

MORMON PASTURE POINT - TREND STUDY NO. 14-27-09

Vegetation Type: Chained, Seeded P-J

Range Type: Crucial Deer Spring/Fall, Crucial Elk Winter

NRCS Ecological Site Description: Not Available

Land Ownership: USFS

Elevation: 7,100 ft (2,164 m)

Aspect: East

Slope: 8%-10%

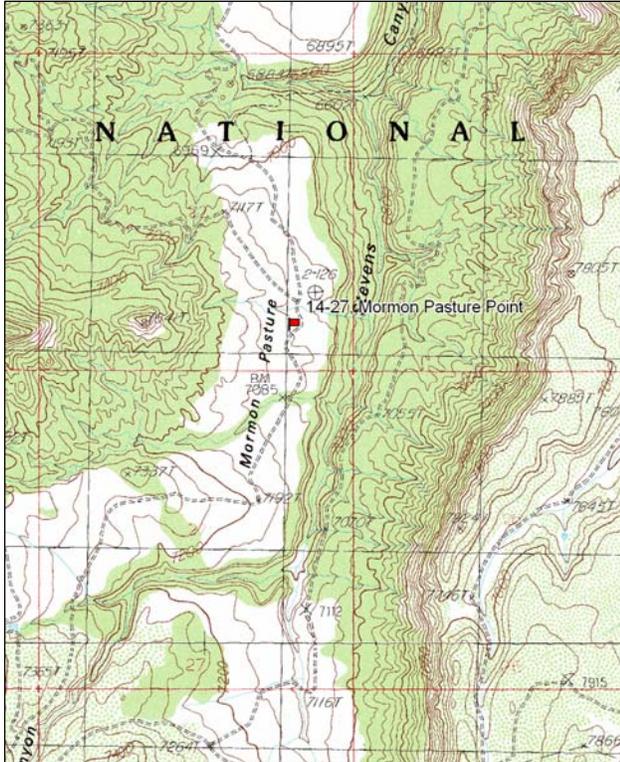
Transect bearing: 165 degrees magnetic

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

Directions:

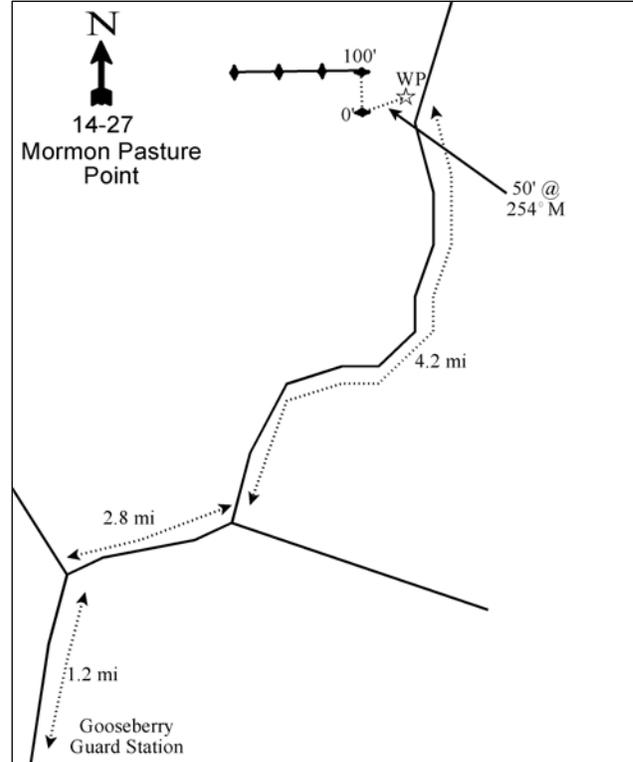
From the Gooseberry Guard Station, go 1.2 miles to the Causeway to a fork. Turn right and go 2.8 miles to a fork. Turn left towards Mormon Pasture and drive 1.2 miles to two mining cabins. Stay right, pass the uranium quarry, and go 0.9 miles to a fork. Stay left for 2.1 miles to the transect. There is a witness post (3 foot tall green fence post) on the left side of the road. The 0-foot end of the baseline is 50 feet west of the witness post (@ 254°M) and is marked with browse tag #7883.

Map Name: Cathedral Butte



Township: 33S, Range: 20E, Section: 22

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 613952 E 4194321 N

MORMON PASTURE POINT - TREND STUDY NO. 14-27

Site Information

Site Description: The study is located in an open rolling valley between high red cliffs and the head Steven's Canyon. The site once supported a pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) woodland, but approximately 900 acres were chained and seeded in the early 1970's. An herbicide treatment of Tordon was also done in 1985 on 200 acres at the north end of the chaining. The Forest Service manages the area as part of the Cottonwood allotment. Pellet group data on the site has estimated light use by deer since 1999. Estimated elk use has fluctuated more with moderate use in 1999, light use in 2004 and moderately heavy use in 2009. Estimated cattle use was moderately high in 1999 and 2009, but was light in 2004 (Table - Pellet Group Data).

Browse: This chained site is dominated by mixed browse in association with a dense perennial grass understory. The preferred browse cover is comprised mainly of clumps of Gambel oak (*Quercus gambelii*) and scattered Utah serviceberry (*Amelanchier utahensis*). Both species have increased steadily in cover since 1992 (Table - Browse Trends). Antelope bitterbrush (*Purshia tridentata*) is the most heavily used preferred browse species on the site with very heavy use in all sample years. Decadence and poor vigor have also been fairly high in the bitterbrush population since 1999. Other important preferred brows include true mountain mahogany (*Cercocarpus montanus*) and mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). All of the preferred browse species other than bitterbrush have had low decadence and good vigor over the sample years. Utilization of browse species other than bitterbrush has been light to moderate (Table - Browse Characteristics).

Pinyon and juniper trees have reestablished on the site and are moderately dense. Point quarter data has estimated little change in the density or basal diameter of pinyon or juniper populations since 1999 (Table - Point-Quarter Tree Data). However, the overhead canopy cover of both pinyon and juniper has steadily increased since 1999 (Table - Canopy Cover) indicating that the trees are filling in.

Herbaceous Understory: Perennial grasses are abundant and provide valuable forage. The introduced perennial grass intermediate wheatgrass (*Agropyron intermedium*) is the dominant species in cover on the site. Intermediate wheatgrass and another introduced perennial grass, crested wheatgrass (*A. cristatum*), provide nearly all of the grass cover on the site. Native perennial species that are not as common include Indian ricegrass (*Oryzopsis hymenoides*), mutton bluegrass (*Poa fendleriana*), and a sedge (*Carex* sp.). Forbs are somewhat diverse on the site, but none are especially abundant. Rock goldenrod (*Petradoria pumila*), looseflower milkvetch (*Astragalus tenellus*), a bladderpod (*Lesquerella rectipes*), and scarlet globemallow (*Sphaeralcea coccinea*) are the most abundant forbs.

Soil: The soil is a light tan sandy clay loam with a slightly alkaline pH and moderately deep effective rooting depth. Phosphorus has limited availability for plant growth and development at just 3.8 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Protective ground cover is moderately high leaving only isolated areas of moderately high exposed bare ground cover (Table - Basic Cover). There is still a lot of litter from the chaining on the site. There are some gullies on the site, although they appear to be healing. The soil erosion condition was classified as stable in 2004 and 2009.

Trend Assessments

Browse:

- **1986 to 1992 - stable (0):** Differences in density may be related to the larger sample area used in 1992; therefore, trend was determined using other parameters. There was little change in the decadence or vigor of any of the preferred browse species. Serviceberry was sampled for the first time in 1992 with the larger sample area.

- **1992 to 1999 - slightly up (+1):** The density of bitterbrush and Gambel oak both increased and mountain big sagebrush was sampled for the first time. Decadence of and poor vigor of bitterbrush both increased to 38%.
- **1999 to 2004 - slightly up (+1):** The density of bitterbrush and serviceberry increased slightly and cover of serviceberry and Gambel oak increased slightly. Decadence and poor vigor of bitterbrush decreased to 30%.
- **2004 to 2009 - stable (0):** The density and cover of mountain big sagebrush increased slightly and cover of serviceberry increased slightly. Decadence and poor vigor of bitterbrush decreased to 25% and 13%, respectively. The overhead canopy cover of pinyon and juniper has steadily increased on the site since 1999.

Grass:

- **1986 to 1992 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 14% with a significant decrease in the native perennial grasses Indian ricegrass and bottlebrush squirreltail (*Sitanion hystrix*).
- **1992 to 1999 - slightly down (-1):** There was a 10% decrease in the sum of nested frequency of perennial grasses and cover decreased from 25% to 17%.
- **1999 to 2004 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 18% and cover decreased to 16%. Intermediate wheatgrass has decreased significantly in nested frequency since 1992.
- **2004 to 2009 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, though cover increased slightly to 18%.

Forb:

- **1986 to 1992 - down (-2):** There was a 32% decrease in the sum of nested frequency of perennial forbs with a significant decrease in the nested frequency of looseflower milkvetch and western salsify (*Tragopogon dubius*).
- **1992 to 1999 - slightly up (+1):** The sum of nested frequency of perennial forbs increased 11%, but cover decreased from 3% to 2%.
- **1999 to 2004 - down (-2):** There was a 27% decrease in the nested frequency of perennial forbs, though cover increased to 4%.
- **2004 to 2009 - up (+2):** There was a 22% increase in the sum of nested frequency of perennial forbs and cover increased to 5%. Most of the increase in cover came from an increase in rock goldenrod.

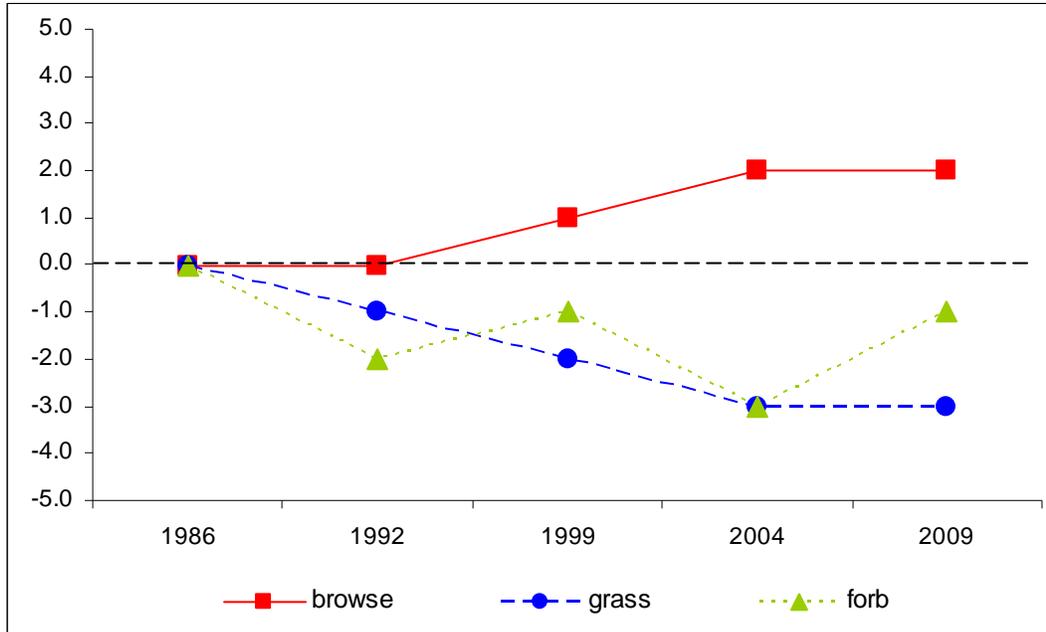
DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --

Management unit 14, study no: 27

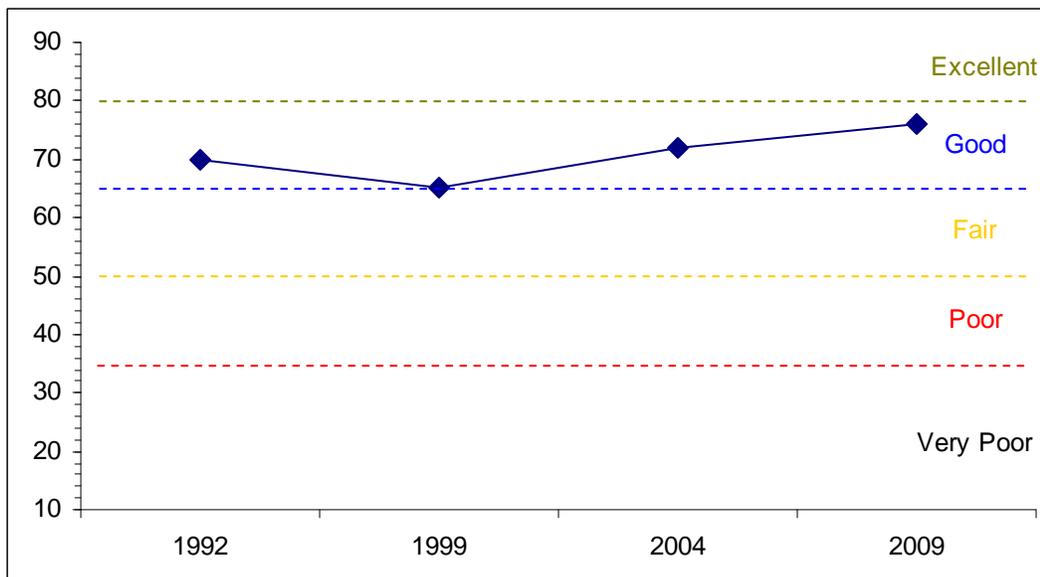
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
92	5.5	12.8	15.0	30.0	0.0	7.0	0.0	70.3	Good
99	7.2	13.0	10.3	30.0	0.0	4.5	0.0	64.9	Fair-Good
04	8.6	13.9	12.2	30.0	0.0	7.6	0.0	72.3	Good
09	12.4	13.4	9.8	30.0	0.0	10.0	0.0	75.6	Good

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 14, Study no: 27



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL
Management unit 14, Study no: 27



HERBACEOUS TRENDS--
Management unit 14, Study no: 27

Type	Species	Nested Frequency					Average Cover %			
		'86	'92	'99	'04	'09	'92	'99	'04	'09
G	Agropyron cristatum	a32	b88	b80	ab57	ab68	4.67	2.90	4.52	3.82

Type	Species	Nested Frequency					Average Cover %			
		'86	'92	'99	'04	'09	'92	'99	'04	'09
G	Agropyron dasystachyum	b218	a-	a-	a-	a-	-	-	-	-
G	Agropyron intermedium	a157	c316	bc270	b227	b236	19.59	13.35	10.83	12.94
G	Carex sp.	12	9	14	15	6	.46	.16	.28	.18
G	Oryzopsis hymenoides	b36	a16	ab19	ab15	ab15	.28	.26	.16	.28
G	Poa fendleriana	a1	b25	b22	ab16	ab18	.23	.29	.43	.40
G	Poa pratensis	7	-	-	-	-	-	-	-	-
G	Sitanion hystrix	b63	a-	a-	a-	a-	-	-	-	-
G	Stipa comata	-	-	3	3	3	-	.03	.04	.41
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		526	454	408	333	346	25.26	17.00	16.28	18.04
Total for Grasses		526	454	408	333	346	25.26	17.00	16.28	18.04
F	Antennaria rosea	-	-	-	-	5	-	-	-	.03
F	Arabis sp.	-	-	6	-	-	-	.01	-	-
F	Aster sp.	-	-	-	-	-	-	-	-	.00
F	Astragalus sp.	-	-	-	-	-	-	-	-	.00
F	Astragalus tenellus	b68	a29	a9	a12	a22	.85	.49	.98	1.36
F	Calochortus nuttallii	3	-	7	-	6	-	.01	-	.01
F	Cirsium sp.	3	6	5	3	-	.18	.01	.03	-
F	Cymopterus sp.	a5	a-	a7	a8	b19	-	.04	.02	.32
F	Descurainia pinnata (a)	-	-	1	-	-	-	.00	-	-
F	Eriogonum racemosum	2	-	-	3	1	-	-	.00	.00
F	Hedysarum boreale	-	-	-	8	-	-	-	.63	-
F	Heterotheca villosa	-	3	-	-	-	.03	.00	.00	-
F	Hymenoxys acaulis	b22	a-	ab12	ab6	b15	-	.09	.21	.32
F	Ipomopsis aggregata	3	3	-	-	-	.01	.00	-	-
F	Lappula occidentalis (a)	-	-	-	8	3	-	-	.04	.00
F	Lesquerella rectipes	a17	b42	ab30	ab25	a6	.28	.16	.11	.04
F	Lomatium sp.	-	-	6	-	-	-	.02	-	-
F	Machaeranthera canescens	3	3	1	-	2	.00	.00	-	.03
F	Pedicularis centranthera	-	-	4	-	-	-	.00	-	-
F	Penstemon lentus	b26	ab20	ab18	a4	b30	.59	.20	.07	.65
F	Petradoria pumila	3	8	14	18	21	.66	.66	.90	2.03
F	Phlox longifolia	11	11	25	7	4	.04	.07	.04	.01
F	Polygonum douglasii (a)	-	-	1	-	-	-	.00	-	-
F	Senecio multilobatus	2	-	3	4	-	-	.00	.01	-
F	Sphaeralcea coccinea	b70	ab45	ab38	a38	a35	.76	.35	.72	.39
F	Taraxacum officinale	1	1	-	-	-	.03	-	-	-
F	Tragopogon dubius	b22	a-	a-	a-	a-	-	-	.00	-
F	Trifolium sp.	-	7	12	7	8	.04	.07	.02	.02
Total for Annual Forbs		0	0	2	8	3	0	0.00	0.04	0.00
Total for Perennial Forbs		261	178	197	143	174	3.49	2.23	3.78	5.26
Total for Forbs		261	178	199	151	177	3.49	2.24	3.83	5.27

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

BROWSE TRENDS--

Management unit 14, Study no: 27

Type	Species	Strip Frequency				Average Cover %			
		'92	'99	'04	'09	'92	'99	'04	'09
B	Amelanchier utahensis	5	4	5	6	1.33	1.97	2.14	3.51
B	Artemisia tridentata vaseyana	0	5	4	10	-	.01	.15	.86
B	Cercocarpus montanus	1	0	0	0	.00	.15	.38	.63
B	Gutierrezia sarothrae	8	1	7	8	.00	.15	.36	.33
B	Juniperus osteosperma	5	2	1	2	1.67	1.38	.68	2.21
B	Juniperus scopulorum	1	0	0	0	.00	-	-	-
B	Opuntia sp.	5	6	6	9	.04	.03	.18	.30
B	Pinus edulis	0	2	3	4	3.08	.88	3.07	2.86
B	Purshia tridentata	2	7	8	6	1.00	.93	.33	.66
B	Quercus gambelii	4	13	19	17	2.00	2.59	4.13	4.15
B	Ribes sp.	1	0	0	0	.00	-	-	-
B	Symphoricarpos oreophilus	1	0	0	0	.00	-	-	-
Total for Browse		33	40	53	62	9.17	8.13	11.43	15.54

CANOPY COVER, LINE INTERCEPT--

Management unit 14, Study no: 27

Species	Percent Cover		
	'99	'04	'09
Amelanchier utahensis	.40	6.84	4.26
Artemisia tridentata vaseyana	-	.23	.60
Cercocarpus montanus	-	-	.80
Gutierrezia sarothrae	-	.31	.15
Juniperus osteosperma	.80	1.76	2.20
Opuntia sp.	-	-	.05
Pinus edulis	2.40	3.16	4.13
Purshia tridentata	-	.55	.46
Quercus gambelii	4.59	8.88	8.98

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 14, Study no: 27

Species	Average leader growth (in)	
	'04	'09
Amelanchier utahensis	1.3	1.8
Artemisia tridentata vaseyana	2.2	3.0
Cercocarpus montanus	3.9	2.8
Purshia tridentata	2.6	1.7

POINT-QUARTER TREE DATA--
Management unit 14, Study no: 27

Species	Trees per Acre			Average diameter (in)		
	'99	'04	'09	'99	'04	'09
Juniperus osteosperma	52	54	53	3.5	6.7	4.0
Pinus edulis	41	43	39	3.1	3.2	3.2
Quercus gambelii	31	-	-	1.1	-	-

BASIC COVER--
Management unit 14, Study no: 27

Cover Type	Average Cover %				
	'86	'92	'99	'04	'09
Vegetation	2.50	39.79	29.47	30.57	36.35
Rock	0	2.72	.47	.54	.26
Pavement	.75	0	1.24	1.02	2.05
Litter	69.50	51.04	48.66	45.04	52.20
Cryptogams	0	.24	.06	.66	.09
Bare Ground	27.25	18.57	31.65	36.72	31.26

SOIL ANALYSIS DATA --
Management unit 14, Study no: 27, Study Name: Mormon Pasture

Effective rooting depth (in)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
15.8	7.5	53.6	17.8	28.6	1.4	3.9	118.4	0.6

PELLET GROUP DATA--
Management unit 14, Study no: 27

Type	Quadrat Frequency				Days use per acre (ha)		
	'92	'99	'04	'09	'99	'04	'09
Rabbit	51	20	19	2	-	-	-
Elk	8	8	4	6	21 (52)	6 (15)	12 (30)
Deer	15	1	-	3	5 (12)	4 (10)	8 (20)
Cattle	7	5	4	4	36 (89)	14 (34)	25 (63)

BROWSE CHARACTERISTICS--

Management unit 14, Study no: 27

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<i>Amelanchier utahensis</i>									
86	0	0	0	0	-	0	0	0	-/-
92	100	60	40	0	-	60	0	0	-/-
99	80	0	100	0	-	25	25	0	89/90
04	220	9	91	0	-	9	0	0	69/70
09	240	8	83	8	20	25	8	0	78/76
<i>Artemisia tridentata vaseyana</i>									
86	0	0	0	-	-	0	0	0	-/-
92	0	0	0	-	-	0	0	0	-/-
99	200	40	60	-	20	40	10	0	16/24
04	140	14	86	-	-	86	0	0	25/37
09	380	26	74	-	-	26	11	11	17/23
<i>Cercocarpus montanus</i>									
86	33	0	100	-	-	100	0	0	55/43
92	20	0	100	-	40	100	0	0	-/-
99	0	0	0	-	-	0	0	0	44/39
04	0	0	0	-	-	0	0	0	64/66
09	0	0	0	-	-	0	0	0	54/58
<i>Chrysothamnus nauseosus</i>									
86	0	0	0	-	-	0	0	0	-/-
92	0	0	0	-	-	0	0	0	-/-
99	0	0	0	-	-	0	0	0	21/32
04	0	0	0	-	-	0	0	0	33/38
09	0	0	0	-	-	0	0	0	27/34
<i>Gutierrezia sarothrae</i>									
86	0	0	0	0	-	0	0	0	-/-
92	380	37	63	0	120	0	0	0	-/-
99	40	50	50	0	-	0	0	0	-/-
04	240	0	83	17	-	0	0	0	9/10
09	440	27	73	0	-	0	0	0	7/10
<i>Juniperus osteosperma</i>									
86	33	100	0	-	-	0	0	0	-/-
92	100	80	20	-	-	0	0	0	-/-
99	40	0	100	-	-	0	0	0	-/-
04	20	0	100	-	-	0	0	0	-/-
09	40	0	100	-	-	0	0	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Juniperus scopulorum										
86	0	0	0	-	-	0	0	0	-/-	
92	20	0	100	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
Opuntia sp.										
86	0	0	0	0	-	0	0	0	-/-	
92	200	60	40	0	-	0	0	0	-/-	
99	200	60	40	0	20	0	0	0	4/13	
04	240	8	92	0	-	0	0	0	8/12	
09	520	35	62	4	-	0	0	4	4/12	
Pinus edulis										
86	33	100	0	-	66	0	0	0	-/-	
92	0	0	0	-	-	0	0	0	-/-	
99	40	50	50	-	-	0	0	0	-/-	
04	60	0	100	-	-	0	0	0	-/-	
09	80	0	100	-	-	0	0	0	-/-	
Purshia tridentata										
86	99	0	100	0	-	33	67	0	12/20	
92	80	0	100	0	-	0	100	0	-/-	
99	160	0	63	38	-	50	50	38	19/50	
04	200	0	70	30	-	30	70	30	18/43	
09	160	0	75	25	-	75	25	13	22/40	
Quercus gambelii										
86	2165	58	26	15	799	62	3	3	63/35	
92	500	68	16	16	40	4	0	0	-/-	
99	1380	45	54	1	20	0	14	0	61/40	
04	1820	37	58	4	-	0	0	16	46/35	
09	2540	34	65	2	-	0	0	.78	37/36	
Ribes sp.										
86	0	0	0	-	-	0	0	0	-/-	
92	20	100	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	59/31	
04	0	0	0	-	-	0	0	0	60/33	
09	0	0	0	-	-	0	0	0	-/-	
Symphoricarpos oreophilus										
86	0	0	0	-	-	0	0	0	-/-	
92	20	100	0	-	40	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	28/72	
04	0	0	0	-	-	0	0	0	31/53	
09	0	0	0	-	-	0	0	0	-/-	