

DRY MOUNTAIN - TREND STUDY NO. 16C-26-09

Vegetation Type: Chained, Seeded P-J

Range Type: Crucial Deer Winter, Substantial Elk Winter

NRCS Ecological Site Description: Not Available

Land Ownership: USFS

Elevation: 7,850 ft (2,393 m)

Aspect: North

Slope: 5%

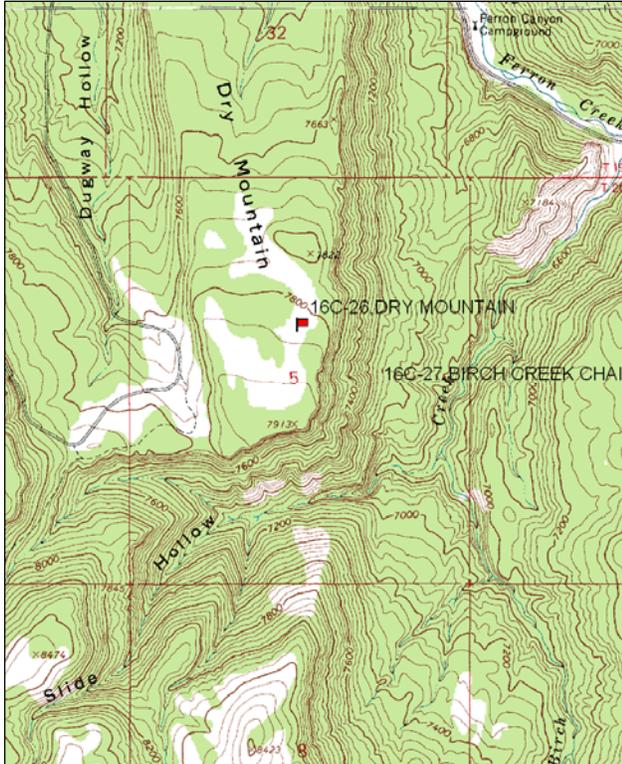
Transect bearing: 180 degrees magnetic.

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

Directions:

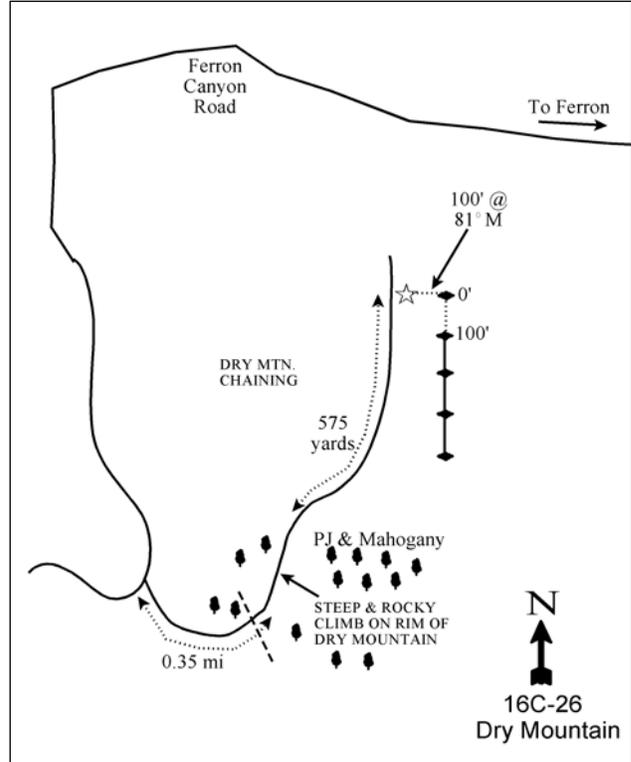
From the junction of Highway U-10 and Canyon Road in Ferron, proceed west up Ferron Canyon toward Ferron Reservoir for 12.85 miles. At this point, bear left (SE) and go 0.35 mile to the base of Dry Mountain, where the road becomes impassably steep and rocky. From the top of this steep section, hike north down the road approximately 575 yards to a witness post on the right side of the road. From the witness post walk east at 81° M about 100 feet to the 0-foot baseline stake. The study stakes are short green fenceposts.

Map Name: Flagstaff Peak



Township: 20S, Range: 6E, Section: 5

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 476587 E 4329154 N

## DRY MOUNTAIN - TREND STUDY NO. 16C-26

### Site Information

Site Description: The study is on the north-facing Dry Mountain Plateau which provides excellent winter range for deer and elk in mild to normal winters. The plateau was chained and seeded in 1967 and now supports a vigorous stand of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and antelope bitterbrush (*Purshia tridentata*). Along the edges are mature pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) populations. The area is managed as part of the Ferron grazing allotment. Summer cattle use is restricted by the lack of water and access to the plateau. Pellet group data has indicated heavy use by deer and light use by elk and cattle since 1999 (Table - Pellet Group Data).

Browse: Both mountain big sagebrush and antelope bitterbrush are abundant on the site and provide valuable forage. Mountain big sagebrush is the dominant species in cover on the site (Table - Browse Trends). The sagebrush population is mostly healthy, but does have moderately high amounts of decadence and poor vigor. Recruitment of young sagebrush plants has been low since 1994. Utilization of sagebrush has been mostly moderate with some heavy use over the study years. The highly palatable antelope bitterbrush is abundant and has a healthy population with low decadence and poor vigor. Decadence of bitterbrush was high in 2004, following a drought. Recruitment of young bitterbrush plants has been mostly low, but there was good recruitment in 1988 and 1999. Utilization of bitterbrush has been mostly moderate and heavy. Stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) is also fairly abundant on the site and has been steadily increasing in cover since 1994 (Table - Browse Characteristics). Juniper and pinyon trees had begun to reestablish at moderate density by 1994, and a lop-and-scatter treatment was done in 1999 prior to the sampling. Density of pinyon and juniper has been less than 18 trees/acre for each species since the treatment (Table - Point-Quarter Tree Data).

Herbaceous Understory: Grasses are diverse, but not very abundant due to the dominance of shrubs. The most abundant grass species include western wheatgrass (*Agropyron smithii*), blue grama (*Bouteloua gracilis*), needle-and-thread (*Stipa comata*), and Indian ricegrass (*Oryzopsis hymenoides*). Many forb species have been sampled over the study years, but forbs are not common. Lobeleaf groundsel (*Senecio multilobatus*) was fairly abundant in 1999, but not in any other sample year (Table - Herbaceous Trends).

Soil: The soil has a loamy sand texture with a neutral to slightly alkaline pH (7.3). Phosphorus and potassium have limited availability for plant growth and development at 2.9 ppm and 41.6 ppm, respectively (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Bare ground cover is fairly low due to high amounts of protective cover provided by litter cover (Table - Basic Cover). The soil erosion condition was classified as stable in 2004 and 2009.

### Trend Assessments

#### Browse:

- **1988 to 1994 - stable (0):** Differences in density may be related to the larger sample area used in 1994; therefore, trend was determined using other parameters. Poor vigor of mountain big sagebrush increased from 2% to 21% of the population and recruitment decreased from 27% to 2%.
- **1994 to 1999 - slightly up (+1):** The density of bitterbrush increased by 14% and decadence decreased from 23% to 9%. Recruitment of young bitterbrush plants increased from 3% to 20% of the population. There was little change in the density of mountain big sagebrush, but poor vigor decreased to 5%.
- **1999 to 2004 - slightly down (-1):** Bitterbrush density decreased by 24%, but mountain big sagebrush density remained similar. Decadence of bitterbrush increased to 48% and poor vigor increased from 1% to 18%. Recruitment of young bitterbrush plants decreased to 5%. Cover of bitterbrush also decreased from 7% to 5%, but again, there was little change in sagebrush.

- **2004 to 2009 - slightly up (+1):** The density of bitterbrush increased by 24% and decadence decreased to 12%. Recruitment of young bitterbrush plants remained low at 6%. There was little change in the mountain big sagebrush population.

Grass:

- **1988 to 1994 - stable (0):** The sum of nested frequency of perennial grasses changed little.
- **1994 to 1999 - down (-2):** Perennial grass sum of nested frequency decreased by 23%, though there was little change in cover.
- **1999 to 2004 - down (-2):** There was a 40% decrease in the sum of nested frequency and cover decreased from 4% to 3%. There was a significant decrease in the nested frequency of needle-and-thread.
- **2004 to 2009 - up (+2):** The sum of nested frequency of perennial grasses increased by 40% and cover increased to 5%. Indian ricegrass increased significantly in nested frequency.

Forb:

- **1988 to 1994 - down (-2):** There was a 52% decrease in the sum of nested frequency of perennial forbs.
- **1994 to 1999 - up (+2):** The sum of nested frequency of perennial forbs increased over four-fold and cover increased from less than 0.5% to 3%. Most of the increase was due to a significant increase in the nested frequency and a large increase in cover of lobeleaf groundsel.
- **1999 to 2004 - down (-2):** Perennial forb sum of nested frequency decreased by 66% and cover decreased to less than 1%. Again, most of the decrease was due to a significant decrease in the nested frequency and a large decrease in cover of lobeleaf groundsel. Forbs are now very rare on the site.
- **2004 to 2009 - slightly down (-1):** Both the sum of nested frequency and cover of perennial forbs continued to decrease. Forbs are very rare on the site.

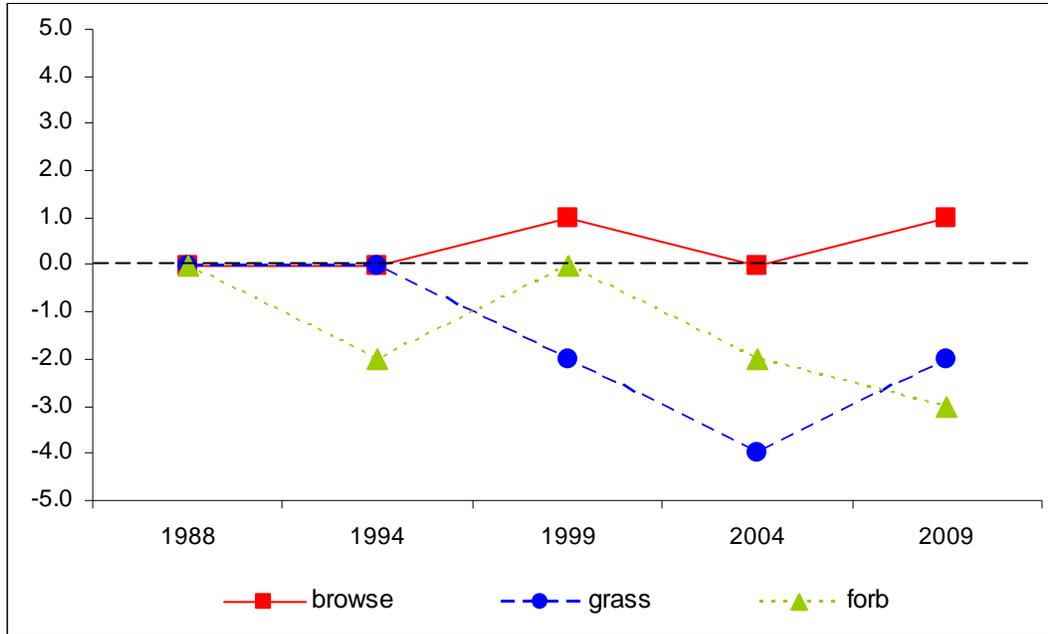
DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --

Management unit 16C, study no: 26

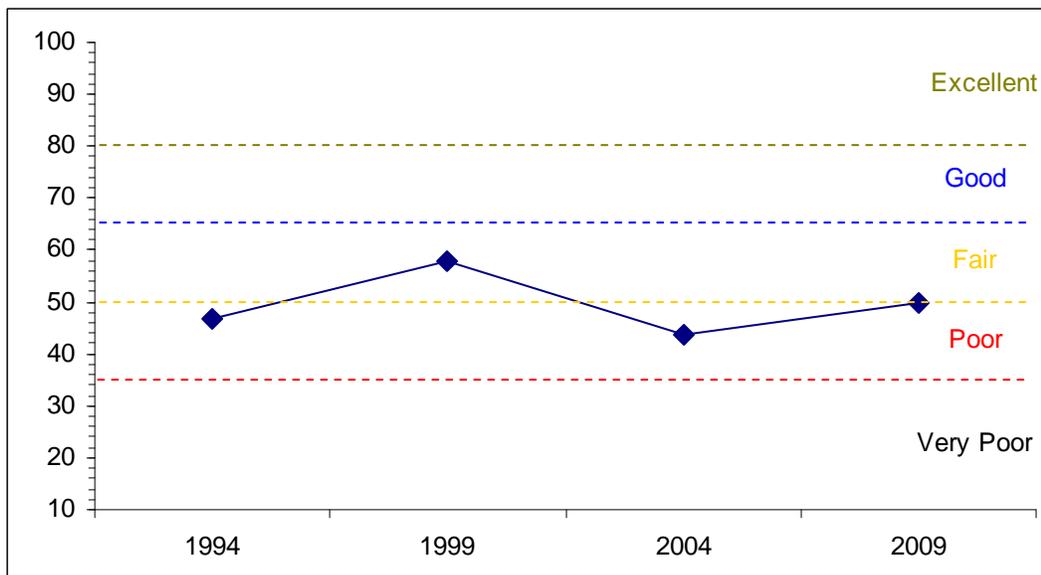
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
94	30.0	5.5	1.1	9.6	0.0	0.6	0.0	<b>46.8</b>	Poor
99	30.0	9.4	4.4	8.7	0.0	5.5	0.0	<b>57.9</b>	Fair
04	30.0	4.3	1.3	6.5	0.0	1.7	0.0	<b>43.8</b>	Poor
09	28.9	7.8	1.0	10.6	0.0	1.2	0.0	<b>49.7</b>	Poor-Fair

## Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--  
Management unit 16C Study no: 26



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL  
Management unit 16C, Study no: 26



HERBACEOUS TRENDS--  
Management unit 16C, Study no: 26

Type	Species	Nested Frequency					Average Cover %			
		'88	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron intermedium	-	-	-	4	-	-	-	.03	-

Type	Species	Nested Frequency					Average Cover %			
		'88	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron smithii	b105	b98	ab68	a42	a38	.35	.40	.47	.26
G	Bouteloua gracilis	64	47	42	34	40	1.86	1.60	1.16	2.15
G	Carex sp.	1	4	4	-	-	.03	.15	.03	-
G	Elymus salina	a-	a-	a3	ab5	b14	-	.03	.37	.54
G	Oryzopsis hymenoides	a6	a26	a16	a15	b53	.69	.43	.29	1.31
G	Poa fendleriana	12	15	10	7	5	.05	.02	.18	.06
G	Sitanion hystrix	a-	b11	ab6	b9	b9	.02	.02	.08	.22
G	Sporobolus cryptandrus	3	3	2	5	-	.00	.15	.06	-
G	Stipa comata	d117	cd97	bc75	a19	ab37	1.76	1.34	.52	.74
G	Stipa lettermani	-	-	6	-	-	-	.18	.03	-
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		308	301	232	140	196	4.78	4.34	3.24	5.31
Total for Grasses		308	301	232	140	196	4.78	4.34	3.24	5.31
F	Androsace septentrionalis (a)	-	a-	b14	a-	a-	-	.06	-	-
F	Antennaria sp.	2	-	-	-	-	-	-	-	-
F	Arabis perennans	b13	a1	a-	a-	a-	.00	-	-	-
F	Arabis sp.	ab23	ab3	22	ab9	b22	.01	.05	.03	.09
F	Aster sp.	a-	a-	b30	a-	a-	-	.17	-	-
F	Astragalus convallarius	2	-	-	2	-	-	-	.03	-
F	Astragalus sp.	-	1	4	2	-	.00	.03	.03	-
F	Chaenactis douglasii	b12	a3	b16	a3	a-	.01	.08	.00	-
F	Chenopodium sp. (a)	-	-	-	3	-	-	-	.00	-
F	Crepis acuminata	4	-	1	-	1	-	.00	-	.03
F	Cryptantha sp.	a-	ab15	b27	a7	a4	.09	.72	.18	.03
F	Descurainia pinnata (a)	-	-	1	3	3	-	.00	.00	.00
F	Erigeron pumilus	a3	a-	b15	ab11	ab6	-	.14	.03	.09
F	Eriogonum cernuum (a)	-	-	-	2	-	-	-	.00	-
F	Eriogonum racemosum	4	2	3	7	1	.01	.04	.09	.03
F	Gaillardia pinnatifida	-	1	-	-	-	.00	-	-	-
F	Gayophytum ramosissimum(a)	-	2	-	3	3	.00	-	.01	.00
F	Heterotheca villosa	-	-	-	1	-	-	-	.03	-
F	Ipomopsis aggregata	-	-	1	-	-	-	.00	-	-
F	Lygodesmia sp.	-	1	3	-	4	.03	.15	-	.01
F	Machaeranthera canescens	-	-	11	1	4	-	.08	.01	.16
F	Oenothera sp.	3	-	1	-	1	-	.00	-	.00
F	Polygonum douglasii (a)	-	3	-	-	-	.00	-	-	-
F	Schoenocrambe linifolia	22	23	12	10	2	.08	.03	.07	.01
F	Senecio multilobatus	a36	a10	b118	a36	a24	.06	1.24	.33	.15
F	Trifolium sp.	-	-	2	1	-	-	.01	.00	-
Total for Annual Forbs		0	5	15	11	6	0.00	0.07	0.02	0.00
Total for Perennial Forbs		124	60	266	90	69	0.31	2.77	0.86	0.62
Total for Forbs		124	65	281	101	75	0.31	2.84	0.88	0.62

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

BROWSE TRENDS--

Management unit 16C, Study no: 26

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	Artemisia tridentata vaseyana	88	86	88	87	19.94	21.67	22.86	17.55
B	Chrysothamnus viscidiflorus viscidiflorus	53	55	56	47	1.53	2.07	2.45	1.77
B	Echinocereus triglochidatus	0	4	0	1	-	.00	-	.00
B	Gutierrezia sarothrae	7	8	9	11	.00	.02	.21	.24
B	Juniperus osteosperma	0	0	0	0	.66	-	-	-
B	Leptodactylon pungens	19	18	16	21	.13	.25	.78	.40
B	Opuntia sp.	5	9	11	7	.00	.05	.18	.07
B	Pinus edulis	0	3	1	1	.44	.18	.00	.00
B	Purshia tridentata	43	51	46	50	5.56	7.15	4.94	4.67
Total for Browse		215	234	227	225	28.28	31.39	31.43	24.71

CANOPY COVER, LINE INTERCEPT--

Management unit 16C, Study no: 26

Species	Percent Cover	
	'04	'09
Artemisia tridentata vaseyana	25.98	25.33
Chrysothamnus viscidiflorus viscidiflorus	3.90	2.48
Gutierrezia sarothrae	.26	.61
Leptodactylon pungens	.33	.25
Purshia tridentata	6.93	7.58

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 16C, Study no: 26

Species	Average leader growth (in)	
	'04	'09
Artemisia tridentata vaseyana	1.6	0.9
Purshia tridentata	3.6	1.8

POINT-QUARTER TREE DATA--

Management unit 16C, Study no: 26

Species	Trees per Acre		Average diameter (in)	
	'94	'99	'94	'99
Juniperus osteosperma	52	9	-	6.6
Pinus edulis	25	13	-	2.2

**BASIC COVER--**

Management unit 16C, Study no: 26

Cover Type	Average Cover %				
	'88	'94	'99	'04	'09
Vegetation	5.75	37.89	34.27	36.88	30.00
Rock	2.25	2.88	3.32	3.91	4.66
Pavement	.25	.52	.63	.79	.43
Litter	69.50	46.47	49.09	54.00	53.30
Cryptogams	2.50	3.01	2.12	2.16	4.82
Bare Ground	19.75	24.49	26.34	22.61	26.62

**SOIL ANALYSIS DATA --**

Management unit 16C, Study no: 26, Study Name: Dry Mountain

Effective rooting depth (in)	pH	loamy sand			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
14	n/a	83.6	5.8	10.6	1	2.9	41.6	0.7

**PELLET GROUP DATA--**

Management unit 16C, Study no: 26

Type	Quadrat Frequency				Days use per acre (ha)		
	'94	'99	'04	'09	'99	'04	'09
Rabbit	21	42	13	36	-	-	-
Elk	2	-	-	-	1 (3)	-	3 (7)
Deer	64	34	38	26	72 (178)	110 (271)	41 (101)
Cattle	-	-	-	1	2 (5)	3 (7)	2 (4)

**BROWSE CHARACTERISTICS--**

Management unit 16C, Study no: 26

		Age class distribution					Utilization		
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
<b>Artemisia tridentata vaseyana</b>									
88	<b>7198</b>	27	42	31	999	61	7	2	19/29
94	<b>3840</b>	2	64	34	20	42	8	21	20/36
99	<b>3940</b>	5	73	22	20	53	10	5	23/36
04	<b>3640</b>	2	65	33	520	66	19	12	20/36
09	<b>3520</b>	1	72	27	120	40	31	18	20/37
<b>Chrysothamnus viscidiflorus viscidiflorus</b>									
88	<b>5064</b>	25	71	4	133	1	1	0	8/9
94	<b>1960</b>	0	99	1	-	9	3	1	11/14
99	<b>2120</b>	16	82	2	160	9	0	.94	14/16
04	<b>2280</b>	2	84	14	20	3	.87	4	13/17
09	<b>2440</b>	3	88	9	40	2	0	6	12/17

		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>Echinocereus triglochidatus</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	80	25	75	-	-	0	0	0	1/3	
04	0	0	0	-	-	0	0	0	-/-	
09	20	0	100	-	-	0	0	0	3/13	
<i>Gutierrezia sarothrae</i>										
88	0	0	0	0	-	0	0	0	-/-	
94	360	6	94	0	-	0	0	0	5/6	
99	400	30	70	0	20	0	0	0	7/6	
04	580	41	59	0	260	0	0	0	9/10	
09	1000	0	98	2	-	0	0	0	7/7	
<i>Juniperus osteosperma</i>										
88	66	100	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
<i>Leptodactylon pungens</i>										
88	2465	38	59	3	133	0	0	0	5/5	
94	800	0	100	0	-	0	0	0	6/6	
99	1040	21	71	8	180	0	0	6	5/7	
04	900	7	87	7	20	0	0	2	7/10	
09	1120	0	100	0	-	0	0	0	5/8	
<i>Opuntia sp.</i>										
88	199	0	100	0	-	0	0	0	2/2	
94	120	17	83	0	-	0	0	0	3/11	
99	280	21	71	7	-	0	0	7	2/6	
04	340	12	88	0	-	0	0	12	2/9	
09	240	8	83	8	-	0	0	8	3/13	
<i>Pinus edulis</i>										
88	266	100	0	-	133	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	60	100	0	-	-	0	0	33	-/-	
04	20	100	0	-	20	0	100	0	-/-	
09	20	100	0	-	-	0	0	0	-/-	
<i>Purshia tridentata</i>										
88	998	27	60	13	66	67	0	0	14/28	
94	1500	3	75	23	-	51	7	5	15/40	
99	1720	20	71	9	60	12	23	1	19/39	
04	1300	5	48	48	-	20	77	18	15/38	
09	1620	6	81	12	-	25	33	9	16/36	