

AMASAS BACK - TREND STUDY NO. 13A-5-09

Vegetation Type: Chained, Seeded P-J

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

NRCS Ecological Site Description: Upland Stony Sand (Utah Juniper - Pinyon), R035XY323UT

Land Ownership: US Forest Service

Elevation: 7,000 ft (2,133 m)

Aspect: South

Slope: 15%-18%

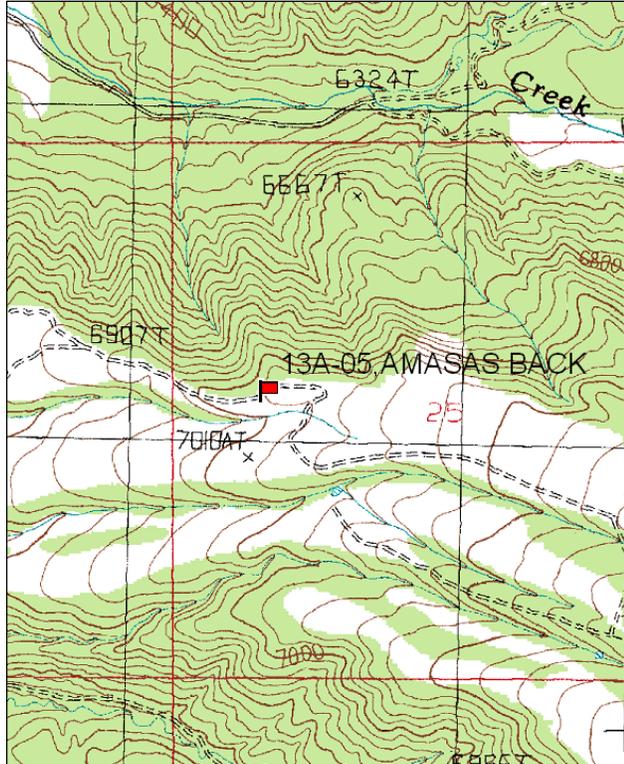
Transect bearing: 247 degrees magnetic

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

Directions:

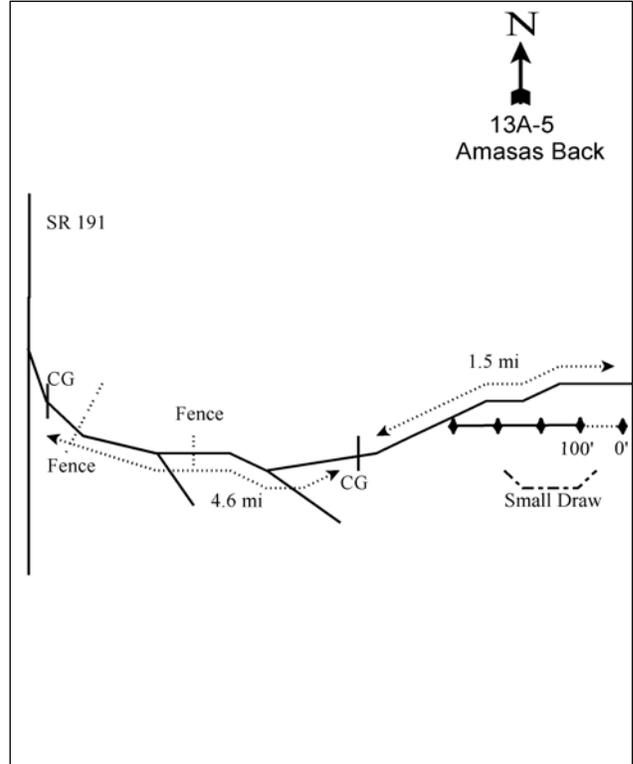
Traveling south on SR 191 out of Moab, turn east off the highway onto a dirt road just past mile marker 114. Cross the cattleguard and stay right, continuing on the main road for 0.7 miles to a fence. Continue 1.3 miles to a fork. Stay left and go 0.4 miles to another fence. Continue 1.0 miles to a fork. Stay left, go 1.2 miles to the Forest Service boundary cattleguard. Cross the cattleguard and continue 1.5 miles to a witness post. The 0-foot stake is 16 paces from the witness post at a bearing of 165°M. The 0-foot stake is marked by browse tag #7859.

Map Name: Mount Tukuhtnikivat



Township: 27S, Range: 23E, Section: 25

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 644334 E 4254327 N

## AMASAS BACK - TREND STUDY NO. 13A-5

### Site Information

Site Description: The study is on a 750 acre chaining and seeding project that was completed in 1978 on the west side of the La Sal Mountains. Pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have reestablished in the chaining to a moderate extent. Pellet group estimates show moderate use from both deer and elk (Table - Pellet Group Data).

Browse: Black sagebrush (*Artemisia nova*) is the key browse, although there may be some hybridization with Wyoming big sagebrush. Black sagebrush cover has averaged just over 8% and density has averaged about 2,200 plants/acre since 1994. Recruitment of young sagebrush plants has decreased since the outset of the study. Both vigor and decadence have been good on the black sagebrush population over the duration of the study. Utilization of black sagebrush has been mostly light to moderate (Table - Browse Characteristics). Other desirable browse plants are limited but include green ephedra (*Ephedra veridica*), fourwing saltbush (*Atriplex canescens*) and antelope bitterbrush (*Purshia tridentata*).

Pinyon pine and juniper are becoming more dominant on the chaining. The estimated density and average basal diameter of pinyon and juniper trees has remained similar since 1994 (Table - Point-Quarter Tree Data). Average combined cover of pinyon and juniper has increased since 1994 (Table - Browse Trends). Line intercept, canopy cover has also shown an increase in pinyon and juniper since 2004 (Table - Canopy Cover).

Herbaceous Understory: The herbaceous understory is dominated by cheatgrass (*Bromus tectorum*), however, the nested frequency and cover of cheatgrass have been declining since 1994. The seeded species, crested wheatgrass (*Agropyron cristatum*) and intermediate wheatgrass (*A. intermedium*), are the dominant perennial grasses on the site. Other common grass species include galleta (*Hilaria jamesii*) and Indian ricegrass (*Oryzopsis hymenoides*) (Table - Herbaceous Trends).

Perennial forb cover and diversity is low. The number of perennial forb species sampled has steadily declined since 1994. Rock goldenrod (*Petrorhiza pumila*) provides nearly all of the forb cover on this site (Table - Herbaceous Trends).

Soil: The soil is a very rocky, sandy clay loam with rocks on the surface ranging in size from large rocks to small boulders. The soil is mildly alkaline (7.5 pH) with an effective rooting depth of less than 10 inches. Soil phosphorus has marginal availability for plant growth and development at 7.5 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). The soil erosion condition classification was rated as stable in 2004 and 2009.

### Trend Assessments

#### Browse:

- **1987 to 1994 - stable (0):** Differences in density of browse species may be related to the larger sample area used in 1994; therefore, trend for browse was determined using other parameters. Recruitment of young black sagebrush plants decreased slightly, and the proportion of plants displaying poor vigor increased slightly.
- **1994 to 1999 - down (-2):** The density of black sagebrush decreased by 26%, and cover decreased from 10% to 7%. Black sagebrush plants displaying poor vigor decreased to 6%, but decadence increased from 8% to 18%.
- **1999 to 2004 - stable (0):** There was little change in the density or cover of black sagebrush. Recruitment of young black sagebrush decreased to only 1% of the population.
- **2004 to 2009 - stable (0):** There was a slight increase in the density and cover of black sagebrush. All of the small population of fourwing saltbush was classified as decadent, 80% of which displayed poor vigor.

Grass:

- **1987 to 1994 - down (-2):** The sum of nested frequency of perennial grasses decreased by 45%. There was a significant decrease in the nested frequency of intermediate wheatgrass and bottlebrush squirreltail (*Sitanion hystrix*).
- **1994 to 1999 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, though cover increased slightly. The cover of cheatgrass decreased from 17% to 9%.
- **1999 to 2004 - down (-2):** The sum of nested frequency of perennial grasses decreased by 23%, though there was little change in cover. There was a significant decrease in the nested frequency of cheatgrass.
- **2004 to 2009 - slightly up (+1):** The sum of nested frequency of perennial grasses increased by 14%. The cover of cheatgrass decreased from 8% to 6%.

Forb:

- **1987 to 1994 - up (+2):** There was a three-fold increase in the sum of nested frequency of perennial forbs. There was a significant increase in the nested frequency of rock goldenrod and thistleleaf peavine (*Lathyrus lanszwertii*).
- **1994 to 1999 - down (-2):** The sum of nested frequency of perennial forbs decreased by 23%, and cover decreased from 9% to 4%. The number of perennial forb species sampled fell from 10 to 7.
- **1999 to 2004 - down (-2):** The sum of nested frequency of perennial forbs decreased by 52%, and cover decreased to 3%. There was a significant decrease in the nested frequency of thistleleaf peavine and timber poisonvetch (*Astragalus convallarius*).
- **2004 to 2009 - stable (0):** There was a slight decrease in the sum of nested frequency of perennial forbs, but cover remained similar.

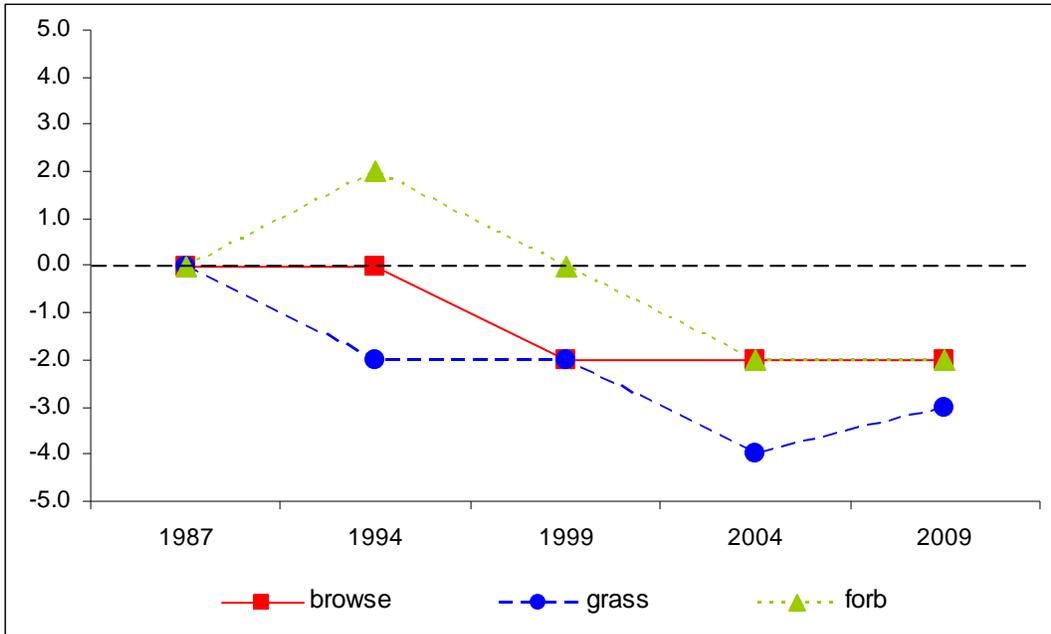
DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 13A, study no: 5

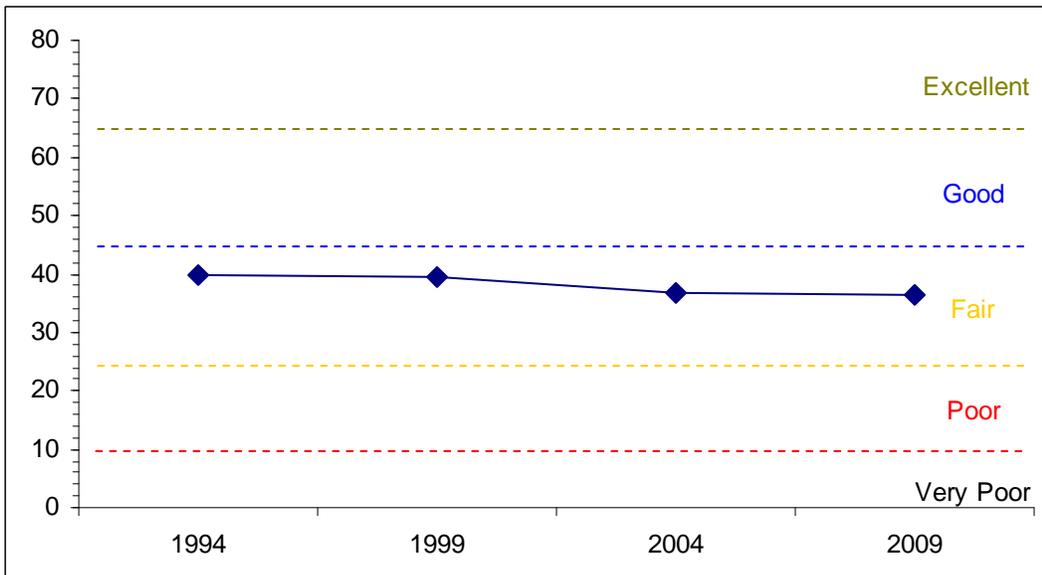
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
94	14.1	12.8	4.3	11.0	-12.4	10.0	0.0	<b>39.8</b>	Fair
99	10.5	9.5	5.5	12.4	-6.8	8.5	0.0	<b>39.5</b>	Fair
04	12.6	11.2	0.4	13.5	-6.2	5.2	0.0	<b>36.7</b>	Fair
09	12.3	9.9	0.5	12.5	-4.2	5.3	0.0	<b>36.3</b>	Fair

## Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--  
Management unit 13A, Study no: 5



DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE  
Management unit 13A, Study no: 5



HERBACEOUS TRENDS--  
Management unit 13A, Study no: 5

Type	Species	Nested Frequency					Average Cover %			
		'87	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron cristatum	94	65	83	78	82	2.66	3.08	3.42	2.94
G	Agropyron intermedium	b137	a48	a49	a37	a36	1.01	1.23	1.18	1.07
G	Bromus japonicus (a)	b31	a7	a2	a-	a11	.15	.01	-	.01
G	Bromus tectorum (a)	-	b317	b333	a280	a276	16.43	9.10	8.30	5.53
G	Hilaria jamesii	a-	b13	b22	b17	b19	.13	.66	.98	.93
G	Oryzopsis hymenoides	b56	ab30	ab24	a19	ab31	1.12	.79	.86	.94
G	Poa fendleriana	b36	b26	ab19	a6	a6	.43	.24	.08	.06
G	Sitanion hystrix	c64	b33	ab16	a6	ab12	.14	.17	.10	.13
G	Sporobolus cryptandrus	-	-	-	1	1	-	-	.15	.15
G	Vulpia octoflora (a)	-	-	-	-	3	-	-	-	.00
Total for Annual Grasses		31	324	335	280	290	16.58	9.11	8.30	5.55
Total for Perennial Grasses		387	215	213	164	187	5.51	6.18	6.77	6.24
Total for Grasses		418	539	548	444	477	22.09	15.30	15.07	11.79
F	Arabis perennans	b12	ab6	a-	a2	a-	.01	-	.00	-
F	Astragalus coltoni	2	3	2	-	-	.03	.01	-	-
F	Astragalus convallarius	a-	ab10	b15	a2	a-	1.54	.43	.18	-
F	Castilleja linariaefolia	-	3	-	-	-	.01	-	-	-
F	Chenopodium fremontii (a)	-	-	-	1	-	-	-	.00	-
F	Cryptantha humilis	-	-	-	-	1	.00	-	-	.00
F	Cymopterus sp.	-	-	1	-	-	-	.03	-	-
F	Descurainia pinnata (a)	-	5	2	-	-	.01	.00	-	-
F	Draba reptans (a)	-	b61	a3	a-	a-	.15	.03	-	-
F	Erigeron pumilus	3	-	-	-	-	-	-	-	-
F	Gilia sp. (a)	-	b36	a5	a14	a-	.08	.01	.02	-
F	Lathyrus lanszwertii	a2	b81	b56	a8	a6	2.56	.74	.10	.01
F	Lesquerella sp.	-	1	6	-	-	.00	.01	-	-
F	Machaeranthera canescens	5	3	-	-	-	.00	-	-	-
F	Microsteris gracilis (a)	-	c46	a5	b31	a2	.12	.01	.09	.00
F	Petradoria pumila	a34	b75	b62	ab48	ab45	4.05	2.96	2.20	2.54
F	Phlox longifolia	-	7	-	3	4	.02	-	.00	.00
F	Ranunculus testiculatus (a)	-	6	-	-	-	.04	-	-	-
F	Sphaeralcea coccinea	-	6	8	9	11	.41	.07	.09	.07
Total for Annual Forbs		0	154	15	46	2	0.40	0.07	0.12	0.00
Total for Perennial Forbs		58	195	150	72	67	8.67	4.26	2.60	2.65
Total for Forbs		58	349	165	118	69	9.07	4.33	2.72	2.65

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

BROWSE TRENDS--

Management unit 13A, Study no: 5

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	Artemisia nova	48	47	48	44	10.10	7.46	7.26	8.95
B	Artemisia tridentata wyomingensis	0	1	1	0	-	.00	.38	-
B	Atriplex canescens	3	3	3	3	1.00	.76	1.41	.76
B	Coryphantha vivipara arizonica	0	2	0	0	-	.00	-	-
B	Ephedra viridis	3	2	2	2	.00	.00	.00	.00
B	Gutierrezia sarothrae	12	13	26	33	.50	.03	.26	1.45
B	Juniperus osteosperma	0	11	8	8	4.92	7.59	11.64	10.73
B	Opuntia erinacea	1	0	1	0	.00	-	.00	-
B	Pediocactus simpsonii	0	1	3	1	-	.00	.03	.03
B	Pinus edulis	0	6	6	8	1.18	3.32	4.26	4.68
B	Purshia tridentata	0	0	1	2	-	-	.63	.00
Total for Browse		67	86	99	101	17.71	19.16	25.89	26.62

CANOPY COVER, LINE INTERCEPT--

Management unit 13A, Study no: 5

Species	Percent Cover		
	'99	'04	'09
Artemisia nova	-	10.10	10.86
Artemisia tridentata wyomingensis	-	.75	-
Atriplex canescens	-	.80	.36
Ephedra viridis	-	-	.21
Gutierrezia sarothrae	-	.71	2.61
Juniperus osteosperma	1.00	12.80	14.80
Pinus edulis	-	5.23	6.00
Purshia tridentata	-	.10	-

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 13A, Study no: 5

Species	Average leader growth (in)	
	'04	'09
Artemisia nova	1.7	0.7
Atriplex canescens	6.4	5.4

POINT-QUARTER TREE DATA--

Management unit 13A, Study no: 5

Species	Trees per Acre			Average diameter (in)		
	'99	'04	'09	'99	'04	'09
Juniperus osteosperma	104	99	95	3.8	4.8	2.6
Pinus edulis	89	101	95	2.7	2.6	2.3

BASIC COVER--

Management unit 13A, Study no: 5

Cover Type	Average Cover %				
	'87	'94	'99	'04	'09
Vegetation	4.75	41.08	37.70	42.25	41.55
Rock	17.50	19.76	20.53	22.23	15.80
Pavement	1.25	1.53	5.09	4.92	1.46
Litter	61.50	42.43	42.45	42.45	44.43
Cryptogams	.50	.58	1.34	.59	.57
Bare Ground	14.50	12.41	12.25	11.99	9.36

SOIL ANALYSIS DATA --

Management unit 13A, Study no: 5, Study Name: Amasas Back

Effective rooting depth (in)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
9.7	7.5	50.9	19.8	29.3	3.5	7.5	96	0.6

PELLET GROUP DATA--

Management unit 13A, Study no: 5

Type	Quadrat Frequency				Days use per acre (ha)		
	'94	'99	'04	'09	'99	'04	'09
Rabbit	9	20	12	29	-	-	-
Elk	7	20	22	13	54 (133)	19 (46)	37 (91)
Deer	13	23	12	18	34 (84)	20 (50)	15 (38)
Cattle	-	-	-	1	-	-	1 (2)

BROWSE CHARACTERISTICS--

Management unit 13A, Study no: 5

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Artemisia nova</b>									
87	<b>2331</b>	17	74	9	-	27	1	10	12/16
94	<b>2720</b>	7	85	8	160	22	1	23	18/31
99	<b>2020</b>	8	74	18	-	31	6	6	17/27
04	<b>2000</b>	1	82	17	60	52	5	7	14/24
09	<b>2140</b>	1	89	10	60	20	7	9	13/23
<b>Artemisia tridentata wyomingensis</b>									
87	<b>0</b>	0	0	-	-	0	0	0	-/-
94	<b>0</b>	0	0	-	-	0	0	0	34/56
99	<b>40</b>	0	100	-	-	100	0	0	30/34
04	<b>60</b>	0	100	-	-	0	100	0	19/36
09	<b>0</b>	0	0	-	-	0	0	0	30/66

		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>Atriplex canescens</i>										
87	0	0	0	0	-	0	0	0	-/-	
94	80	25	75	0	-	0	0	0	36/44	
99	100	40	40	20	-	60	40	0	34/40	
04	100	0	100	0	-	40	60	0	38/52	
09	100	0	0	100	-	0	100	80	35/43	
<i>Coryphantha vivipara arizonica</i>										
87	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	40	50	50	-	-	0	0	0	3/8	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
<i>Ephedra viridis</i>										
87	0	0	0	-	-	0	0	0	-/-	
94	100	20	80	-	-	0	80	0	11/6	
99	40	0	100	-	-	0	50	0	19/23	
04	40	0	100	-	-	50	0	0	15/27	
09	140	0	100	-	-	0	0	0	14/12	
<i>Gutierrezia sarothrae</i>										
87	0	0	0	0	-	0	0	0	-/-	
94	660	18	64	18	40	0	0	3	8/11	
99	420	19	81	0	-	0	0	0	8/11	
04	3340	46	54	0	-	0	0	0	7/11	
09	3180	8	77	15	-	.62	0	13	7/11	
<i>Juniperus osteosperma</i>										
87	99	0	100	-	-	0	0	0	46/31	
94	0	0	0	-	-	0	0	0	-/-	
99	220	27	73	-	-	0	0	0	-/-	
04	160	13	88	-	-	0	0	0	-/-	
09	180	11	89	-	-	0	0	0	-/-	
<i>Opuntia erinacea</i>										
87	0	0	0	-	-	0	0	0	-/-	
94	20	0	100	-	20	0	0	100	2/4	
99	0	0	0	-	-	0	0	0	5/15	
04	40	0	100	-	-	0	0	0	5/21	
09	0	0	0	-	-	0	0	0	-/-	
<i>Pediocactus simpsonii</i>										
87	0	0	0	0	-	0	0	0	-/-	
94	0	0	0	0	-	0	0	0	-/-	
99	40	50	50	0	-	0	0	0	1/3	
04	60	0	67	33	-	0	0	33	4/7	
09	20	0	100	0	-	0	0	0	3/3	

		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>Pinus edulis</i>										
87	<b>0</b>	0	0	0	-	0	0	0	-/-	
94	<b>0</b>	0	0	0	-	0	0	0	-/-	
99	<b>120</b>	33	67	0	-	0	0	0	-/-	
04	<b>120</b>	17	67	17	-	0	0	17	-/-	
09	<b>160</b>	25	75	0	-	0	0	0	-/-	
<i>Purshia tridentata</i>										
87	<b>33</b>	0	100	-	-	100	0	0	5/11	
94	<b>0</b>	0	0	-	-	0	0	0	16/29	
99	<b>0</b>	0	0	-	-	0	0	0	19/43	
04	<b>20</b>	0	100	-	-	0	100	0	13/31	
09	<b>80</b>	0	100	-	-	25	0	25	20/58	
<i>Yucca baccata baccata</i>										
87	<b>0</b>	0	0	-	-	0	0	0	-/-	
94	<b>0</b>	0	0	-	-	0	0	0	4/8	
99	<b>0</b>	0	0	-	-	0	0	0	-/-	
04	<b>0</b>	0	0	-	-	0	0	0	-/-	
09	<b>0</b>	0	0	-	-	0	0	0	9/15	