

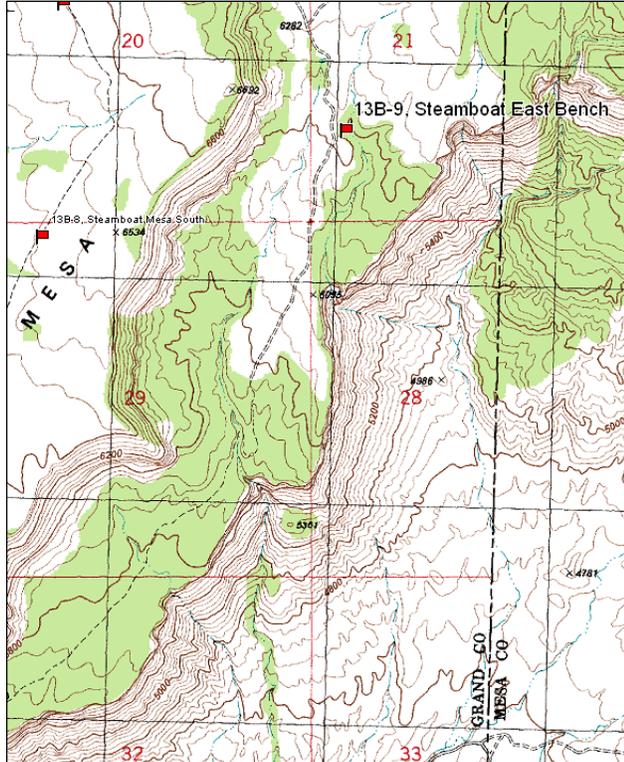
STEAMBOAT EAST BENCH - TREND STUDY NO. 13B-9-10

Vegetation Type: Chained, Seeded Pinyon-Juniper  
Range Type: Crucial Deer Winter, Crucial Elk Winter  
NRCS Ecological Site Description: Not Available  
Land Ownership: BLM  
Elevation: 6200 ft. (1890 m)  
Aspect: South-Southwest  
Slope: 7%  
Transect bearing: 165° magnetic  
Belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

Directions:

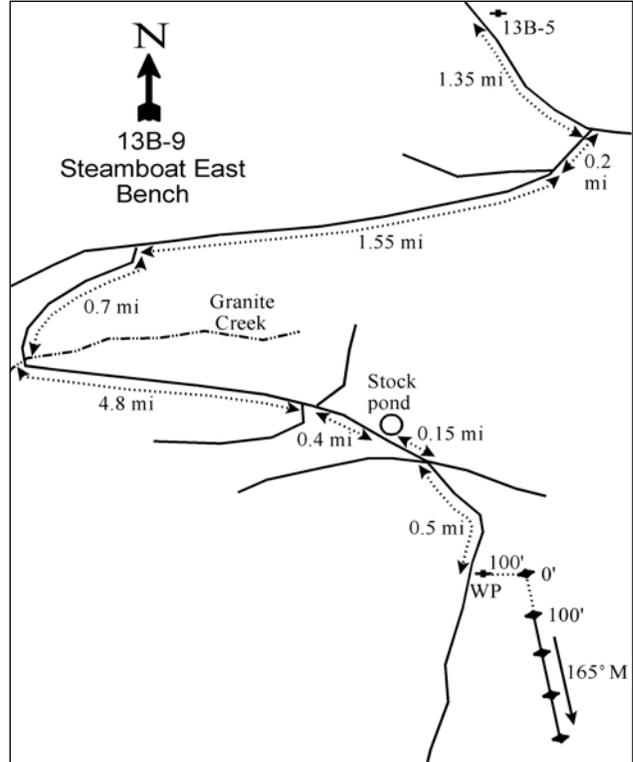
From the Buckhorn Draw transect (13B-5), continue southeast for 1.35 miles to the "Granary" intersection. Turn right and go 0.2 miles to a fork. Stay left and go 1.55 miles. Turn left and go down this road 0.7 miles to Granite Creek. Cross the creek and proceed 4.8 miles to a fork. Stay left, then right 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). Stay on the same road (straight through the intersection and up a steep hill) for 0.5 miles to an old Pinyon-Juniper chaining and a 2 ½ foot tall rebar witness post on the left, 6 feet off the road. The 0-foot end of the baseline is 100 feet east of the witness post and is marked by a rebar tagged #7890.

Map Name: Steamboat Mesa



Township: 23S Range: 26E Section: 21

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 667958 E 4294860 N

## STEAMBOAT EAST BENCH - TREND STUDY NO. 13B-9

### Site Information

Site Description: The study site is located on a narrow bench (one-half mile wide) below Steamboat Mesa, bounded on the west by the sheer sandstone cliffs of Steamboat Mesa and on the east by deep canyons of the Dolores River. The northern part of the bench was included in the 1968 Steamboat Mesa allotment chaining. Grazing in the area is managed by the Bureau of Land Management (BLM) as part of the Steamboat Mesa allotment. The area supports a moderately dense stand of pinyon pine (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*) and a variety of shrubs and herbaceous plants. Drainage off the bench is to the south. The pellet group data has estimated light use by deer, elk and cattle since 2000 (Table - Pellet Group Data). A dead horse was located near the road by the site in 2010.

Browse: The site supports a variety of browse species. Preferred species include: Utah serviceberry (*Amelanchier utahensis*), black sagebrush (*Artemisia nova*), Wyoming big sagebrush (*A. tridentata* ssp. *wyomingensis*), true mountain mahogany (*Cercocarpus montanus*) and green ephedra (*Ephedra viridis*). Most of these key browse species occur in low to very low cover and density. For example, true mountain mahogany provides the most forage and has provided an average of around 3% cover (Table - Browse Trends) and has had a density of between 120 to 240 plants per acre since 1995. Mature mahogany plants are large, averaging over 5 feet in height making them partly unavailable to browsing. Use of mahogany has been mostly light with some years displaying more moderate use (Table - Browse Characteristics). All of the other preferred browse species combined have provided only 1% or less cover in any sample year. Pinyon and juniper trees dominate the site providing nearly all of the browse cover on the site (Table - Browse Trends) and with high density measurements (Table - Point-Quarter Tree Data).

Herbaceous Understory: Perennial grasses are diverse and fairly abundant on the site. The seeded species, crested wheatgrass (*Agropyron cristatum*), is the dominant grass species in cover. Other common perennial grasses include Indian ricegrass (*Oryzopsis hymenoides*), galleta (*Hilaria jamesii*) and bottlebrush squirreltail (*Sitanion hystrix*). The annual grass species, cheatgrass (*Bromus tectorum*), is prevalent on the site, as well, and has at times been the dominant grass species on the site. Forbs provide little forage or ground cover and most have low growth forms. Rock goldenrod (*Petradoria pumila*) is the most abundant forb on the site (Table - Herbaceous Trends).

Soil: The soil texture is a sandy clay loam that is moderately deep. Phosphorus has limited availability for plant growth and development at only 2 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Overall, the vegetation and litter cover provide adequate soil protection and bare ground cover is relatively low (Table - Basic Cover). However, some erosion is evident in areas disturbed by roads. Some slight pedestalling around plants and large rocks has also been noted. The soil erosion condition was classified as stable in 2005 and 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. There was little change in any of the preferred browse species.
- **1995 to 2000 - stable (0):** There was a slight decrease in the density of Wyoming big sagebrush and true mountain mahogany, but there was little change in cover. Pinyon and juniper cover remained high.
- **2000 to 2005 - slightly down (-1):** Wyoming big sagebrush was no longer sampled on the site in 2005. The density of true mountain mahogany increased, but cover decreased slightly. Decadence of black sagebrush increased from 0% to 35%.

- **2005 to 2010 - stable (0):** The density of true mountain mahogany and black sagebrush both decreased slightly, but the density of Wyoming big sagebrush increased. Cover of true mountain mahogany increased to 2000 levels.

Grass:

- **1986 to 1995 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, though the composition changed slightly with a significant increase in the nested frequency of crested wheatgrass and a significant decrease in the nested frequency of bottlebrush squirreltail.
- **1995 to 2000 - stable (0):** The sum of nested frequency of perennial grasses decreased by 18%, but cover increased from 3% to 8%. The increase in cover was due to a large increase in the cover of crested wheatgrass. Cheatgrass decreased significantly in nested frequency and cover decreased from 3% to near 0%.
- **2000 to 2005 - stable (0):** There was a 12% increase in the sum of nested frequency of perennial grasses, but cover decreased to 5%. Cheatgrass increased significantly in nested frequency and cover increased to 3%.
- **2005 to 2010 - slightly up (+1):** The sum of nested frequency of perennial grasses increased 11% and cover increased to 7%. There was little change in cheatgrass nested frequency or cover.

Forb:

- **1986 to 1995 - slightly down (-1):** Perennial forb sum of nested frequency decreased by 15% with a significant decrease in the nested frequency of stemless goldenweed (*Haplopappus acaulis*).
- **1995 to 2000 - down (-2):** There was a 62% decrease in the sum of nested frequency of perennial forbs, though cover remained similar.
- **2000 to 2005 - up (+2):** The sum of nested frequency of perennial forbs increased more than three-fold and cover increased to 4%. Most of the increase was due to a significant increase in the nested frequency of one species, Drummond campion (*Lychnis drummondii*).
- **2005 to 2010 - down (-2):** The sum of nested frequency of perennial forbs decreased 50% and cover decreased to 3%.

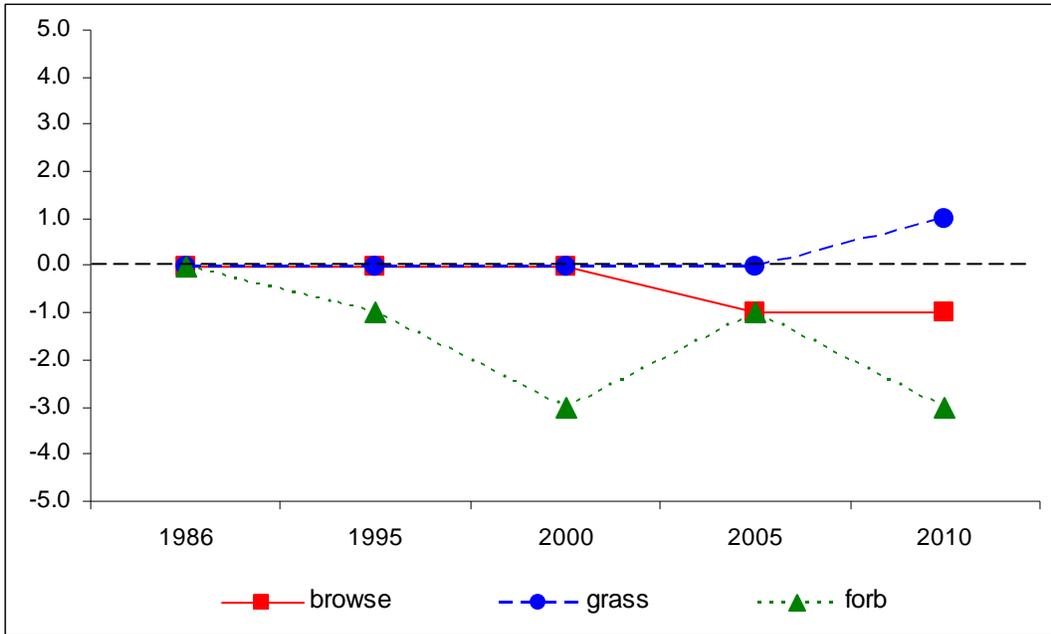
DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 13B, study no: 9

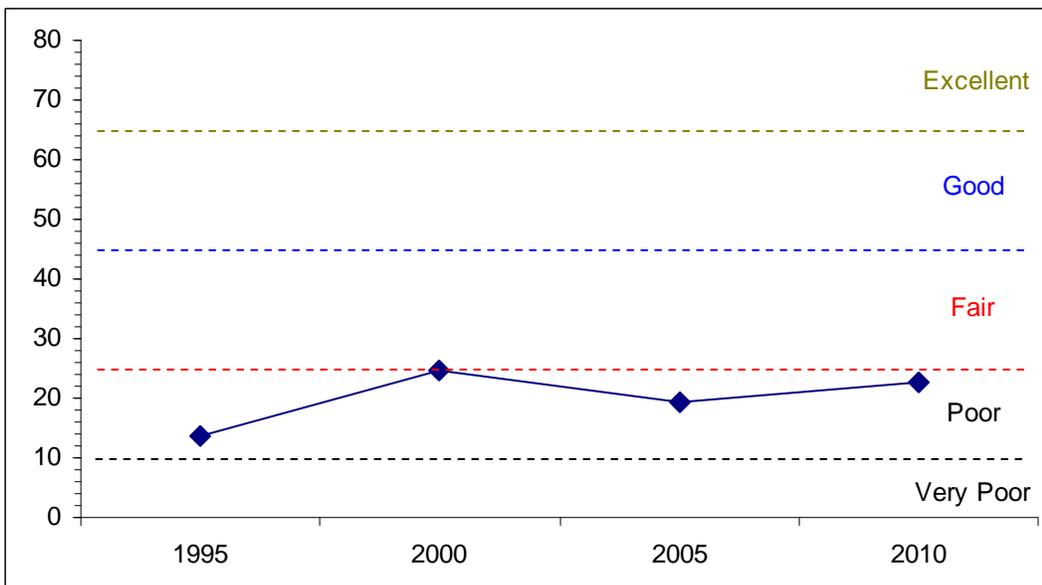
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
95	6.4	0.0	0.0	6.9	-2.3	2.8	0.0	<b>13.8</b>	Poor
00	5.8	0.0	0.0	15.6	-0.1	3.3	0.0	<b>24.6</b>	Poor-Fair
05	2.9	0.0	0.0	10.9	-2.0	7.4	0.0	<b>19.2</b>	Poor
10	4.2	0.0	0.0	14.7	-1.9	5.7	0.0	<b>22.7</b>	Poor

## Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--  
 Management unit 13B, Study no: 9



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--  
 Management unit 13B, Study no: 9



HERBACEOUS TRENDS--  
Management unit 13B, Study no: 9

Type	Species	Nested Frequency					Average Cover %			
		'86	'95	'00	'05	'10	'95	'00	'05	'10
G	Agropyron cristatum	a63	b106	ab96	ab80	b108	2.00	5.21	2.82	4.86
G	Aristida purpurea	a-	b16	b13	ab12	a-	.40	.84	.33	-
G	Bromus tectorum (a)	-	c243	a6	b139	b144	3.00	.09	2.62	2.52
G	Hilaria jamesii	a-	ab14	b18	b19	b16	.48	1.01	1.24	.59
G	Oryzopsis hymenoides	b29	ab17	a11	a6	ab29	.46	.68	.19	1.33
G	Poa bulbosa	-	-	-	-	1	-	-	-	.03
G	Poa fendleriana	b15	b15	a-	b10	ab5	.03	-	.19	.03
G	Poa secunda	a-	a-	ab2	b11	ab6	-	.00	.20	.18
G	Sitanion hystrix	b62	a7	a4	a21	a10	.04	.04	.45	.33
G	Stipa comata	-	-	-	2	3	-	-	.00	.00
G	Vulpia octoflora (a)	-	ab4	a-	b12	a-	.01	-	.02	-
Total for Annual Grasses		0	247	6	151	144	3.01	0.09	2.64	2.52
Total for Perennial Grasses		169	175	144	161	178	3.43	7.80	5.44	7.38
Total for Grasses		169	422	150	312	322	6.45	7.89	8.09	9.90
F	Arabis drummondii	-	9	-	-	-	.02	-	-	-
F	Artemisia dracunculul	-	-	-	7	-	-	-	.01	-
F	Astragalus convallarius	-	-	-	9	-	-	-	.30	-
F	Astragalus mollissimus	b15	ab10	a-	b10	ab8	.05	-	.07	.25
F	Astragalus sp.	-	4	-	-	-	.01	-	-	-
F	Calochortus nuttallii	-	5	-	2	3	.01	-	.00	.00
F	Chenopodium fremontii (a)	-	-	-	2	-	-	-	.00	-
F	Cryptantha sp.	a-	b23	a-	b12	a-	.06	-	.08	-
F	Cymopterus sp.	a-	c16	a-	ab5	bc9	.04	-	.02	.21
F	Descurainia pinnata (a)	-	a-	a-	b17	ab3	-	-	.23	.01
F	Draba nemorosa (a)	-	a4	a-	b68	a3	.01	-	.29	.01
F	Erigeron pumilus	2	-	-	-	5	-	-	-	.04
F	Erodium cicutarium (a)	-	ab18	a5	b34	a3	.04	.01	.22	.01
F	Euphorbia sp.	b13	a4	a-	a-	a-	.01	-	-	-
F	Gilia hutchinifolia (a)	-	b28	a-	c53	b13	.08	-	.26	.03
F	Haplopappus acaulis	c70	b31	b29	a3	a-	.39	.24	.04	-
F	Heterotheca villosa	-	12	4	4	4	.16	.15	.01	.15
F	Hymenoxys acaulis	a-	a-	ab5	ab4	b19	-	.06	.01	.42
F	Lactuca serriola	-	1	-	-	-	.00	-	-	-
F	Lappula occidentalis (a)	-	2	-	10	36	.00	-	.02	.11
F	Lepidium densiflorum (a)	-	-	-	1	-	-	-	.01	-
F	Lesquerella ludoviciana	10	-	-	-	-	-	-	.00	-
F	Lithospermum sp.	-	2	-	-	1	.00	-	-	.03
F	Lupinus sp.	-	-	-	-	3	-	-	-	.00
F	Lychnis drummondii	a-	a11	a-	b101	a-	.02	-	2.25	-
F	Machaeranthera grindelioides	10	-	-	3	-	-	-	.00	-
F	Medicago sativa	-	-	-	-	1	.01	-	.00	.15
F	Penstemon sp.	3	5	-	2	3	.04	-	.01	.04
F	Petradoria pumila	28	14	16	13	22	.47	1.12	.50	1.23

Type	Species	Nested Frequency					Average Cover %			
		'86	'95	'00	'05	'10	'95	'00	'05	'10
F	Phlox hoodii	25	11	10	18	18	.05	.07	.25	.22
F	Physaria sp.	1	-	-	-	-	-	-	-	-
F	Ranunculus testiculatus (a)	-	-	-	-	4	-	-	-	.01
F	Sisymbrium altissimum (a)	<sub>a</sub> 1	<sub>b</sub> 13	<sub>a</sub> -	<sub>a</sub> 2	<sub>a</sub> -	.03	-	.00	-
F	Streptanthus cordatus	-	7	-	8	4	.02	-	.10	.03
F	Townsendia incana	3	-	-	-	-	-	-	-	-
F	Tragopogon dubius	<sub>b</sub> 17	<sub>a</sub> 3	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> 1	.00	-	-	.03
Total for Annual Forbs		1	65	5	187	62	0.16	0.00	1.05	0.19
Total for Perennial Forbs		197	168	64	201	101	1.40	1.66	3.71	2.83
Total for Forbs		198	233	69	388	163	1.57	1.67	4.76	3.02

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

#### BROWSE TRENDS--

Management unit 13B, Study no: 9

Type	Species	Strip Frequency				Average Cover %			
		'95	'00	'05	'10	'95	'00	'05	'10
B	Amelanchier utahensis	1	0	1	1	-	-	-	.03
B	Artemisia nova	13	13	12	10	.85	1.00	.37	.22
B	Artemisia tridentata wyomingensis	5	1	0	3	.18	.15	-	-
B	Cercocarpus montanus	10	5	9	9	3.25	2.76	1.58	2.61
B	Echinocactus sp.	0	0	0	1	-	-	-	-
B	Ephedra viridis	1	1	1	1	.15	.15	.03	-
B	Gutierrezia sarothrae	30	32	21	27	.71	1.28	.76	1.32
B	Juniperus osteosperma	0	7	8	6	2.95	5.73	3.52	7.59
B	Opuntia sp.	1	2	1	3	-	.03	.15	.15
B	Pinus edulis	0	16	16	15	11.50	12.08	5.91	9.19
B	Sclerocactus sp.	1	5	2	1	.00	.06	.00	-
B	Symphoricarpos oreophilus	1	1	2	0	.15	.15	.15	-
B	Yucca harrimaniae	1	2	1	2	.00	.00	-	-
Total for Browse		64	85	74	79	19.75	23.42	12.49	21.13

CANOPY COVER, LINE INTERCEPT--

Management unit 13B, Study no: 9

Species	Percent Cover		
	'00	'05	'10
Amelanchier utahensis	-	1.39	.11
Artemisia nova	-	.66	.18
Artemisia tridentata wyomingensis	-	-	.35
Cercocarpus montanus	-	3.08	4.16
Ephedra viridis	-	.26	.41
Gutierrezia sarothrae	-	.68	.81
Juniperus osteosperma	9.00	10.44	8.06
Opuntia sp.	-	.05	.15
Pinus edulis	12.19	17.83	15.66
Pinus monophylla	-	-	.15
Sclerocactus sp.	-	.03	-
Symphoricarpos oreophilus	-	.23	-

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 13B, Study no: 9

Species	Average leader growth (in)	
	'05	'10
Cercocarpus montanus	3.1	0.9

POINT-QUARTER TREE DATA--

Management unit 13B, Study no: 9

Species	Trees per Acre				Average diameter (in)			
	'95	'00	'05	'10	'95	'00	'05	'10
Juniperus osteosperma	47	63	66	61	6.3	4.9	8.2	7.0
Pinus edulis	134	274	184	195	2.8	2.4	3.9	2.9

BASIC COVER--

Management unit 13B, Study no: 9

Cover Type	Average Cover %				
	'86	'95	'00	'05	'10
Vegetation	2.00	27.71	32.60	22.95	34.04
Rock	7.00	15.66	11.94	11.42	13.64
Pavement	1.75	.52	6.53	1.84	4.97
Litter	55.50	41.47	50.87	37.79	44.57
Cryptogams	1.00	.80	1.73	.43	1.50
Bare Ground	32.75	26.00	28.85	37.29	26.26

SOIL ANALYSIS DATA --

Management unit 13B, Study no: 9, Study Name: Steamboat East Bench

Effective rooting depth (in)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
11.7	7.3	57.6	17.1	25.2	2.0	2.0	80.0	0.6

PELLET GROUP DATA--

Management unit 13B, Study no: 9

Type	Quadrat Frequency			
	'95	'00	'05	'10
Rabbit	17	15	28	19
Elk	9	-	8	3
Deer	6	10	16	10
Cattle	-	1	2	2

Days use per acre (ha)		
'00	'05	'10
-	-	-
7 (19)	7 (18)	7 (17)
17 (42)	3 (6)	16 (40)
-	5 (13)	8 (20)

BROWSE CHARACTERISTICS--

Management unit 13B, Study no: 9

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Amelanchier utahensis</b>									
86	0	0	0	-	-	0	0	0	-/-
95	20	100	0	-	40	0	0	0	119/169
00	0	0	0	-	-	0	0	0	109/167
05	20	100	0	-	-	0	0	0	89/119
10	20	100	0	-	20	0	0	0	69/98
<b>Artemisia nova</b>									
86	1198	31	36	33	-	50	6	6	8/11
95	440	27	68	5	40	55	18	0	10/18
00	440	5	95	0	-	5	0	0	7/17
05	400	10	55	35	40	5	20	0	9/21
10	300	27	60	13	-	0	0	7	10/22
<b>Artemisia tridentata wyomingensis</b>									
86	132	25	25	50	-	50	25	25	5/7
95	120	17	50	33	-	0	33	0	14/22
00	40	0	100	0	-	0	100	0	9/17
05	0	0	0	0	-	0	0	0	14/20
10	120	17	83	0	-	67	0	0	11/24
<b>Atriplex canescens</b>									
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	31/39
10	0	0	0	-	-	0	0	0	35/36
<b>Cercocarpus montanus</b>									
86	0	0	0	0	-	0	0	0	-/-
95	240	50	42	8	40	8	0	8	68/94
00	120	33	50	17	-	17	0	0	74/92
05	240	67	17	17	-	42	8	8	55/59
10	200	50	40	10	120	20	10	10	48/51

		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 nauseosus hololeucus</i>										
86	0	0	0	-	-	0	0	0	-/-	
95	0	0	0	-	-	0	0	0	43/56	
00	0	0	0	-	-	0	0	0	-/-	
05	0	0	0	-	-	0	0	0	-/-	
10	0	0	0	-	-	0	0	0	43/68	
<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	40	0	100	-	-	0	0	0	6/11	
<i>Ephedra viridis</i>										
86	0	0	0	-	-	0	0	0	-/-	
95	20	0	100	-	-	0	0	0	34/35	
00	20	0	100	-	-	0	0	0	33/57	
05	20	0	100	-	-	100	0	0	33/57	
10	20	0	100	-	-	0	0	0	39/55	
<i>Gutierrezia sarothrae</i>										
86	1565	15	83	2	-	0	0	0	8/10	
95	1680	8	88	4	260	0	0	1	9/13	
00	1300	3	68	29	-	0	0	29	6/11	
05	700	9	89	3	20	0	0	3	15/23	
10	1640	9	90	1	-	0	0	1	7/12	
<i>Juniperus osteosperma</i>										
86	0	0	0	0	33	0	0	0	-/-	
95	0	0	0	0	-	0	0	0	-/-	
00	140	14	86	0	-	0	0	0	-/-	
05	160	25	63	13	-	0	0	0	-/-	
10	120	17	83	0	20	0	0	0	-/-	
<i>Opuntia sp.</i>										
86	0	0	0	-	-	0	0	0	-/-	
95	20	0	100	-	-	0	0	0	3/11	
00	40	0	100	-	-	0	0	0	3/12	
05	40	0	100	-	-	0	0	0	3/13	
10	80	0	100	-	-	0	0	50	14/16	
<i>Pinus edulis</i>										
86	331	30	60	10	-	0	0	10	81/39	
95	0	0	0	0	20	0	0	0	-/-	
00	460	52	48	0	20	0	0	0	-/-	
05	460	35	65	0	-	0	0	0	-/-	
10	340	71	29	0	20	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>Purshia tridentata</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	34/48	
10	0	0	0	-	-	0	0	0	41/91	
<i>Sclerocactus sp.</i>										
86	0	0	0	-	-	0	0	0	-/-	
95	40	50	50	-	-	0	0	0	11/8	
00	160	0	100	-	-	0	0	0	5/7	
05	40	0	100	-	-	0	0	0	5/6	
10	20	0	100	-	-	0	0	0	5/4	
<i>Symphoricarpos oreophilus</i>										
86	0	0	0	-	-	0	0	0	-/-	
95	20	0	100	-	-	0	0	0	30/57	
00	20	0	100	-	-	0	0	0	-/-	
05	100	0	100	-	-	0	0	0	32/59	
10	0	0	0	-	-	0	0	0	29/53	
<i>Yucca harrimaniae</i>										
86	832	28	68	4	-	0	0	4	12/16	
95	20	0	100	0	-	0	0	0	4/2	
00	40	100	0	0	-	0	0	0	12/13	
05	20	0	100	0	-	0	0	0	11/15	
10	40	0	100	0	-	0	0	0	11/16	