

BALLY MOUNTAIN - TREND STUDY NO. 1-19-11

Vegetation Type: Black Sagebrush

Range Type: Substantial Deer Winter, Substantial Elk Winter

NRCS Ecological Site Description: [Upland Stony Loam \(Pinyon-Utah Juniper\), R028AY338UT](#)

Land Ownership: USFS

Elevation: 7,040 ft. (2,146 m)

Aspect: Southwest

Slope: 15%

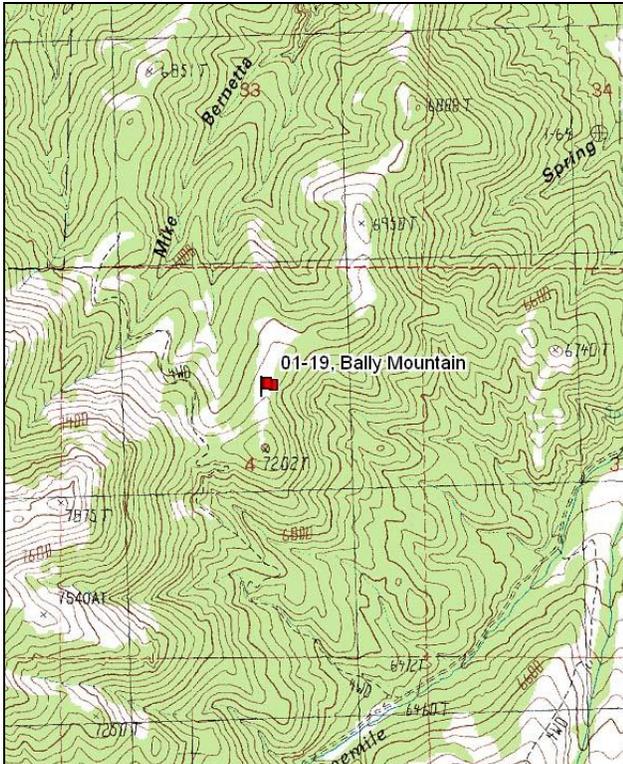
Transect bearing: 0° magnetic

Belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95 ft)

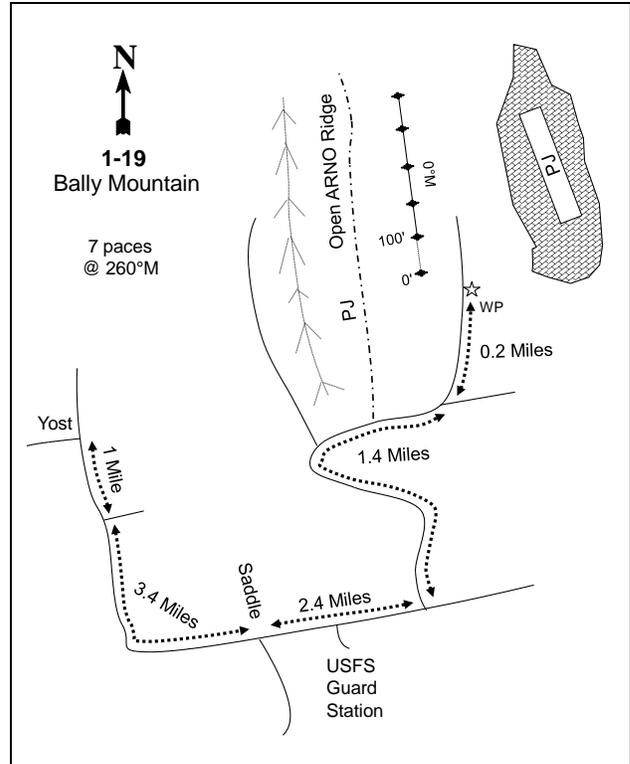
Directions:

From the yield sign east of the town of Yost, travel south and then west towards Bally Mountain for 1.0 miles. Stay right and continue for 3.4 miles. Stay left and travel 2.4 miles. Take a left for 1.4 miles then go right for 0.2 miles to the witness post. From the witness post to the 0 foot stake, walk 7 paces at 260 degrees magnetic. The baseline runs 0 degrees magnetic. The 0 foot stake is marked with browse tag #135.

Map Name: Standrod



Diagrammatic Sketch:



Township: 15N Range: 25E Section: 4

GPS: NAD 83, UTM 12S 296543 E 4649612 N

## BALLY MOUNTAIN - TREND STUDY NO. 1-19

### Site Information

Site Description: The study samples an open west facing ridge on Bally Mountain. The open ridge top where the study is located was dominated by black sagebrush (*Artemisia nova*), but was surrounded by singleleaf pinyon (*Pinus monophylla*), Utah juniper (*Juniperus osteosperma*), and curleaf mountain mahogany (*Cercocarpus ledifolius*). In the fall of 2003, this area was burned as part of the Bally Mountain Prescribed Fire. The purpose of the burn was to reduce natural fuels build-up of juniper canopy; improve watershed conditions by reducing juniper encroachment; improve plant vigor and bio-diversity of flora to produce 600 to 800 lbs/acre of forage for ungulates; improve winter range for mule deer; and create greater diversity of flora and fauna (USDA-FS 2005). The fire burned across the ridge and the surrounding forested areas, but a few patches of trees survived. The area is managed by the Raft River Division of the Sawtooth National Forest as part of the One Mile/Bally pasture in the Clear Creek allotment. The burned area was rested from grazing from 2004 to 2006. Deer pellet groups have been sampled in low abundance since 2001. Cattle sign was sampled in low abundance in 2001, but moderate abundance in 2011 (Table - Pellet Group Data).

Browse: Prior to the fire, the open ridge was dominated by a dense population of low growing black sagebrush. The prescribed fire burned quite evenly across the open ridge and reduced black sagebrush density substantially. Utilization of black sagebrush has been light to moderate over the course of the study. Decadence and poor vigor have been low in most studies, but was moderate in 2011. Prior to the fire, the weedy species broom snakeweed (*Gutierrezia sarothrae*) was also prevalent, but has been reduced substantially following the fire. Other browse species are rare on the site (Table - Browse Characteristics).

Herbaceous Understory: The herbaceous understory is diverse and abundant. Perennial grasses are dominated by three species bluebunch wheatgrass (*Agropyron spicatum*), prairie junegrass (*Koeleria cristata*), and Sandberg bluegrass (*Poa secunda*). Prairie junegrass nested frequency significantly increased after the burn. Forbs are diverse and abundant, but many of the common forbs are low growing species. These include Fendler sandwort (*Arenaria fendleri*), Torrey milkvetch (*Astragalus calycosus*), stemless goldenweed (*Haplopappus acaulis*), desert phlox (*Phlox austromontana*), and dandelion (*Taraxacum officinale*) (Table - Herbaceous Trends).

Soil: The soil is in the Clavicon-Rock outcrop complex, which occurs on hillslopes. Parent material consists of colluvium and residuum derived from limestone, chert, and dolomite (Soil Survey Staff 2011). The soil texture is a clay loam with a soil reaction that is slightly alkaline (pH 7.7). Phosphorus may have limited availability for plant growth and development at 6.0 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). The soil profile is rocky throughout with mostly gravel and some cobble size rocks. There is abundant vegetation and litter cover. Bare ground cover has increased since the fire, but is still moderately low (Table - Basic Cover). The soil erosion condition has been classified as stable since 2001.

### Trend Assessments

#### Browse:

- **1996 to 2001 - stable (0):** There was little change in the density of black sagebrush. Recruitment of young black sagebrush plants decreased from 19% to 7%.
- **2001 to 2006 - down (-2):** The prescribed fire reduced the very dense population of black sagebrush by 88% from 24,880 plants/acre to 2,920 plants/acre. Cover of black sagebrush decreased from 18% to 2%.
- **2006 to 2011 - down (-2):** Density of black sagebrush decreased 43% to 1,660 plants/acre, but cover remained similar at 2%. Decadence of black sagebrush increased from 6% to 34%, and poor vigor increased from 1% to 28%. However, recruitment of young black sagebrush plants increased to 27% of the population.

Grass:

- **1996 to 2001 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, but cover increased from 12% to 23%.
- **2001 to 2006 - slightly up (+1):** Following the fire, the sum of nested frequency increased 15%, and cover increased to 40%. Bluebunch wheatgrass cover was nearly 26%, but nested frequency remained similar. There was a significant increase in the nested frequency of prairie junegrass.
- **2006 to 2011 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 9%, and cover decreased to 20%. There was a significant decrease in the sum of nested frequency of bluebunch wheatgrass.

Forb:

- **1996 to 2001 - down (-2):** The sum of nested frequency of perennial forbs decreased by 37%, and cover decreased from 12% to 7%.
- **2001 to 2006 - slightly up (+1):** The sum of nested frequency of perennial forbs increased by 14%, and cover increased to 10%.
- **2006 to 2011 - stable (0):** There was little change in the sum of nested frequency of perennial forbs, but cover decreased to 7%.

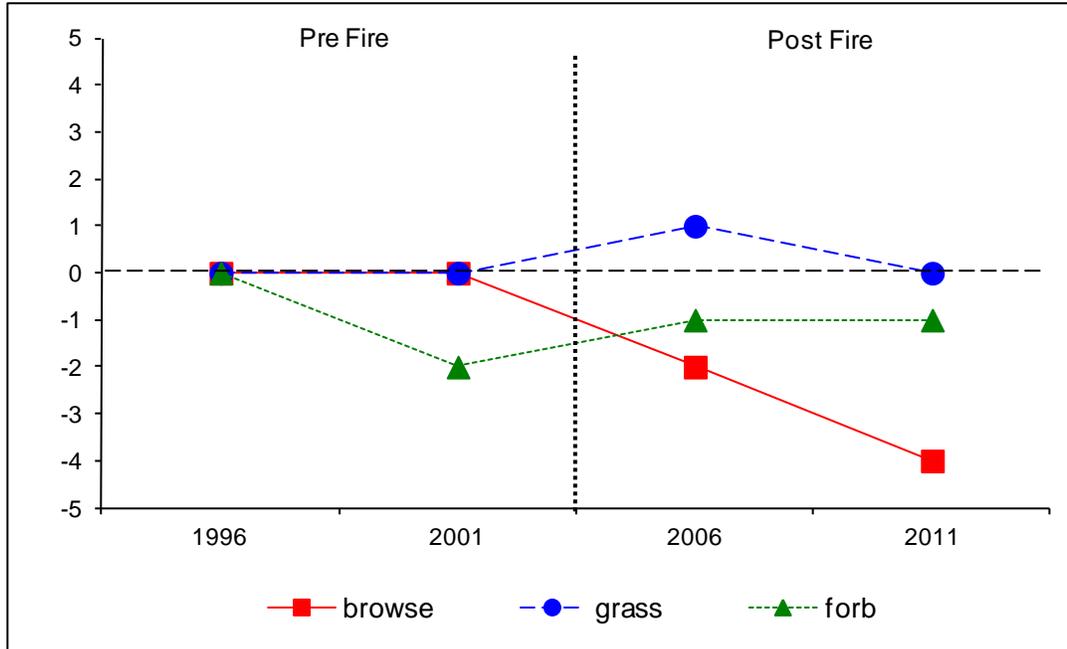
DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --

Management unit 1, study no: 19

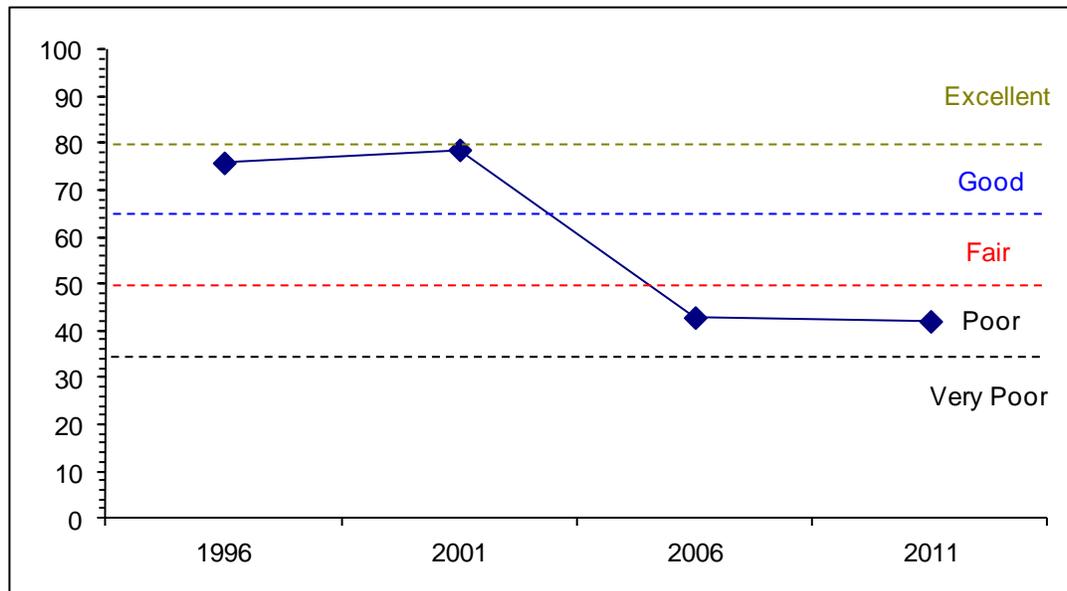
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
96	18.0	13.8	9.5	24.6	0.0	10.0	0.0	<b>75.9</b>	Good
01	22.2	12.9	3.5	30.0	0.0	10.0	0.0	<b>78.6</b>	Good-Excellent
06	2.9	0.0	0.0	30.0	0.0	10.0	0.0	<b>42.9</b>	Poor
11	2.1	0.0	0.0	30.0	0.0	10.0	0.0	<b>42.1</b>	Poor

## Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--  
 Management unit 1, Study no: 19



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL--  
 Management unit 1, Study no: 19



HERBACEOUS TRENDS--  
Management unit 01, Study no: 19

Type	Species	Nested Frequency				Average Cover %			
		'96	'01	'06	'11	'96	'01	'06	'11
G	<i>Agropyron dasystachyum</i>	-	-	6	7	-	-	.18	.15
G	<i>Agropyron spicatum</i>	ab334	c367	bc359	a319	6.34	16.36	25.72	9.68
G	<i>Bromus tectorum</i> (a)	3	8	3	-	.00	.01	.00	-
G	<i>Festuca</i> sp.	-	-	-	2	-	-	-	.06
G	<i>Koeleria cristata</i>	a64	a100	b188	b190	1.12	2.23	7.99	4.76
G	<i>Oryzopsis hymenoides</i>	b14	a-	a3	a-	.25	-	.03	-
G	<i>Poa secunda</i>	b301	ab259	ab277	a240	4.57	4.67	5.64	5.45
G	<i>Sitanion hystrix</i>	2	-	-	-	.00	-	-	-
Total for Annual Grasses		3	8	3	0	0.00	0.00	0.00	0
Total for Perennial Grasses		715	726	833	758	12.30	23.27	39.57	20.11
Total for Grasses		718	734	836	758	12.31	23.28	39.57	20.11
F	<i>Achillea millefolium</i>	4	4	7	9	.03	.15	.06	.04
F	<i>Agoseris glauca</i>	2	8	3	6	.00	.04	.03	.02
F	<i>Alyssum alyssoides</i> (a)	-	-	1	-	-	-	.00	-
F	<i>Antennaria rosea</i>	a6	a10	a12	b50	.06	.05	.28	.46
F	<i>Arabis</i> sp.	37	10	10	30	.08	.03	.06	.13
F	<i>Arenaria fendleri</i>	c160	b84	c161	a54	.97	.38	2.21	.22
F	<i>Aster</i> sp.	24	6	6	18	.06	.15	.38	.22
F	<i>Astragalus calycosus</i>	b117	a51	b84	a24	1.52	.27	.33	.05
F	<i>Calochortus nuttallii</i>	-	-	5	6	-	-	.01	.01
F	<i>Castilleja angustifolia</i>	11	17	5	12	.02	.33	.04	.07
F	<i>Castilleja linariaefolia</i>	36	55	-	1	.17	.51	-	.00
F	<i>Chenopodium fremontii</i> (a)	-	3	10	-	-	.00	.04	-
F	<i>Cirsium</i> sp.	3	4	6	4	.01	.01	.16	.01
F	<i>Collinsia parviflora</i> (a)	b275	b293	a117	a149	1.78	2.56	.22	.36
F	<i>Comandra pallida</i>	2	6	3	4	.00	.01	.04	.01
F	<i>Cordylanthus ramosus</i> (a)	7	-	-	-	.01	-	-	-
F	<i>Crepis intermedia</i>	2	-	-	7	.00	-	-	.01
F	<i>Cryptantha</i> sp.	b21	a-	a2	a4	.13	-	.01	.04
F	<i>Cymopterus</i> sp.	4	-	7	11	.00	-	.05	.03
F	<i>Descurainia pinnata</i> (a)	-	-	1	5	-	-	.00	.00
F	<i>Draba</i> sp. (a)	-	-	1	-	-	-	.00	-
F	<i>Erigeron pumilus</i>	b54	a24	a14	a29	.26	.07	.26	.07
F	<i>Hackelia patens</i>	-	-	-	5	-	-	-	.06
F	<i>Haplopappus acaulis</i>	b88	a50	a33	a35	2.61	.75	.78	.27
F	<i>Lactuca serriola</i> (a)	a-	a-	b27	a1	-	-	.05	.00
F	<i>Lappula occidentalis</i> (a)	b30	a1	c76	ab14	.20	.00	.33	.05
F	<i>Lesquerella</i> sp.	a4	ab11	a1	b13	.00	.02	.00	.06
F	<i>Linum lewisii</i>	b55	a6	b46	c92	.26	.04	.51	1.02
F	<i>Lithospermum ruderae</i>	-	-	1	2	-	-	.00	.00
F	<i>Lomatium</i> sp.	5	7	-	1	.03	.02	-	.00
F	<i>Machaeranthera canescens</i>	4	-	1	-	.00	-	.00	-
F	<i>Microsteris gracilis</i> (a)	a-	a4	a6	b29	-	.00	.01	.07

T y P e	Species	Nested Frequency				Average Cover %			
		'96	'01	'06	'11	'96	'01	'06	'11
F	Penstemon sp.	2	-	-	-	.00	-	-	-
F	Phlox austromontana	c238	b183	a149	ab174	5.08	3.70	2.54	3.25
F	Phlox hoodii	-	-	-	1	-	-	-	.00
F	Phlox longifolia	a-	a6	ab11	b17	-	.01	.07	.13
F	Ranunculus testiculatus (a)	a13	a19	b71	c175	.16	.19	.27	1.41
F	Sanguisorba minor	-	-	-	4	-	-	-	.00
F	Senecio multilobatus	bc48	a25	ab38	c69	.28	.14	.45	.39
F	Taraxacum officinale	ab92	a69	b119	a66	.50	.64	1.24	.29
F	Tragopogon dubius (a)	ab18	a6	a3	b18	.06	.03	.03	.15
F	Viola sp.	-	3	3	1	-	.00	.00	.00
Total for Annual Forbs		343	326	313	391	2.22	2.80	1.00	2.05
Total for Perennial Forbs		1019	639	727	749	12.16	7.38	9.59	6.95
Total for Forbs		1362	965	1040	1140	14.39	10.18	10.59	9.00

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

#### BROWSE TRENDS--

Management unit 01, Study no: 19

T y P e	Species	Strip Frequency				Average Cover %			
		'96	'01	'06	'11	'96	'01	'06	'11
B	Artemisia nova	100	100	26	25	14.38	17.74	2.26	1.61
B	Artemisia tridentata vaseyana	1	2	1	1	-	-	-	-
B	Cercocarpus ledifolius	1	1	0	0	-	-	-	-
B	Chrysothamnus nauseosus consimilis	24	24	9	15	.82	1.19	.51	.67
B	Chrysothamnus viscidiflorus stenophyllus	1	1	2	15	-	-	.01	.51
B	Eriogonum microthecum	15	21	9	11	.01	.04	.03	.04
B	Gutierrezia sarothrae	98	86	12	12	3.24	1.33	.30	.13
B	Pediocactus simpsonii	4	0	2	0	.01	-	-	-
B	Pinus monophylla	2	1	1	1	-	-	-	-
B	Tetradymia canescens	1	1	3	2	-	-	-	-
Total for Browse		247	237	65	82	18.48	20.31	3.13	2.96

CANOPY COVER, LINE INTERCEPT--

Management unit 01, Study no: 19

Species	Percent Cover	
	'06	'11
Artemisia nova	2.18	3.88
Artemisia tridentata vaseyana	.40	1.39
Chrysothamnus nauseosus consimilis	.50	1.41
Chrysothamnus viscidiflorus stenophyllus	-	.21
Eriogonum microthecum	.13	-
Gutierrezia sarothrae	.06	-
Tetradymia canescens	-	.06

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 01, Study no: 19

Species	Average leader growth (in)		
	'01	'06	'11
Artemisia nova	0.7	-	0.3

BASIC COVER--

Management unit 01, Study no: 19

Cover Type	Average Cover %			
	'96	'01	'06	'11
Vegetation	44.50	63.04	50.23	37.70
Rock	6.55	1.45	5.07	4.80
Pavement	11.31	11.48	17.12	18.10
Litter	29.17	23.38	18.61	17.33
Cryptogams	2.90	2.75	.96	1.71
Bare Ground	5.23	9.27	19.50	18.72

SOIL ANALYSIS DATA --

Management unit 01, Study no: 19, Study Name: Bally Mountain

Effective rooting depth (in)	pH	Clay-Loam			% OM	PPM P	PPM K	ds/m
		% sand	% silt	% clay				
13.4	7.8	26.7	42.0	31.3	5.0	6.0	297.6	0.7

PELLET GROUP DATA--

Management unit 01, Study no: 19

Type	Quadrat Frequency				Days use per acre (ha)		
	'96	'01	'06	'11	'01	'06	'11
Rabbit	2	1	4	-	-	-	-
Deer	13	2	3	1	6 (15)	5 (12)	1 (3)
Cattle	3	2	-	15	10 (25)	-	30 (73)

BROWSE CHARACTERISTICS--

Management unit 01, Study no: 19

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>Artemisia nova</i>									
96	<b>26540</b>	19	77	4	380	76	3	.82	5/15
01	<b>24880</b>	7	86	7	180	3	0	1	6/12
06	<b>2920</b>	5	88	6	-	34	5	1	5/12
11	<b>1660</b>	27	40	34	20	52	0	28	6/15
<i>Artemisia tridentata vaseyana</i>									
96	<b>20</b>	100	0	-	-	0	0	0	8/19
01	<b>40</b>	0	100	-	-	0	0	0	9/19
06	<b>20</b>	0	100	-	-	0	100	0	23/43
11	<b>40</b>	0	100	-	-	100	0	0	26/37
<i>Cercocarpus ledifolius</i>									
96	<b>20</b>	100	0	-	-	0	100	0	-/-
01	<b>20</b>	100	0	-	-	100	0	0	-/-
06	<b>0</b>	0	0	-	-	0	0	0	-/-
11	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Chrysothamnus nauseosus consimilis</i>									
96	<b>620</b>	23	61	16	-	32	13	6	17/24
01	<b>720</b>	33	28	39	-	0	0	19	19/23
06	<b>220</b>	9	91	0	-	18	0	0	14/19
11	<b>360</b>	11	72	17	-	11	6	6	19/26
<i>Chrysothamnus viscidiflorus stenophyllus</i>									
96	<b>20</b>	0	100	0	-	0	0	0	6/10
01	<b>20</b>	0	0	100	20	0	0	0	-/-
06	<b>60</b>	0	100	0	-	0	0	0	8/10
11	<b>380</b>	42	47	11	40	5	0	11	4/5
<i>Eriogonum microthecum</i>									
96	<b>500</b>	32	68	0	-	20	0	0	6/10
01	<b>980</b>	20	80	0	-	0	0	0	6/10
06	<b>240</b>	25	75	0	-	0	0	0	4/7
11	<b>260</b>	0	85	15	-	31	0	62	3/7
<i>Gutierrezia sarothrae</i>									
96	<b>19520</b>	28	69	2	1160	0	0	.51	3/4
01	<b>11080</b>	12	85	3	340	0	0	2	3/5
06	<b>380</b>	0	89	11	100	0	0	11	4/7
11	<b>460</b>	22	61	17	80	0	17	0	3/5
<i>Pediocactus simpsonii</i>									
96	<b>80</b>	0	100	-	-	0	0	0	1/2
01	<b>0</b>	0	0	-	-	0	0	0	-/-
06	<b>40</b>	0	100	-	-	0	0	0	1/2
11	<b>0</b>	0	0	-	-	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)	
<i>Pinus monophylla</i>										
96	<b>40</b>	100	0	-	20	0	0	0	-/-	
01	<b>20</b>	100	0	-	40	0	0	0	-/-	
06	<b>20</b>	100	0	-	-	0	0	0	-/-	
11	<b>20</b>	100	0	-	-	0	0	0	24/19	
<i>Symphoricarpos oreophilus</i>										
96	<b>0</b>	0	0	-	-	0	0	0	-/-	
01	<b>0</b>	0	0	-	-	0	0	0	-/-	
06	<b>0</b>	0	0	-	-	0	0	0	17/33	
11	<b>0</b>	0	0	-	-	0	0	0	23/31	
<i>Tetradymia canescens</i>										
96	<b>20</b>	0	100	-	-	0	0	0	11/17	
01	<b>20</b>	0	100	-	-	0	0	0	14/20	
06	<b>60</b>	67	33	-	-	0	0	0	9/10	
11	<b>40</b>	0	100	-	-	50	0	0	7/13	