

Trend Study 30-40-08

Study site name: Telegraph Draw.

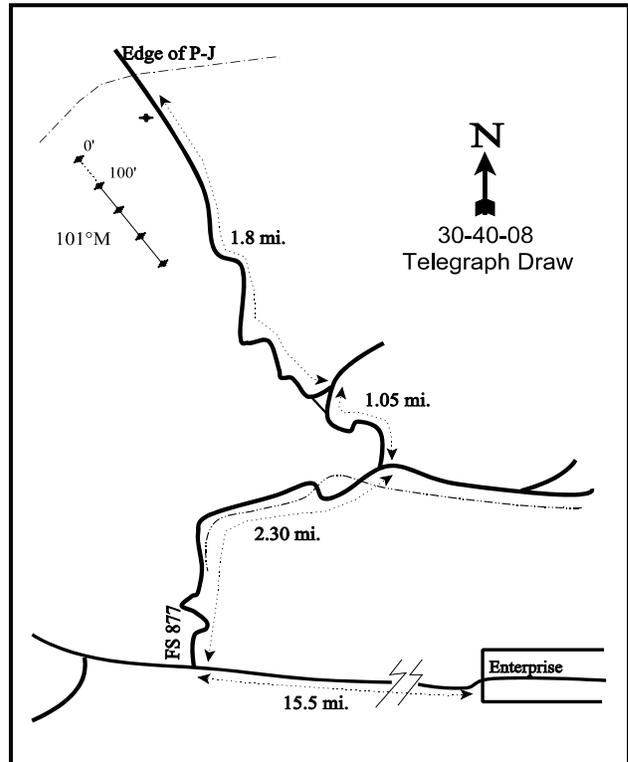
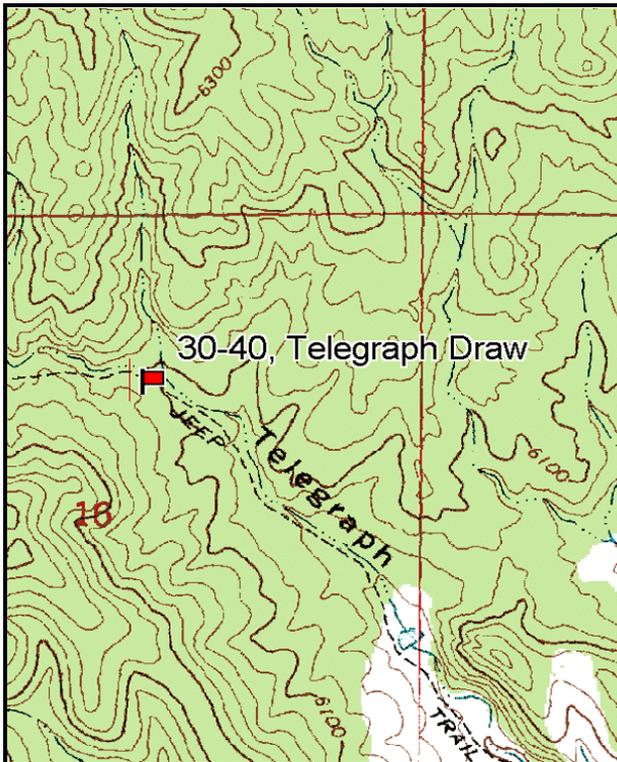
Vegetation type: Chained, seeded P-J.

Compass bearing: frequency baseline 101 degrees magnetic.

Frequency belt placement: line 1 (14 & 81ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). No rebar.

LOCATION DESCRIPTION

From Center and Main in Enterprise, go west on the Shoal Creek road for 15.5 miles then turn right (north). Clover Valley road is 0.1 miles too far. Stay on the main road heading north for approximately 2.3 miles (at 1.3 miles, stay to the south of the wash; the north road is washed out). At this point, there will be a fork in the road. Go to the left (north) on F.S. road 1014 for approximately 1.05 miles to a triangle of roads at the top of the ridge. Stay to the left on the road that goes down into the draw for 1.8 miles, at which point the road enters pinyon-juniper. Just as you come to the pinyon-juniper, stop at the witness post on the left side of the road. The 0-foot baseline stake is located 49 paces from the witness post at 139 degrees magnetic. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height. The 0-foot stake is marked by browse tag #287.



Map Name: Mount Escalante

Diagrammatic Sketch

Township 36S, Range 19W, Section 16

GPS: NAD 83, UTM 12S 236896 E, 4172114 N

DISCUSSION

Telegraph Draw - Trend Study No. 30-40

Study Information

This trend study is located on winter range in Telegraph Draw [elevation: 6,080 feet (1,853 m), slope: 10%, aspect: southeast]. The area has been chained and seeded, although the long range success of the seeded species has been minimal and singleleaf pinyon pine (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) trees are still abundant. Vegetative cover on the study site is considerably improved over the surrounding pinyon-juniper woodland, but is still rather sparse and variably dispersed. The community is dominated by Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) interspersed with young pinyon and juniper trees. Deer use is primarily during the winter, however fresh pellet groups were observed during the summer of 1992. In addition, wild horses and stud piles were observed nearby, and fresh unshod pony tracks were encountered on the study site in 1992. This study is located in an area of the USFS Terryshoal Creek allotment that receives no use by livestock and is set aside for wild horses and burros. Pellet group data from the site estimated use by deer to be light in 1998, 2003, and 2008 (14 deer days use/acre:35 ddu/ha, 4 ddu/acre:10 ddu/ha, and 6 ddu/acre:15 ddu/ha, respectively). Use by wild horses was also estimated to be light in 1998, 2003, and 2008 (14 days use/acre:36 hdu/ha, 9 hdu/acre:23 hdu/ha, and 5 hdu/acre:12 hdu/ha, respectively). Several wild horses were also seen near the site in 1998.

Soil

Soil is relatively deep and rocky with an effective rooting depth of 17 inches. Soil parent material is granite and rocks are common on the surface. Texture is a sandy clay which is moderately acidic (pH 5.6). The soil is sandy on the surface with a compacted clay layer encountered at a depth of 4 inches. This granitic soil is very low in phosphorus with a value of only 3.8 ppm. Values less than 6 ppm are considered to have low availability for plant growth and development (Tiedemann and Lopez 2004). Some surface erosion has taken place, whereas active erosion has been greatly reduced from what occurs on untreated areas. Relative combined vegetation and litter cover has been high and ranged from 67%-71% from 1998 to 2008. Relative bare ground cover has been fairly low at 15% in 1998 and 2003, and decreased to 11% in 2008. The erosion condition rating was classified as stable in 2003 and slight in 2008 due primarily to flow patterns.

Browse

The key browse is Wyoming big sagebrush which has hybridized with black sagebrush (*Artemisia nova*) in some areas. All sagebrush has been classified as Wyoming big sagebrush. Population density was estimated at 6,166 plants/acre in 1982 when the site was established. The stand is dynamic with abundant seedling and young recruitment causing major fluctuations in density over the years. Data from 2008 estimate a population of 8,160 plants/acre. Utilization has been mostly light during all readings and vigor was good on most plants. Decadence in sagebrush has been low, but increased from 15% in 2003 to 33% in 2008.

Other preferred browse include a small population of antelope bitterbrush (*Purshia tridentata*). Presumably, the bitterbrush were seeded after the chaining. These plants had moderate to heavy use from 1982 to 1998, but mostly light use in 2003 and 2008. Bitterbrush plants displayed good vigor from 1992 to 2003, with the proportion of plants displaying poor vigor increasing in 2008. Decadence in bitterbrush was also low from 1982 to 2003, with an increase in decadence in 2008. Young recruitment has been good since 1982.

Increaser shrubs, including stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) and broom snakeweed (*Gutierrezia sarothrae*), appeared to be increasing on the site. However, drought conditions have caused major declines in their respective population densities.

Pinyon and juniper trees have increased in density and stature. Point-quarter data from 1998 estimated 160 singleleaf pinyon trees/acre and 56 juniper trees/acre. Average basal diameter was 2.5 inches for pinyon and 3.6 inches for juniper. Point-quarter data from 2003 and 2008 estimate similar densities for both species. Average basal diameter remained similar for pinyon in 2003 and 2008, but the average basal diameter of juniper increased to 9 inches in 2008. In 2003, about 40% of the trees were 8 feet tall or greater, increasing to 50% in 2008. Line intercept canopy cover of juniper was 7% in 2003 and 8% in 2008. Line intercept canopy cover of pinyon was 8% in 2003 and 11% in 2008.

Herbaceous Understory

The herbaceous understory is poor. Grasses are fairly diverse, yet they only produced 5% cover in 1998, less than 1% in 2003, and 1.5% in 2008. Cheatgrass (*Bromus tectorum*) provided 52% of the grass cover in 1998, 39% in 2003, but only 10% in 2008. The only fairly common perennial grasses include crested wheatgrass (*Agropyron cristatum*), Indian ricegrass (*Oryzopsis hymenoides*), mutton bluegrass (*Poa fendleriana*), and bottlebrush squirreltail (*Sitanion hystrix*). Forbs outnumber grasses in abundance and species diversity. The principal species are desert phlox (*Phlox austromontana*) and rock goldenrod (*Petradoria pumila*). Hooker balsamroot (*Balsamorhiza hookeri*), bastard toadflax (*Comandra pallida*), and sulfur eriogonum (*Eriogonum umbellatum*) are also fairly abundant. No seeded forbs were encountered or observed.

1992 TREND ASSESSMENT

The trend for browse is up. The key browse species, Wyoming big sagebrush, has nearly doubled in density. Data from 1982 for the herbaceous understory is limited to species quadrat frequency. With that in mind, the trend for both the forbs and grasses is stable. Grasses have increased slightly in quadrat frequency and the quadrat frequency of forbs have remained similar. Forbs are abundant and diverse but consist of poor forage species. No seeded forbs were encountered.

browse - up (+2)

grass - stable (0)

forb - stable (0)

1998 TREND ASSESSMENT

Trend for browse stable. Differences in density of browse species may be related to the larger sample area used in 1998; therefore, trend for browse was determined using other parameters. Sagebrush vigor and decadence are similar to 1992 levels. Reproduction and recruitment was also good with abundant seedlings and young. Vigor for bitterbush is good and decadence declined from 20% in 1992 to 6%. Trend for both the grasses and forbs is stable. Sum of nested frequency for perennial grasses and forbs has remained similar to 1992 levels. Composition is poor with cheatgrass providing 52% of the grass cover, and rock goldenrod and desert phlox providing 51% of the forb cover.

winter range condition (DCI) - good-excellent (64) Low potential scale

browse - stable (0)

grass - stable (0)

forb - stable (0)

2003 TREND ASSESSMENT

Trend for the key browse species, Wyoming big sagebrush and antelope bitterbrush is up. Both species have increased in density, 36% for sagebrush and 28% for bitterbrush since 1998. Sagebrush has mostly good vigor and decadence was low at 15%. Young recruitment remains excellent indicating a dynamic and expanding population. Bitterbrush shows good vigor and excellent young recruitment. Decadence in bitterbrush has increased from 6% of the population in 1998 to 23%, but this is still relatively low. The only down side to the browse trend is the continued increase in density and cover of pinyon and juniper trees which are slowly regaining their dominance of this old chaining. Current line-intercept canopy cover is estimated at 7% for juniper and 8% for pinyon. Trend for both the grasses and forbs is down. Sum of nested frequency of perennial grasses has declined by 53%, and cover of perennial grasses decreased from 2% in 1998 to less than 1%. Most perennial grasses have declined significantly in nested frequency. The only positive change in the grass composition is the significant decline in nested frequency of cheatgrass. The sum of nested frequency of perennial forbs declined by 37% from 1998, and cover decreased from 6% in 1998 to 3%. The forb composition is diverse, but only toadflax, rock goldenrod, and desert phlox are fairly common. Twenty four species of forbs were sampled in 1998 and only 18 in 2003.

winter range condition (DCI) - good (56) Low potential scale

browse - up (+2)

grass - down (-2)

forb - down (-2)

2008 TREND ASSESSMENT

Trend for browse is slightly up. The primary browse species, Wyoming big sagebrush, increased by 17% from 2003 to 8,160 plants/acre. Vigor of sagebrush remains good, but decadence has increased from 15% in 2003 to 33%, though it is still considered low. Reproduction and recruitment of young sagebrush remains good with plentiful seedlings and young plants. The preferred browse species, antelope bitterbrush, has decreased slightly in density. The proportion of bitterbrush plants displaying poor vigor increased from 5% in 2003 to 28%, and decadence increased from 23% in 2003 to 51%. Recruitment of young bitterbrush was good with young plants comprising 13% of the population, but no seedling bitterbrush were encountered. Trend for both grasses and forbs is up. The sum of nested frequency of perennial grasses had a 2 fold increase from 2003, with significant increases in the frequency of crested wheatgrass, bottlebrush squirreltail, and needle and thread grass (*Stipa comata*). The nested frequency of the annual, cheatgrass, declined significantly, and cover declined markedly. The sum of nested frequency of perennial forbs increased by 23% from 2003, with 24 species being encountered.

winter range condition (DCI) - fair-good (45) Low potential scale

browse - slightly up (+1)

grass - up (+2)

forb - up (+2)

HERBACEOUS TRENDS --

Management unit 30 , Study no: 40

T y p e	Species					Average Cover %		
		'92	'98	'03	'08	'98	'03	'08
G	Agropyron cristatum	_a 12	_a 12	_a 17	_b 35	.11	.25	.42
G	Bromus tectorum (a)	-	_c 163	_b 82	_a 45	2.52	.35	.15
G	Elymus junceus	9	-	-	-	-	-	-
G	Hilaria jamesii	-	4	-	-	.03	-	-
G	Koeleria cristata	3	-	-	-	-	-	-
G	Oryzopsis hymenoides	_a 5	_c 50	_{ab} 16	_{bc} 29	1.05	.06	.20
G	Poa fendleriana	_a 2	_b 30	_a 6	_a 1	.47	.04	.03
G	Poa secunda	-	2	-	3	.00	-	.00
G	Sitanion hystrix	_c 65	_b 43	_a 5	_b 37	.57	.02	.47
G	Stipa comata	_a 3	_a -	_a -	_b 22	-	-	.09
G	Stipa coronata depauperata	_b 45	_a 5	_a -	_a 3	.06	-	.01
G	Stipa lettermani	_a -	_a -	_b 24	_a 7	-	.16	.10
Total for Annual Grasses		0	163	82	45	2.52	0.35	0.15
Total for Perennial Grasses		144	146	68	137	2.30	0.54	1.35
Total for Grasses		144	309	150	182	4.83	0.89	1.50
F	Agoseris glauca	-	-	-	1	-	-	.03
F	Alyssum alyssoides (a)	-	1	-	-	.00	-	-
F	Allium sp.	-	1	-	-	.00	-	-
F	Antennaria rosea	-	-	2	8	-	.00	.01
F	Astragalus sp.	1	2	-	-	.03	-	.03
F	Balsamorhiza hookeri	_a 1	_b 23	_b 18	_{ab} 11	.57	.72	.39
F	Calochortus nuttallii	-	-	-	6	-	-	.01
F	Chenopodium album (a)	-	-	-	3	-	-	.38
F	Chaenactis douglasii	_a 5	_b 20	_a -	_a -	.09	-	-
F	Comandra pallida	_a 9	_a 30	_b 55	_b 60	.24	.45	.36
F	Collinsia parviflora (a)	-	_a 6	_a 22	_b 37	.02	.04	.09
F	Crepis acuminata	2	-	1	3	-	.09	.00
F	Dalea searlsiae	_b 12	_a -	_a -	_a -	-	-	-
F	Descurainia pinnata (a)	-	-	2	-	-	.00	-
F	Eriogonum cernuum (a)	-	5	-	10	.06	-	.02
F	Erigeron sp.	-	3	-	-	.03	-	-
F	Eriogonum sp.	-	7	-	-	.16	-	-
F	Eriogonum racemosum	_{ab} 8	_b 9	_a -	_{ab} 5	.10	-	.07
F	Eriogonum shockleyi	1	-	5	6	-	.15	.06

T y p e	Species					Average Cover %		
		'92	'98	'03	'08	'98	'03	'08
F	Eriogonum umbellatum	_a 34	_b 39	_a 19	_{ab} 21	.29	.16	.26
F	Gilia sp. (a)	-	6	-	-	.04	-	-
F	Hymenopappus filifolius	1	-	-	-	-	-	-
F	Ipomopsis aggregata	1	-	-	4	-	-	.01
F	Lappula occidentalis (a)	-	12	14	1	.05	.03	.00
F	Lesquerella sp.	-	-	-	1	-	-	.00
F	Lomatium sp.	-	4	13	14	.04	.03	.06
F	Lotus utahensis	_b 8	_{ab} 3	_a -	_{ab} 1	.03	-	.00
F	Lupinus argenteus	_b 17	_a 4	_a 2	_a 3	.06	.00	.01
F	Machaeranthera canescens	5	-	-	-	-	-	-
F	Microsteris gracilis (a)	-	_b 80	_a 6	_a -	.20	.01	-
F	Orobanche fasciculata	-	-	1	-	-	.00	-
F	Penstemon caespitosus	_b 45	_a -	_a -	_a 8	-	-	.16
F	Penstemon sp.	8	7	-	6	.07	-	.13
F	Petrorhiza pumila	55	52	37	30	1.41	.74	.59
F	Phlox austromontana	_{ab} 63	_b 76	_a 34	_a 29	1.62	.38	.36
F	Phlox longifolia	14	6	7	12	.03	.04	.03
F	Polygonum douglasii (a)	-	-	1	-	-	.00	-
F	Ranunculus testiculatus (a)	-	-	-	2	-	-	.00
F	Senecio multilobatus	9	-	-	2	-	-	.00
F	Sphaeralcea grossulariifolia	1	-	-	-	-	-	-
F	Streptanthus cordatus	-	_b 30	_a -	_a 4	.64	-	.03
F	Trifolium sp.	_b 22	_a 12	_a 13	_{ab} 20	.06	.05	.09
Total for Annual Forbs		0	110	45	53	0.38	0.09	0.50
Total for Perennial Forbs		322	328	207	255	5.52	2.87	2.77
Total for Forbs		322	438	252	308	5.91	2.97	3.27

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

BROWSE TRENDS --

Management unit 30 , Study no: 40

Type	Species	Strip Frequency			Average Cover %		
		'98	'03	'08	'98	'03	'08
B	Artemisia tridentata wyomingensis	80	82	89	14.61	21.35	14.10
B	Ceanothus greggii	0	1	0	-	.03	.06
B	Chrysothamnus depressus	33	8	26	.44	.21	1.18
B	Chrysothamnus viscidiflorus	29	12	20	1.47	.57	.37
B	Gutierrezia sarothrae	20	17	6	.17	.28	.06
B	Juniperus osteosperma	7	10	7	2.04	4.28	3.13
B	Opuntia sp.	0	1	1	-	.00	.03
B	Pinus monophylla	18	15	16	5.69	4.85	6.29
B	Polygala subspinosa subspinosa	0	6	3	-	.01	.02
B	Purshia tridentata	26	28	31	3.97	6.86	4.49
Total for Browse		213	180	205	28.41	38.46	29.78

CANOPY COVER, LINE INTERCEPT --

Management unit 30 , Study no: 40

Species	Percent Cover		
	'98	'03	'08
Artemisia tridentata wyomingensis	-	16.96	18.21
Ceanothus greggii	-	.03	-
Chrysothamnus depressus	-	.11	.11
Chrysothamnus viscidiflorus	-	.35	1.16
Gutierrezia sarothrae	-	.10	.06
Juniperus osteosperma	1.00	7.05	7.90
Pinus monophylla	-	7.76	10.96
Purshia tridentata	-	7.18	5.59

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 30 , Study no: 40

Species	Average leader growth (in)	
	'03	'08
Artemisia tridentata wyomingensis	1.0	0.8
Purshia tridentata	0.6	0.4

POINT-QUARTER TREE DATA --
 Management unit 30 , Study no: 40

Species	Trees per Acre		
	'98	'03	'08
Juniperus osteosperma	56	59	57
Pinus monophylla	161	122	168

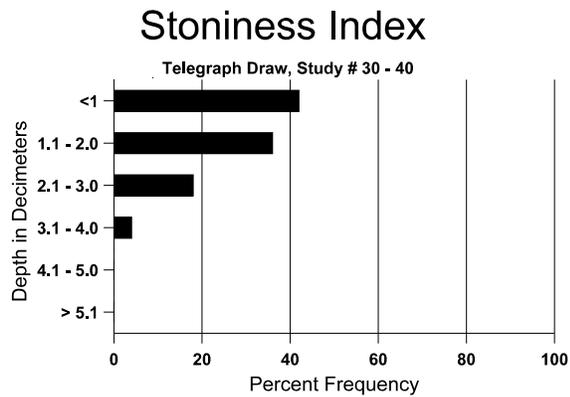
Average diameter (in)		
'98	'03	'08
3.9	6.4	9.0
2.5	3.3	2.6

BASIC COVER --
 Management unit 30 , Study no: 40

Cover Type	Average Cover %				
	'82	'92	'98	'03	'08
Vegetation	1.50	4.25	39.52	39.01	34.21
Rock	6.00	6.00	10.70	8.96	11.21
Pavement	7.75	22.25	13.13	8.37	11.05
Litter	56.50	58.00	51.14	44.97	52.30
Cryptogams	.25	0	.17	.07	.33
Bare Ground	27.25	9.50	20.32	17.92	12.88

SOIL ANALYSIS DATA --
 Management unit 30, Study no: 40, Study Name: Telegraph Draw

Effective rooting depth (in)	Temp °F (depth)	pH	sandy clay			%OM	PPM P	PPM K	ds/m
			%sand	%silt	%clay				
16.9	43.6 (17.7)	5.6	46.0	17.4	36.6	2.4	3.8	310.4	0.4



PELLET GROUP DATA --

Management unit 30 , Study no: 40

Type	Quadrat Frequency		
	'98	'03	'08
Rabbit	8	2	59
Horse	3	4	3
Deer	9	3	9

Days use per acre (ha)		
'98	'03	'08
-	-	-
16 (40)	9 (23)	5 (12)
21 (52)	4 (10)	6 (15)

BROWSE CHARACTERISTICS --

Management unit 30 , Study no: 40

		Age class distribution (plants per acre)					Utilization					
Y	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Artemisia tridentata wyomingensis</i>												
82	6165	466	3299	2866	-	-	6	2	0	-	0	16/18
92	11831	833	4699	6533	599	-	17	2	5	.33	5	13/15
98	4560	1260	1120	3280	160	20	29	1	4	1	1	19/29
03	6740	40	1200	4560	980	180	0	0	15	5	5	20/27
08	8160	1120	940	4560	2660	480	4	1	33	6	8	17/25
<i>Ceanothus greggii</i>												
82	0	-	-	-	-	-	0	0	-	-	0	-/-
92	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	20	-	-	20	-	-	0	100	-	-	0	5/12
08	0	-	-	-	-	-	0	0	-	-	0	11/39
<i>Chrysothamnus depressus</i>												
82	0	-	-	-	-	-	0	0	0	-	0	-/-
92	0	-	-	-	-	-	0	0	0	-	0	-/-
98	2300	220	640	1600	60	-	0	0	3	3	3	4/6
03	280	20	20	240	20	-	7	14	7	-	0	4/6
08	1080	140	300	720	60	-	24	28	6	2	2	3/5
<i>Chrysothamnus nauseosus</i>												
82	0	-	-	-	-	-	0	0	-	-	0	-/-
92	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	5/8
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)
Chrysothamnus viscidiflorus												
82	0	-	-	-	-	-	0	0	0	-	0	-/-
92	132	-	99	-	33	-	0	0	25	15	25	-/-
98	1360	-	260	1040	60	-	0	0	4	1	1	11/16
03	520	-	80	340	100	20	0	4	19	12	12	13/18
08	920	40	40	720	160	20	2	30	17	4	7	8/10
Gutierrezia sarothrae												
82	0	-	-	-	-	-	0	0	0	-	0	-/-
92	66	-	33	33	-	-	0	0	0	-	0	6/4
98	1420	580	300	1100	20	20	0	0	1	1	1	6/10
03	720	-	100	620	-	120	0	0	0	-	0	5/6
08	440	40	20	380	40	20	41	14	9	-	0	4/4
Juniperus osteosperma												
82	166	-	-	166	-	-	0	0	-	-	0	39/26
92	99	-	66	33	-	-	0	0	-	-	0	81/54
98	140	-	40	100	-	20	0	0	-	-	0	-/-
03	220	-	80	140	-	-	0	0	-	-	0	-/-
08	140	-	40	100	-	100	0	0	-	-	0	-/-
Opuntia sp.												
82	0	-	-	-	-	-	0	0	0	-	0	-/-
92	0	-	-	-	-	-	0	0	0	-	0	-/-
98	0	-	-	-	-	-	0	0	0	-	0	-/-
03	20	-	-	20	-	-	0	100	0	-	0	7/16
08	20	-	-	-	20	-	0	0	100	-	0	5/13
Pinus monophylla												
82	166	-	-	166	-	-	0	0	0	-	0	32/31
92	332	33	266	33	33	-	10	0	10	-	10	110/74
98	380	60	240	140	-	20	0	0	0	-	0	-/-
03	400	40	260	120	20	20	0	0	5	5	5	-/-
08	360	60	200	140	20	40	0	0	6	6	6	-/-
Polygala subspinososa subspinososa												
82	66	-	-	66	-	-	0	0	-	-	0	5/8
92	266	-	33	233	-	-	0	0	-	-	0	3/4
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	140	-	20	120	-	-	0	0	-	-	0	3/3
08	80	-	-	80	-	-	25	0	-	-	0	2/3

		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)
<i>Purshia tridentata</i>												
82	199	-	-	199	-	-	50	17	0	-	0	26/31
92	332	66	33	233	66	-	10	20	20	-	0	34/43
98	620	240	140	440	40	20	48	16	6	-	0	34/49
03	860	20	220	440	200	-	12	5	23	5	5	38/53
08	780	-	100	280	400	20	10	3	51	23	28	27/37
<i>Ribes</i> sp.												
82	0	-	-	-	-	-	0	0	-	-	0	-/-
92	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	40/65
08	0	-	-	-	-	-	0	0	-	-	0	-/-