

RED CLIFFS - TREND STUDY NO. 13B-4-10

Vegetation Type: Blackbrush

Range Type: Crucial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: Not Available

Land Ownership: BLM

Elevation: 5605 ft. (1709 m)

Aspect: Southwest

Slope: 3%-5%

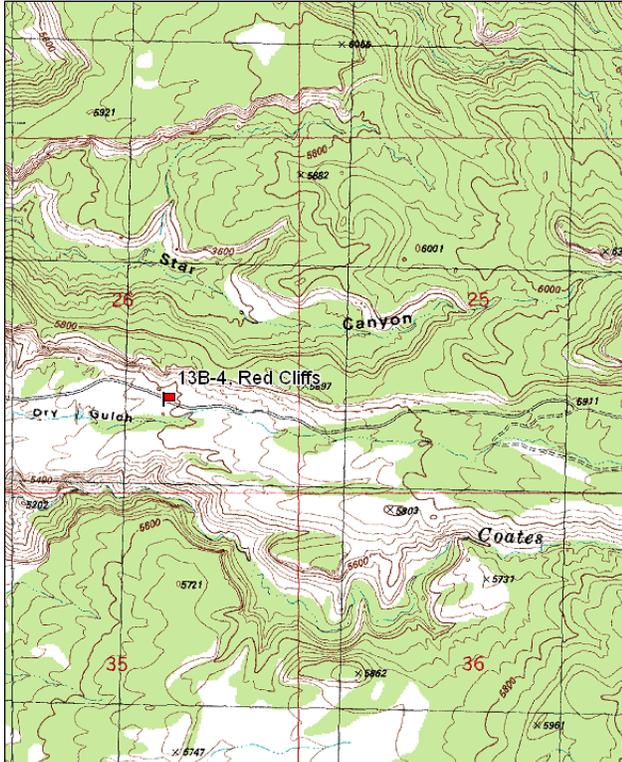
Transect bearing: 250° magnetic

Belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (86ft). Belt rebar placement: belt 2@1ft, belt 3@2ft, belt 5@5ft.

Directions:

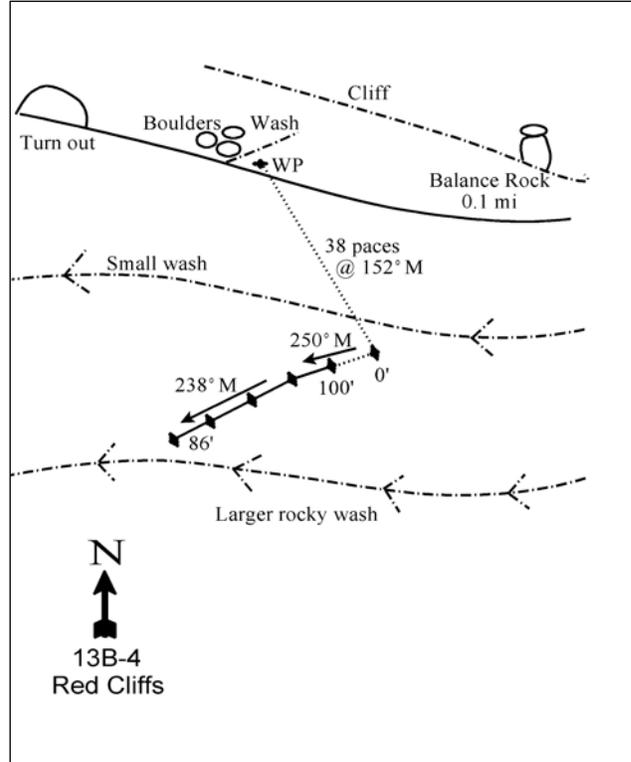
From the Utah-Colorado state line west of Glade Park, go west 2.1 miles on the Coates Creek Road to a cattle guard. Continue on the main road 2.1 miles to a Pinyon-Juniper area bordered on the right by large sandstone cliffs. The witness post is on the right (north) side of the road. The baseline starts 140 feet south (across the road) from the witness post. A short rebar, tagged #7816, marks the 0-foot end of the baseline.

Map Name: Marble Canyon



Township: 21S Range: 25E Section: 26

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 663120 E 4312556 N

## RED CLIFFS - TREND STUDY NO. 13B-4

### Site Information

Site Description: The study site is located along the Coates Creek Road in an area dominated by pinyon pine (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*) and blackbrush (*Coleogyne ramosissima*). Steep orange sandstone cliffs are located just north and across the road from the site. The transect samples slightly rolling topography with exposures varying from north to south and west. There is a stock pond down a wash about one-tenth of a mile to the west of the transect, although livestock do not appear to utilize this site. Grazing in the area is managed by the Bureau of Land Management (BLM) as part of the Sand Flats allotment. Deer and rabbit pellet groups are usually common in the area. To accommodate the increased sample size and stay within the same vegetation type, the position of the transect extension was slightly altered in 1995. The pellet-group data has indicated increasing deer use from moderate use in 2000 to very heavy use in 2010. No elk use was noted in 2000 and use has been light since 2005. Cattle use was estimated to be light in 2010 (Table - Pellet Group Data).

Browse: The key browse species on this site is blackbrush which has provided the majority of the cover on the site since 1995 (Table - Browse Trends). The age class structure of the blackbrush population has changed little since 1986 with it being a mature population with few young or decadent plants. Utilization has been mostly light with some moderate use. Blackbrush plants exhibit good vigor. Several other browse species are present, but infrequently encountered. These include: broom snakeweed (*Gutierrezia sarothrae*), Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), spiny hopsage (*Grayia spinosa*) and green ephedra (*Ephedra viridis*) (Table - Browse Characteristics). Point-center quarter data shows a small, mature stand of pinyon pine and Utah juniper trees established on the site (Table - Point Quarter Tree Data).

Herbaceous Understory: The herbaceous understory is dominated by the annual grass, cheatgrass (*Bromus tectorum*), with perennial grasses and forbs being rare. Perennial forbs have rarely been found, but the annual species have been sampled at fluctuating frequency and cover over the sample years (Table - Herbaceous Trends).

Soil: The light orange soil texture is a sandy clay loam composed of very fine particles which is loosely compacted on the surface, and with a soil reaction that is mildly alkaline (pH 7.6). Phosphorus may have limited availability for plant growth and development at 5.9 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Black rock and pavement are scattered throughout the site providing good ground cover. Vegetation and little cover have fluctuated over the sample years due to the prevalence of annual species on the site, but bare ground cover has remained relatively low. The bare soil interspaces between the blackbrush plants is protected mainly by cryptogammic crust, which has high cover over the site (Table - Basic Cover). Some slight erosion, as well as pedestaling under the shrubs, was noted in 1995 and 2000. The soil erosion condition was classified as slight in 2005 due to common pedestaling under the shrubs, a small amount of recent soil and rock movement, small rills on the site, and a large gully north of the site near the road. The soil erosion condition was classified as stable in 2010.

### Trend Assessments

#### Browse:

- **1986 to 1995 - stable (0):** Differences in density may be related to the larger sample area used in 1995; therefore, trend was determined using other parameters. Decadence and the proportion of plants displaying poor vigor in the blackbrush population decreased slightly, but recruitment of young plants remained low.
- **1995 to 2000 - stable (0):** The density of blackbrush decreased 6% from 4,560 plants/acre to 4,280 plants/acre, and cover decreased from 17% to 14%. Decadence and poor vigor of blackbrush remained low, but so did the recruitment of young plants.

- **2000 to 2005 - stable (0):** Blackbrush density increased by 4% to 4,460 plants/acre, and cover increased to 15%. Decadence in the blackbrush population increased slightly to 12%.
- **2005 to 2010 - slightly down (-1):** The density of blackbrush decreased by 24% to 3,380 plants/acre, though cover increased to 16%. Decadence decreased slightly to 5% and recruitment of young blackbrush plants increased slightly from 2% to 4%, but remained low.

Grass:

- **1986 to 1995 - down (-2):** Perennial grass sum of nested frequency decreased by 78% and perennial grasses were very rare on the site. Cheatgrass was prevalent on the site with high nested frequency and cover at around 5%.
- **1995 to 2000 - slightly up (+1):** The sum of nested frequency of perennial grasses increased substantially, but perennial grasses remain rare at less than 1% cover. Cheatgrass nested frequency decreased significantly and cover decreased to 2%.
- **2000 to 2005 - slightly down (-1):** There was little change in the sum of nested frequency of perennial grasses, though cover increased to 2%. There was a significant increase in the nested frequency of cheatgrass and cover increased to 15%.
- **2005 to 2010 - stable (0):** The sum of nested frequency and cover of perennial grasses and cheatgrass changed little.

Forb:

- **1986 to 1995 - stable (0):** Perennial forbs were very rare on the site with little change in frequency or cover.
- **1995 to 2000 - stable (0):** Perennial forbs were very rare on the site with little change in frequency or cover.
- **2000 to 2005 - slightly up (+1):** There was a slight increase in the sum of nested frequency and cover of perennial forbs, but perennial forbs remain rare.
- **2005 to 2010 - stable (0):** Perennial forbs were rare on the site with little change in frequency or cover.

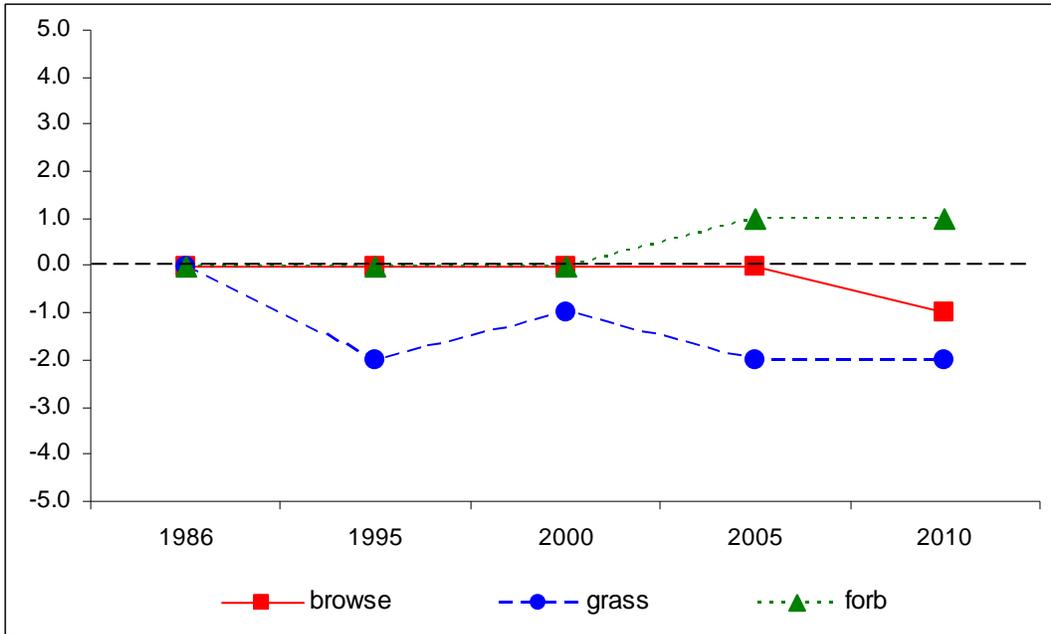
DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 13B, study no: 4

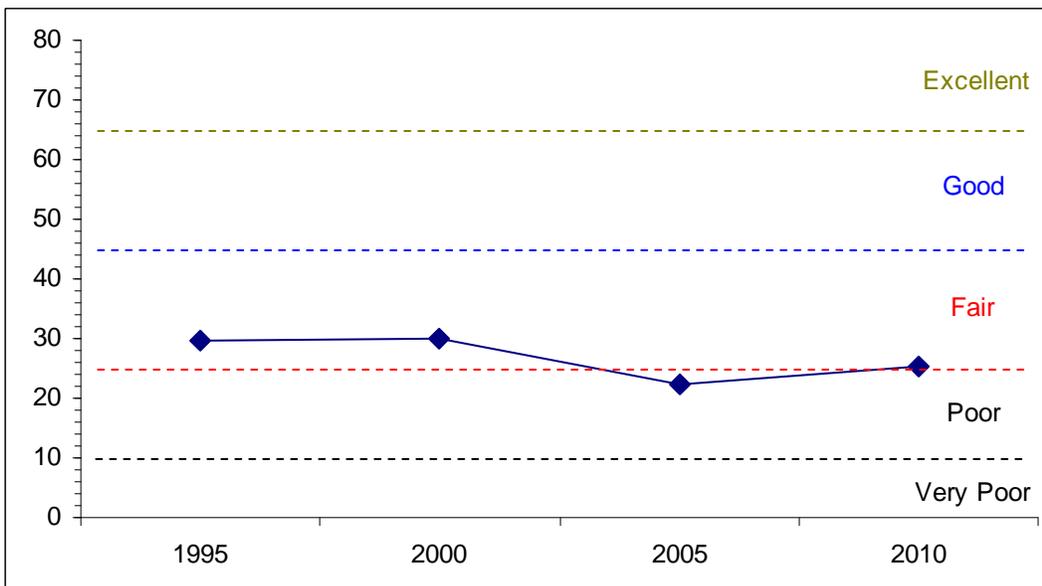
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
95	16.7	13.8	1.5	1.0	-3.4	0.1	0.0	<b>29.6</b>	Fair
00	14.6	13.6	1.5	1.8	-1.7	0.1	0.0	<b>29.9</b>	Fair
05	15.5	11.5	1.7	4.0	-11.5	1.3	0.0	<b>22.5</b>	Poor
10	16.3	13.5	2.2	2.2	-9.7	1.0	0.0	<b>25.5</b>	Poor-Fair

## Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--  
 Management unit 13B, Study no: 4



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--  
 Management unit 13B, Study no: 4



HERBACEOUS TRENDS--  
Management unit 13B, Study no: 4

Type	Species	Nested Frequency					Average Cover %			
		'86	'95	'00	'05	'10	'95	'00	'05	'10
G	<i>Aristida purpurea</i>	3	3	6	-	-	.30	.06	-	-
G	<i>Bromus tectorum</i> (a)	-	b336	a264	b308	b312	4.56	2.24	14.91	12.92
G	<i>Oryzopsis hymenoides</i>	-	-	5	-	-	-	.03	-	-
G	<i>Poa fendleriana</i>	c110	b21	b11	a-	b25	.15	.13	-	.25
G	<i>Poa secunda</i>	a-	a-	b31	c57	b36	-	.68	1.98	.84
G	<i>Sitanion hystrix</i>	5	-	-	1	-	-	-	.01	-
G	<i>Sporobolus cryptandrus</i>	3	-	-	-	-	-	-	-	-
G	<i>Stipa comata</i>	-	3	-	-	-	.03	-	-	-
G	<i>Vulpia octoflora</i> (a)	-	a-	b24	b33	b14	-	.05	.44	.02
Total for Annual Grasses		0	336	288	341	326	4.56	2.28	15.35	12.94
Total for Perennial Grasses		121	27	53	58	61	0.48	0.91	1.99	1.09
Total for Grasses		121	363	341	399	387	5.04	3.20	17.34	14.03
F	<i>Astragalus nuttallianus</i> (a)	-	d242	a-	c177	b23	6.36	-	1.54	.05
F	<i>Calochortus nuttallii</i>	a-	a-	ab1	ab5	b6	-	.00	.01	.06
F	<i>Chaenactis stevioides</i>	-	-	-	12	-	-	-	.21	-
F	<i>Chenopodium fremontii</i> (a)	-	-	-	-	2	-	-	-	.00
F	<i>Cryptantha</i> sp.	a-	a2	a-	b14	a3	.00	-	.03	.00
F	<i>Cymopterus</i> sp.	a-	a-	a1	a1	b9	-	.00	.01	.10
F	<i>Delphinium nuttallianum</i>	-	-	-	4	5	-	-	.02	.06
F	<i>Delphinium occidentale</i>	-	-	-	3	-	-	-	.00	-
F	<i>Draba nemorosa</i> (a)	-	a12	b33	a16	b21	.02	.08	.05	.05
F	<i>Erigeron</i> sp.	-	1	-	-	-	.00	-	-	-
F	<i>Erodium cicutarium</i> (a)	-	a18	a20	b41	c80	.19	.07	.38	.65
F	<i>Gilia hutchinifolia</i> (a)	-	a14	a10	b88	a27	.03	.64	.45	.07
F	<i>Lappula occidentalis</i> (a)	-	ab3	a-	ab4	b11	.01	-	.01	.02
F	<i>Lepidium</i> sp. (a)	-	b12	a-	ab7	a-	.02	-	.02	-
F	<i>Machaeranthera glabriusculas</i>	3	-	-	-	7	-	-	-	.01
F	<i>Mentzelia</i> sp.	a-	a-	b20	c43	c45	-	.03	.36	.22
F	<i>Navarretia intertexta</i> (a)	-	-	7	8	-	-	.01	.04	-
F	<i>Phlox longifolia</i>	-	9	-	3	-	.04	-	.00	-
F	<i>Plantago patagonica</i> (a)	-	8	-	4	3	.01	-	.01	.00
F	<i>Ranunculus testiculatus</i> (a)	-	-	-	-	2	-	-	-	.00
F	<i>Schoenocrambe linifolia</i>	-	1	-	-	-	.00	-	-	-
F	Unknown forb-annual (a)	-	2	-	-	-	.00	-	-	-
F	<i>Zigadenus paniculatus</i>	-	-	-	-	2	-	-	-	.03
Total for Annual Forbs		0	311	70	345	169	6.68	0.81	2.51	0.86
Total for Perennial Forbs		3	13	22	85	77	0.05	0.04	0.66	0.51
Total for Forbs		3	324	92	430	246	6.73	0.86	3.17	1.37

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

BROWSE TRENDS--

Management unit 13B, Study no: 4

Type	Species	Strip Frequency				Average Cover %			
		'95	'00	'05	'10	'95	'00	'05	'10
B	<i>Artemisia tridentata wyomingensis</i>	2	5	2	2	-	.84	.00	.38
B	<i>Coleogyne ramosissima</i>	81	72	76	74	16.70	13.51	14.83	15.67
B	<i>Ephedra viridis</i>	0	1	1	2	-	-	.53	.15
B	<i>Grayia spinosa</i>	0	1	2	2	-	.38	.93	1.63
B	<i>Gutierrezia sarothrae</i>	3	2	0	0	.04	.15	-	-
B	<i>Juniperus osteosperma</i>	0	3	2	2	4.65	4.22	4.43	2.65
B	<i>Opuntia sp.</i>	2	5	4	4	.03	.15	.38	.38
B	<i>Pinus edulis</i>	-	-	-	-	.38	-	-	-
B	<i>Sclerocactus sp.</i>	1	8	3	1	-	.06	-	-
Total for Browse		89	97	90	87	21.80	19.30	21.12	20.88

CANOPY COVER, LINE INTERCEPT--

Management unit 13B, Study no: 4

Species	Percent Cover		
	'00	'05	'10
<i>Coleogyne ramosissima</i>	-	18.73	18.78
<i>Ephedra viridis</i>	-	-	.35
<i>Grayia spinosa</i>	-	1.10	4.13
<i>Juniperus osteosperma</i>	3.40	5.19	5.40
<i>Opuntia sp.</i>	-	.16	.16

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 13B, Study no: 4

Species	Average leader growth (in)	
	'05	'10
<i>Artemisia tridentata</i>	1.8	2.5
<i>Coleogyne ramosissima</i>	1.5	1.5

POINT-QUARTER TREE DATA--

Management unit 13B, Study no: 4

Species	Trees per Acre			Average diameter (in)		
	'00	'05	'10	'00	'05	'10
<i>Juniperus osteosperma</i>	33	36	31	11.9	9.1	7.0
<i>Pinus edulis</i>	8	-	22	6.2	-	5.7

BASIC COVER--

Management unit 13B, Study no: 4

Cover Type	Average Cover %				
	'86	'95	'00	'05	'10
Vegetation	13.75	33.59	24.73	39.10	34.42
Rock	16.25	11.28	13.46	10.78	11.46
Pavement	3.00	.08	6.66	5.07	3.06
Litter	25.00	23.32	20.85	13.35	39.85
Cryptogams	23.50	15.57	20.23	20.57	13.83
Bare Ground	18.50	25.61	30.77	24.21	25.70

SOIL ANALYSIS DATA --

Management unit 13B, Study no: 4, Study Name: Red Cliffs

Effective rooting depth (in)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
13.8	7.6	60.0	19.4	20.6	0.7	5.8	147.2	0.5

PELLET GROUP DATA--

Management unit 13B, Study no: 4

Type	Quadrat Frequency				Days use per acre (ha)		
	'95	'00	'05	'10	'00	'05	'10
Rabbit	23	11	24	14	-	-	-
Elk	-	-	1	16	-	3 (8)	9 (22)
Deer	34	29	37	26	44 (108)	80 (197)	103 (255)
Cattle	-	-	-	-	-	-	3 (7)

BROWSE CHARACTERISTICS--

Management unit 13B, Study no: 4

		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>Artemisia tridentata wyomingensis</i>										
86	<b>0</b>	0	0	0	-	0	0	0	-/-	
95	<b>40</b>	0	50	50	-	50	0	0	26/41	
00	<b>100</b>	20	80	0	-	20	40	0	27/44	
05	<b>40</b>	50	50	0	-	50	50	0	29/37	
10	<b>40</b>	0	100	0	-	0	0	0	24/38	
<i>Chrysothamnus nauseosus albicaulis</i>										
86	<b>0</b>	0	0	-	-	0	0	0	-/-	
95	<b>0</b>	0	0	-	-	0	0	0	-/-	
00	<b>0</b>	0	0	-	-	0	0	0	15/42	
05	<b>0</b>	0	0	-	-	0	0	0	19/43	
10	<b>0</b>	0	0	-	-	0	0	0	20/43	

		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>Chrysothamnus viscidiflorus stenophyllus</i>										
86	133	0	0	100	-	0	0	0	-/-	
95	0	0	0	0	-	0	0	0	-/-	
00	0	0	0	0	-	0	0	0	-/-	
05	0	0	0	0	-	0	0	0	-/-	
10	0	0	0	0	-	0	0	0	-/-	
<i>Coleogyne ramosissima</i>										
86	11197	4	86	11	-	27	5	11	15/16	
95	4560	3	94	4	-	20	2	1	16/30	
00	4280	2	93	5	20	12	0	1	15/26	
05	4460	2	86	12	240	21	0	2	16/31	
10	3380	4	92	5	80	17	0	1	15/34	
<i>Echinocactus sp.</i>										
86	0	0	0	-	-	0	0	0	-/-	
95	0	0	0	-	-	0	0	0	-/-	
00	0	0	0	-	-	0	0	0	-/-	
05	0	0	0	-	-	0	0	0	-/-	
10	0	0	0	-	-	0	0	0	10/26	
<i>Ephedra viridis</i>										
86	0	0	0	-	-	0	0	0	-/-	
95	0	0	0	-	-	0	0	0	26/33	
00	20	0	100	-	-	0	0	0	26/43	
05	220	45	55	-	-	55	0	0	36/49	
10	80	50	50	-	-	0	75	25	32/42	
<i>Grayia spinosa</i>										
86	0	0	0	-	-	0	0	0	-/-	
95	0	0	0	-	-	0	0	0	-/-	
00	20	0	100	-	-	0	0	0	23/59	
05	80	0	100	-	-	0	0	0	23/48	
10	80	0	100	-	-	0	0	0	27/50	
<i>Gutierrezia sarothrae</i>										
86	66	0	100	-	-	0	0	0	10/5	
95	100	0	100	-	-	0	0	0	10/12	
00	40	0	100	-	-	0	0	0	7/13	
05	0	0	0	-	-	0	0	0	10/10	
10	0	0	0	-	-	0	0	0	10/15	
<i>Juniperus osteosperma</i>										
86	0	0	0	0	-	0	0	0	-/-	
95	0	0	0	0	-	0	0	0	-/-	
00	60	33	67	0	20	0	0	0	22/48	
05	40	0	50	50	-	0	0	50	-/-	
10	40	50	50	0	-	0	0	50	-/-	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Opuntia sp.										
86	<b>0</b>	0	0	0	-	0	0	0	-/-	
95	<b>40</b>	0	100	0	-	0	0	0	5/26	
00	<b>220</b>	0	100	0	-	0	0	0	5/23	
05	<b>160</b>	0	38	63	-	0	0	63	6/24	
10	<b>100</b>	0	40	60	-	0	0	0	5/18	
Sclerocactus sp.										
86	<b>66</b>	0	100	-	-	0	0	0	7/3	
95	<b>20</b>	0	100	-	-	0	0	0	4/3	
00	<b>260</b>	0	100	-	-	0	0	0	5/3	
05	<b>80</b>	0	100	-	-	0	0	0	5/7	
10	<b>20</b>	0	100	-	-	0	0	0	7/7	