

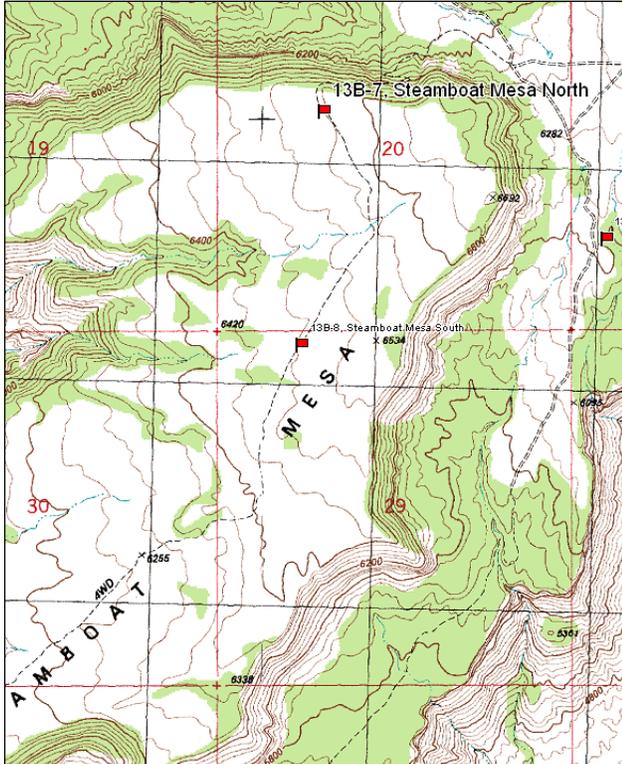
STEAMBOAT MESA NORTH - TREND STUDY NO. 13B-7-10

Vegetation Type: Chained, Seeded Pinyon-Juniper
Range Type: Crucial Deer Winter, Crucial Elk Winter
NRCS Ecological Site Description: Not Available
Land Ownership: BLM
Elevation: 6550 ft. (1997 m)
Aspect: Southwest
Slope: 3%-5%
Transect bearing: 165° magnetic
Belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

Directions:

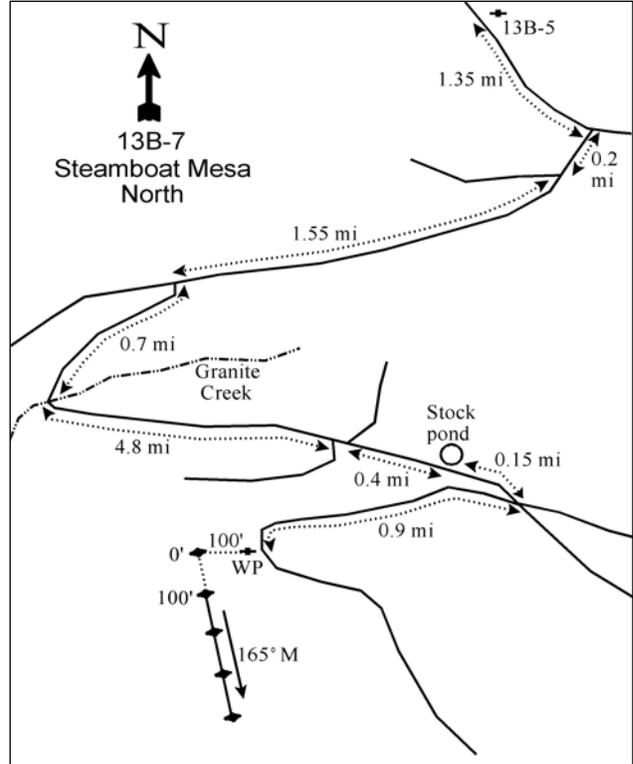
From the Buckhorn Draw transect (13B-5), continue southeast for 1.35 miles to the "Granary" intersection. Turn right and go 0.2 miles to a fork. Stay left and drive 1.55 miles to a road on the left. Turn left and go down this road 0.7 miles to Granite Creek. Cross the creek and proceed 4.8 miles to a fork. Stay left, then right at another fork which connects back to the main road, traveling 0.4 miles to a stock pond. Continue 0.15 miles to a fork with many branches (the right goes up on Steamboat Mesa). It is 0.9 miles from the fork to the top of Steamboat Mesa and a witness post on the right side of the road. The witness post (a green fence post) is six feet off the road. The 0-foot baseline stake is 100 feet west of the witness post. All the transect posts are rebar.

Map Name: Steamboat Mesa



Township: 23S Range: 26E Section: 20

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 666665 E 4295412 N

STEAMBOAT MESA NORTH - TREND STUDY NO. 13B-7

Site Information

Site Description: Steamboat Mesa is a large flat mesa located in the southeast corner of the Dolores Triangle, just north of the Dolores River and west of the Colorado border. The mesa is surrounded by steep rock cliffs, with the only access being a rough 4-wheel drive road on the north end. The Steamboat Mesa North study site was set up in a large chaining just beyond the north edge of the mesa. Managed by the Bureau of Land Management (BLM), this portion of the Steamboat Mesa allotment was two-way chained and seeded in 1968. The species seeded were crested wheatgrass (*Agropyron cristatum*), fourwing saltbush (*Atriplex canescens*), big sagebrush (*Artemisia tridentata*), alfalfa (*Medicago sativa*) and bitterbrush (*Purshia tridentata*). Pellet group data has indicated moderately heavy deer use and light elk and cattle use since 2000 (Table - Pellet Group Data).

Browse: There are a wide variety of browse species found on the site in low densities and cover including: true mountain mahogany (*Cercocarpus montanus*), antelope bitterbrush, green ephedra (*Ephedra viridis*), rubber rabbitbrush (*Chrysothamnus nauseosus*), Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), black sagebrush (*A. nova*), Utah serviceberry (*Amelanchier utahensis*) and fourwing saltbush (Table- Browse Cover). Green ephedra and fourwing saltbush have showed moderate hedging with some in poor condition (Table - Browse Characteristics). This is generally normal for these two species where they are found in low densities. There is a mature, stable stand of pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) trees that have had moderate canopy cover (Table - Canopy Cover) and moderate density (Table - Point-Quarter Tree Data) on the site since 2000.

Herbaceous Understory: Crested wheatgrass is the key forage species for cattle and the dominant species in cover on the site. Crested wheatgrass has accounted for nearly all of the grass cover and forms large, distinct patches over the site. Other perennial grass species are rare. Cheatgrass (*Bromus tectorum*) is prevalent on the site, but has fluctuated in nested frequency and cover. A variety of native perennial forbs are found on the site, although none are particularly important in terms of forage value on winter range. Most common are increasers such as rock goldenrod (*Petradoria pumila*), Hoods phlox (*Phlox hoodii*) and hairy gold aster (*Heterotheca villosa*). Alfalfa is scattered throughout the site in very low frequency (Table - Herbaceous Trends).

Soil: The soil is a shallow, well-drained, sandy clay loam derived from sandstone with a mildly alkaline soil reaction (pH 7.7) (Table - Soil Analysis Data). Most of the protective ground cover is provided by litter, but vegetation cover has increased since 1986. Bare ground cover is moderately high (Table - Basic Cover). The soil erosion condition was classified as slight in 2005 and 2010 due to excessive pedestalling around shrubs and perennial grasses, some flow patterns and rills between vegetation, moderate surface litter movement, and some soil movement between perennial species.

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. Browse species are scattered throughout the site in low cover. Green ephedra is the most common preferred browse species and had good vigor and low decadence.
- **1995 to 2000 - slightly down (-1):** Browse species are rare and scattered on the site in low densities. Green ephedra decreased slightly in density and cover, and decadence increased to 30%. Recruitment of young ephedra plants decreased from 33% to 5% of the population.
- **2000 to 2005 - slightly up (+1):** Green ephedra density returned to 1995 levels, though cover remained similar. Much of the increase in density is due to the large increase in recruitment of young ephedra plants to 44%.

- **2005 to 2010 - down (-2):** The density of green ephedra decreased by more than 50% to 220 plants/acre with the majority of the plants being young plants. There was a general decrease in many of the other browse species on the site.

Grass:

- **1986 to 1995 - stable (0):** There was little change in the sum of nested frequency of perennial grasses. However, there was a change in composition with a significant increase in the nested frequency of crested wheatgrass and a significant decrease in the nested frequency of Indian ricegrass (*Oryzopsis hymenoides*) and bottlebrush squirreltail (*Sitanion hystrix*). With the decrease in the two native species, crested wheatgrass became the only prevalent perennial grass species on the site.
- **1995 to 2000 - slightly up (+1):** The sum of nested frequency of perennial grasses increased by 18% and cover increased from 9% to 16%. Crested wheatgrass increased significantly in nested frequency and cheatgrass decreased significantly in nested frequency, with a subsequent decrease in cover.
- **2000 to 2005 - stable (0):** There was little change in the sum of nested frequency or cover of perennial grasses, but cheatgrass nested frequency increased significantly and cover increased to 2%.
- **2005 to 2010 - stable (0):** The sum of nested frequency and cover of perennial grasses changed little. There was a slight increase in the cover of cheatgrass.

Forb:

- **1986 to 1995 - up (+2):** The sum of nested frequency of perennial forbs increased more than two-fold.
- **1995 to 2000 - down (-2):** Perennial forb sum of nested frequency decreased by 57% and cover decreased from 4% to 2%.
- **2000 to 2005 - slightly up (+1):** The perennial forb sum of nested frequency increased by 50% and cover increased to 3%.
- **2005 to 2010 - slightly down (-1):** Perennial forb sum of nested frequency decreased 38% returning to 1986 and 2000 levels. Cover remained similar at 3%.

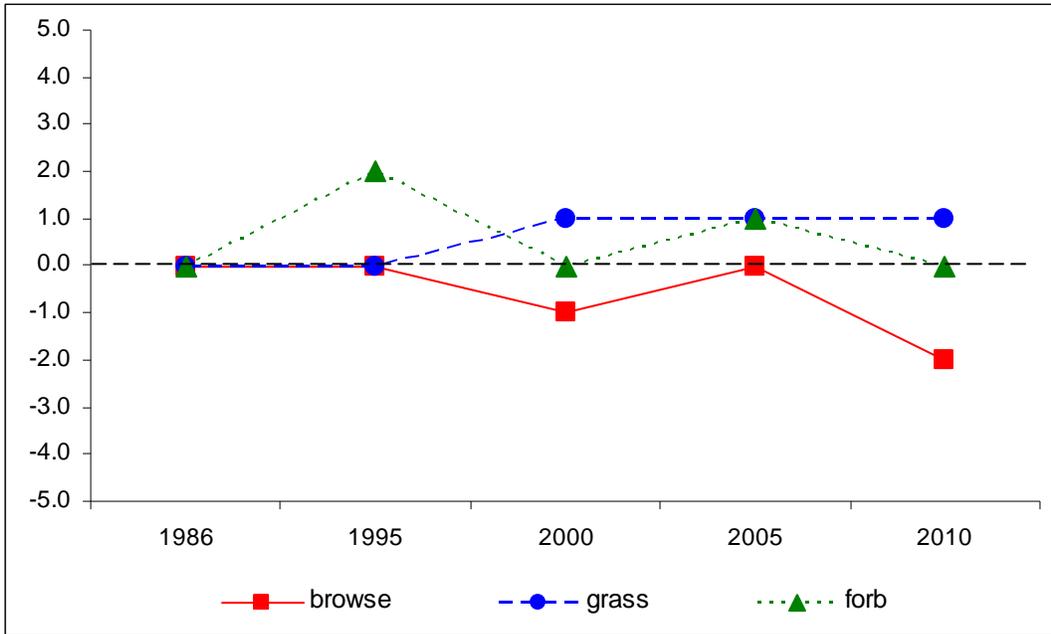
DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 13B, study no: 7

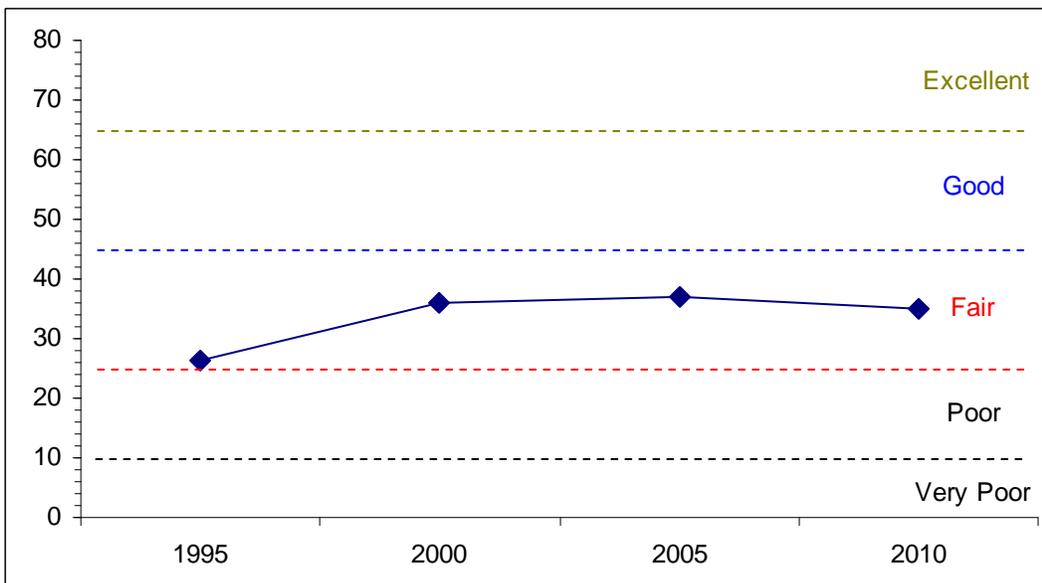
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
95	1.9	0.0	0.0	18.5	-1.0	7.1	0.0	26.4	Poor-Fair
00	2.0	0.0	0.0	30.0	0.0	4.1	0.0	36.1	Fair
05	2.0	0.0	0.0	30.0	-1.6	6.5	0.0	36.9	Fair
10	2.1	0.0	0.0	30.0	-2.6	5.5	0.0	35.0	Fair

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
 Management unit 13B, Study no: 7



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--
 Management unit 13B, Study no: 7



HERBACEOUS TRENDS--
Management unit 13B, Study no: 7

T y p e	Species	Nested Frequency					Average Cover %			
		'86	'95	'00	'05	'10	'95	'00	'05	'10
G	Agropyron cristatum	a155	b228	c277	bc245	bc245	9.01	16.29	17.79	14.95
G	Bromus tectorum (a)	-	b163	a3	bc125	b101	1.35	.03	2.10	3.43
G	Oryzopsis hymenoides	c52	ab15	a-	b21	a-	.14	.00	.44	-
G	Poa bulbosa	-	-	-	3	10	-	-	.15	.21
G	Poa fendleriana	4	4	-	-	-	.04	-	-	-
G	Poa secunda	a-	ab3	ab9	b12	ab8	.03	.04	.08	.21
G	Sitanion hystrix	b28	a-	a2	a3	a-	-	.03	.15	-
G	Sporobolus cryptandrus	-	-	1	-	-	-	.03	-	-
G	Stipa comata	b8	a-	ab5	ab1	a-	-	.03	.01	-
G	Vulpia octoflora (a)	-	ab5	a-	b19	a-	.01	-	.06	-
Total for Annual Grasses		0	168	3	144	101	1.37	0.03	2.16	3.43
Total for Perennial Grasses		247	250	294	285	263	9.23	16.43	18.63	15.37
Total for Grasses		247	418	297	429	364	10.60	16.47	20.79	18.81
F	Agoseris glauca	-	-	-	1	3	.01	-	.00	.06
F	Allium sp.	-	3	-	-	-	.00	-	-	-
F	Astragalus convallarius	7	1	1	8	-	.01	.03	.45	-
F	Astragalus mollissimus	-	6	1	1	1	.01	.00	.03	.03
F	Calochortus nuttallii	-	8	-	4	7	.01	-	.01	.01
F	Chenopodium fremontii (a)	-	-	-	4	-	-	-	.01	-
F	Crepis acuminata	-	-	-	3	-	-	-	.00	-
F	Cryptantha sp.	-	4	-	2	-	.01	-	.03	-
F	Cymopterus sp.	a-	b16	a-	b15	b11	.04	-	.11	.27
F	Descurainia pinnata (a)	-	a4	a-	b29	a4	.01	-	.31	.00
F	Draba nemorosa (a)	-	b96	a-	b87	a3	.21	-	.39	.00
F	Erigeron pumilus	a2	b19	ab13	a-	a5	.04	.05	-	.03
F	Erodium cicutarium (a)	-	8	9	21	5	.16	.41	.45	.03
F	Gilia hutchinifolia (a)	-	bc28	a-	c42	b17	.07	-	.21	.08
F	Haplopappus acaulis	3	7	3	-	-	.01	.00	-	-
F	Heterotheca villosa	a-	b16	b16	c39	b9	.21	.29	.82	.20
F	Hymenoxys acaulis	-	-	-	7	3	-	-	.16	.00
F	Lactuca serriola	-	6	-	-	-	.15	-	-	-
F	Lappula occidentalis (a)	-	b43	a-	c82	b50	.15	-	1.49	.30
F	Lepidium densiflorum (a)	-	b24	a-	b33	a-	.19	-	.20	-
F	Lesquerella sp.	-	-	-	1	-	-	-	.03	-
F	Lychnis drummondii	-	-	-	-	-	-	-	.00	-
F	Machaeranthera grindelioides	a-	b21	a-	a5	a-	.04	-	.06	-
F	Medicago sativa	-	3	2	-	-	.00	.03	-	-
F	Penstemon sp.	-	1	3	1	-	.00	.15	.03	-
F	Petroradia pumila	37	41	32	26	26	2.21	1.35	1.08	1.73
F	Phlox hoodii	bc28	c32	abc13	a11	ab12	.49	.11	.07	.28
F	Phlox longifolia	-	2	-	-	-	.00	-	-	-
F	Plantago patagonica (a)	-	a3	a-	b32	a-	.01	-	.30	-
F	Polygonum douglasii (a)	-	3	-	-	-	.00	-	.00	-

Type	Species	Nested Frequency					Average Cover %			
		'86	'95	'00	'05	'10	'95	'00	'05	'10
F	Ranunculus testiculatus (a)	-	a ³	a ⁻	b ³⁸	c ¹⁰⁴	.01	-	.18	1.11
F	Salsola iberica (a)	-	-	-	-	1	-	-	-	.00
F	Schoenocrambe linifolia	a ⁻	b ¹⁷	a ⁻	a ⁻	a ³	.07	-	.16	.04
F	Sisymbrium altissimum (a)	-	b ²⁷	a ⁻	a ⁵	a ⁻	.07	-	.33	-
F	Sphaeralcea coccinea	a ⁻	bc ¹³	bc ¹²	c ²⁰	ab ⁸	.13	.05	.18	.09
F	Streptanthus cordatus	-	3	-	-	2	.00	-	-	.00
F	Tragopogon dubius	b ¹⁴	ab ⁵	a ⁻	a ⁻	a ⁻	.02	-	-	-
Total for Annual Forbs		0	239	9	373	184	0.88	0.41	3.90	1.55
Total for Perennial Forbs		91	224	96	144	90	3.53	2.07	3.27	2.77
Total for Forbs		91	463	105	517	274	4.42	2.48	7.17	4.32

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

BROWSE TRENDS--

Management unit 13B, Study no: 7

Type	Species	Strip Frequency				Average Cover %			
		'95	'00	'05	'10	'95	'00	'05	'10
B	Amelanchier utahensis	0	0	0	0	-	-	.38	.85
B	Artemisia nova	0	1	1	1	-	-	-	-
B	Artemisia tridentata wyomingensis	0	1	1	0	-	.38	.38	-
B	Atriplex canescens	1	1	1	1	-	.00	-	-
B	Chrysothamnus nauseosus	4	7	6	2	.98	1.62	.33	-
B	Chrysothamnus viscidiflorus	0	0	0	1	-	-	-	-
B	Ephedra viridis	9	8	7	7	1.35	.86	.57	.62
B	Gutierrezia sarothrae	0	11	4	2	-	.02	.00	.38
B	Juniperus osteosperma	0	6	3	3	2.70	3.67	2.62	4.00
B	Leptodactylon pungens	4	4	5	2	.01	.18	.15	.15
B	Opuntia sp.	2	2	3	3	.03	.00	-	.03
B	Pinus edulis	0	6	5	5	4.77	4.36	3.08	4.01
B	Purshia tridentata	1	1	2	1	.15	.30	.18	.00
Total for Browse		21	48	38	28	9.99	11.42	7.69	10.05

CANOPY COVER, LINE INTERCEPT--

Management unit 13B, Study no: 7

Species	Percent Cover		
	'00	'05	'10
Artemisia tridentata wyomingensis	-	.35	-
Atriplex canescens	-	.21	.16
Chrysothamnus nauseosus	-	.41	-
Ephedra viridis	-	.26	.05
Gutierrezia sarothrae	-	-	.08
Juniperus osteosperma	4.59	8.56	6.69
Leptodactylon pungens	-	-	.13
Pinus edulis	4.19	7.21	7.78
Purshia tridentata	-	.58	.31

POINT-QUARTER TREE DATA--

Management unit 13B, Study no: 7

Species	Trees per Acre			
	'95	'00	'05	'10
Juniperus osteosperma	105	142	150	134
Pinus edulis	170	177	101	102

Average diameter (in)			
'95	'00	'05	'10
3.7	3.3	5.4	5.2
2.9	2.6	4.2	3.4

BASIC COVER--

Management unit 13B, Study no: 7

Cover Type	Average Cover %				
	'86	'95	'00	'05	'10
Vegetation	11.25	26.70	33.01	34.45	31.42
Rock	.25	4.64	6.08	3.90	3.43
Pavement	0	.13	2.52	1.02	2.69
Litter	65.00	37.74	47.32	28.86	38.46
Cryptogams	.25	.53	2.33	.78	1.62
Bare Ground	23.25	33.34	38.60	45.54	33.77

SOIL ANALYSIS DATA --

Management unit 13B, Study no: 7, Study Name: Steamboat Mesa North

Effective rooting depth (in)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
11.5	7.7	56.6	25.1	21.3	1.9	8.7	92.8	0.7

PELLET GROUP DATA--

Management unit 13B, Study no: 7

Type	Quadrat Frequency			
	'95	'00	'05	'10
Rabbit	18	32	29	14
Elk	1	-	5	9
Deer	19	9	30	13
Cattle	6	8	5	3

Days use per acre (ha)		
'00	'05	'10
-	-	-
-	1 (3)	5 (13)
42 (105)	61 (150)	53 (131)
17 (43)	-	7 (18)

BROWSE CHARACTERISTICS--
Management unit 13B, Study no: 7

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
Amelanchier utahensis									
86	0	0	0	-	-	0	0	0	-/-
95	0	0	0	-	-	0	0	0	29/62
00	0	0	0	-	-	0	0	0	63/76
05	0	0	0	-	-	0	0	0	34/58
10	0	0	0	-	-	0	0	0	32/34
Artemisia nova									
86	0	0	0	0	-	0	0	0	-/-
95	0	0	0	0	-	0	0	0	-/-
00	20	0	100	0	-	0	0	0	5/13
05	20	0	0	100	-	0	100	0	7/24
10	20	0	100	0	-	100	0	0	6/13
Artemisia tridentata wyomingensis									
86	66	0	100	0	-	0	0	0	22/19
95	0	0	0	0	-	0	0	0	9/14
00	20	0	100	0	-	0	100	0	9/15
05	20	0	0	100	-	0	100	0	14/14
10	0	0	0	0	-	0	0	0	12/19
Atriplex canescens									
86	66	0	0	100	-	0	0	0	-/-
95	20	0	100	0	-	0	100	0	38/41
00	20	0	0	100	-	0	0	0	34/79
05	40	50	0	50	-	0	50	0	34/49
10	20	0	0	100	-	0	0	100	17/23
Cercocarpus montanus									
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	55/32
10	0	0	0	-	-	0	0	0	41/38
Chrysothamnus nauseosus									
86	0	0	0	0	-	0	0	0	-/-
95	100	0	100	0	-	0	0	0	27/34
00	140	0	86	14	-	29	0	0	37/45
05	120	0	50	50	-	17	17	17	24/30
10	40	0	50	50	-	0	0	50	24/37

		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</i>										
86	0	0	0	0	-	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	20	0	0	100	-	0	0	100	15/18	
<i>Ephedra viridis</i>										
86	133	0	100	0	-	0	100	0	18/11	
95	540	33	56	11	-	22	7	0	17/22	
00	400	5	65	30	-	15	60	5	21/29	
05	500	44	40	16	-	0	20	8	25/38	
10	220	64	36	0	-	0	0	0	22/33	
<i>Gutierrezia sarothrae</i>										
86	66	0	0	100	333	0	0	0	-/-	
95	0	0	0	0	-	0	0	0	7/15	
00	560	7	82	11	-	0	0	4	5/10	
05	140	0	100	0	20	0	0	0	11/15	
10	100	20	80	0	-	0	0	0	5/8	
<i>Juniperus osteosperma</i>										
86	66	0	100	-	-	0	0	0	83/58	
95	0	0	0	-	-	0	0	0	-/-	
00	120	17	83	-	-	0	0	0	-/-	
05	60	0	100	-	-	0	0	0	-/-	
10	60	33	67	-	-	0	0	0	-/-	
<i>Leptodactylon pungens</i>										
86	0	0	0	-	-	0	0	0	-/-	
95	80	0	100	-	-	0	0	0	5/10	
00	120	0	100	-	-	0	0	0	5/10	
05	120	0	100	-	-	0	0	0	4/8	
10	40	0	100	-	-	0	0	0	5/14	
<i>Opuntia sp.</i>										
86	0	0	0	0	-	0	0	0	-/-	
95	60	33	67	0	-	0	0	0	5/18	
00	60	33	67	0	-	0	0	0	4/10	
05	60	33	33	33	-	0	0	0	4/17	
10	120	0	100	0	-	0	0	0	4/16	
<i>Pinus edulis</i>										
86	332	60	40	0	-	0	0	0	81/47	
95	0	0	0	0	-	0	0	0	-/-	
00	120	0	100	0	-	0	0	0	-/-	
05	100	0	100	0	-	0	0	20	-/-	
10	100	20	60	20	-	0	0	20	-/-	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Purshia tridentata										
86	0	0	0	-	-	0	0	0	-/-	
95	20	0	100	-	-	0	0	0	20/40	
00	40	0	100	-	-	0	100	0	24/89	
05	140	0	100	-	-	0	100	0	12/37	
10	60	0	100	-	-	100	0	0	40/41	