<i>Oenothera</i> sp.	1	3	7	-	-	.01	-	-
F	<i>Oenothera pallida</i>	3	12	13	11	8	.05	.19	.19
F	<i>Penstemon comarrhenus</i>	_a -	_a 5	_a -	_a -	_b 26	-	-	.20
F	<i>Penstemon</i> sp.	_B 23	_a 5	_a 7	_a 1	_a -	.04	.03	-
F	<i>Penstemon pachyphyllus</i>	8	1	-	-	4	-	-	.06
F	<i>Phlox longifolia</i>	2	8	6	1	7	.01	.00	.02
F	<i>Polygonum douglasii</i> (a)	-	-	6	-	-	.01	-	-
F	<i>Senecio multilobatus</i>	_b 49	_a 3	_a 12	_c 129	_a 12	.08	3.24	.08
F	<i>Sphaeralcea coccinea</i>	_{ab} 8	_b 22	_a 3	_a 6	_a -	.01	.03	-
Total for Annual Forbs		7	0	41	27	6	0.12	0.90	0.00
Total for Perennial Forbs		236	147	209	227	181	5.00	4.88	2.35
Total for Forbs		243	147	250	254	187	5.12	5.78	2.36

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

BROWSE TRENDS --

Management unit 25C, Study no: 17

Type	Species	Strip Frequency			Average Cover %		
		'98	'03	'08	'98	'03	'08
		B	<i>Artemisia frigida</i>	0	5	5	-
B	<i>Artemisia tridentata vaseyana</i>	31	34	46	5.81	8.66	5.32
B	<i>Chrysothamnus nauseosus</i>	0	0	1	-	-	.00
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	8	24	5	.38	.82	.00
B	<i>Gutierrezia sarothrae</i>	30	37	16	1.21	1.22	.05
B	<i>Juniperus osteosperma</i>	2	2	1	1.12	1.92	.30
B	<i>Pinus edulis</i>	5	7	3	1.80	2.71	.15
B	<i>Purshia tridentata</i>	2	4	5	.38	.68	.41
B	<i>Quercus gambelii</i>	4	5	5	2.51	3.47	1.63
B	<i>Symphoricarpos oreophilus</i>	1	1	1	.85	.98	.63
B	<i>Tetradymia canescens</i>	1	2	2	.00	.03	.00
Total for Browse		84	121	90	14.09	20.70	8.55

CANOPY COVER, LINE INTERCEPT --

Management unit 25C, Study no: 17

Species	Percent Cover		
	'98	'03	'08
<i>Artemisia frigida</i>	-	.23	.05
<i>Artemisia tridentata vaseyana</i>	-	9.56	6.05
<i>Chrysothamnus viscidiflorus viscidiflorus</i>	-	.41	-
<i>Gutierrezia sarothrae</i>	-	1.38	.06
<i>Juniperus osteosperma</i>	.80	1.43	.45
<i>Pinus edulis</i>	-	4.33	.31
<i>Purshia tridentata</i>	-	1.21	1.01
<i>Quercus gambelii</i>	1.20	2.90	2.46
<i>Symphoricarpos oreophilus</i>	-	.25	-
<i>Tetradymia canescens</i>	-	.08	.03

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 25C, Study no: 17

Species	Average leader growth (in)	
	'03	'08
<i>Artemisia tridentata vaseyana</i>	2.3	1.8
<i>Purshia tridentata</i>	2.5	3.2

POINT-QUARTER TREE DATA --

Management unit 25C, Study no: 17

Species	Trees per Acre		
	'98	'03	'08
<i>Juniperus osteosperma</i>	22	30	24
<i>Pinus edulis</i>	54	104	114

Average diameter (in)		
'98	'03	'08
4.9	3.5	4.5
2.9	2.0	1.3

BASIC COVER --

Management unit 25C, Study no: 17

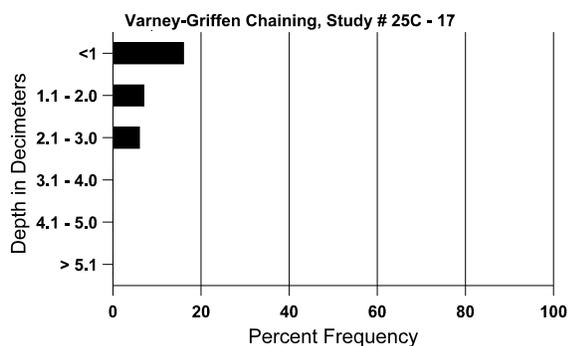
Cover Type	Average Cover %				
	'87	'91	'98	'03	'08
Vegetation	6.25	10.75	48.51	29.84	24.13
Rock	0	.50	.16	.23	.79
Pavement	1.25	2.25	1.11	2.62	4.00
Litter	74.75	65.00	68.40	55.40	48.08
Cryptogams	.50	1.75	.92	0	.03
Bare Ground	17.25	19.75	10.81	30.42	35.77

SOIL ANALYSIS DATA --

Management unit 25C, Study no: 17, Study Name: Varney-Griffen Chaining

Effective rooting depth (in)	Temp °F (depth)	pH	sandy loam			%OM	PPM P	PPM K	ds/m
			% sand	% silt	% clay				
9.8	62.7 (13.5)	6.1	73.1	12.4	14.6	1.4	12.7	134.4	.3

Stoniness Index



PELLET GROUP DATA --

Management unit 25C, Study no: 17

Type	Quadrat Frequency		
	'98	'03	'08
Rabbit	52	20	67
Elk	13	41	28
Deer	9	9	10
Cattle	6	3	4

Days use per acre (ha)		
'98	'03	'08
-	-	-
41 (101)	71 (175)	39 (96)
26 (64)	1 (2)	1 (2)
23 (57)	2 (5)	5 (13)

BROWSE CHARACTERISTICS --

Management unit 25C, Study no: 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)
Amelanchier utahensis												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	52/54
08	0	-	-	-	-	-	0	0	-	-	0	74/65

		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>Artemisia frigida</i>												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	140	-	-	140	-	-	0	0	-	-	0	14/13
08	120	-	-	120	-	-	17	0	-	-	0	7/8
<i>Artemisia tridentata vaseyana</i>												
87	66	-	-	66	-	-	50	0	0	-	0	25/21
91	66	-	-	66	-	-	0	0	0	-	0	29/31
98	820	80	220	580	20	20	5	0	2	-	0	29/40
03	780	-	60	600	120	20	28	5	15	-	0	31/44
08	1420	140	460	580	380	100	8	3	27	7	14	28/40
<i>Chrysothamnus nauseosus</i>												
87	0	-	-	-	-	-	0	0	0	-	0	-/-
91	0	-	-	-	-	-	0	0	0	-	0	-/-
98	0	-	-	-	-	-	0	0	0	-	0	-/-
03	0	-	-	-	-	-	0	0	0	-	0	46/57
08	20	-	-	-	20	-	100	0	100	-	0	45/61
<i>Chrysothamnus viscidiflorus viscidiflorus</i>												
87	0	-	-	-	-	-	0	0	0	-	0	-/-
91	33	-	-	33	-	-	0	0	0	-	0	14/9
98	180	40	20	160	-	-	0	0	0	-	0	21/21
03	1740	-	180	1500	60	140	2	0	3	1	1	17/19
08	140	-	60	20	60	-	14	43	43	14	29	15/23
<i>Gutierrezia sarothrae</i>												
87	2999	133	633	2333	33	-	0	0	1	-	0	9/8
91	565	333	233	299	33	-	6	0	6	-	18	7/8
98	1400	520	660	740	-	-	0	0	0	-	0	12/13
03	2720	-	280	2380	60	100	0	0	2	.73	.73	9/8
08	380	160	80	300	-	120	0	0	0	-	0	7/7
<i>Juniperus osteosperma</i>												
87	33	-	33	-	-	-	0	0	-	-	0	-/-
91	33	-	33	-	-	-	0	0	-	-	0	-/-
98	40	-	40	-	-	-	0	0	-	-	0	-/-
03	60	-	-	60	-	-	0	0	-	-	0	-/-
08	20	-	-	20	-	-	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)
Pinus edulis												
87	0	266	-	-	-	-	0	0	0	-	0	-/-
91	233	99	233	-	-	-	0	0	0	-	43	-/-
98	120	20	100	20	-	-	0	0	0	-	0	-/-
03	180	-	100	80	-	-	0	0	0	-	0	-/-
08	100	-	40	20	40	20	0	0	40	20	40	-/-
Pinus ponderosa												
87	0	33	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	-/-
Purshia tridentata												
87	33	-	-	33	-	-	0	100	0	-	0	12/33
91	33	-	-	-	33	-	0	100	100	-	0	-/-
98	40	-	-	40	-	-	0	0	0	-	0	33/51
03	80	-	-	60	20	-	25	25	25	25	25	36/57
08	160	-	60	60	40	20	13	38	25	-	13	24/43
Quercus gambelii												
87	0	-	-	-	-	-	0	0	0	-	0	-/-
91	0	-	-	-	-	-	0	0	0	-	0	-/-
98	320	-	40	220	60	20	0	0	19	6	6	62/38
03	480	-	-	480	-	40	0	0	0	-	0	43/32
08	380	-	140	240	-	-	0	0	0	-	0	46/27
Symphoricarpos oreophilus												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
98	20	-	-	20	-	-	0	0	-	-	0	26/109
03	20	-	-	20	-	-	0	0	-	-	0	35/58
08	20	-	-	20	-	-	0	0	-	-	0	24/58
Tetradymia canescens												
87	0	-	-	-	-	-	0	0	0	-	0	-/-
91	0	-	-	-	-	-	0	0	0	-	0	-/-
98	20	-	-	20	-	-	0	0	0	-	0	20/28
03	40	-	-	40	-	-	0	0	0	-	0	18/29
08	40	-	-	-	40	-	0	0	100	100	100	13/14