

TWO BAR RANCH - TREND STUDY NO. 17-53-10

Vegetation Type: Wyoming Big Sagebrush

Range Type: Crucial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: Not Available

Land Ownership: UDWR

Elevation: 6665 ft. (2032 m)

Aspect: West

Slope: 4%

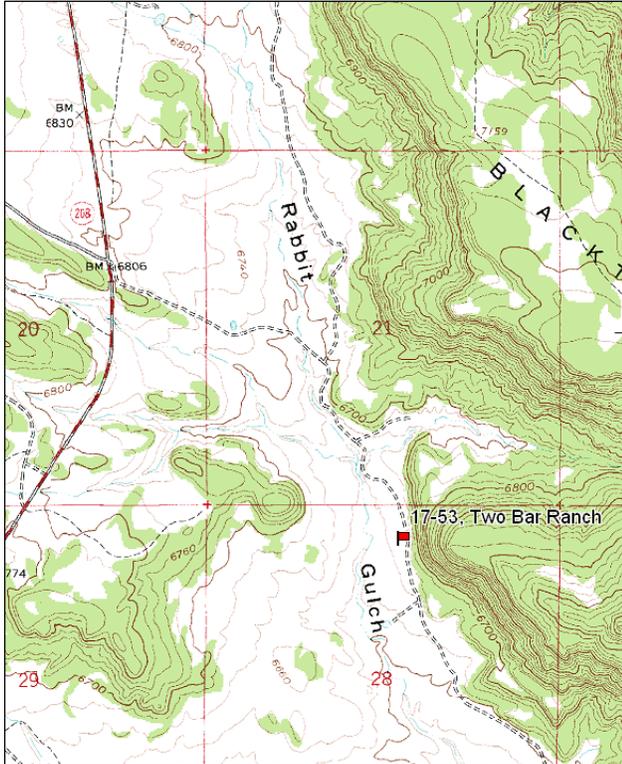
Transect bearing: 345° magnetic

Belt placement: line 1 (9 & 85ft), line 2 (26ft), line 3 (45ft), line 4 (60ft).

Directions:

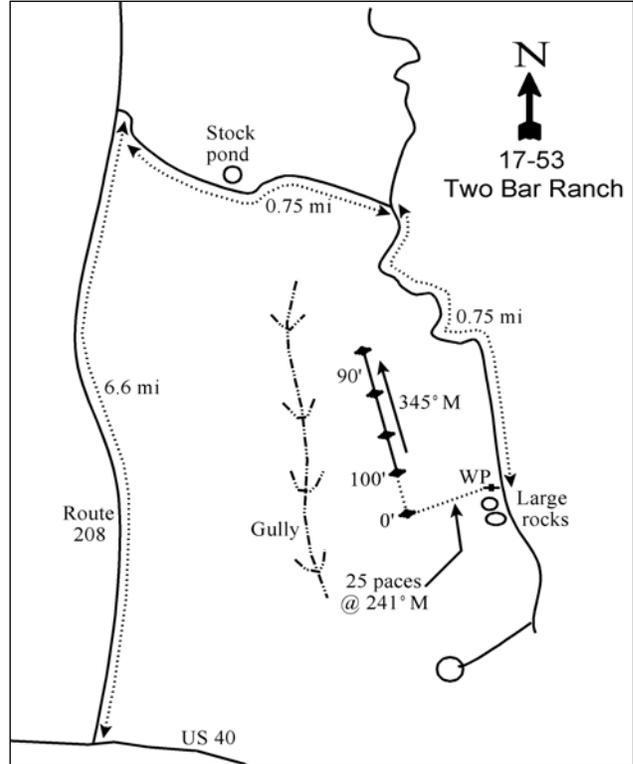
From U.S. 40 five miles east of Fruitland, take Rt. 208 north towards Tabiona for 6.6 miles. Just after a small road cut, there is a road on the right. Turn right towards Rabbit Gulch and go 0.75 miles to an intersection. Turn right (south) and go another 0.75 miles down a gully-ridden road to two large rocks on the west side of the road. From the highest point of the first rock, the 0-foot baseline stake is 25 paces away at 241°M.

Map Name: Tabiona



Township: 2S Range: 7W Section: 28

Diagrammatic Sketch:



GPS: NAD 83, UTM 12T 527226 E 4459218 N

TWO BAR RANCH - TREND STUDY NO. 17-53

Site Information

Site Description: The study is located on the upper part of Rabbit Gulch near the base of Blacktail Ridge within a large Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) flat. The area is administered by the Utah Division of Wildlife (UDWR) as part of the Tabby Mountain Wildlife Management Area (WMA). This is the lowest elevation study on the unit. Thermal and escape cover for big game is limited within the sagebrush flat, but good cover is available in the pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) woodlands along the ridge east of the site. There is evidence of substantial deer use during past readings. Grazing is managed by the UDWR for spring grazing (April/May) to promote browse. Stocking rates are very low. Pellet group transect data has indicated lightly moderate use by deer since 2000. Estimated use by elk was fairly moderate in 2000, with lighter use in 2005 and 2010. There has been minimal use by cattle since 2000 (Table - Pellet Group Data).

Browse: The key browse species is Wyoming big sagebrush, though there was a large decrease in the cover of Wyoming big sagebrush in 2005 and shadscale (*Atriplex confertifolia*) has increased steadily in cover since 1995 to become the co-dominant browse species (Table - Browse Trends). The Wyoming big sagebrush had a fairly dense population prior to 2005, but density decreased in relation to cover in that year. The population of Wyoming big sagebrush is comprised of mature plants with moderate decadence and fairly high amounts of poor vigor. Decadence and poor vigor were highest in 2005. Recruitment of young sagebrush plants has been mostly good over the course of the study. Utilization of Wyoming big sagebrush has been mostly moderate with very heavy use in 2005. Shadscale is comprised of a moderately dense stand of mostly mature plants that have low decadence and good vigor. Recruitment of young shadscale has been historically good and utilization mostly light. There is also a small population of black greasewood (*Sarcobatus vermiculatus*) found on the site (Table - Browse Characteristics).

Herbaceous Understory: Grasses are fairly diverse for a site such as this, and have steadily increased in cover since 1995. Needle-and-thread (*Stipa comata*) has been the main reason for the increase in cover and has been the dominant grass since 2005. Thickspike wheatgrass (*Agropyron dasystachyum*) was the co-dominant species prior to 2005, but decreased significantly in nested frequency in that year. Thickspike wheatgrass remains common on the site as do Indian ricegrass (*Oryzopsis hymenoides*) and bottlebrush squirreltail (*Sitanion hystrix*). Perennial forbs are scarce with scarlet globemallow (*Sphaeralcea coccinea*) providing the majority of the forb cover. Scarlet globemallow increased significantly in nested frequency in 2005 (Table - Herbaceous Trends).

Soil: Soils are an alluvial deposited sandy clay loam with a slightly alkaline soil reaction (pH 7.7). Phosphorus may have limited availability for plant growth and development at 1.5 ppm (Tiedemann and Lopez 2004). Exposed bare ground cover is high with vegetation and litter sparse and generally inadequate to prevent soil movement. Cryptogam cover is high and provides some extra protective ground cover (Table - Basic Cover). The soil erosion condition was classified as moderate to high in 2005 and slight in 2010 because of small frequent pedestals surrounding shrubs and perennial grasses, gullies covering over 50% of the site (two large gullies on the site), large amounts of soil movement, minor litter movement, many small rills, and moderate flow patterns between perennial species.

Trend Assessments

Browse:

- **1982 to 1988 - up (+2):** There was a four-fold increase in the density of the primary browse species Wyoming big sagebrush, but most of the increase was due to a large increase in the recruitment of young plants as the density of mature plants changed little.
- **1988 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 vigor of Wyoming big

sagebrush remained similar. Recruitment of young plants decreased, but remained very good at 26% of the population.

- **1995 to 2000 - stable (0):** There was no change in the density of Wyoming big sagebrush, though the population appears to be maturing with a decrease in recruitment of young plants and an increase in the density of mature plants. This is also represented by an increase in cover from 11% to 13%. Decadence of Wyoming big sagebrush increased from 15% to 33% and poor vigor increased from 7% to 16%.
- **2000 to 2005 - down (-2):** The density of Wyoming big sagebrush decreased by 55% from 5,080 plants/acre to 2,280 plants/acre, with a corresponding decrease in cover to 4%. Decadence increased to 62% and poor vigor increased to 56% of the population. Recruitment of young sagebrush plants decreased to 3%. Shadscale also decreased in density from 4,020 plants/acre to 2,640 plants/acre, but increased in cover from 5% to 7%.
- **2005 to 2010 - slightly up (+1):** There was a slight decrease in the density of Wyoming big sagebrush to 2,080 plants/acre, but cover increased slightly to 5%. Decadence decreased to 23% and poor vigor decreased to 20%. Recruitment of young sagebrush plants increased to 13% of the population. Shadscale had a 14% increase in density to 3,020 plants/acre.

Grass:

- **1982 to 1988 - no trend (NT):** Only quadrat frequency data for grasses are available from 1982, so no trend was given.
- **1988 to 1995 - slightly up (+1):** The sum of nested frequency of perennial grasses increased by 18% with a significant increase in the nested frequency of thickspike wheatgrass.
- **1995 to 2000 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, though cover increased from 7% to 10% with a significant increase in the nested frequency of needle-and-thread.
- **2000 to 2005 - down (-2):** The sum of nested frequency of perennial grasses decreased by 23% with a significant decrease in the nested frequency of thickspike wheatgrass. Cover of perennial grasses increased to 12% primarily because of an increase in the cover of needle-and-thread.
- **2005 to 2010 - up (+2):** The perennial grass sum of nested frequency increased by 22% and cover increased to 18%, again primarily due to an increase in the cover of needle-and-thread.

Forb:

- **1982 to 1988 - no trend (NT):** Only quadrat frequency data for forbs are available from 1982, so no trend was given.
- **1988 to 1995 - up (+2):** There was a three-fold increase in the sum of nested frequency of perennial forbs, but cover was only 1%.
- **1995 to 2000 - down (-2):** The sum of nested frequency of perennial forbs returned to 1988 levels.
- **2000 to 2005 - up (+2):** The perennial forb sum of nested frequency increased two-fold with a significant increase in the nested frequency of scarlet globemallow. Cover increased from less than 1% to 3% with an increase in cover of scarlet globemallow.
- **2005 to 2010 - slightly down (-1):** There was a slight decrease in the sum of nested frequency of perennial forbs, but cover remained similar.

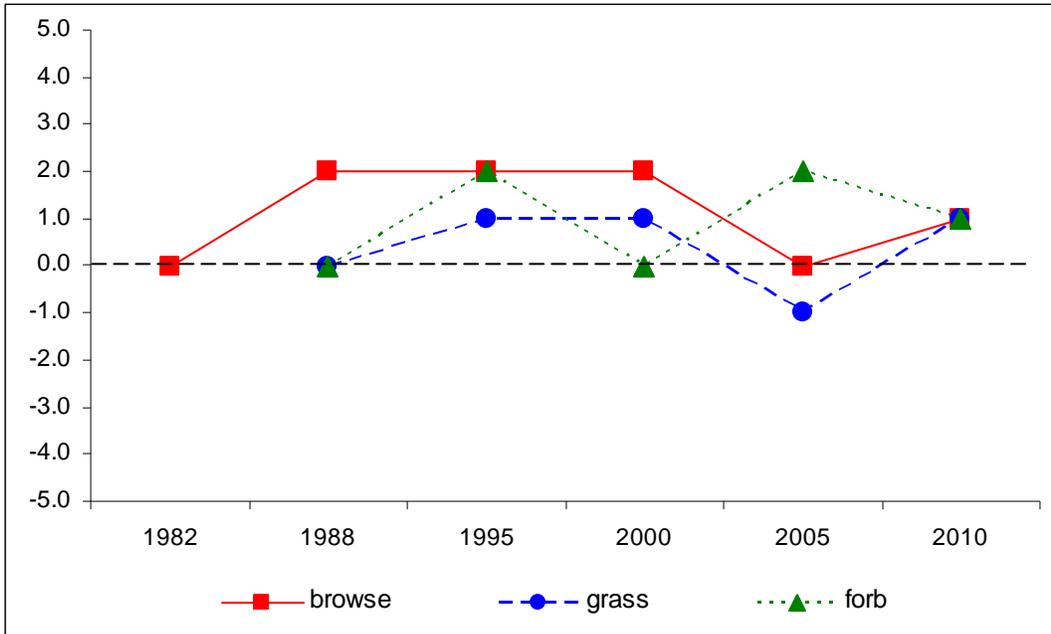
DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 17, study no: 53

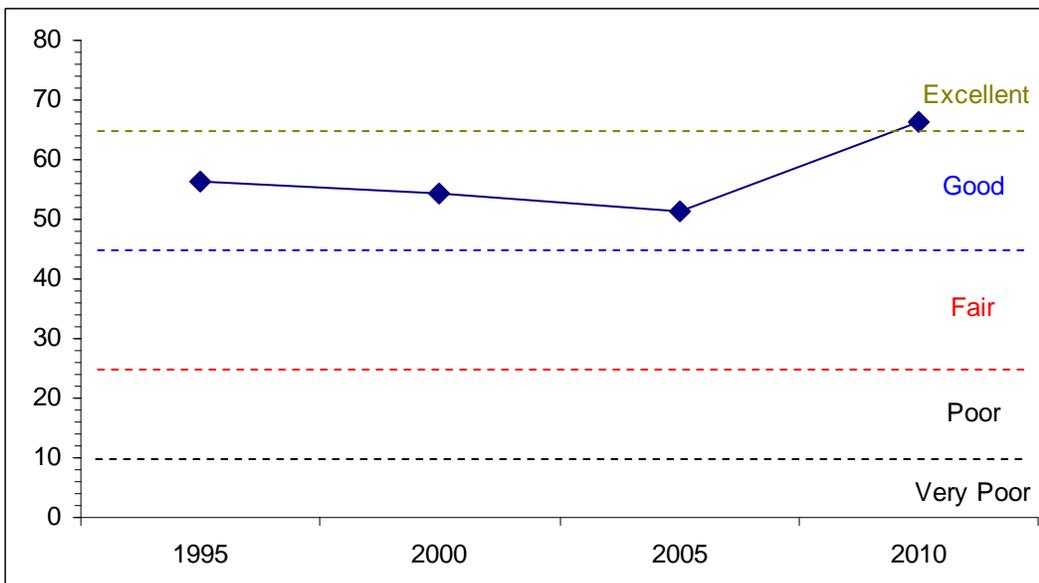
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
95	16.6	11.3	12.4	14.1	0.0	2.0	0.0	56.5	Good
00	21.0	6.7	5.6	19.9	0.0	1.2	0.0	54.5	Good
05	11.9	5.8	3.3	24.0	0.0	6.2	0.0	51.2	Good
10	13.2	11.2	6.5	30.0	0.0	5.3	0.0	66.2	Good-Excellent

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
 Management unit 17, Study no: 53



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--
 Management unit 17, Study no: 53



HERBACEOUS TRENDS--
Management unit 17, Study no: 53

Type	Species	Nested Frequency					Average Cover %			
		'88	'95	'00	'05	'10	'95	'00	'05	'10
G	<i>Agropyron dasystachyum</i>	bc132	d173	cd156	a62	ab96	2.55	3.42	1.81	3.50
G	<i>Bromus tectorum</i> (a)	-	1	-	-	6	.00	-	-	.01
G	<i>Carex</i> sp.	c73	abc38	a15	bc43	ab33	.23	.18	.46	.53
G	<i>Oryzopsis hymenoides</i>	40	65	31	39	46	1.10	.87	1.62	1.57
G	<i>Poa secunda</i>	-	-	-	-	3	-	-	-	.01
G	<i>Sitanion hystrix</i>	29	29	49	23	27	1.33	1.10	1.16	1.06
G	<i>Sporobolus cryptandrus</i>	-	2	-	-	-	.00	-	-	-
G	<i>Stipa comata</i>	a29	a51	b103	b106	b128	1.82	4.39	6.96	11.17
Total for Annual Grasses		0	1	0	0	6	0.00	0	0	0.01
Total for Perennial Grasses		303	358	354	273	333	7.06	9.97	12.02	17.85
Total for Grasses		303	359	354	273	339	7.07	9.97	12.02	17.87
F	<i>Arabis</i> sp.	-	7	3	5	-	.04	.00	.01	-
F	<i>Arenaria</i> sp.	-	-	-	-	3	-	-	-	.00
F	<i>Astragalus convallarius</i>	-	-	-	4	-	-	-	.01	-
F	<i>Calochortus nuttallii</i>	-	-	-	-	-	-	-	-	.00
F	<i>Chenopodium fremontii</i> (a)	-	3	-	6	-	.01	-	.01	-
F	<i>Chenopodium leptophyllum</i> (a)	-	bc6	a-	c18	ab4	.02	-	.05	.01
F	<i>Collinsia parviflora</i> (a)	-	-	-	1	-	-	-	.00	-
F	<i>Comandra pallida</i>	-	-	-	-	1	-	-	-	.00
F	<i>Descurainia pinnata</i> (a)	-	a1	a1	b49	a1	.00	.00	.60	.00
F	<i>Draba</i> sp. (a)	-	3	-	-	-	.00	-	-	-
F	<i>Eriogonum cernuum</i> (a)	-	2	-	8	3	.01	-	.02	.00
F	<i>Lappula occidentalis</i> (a)	-	b16	a-	d112	c48	.03	-	2.67	.14
F	<i>Lepidium</i> sp. (a)	-	b24	a-	ab5	a1	.12	-	.04	.00
F	<i>Lychnis drummondii</i> <i>drummondii</i>	1	-	-	-	-	-	-	-	-
F	<i>Machaeranthera canescens</i>	a6	b32	a1	a4	a1	.22	.03	.06	.00
F	<i>Phlox longifolia</i>	a3	c81	a7	b43	a8	.21	.06	.28	.02
F	<i>Plantago patagonica</i> (a)	-	ab9	a-	b18	b18	.07	-	.06	.10
F	<i>Schoenrambe linifolia</i>	a2	b10	a1	a3	a3	.03	.03	.00	.00
F	<i>Sphaeralcea coccinea</i>	a52	a65	a62	b103	b111	.45	.50	2.71	2.61
F	<i>Townsendia incana</i>	-	1	-	2	-	.03	-	.03	-
Total for Annual Forbs		0	64	1	217	75	0.28	0.00	3.46	0.27
Total for Perennial Forbs		64	196	74	164	127	0.99	0.62	3.12	2.65
Total for Forbs		64	260	75	381	202	1.28	0.63	6.59	2.93

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

BROWSE TRENDS--

Management unit 17, Study no: 53

Type	Species	Strip Frequency				Average Cover %			
		'95	'00	'05	'10	'95	'00	'05	'10
B	Artemisia tridentata wyomingensis	93	82	57	58	11.23	13.25	4.33	5.19
B	Atriplex confertifolia	63	70	62	66	2.59	4.47	6.48	6.71
B	Ceratoides lanata	0	2	1	2	-	-	.00	.03
B	Chrysothamnus depressus	-	-	-	-	-	-	.03	-
B	Chrysothamnus viscidiflorus viscidiflorus	1	1	2	0	-	-	.00	-
B	Opuntia sp.	36	39	37	40	1.10	.97	1.02	1.37
B	Pediocactus simpsonii	0	0	1	0	-	-	.00	-
B	Pinus edulis	0	4	3	3	.15	.38	.38	.63
B	Sarcobatus vermiculatus	16	14	17	15	1.28	1.25	3.28	3.19
B	Tetradymia canescens	0	0	1	2	-	-	-	.00
Total for Browse		209	212	181	186	16.36	20.32	15.55	17.12

CANOPY COVER, LINE INTERCEPT--

Management unit 17, Study no: 53

Species	'05	'10
Artemisia tridentata wyomingensis	4.13	5.21
Atriplex confertifolia	7.80	7.08
Ceratoides lanata	.13	.06
Juniperus osteosperma	.50	-
Opuntia sp.	.93	1.01
Pinus edulis	-	.53
Sarcobatus vermiculatus	4.09	5.50

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 17, Study no: 53

Species	Average leader growth (in)	
	'05	'10
Artemisia tridentata wyomingensis	2.9	1.2

BASIC COVER--

Management unit 17, Study no: 53

Cover Type	Average Cover %					
	'82	'88	'95	'00	'05	'10
Vegetation	5.50	2.00	26.45	30.25	28.32	39.90
Rock	0	1.00	.06	.15	.01	0
Pavement	0	.50	.12	.09	.07	.03
Litter	45.25	31.50	29.09	27.65	34.43	42.75
Cryptogams	2.50	12.25	15.82	15.10	11.37	7.16
Bare Ground	46.75	52.75	33.79	45.52	43.01	35.70

SOIL ANALYSIS DATA --

Management unit 17, Study no: 53, Study Name: Two Bar Ranch

Effective rooting depth (in)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
15.4	7.7	52.6	24.8	22.6	1.2	1.5	92.8	0.5

PELLET GROUP DATA--

Management unit 17, Study no: 53

Type	Quadrat Frequency				Days use per acre (ha)		
	'95	'00	'05	'10	'00	'05	'10
Rabbit	2	3	18	18	-	-	-
Elk	17	11	18	20	35 (86)	17 (43)	14 (35)
Deer	28	9	28	12	38 (93)	23 (57)	21 (53)
Cattle	-	-	-	-	-	1 (2)	-

BROWSE CHARACTERISTICS--

Management unit 17, Study no: 53

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Artemisia nova</i>									
82	0	0	0	-	-	0	0	0	-/-
88	0	0	0	-	-	0	0	0	-/-
95	0	0	0	-	-	0	0	0	11/23
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	-/-
10	0	0	0	-	-	0	0	0	-/-
<i>Artemisia tridentata wyomingensis</i>									
82	2531	13	79	8	1999	13	0	0	25/29
88	9865	66	21	14	1866	39	3	.67	22/21
95	5080	26	59	15	340	48	35	7	21/30
00	5080	11	56	33	180	40	28	16	17/25
05	2280	3	35	62	20	25	52	56	17/23
10	2080	13	63	23	40	32	6	20	16/22
<i>Atriplex confertifolia</i>									
82	2599	49	51	0	1133	18	0	0	12/20
88	3398	29	55	16	333	12	2	0	10/10
95	3080	20	79	1	-	7	3	1	12/19
00	4020	12	76	12	60	8	12	2	8/15
05	2640	9	81	10	680	2	0	9	14/22
10	3020	13	83	5	140	8	0	5	14/21

		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>Ceratoides lanata</i>										
82	0	0	0	0	-	0	0	0	-/-	
88	0	0	0	0	-	0	0	0	-/-	
95	0	0	0	0	-	0	0	0	6/7	
00	40	50	0	50	-	0	0	50	-/-	
05	20	0	100	0	-	100	0	0	13/14	
10	40	0	100	0	-	0	0	0	14/15	
<i>Chrysothamnus viscidiflorus viscidiflorus</i>										
82	0	0	0	-	-	0	0	0	-/-	
88	0	0	0	-	-	0	0	0	-/-	
95	20	0	100	-	-	0	0	0	10/4	
00	20	0	100	-	-	0	0	0	9/18	
05	40	50	50	-	140	0	0	0	14/23	
10	0	0	0	-	-	0	0	0	15/28	
<i>Grayia spinosa</i>										
82	0	0	0	-	-	0	0	0	-/-	
88	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	11/9	
<i>Opuntia sp.</i>										
82	0	0	0	0	-	0	0	0	-/-	
88	2066	6	94	0	-	0	0	0	4/3	
95	1260	2	86	13	-	0	0	8	5/15	
00	1440	6	90	4	-	0	0	8	4/9	
05	1380	4	88	7	-	0	0	1	5/15	
10	1400	7	86	7	-	0	0	11	4/13	
<i>Pediocactus simpsonii</i>										
82	0	0	0	-	-	0	0	0	-/-	
88	0	0	0	-	-	0	0	0	-/-	
95	0	0	0	-	-	0	0	0	-/-	
00	0	0	0	-	-	0	0	0	-/-	
05	20	0	100	-	-	0	0	0	0/1	
10	0	0	0	-	-	0	0	0	-/-	
<i>Pinus edulis</i>										
82	0	0	0	-	-	0	0	0	-/-	
88	66	100	0	-	-	0	0	0	-/-	
95	0	0	0	-	-	0	0	0	-/-	
00	80	75	25	-	-	0	0	0	-/-	
05	60	67	33	-	-	0	33	0	-/-	
10	60	100	0	-	-	33	0	100	-/-	

		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>Sarcobatus vermiculatus</i>										
82	0	0	0	0	-	0	0	0	-/-	
88	1399	52	38	10	-	0	0	0	39/27	
95	700	54	46	0	20	0	0	0	47/38	
00	500	8	92	0	-	0	0	0	29/37	
05	560	29	61	11	-	0	0	0	28/43	
10	580	14	86	0	-	0	0	0	29/43	
<i>Tetradymia canescens</i>										
82	0	0	0	-	-	0	0	0	-/-	
88	0	0	0	-	-	0	0	0	-/-	
95	0	0	0	-	-	0	0	0	-/-	
00	0	0	0	-	-	0	0	0	-/-	
05	20	0	100	-	-	0	0	0	7/11	
10	40	100	0	-	-	0	0	0	11/18	