

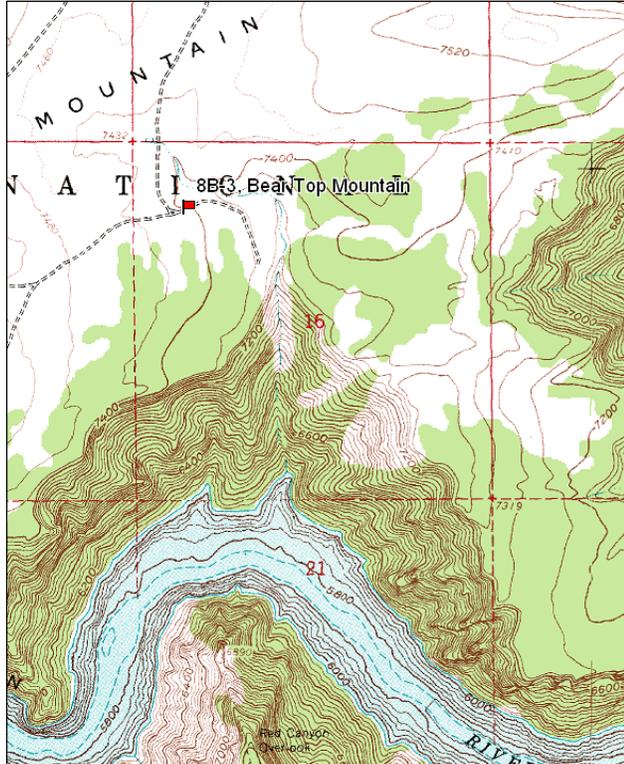
BEAR TOP MOUNTAIN - TREND STUDY NO. 8B-3-10

Vegetation Type: Mountain Big Sagebrush-Grass
Range Type: Substantial Deer Winter, Crucial Elk Year-Long (Calving habitat)
NRCS Ecological Site Description: Not Available
Land Ownership: USFS
Elevation: 7430 ft. (2265 m)
Aspect: Northeast
Slope: 0%-3%
Transect bearing: 165° magnetic
Belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

Directions:

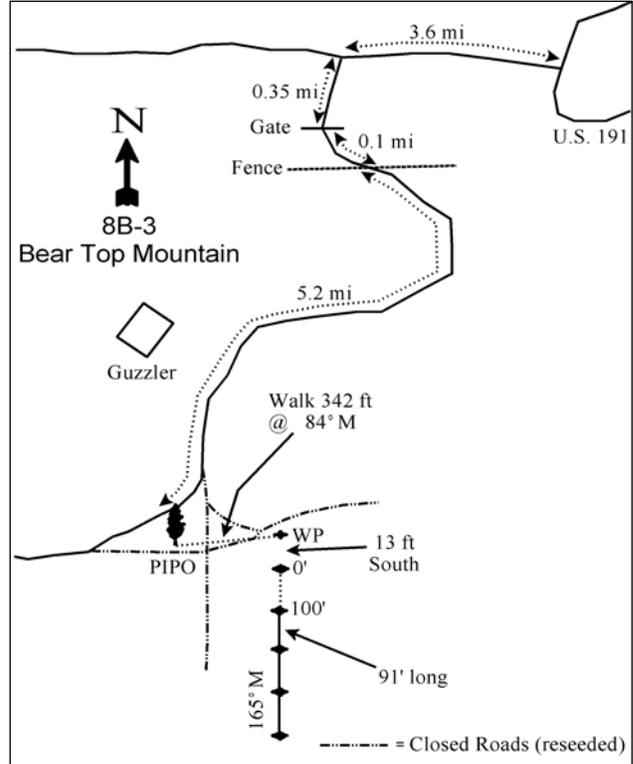
From the intersection of Highway U-260 and U.S. 191 northwest of Dutch John, proceed west towards Antelope Flat campground for 3.6 miles. Turn left, and proceed on the dirt road towards Bear Top Mountain for 0.35 miles to a locked gate. Go through the gate and continue 0.1 miles to a new fence. Continue up the mountain approximately 5.2 miles to a large Ponderosa pine (*Pinus ponderosa*). From the pine, the witness post is 342 feet at 84°M. The 0-foot stake is 13 feet south of the witness post. It is marked with a red browse tag #7095.

Map Name: Flaming Gorge



Township: 2N Range: 21E Section: 16

Diagrammatic Sketch:



GPS: NAD 83, UTM 12T 620899 E 4530310 N

BEAR TOP MOUNTAIN - TREND STUDY NO. 8B-3

Site Information

Site Description: The study is on U.S. Forest Service managed land on Bear Top Mountain, about a quarter mile from the cliffs overlooking Flaming Gorge Reservoir. Rocky Mountain bighorn sheep were transplanted in the early 1980's and utilize the area as summer range. Two nearby guzzlers provide water for wildlife since livestock have been excluded since the early 1960's. The area was burned in 1998 as part of a prescribed fire to clear the rim of Bear Top Mountain for big horn sheep habitat. However, the fire eliminated most of the shrubs. Antelope, mule deer, elk, bighorn sheep and sage grouse have been observed in close proximity to the site during past readings. Because of the difficulty in differentiating between species; deer, antelope and big horn pellets were all classified as deer. Pellet group transect data has estimated elk and deer/antelope use to be very light to moderately light since 2000. Light use by moose was sampled in 2000. Sage grouse, coyote and marmot droppings were all sampled in the pellet group transect in 2005 (Table - Pellet Group Data).

Browse: The key browse species prior to the fire was a moderately dense stand of mostly mature mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) with low to moderate decadence and moderate to heavy use. The fire removed almost all of the mountain big sagebrush plants and the population is now comprised of a small, scattered stand of mixed young, mature and decadent plants. Utilization of sagebrush has remained moderate to heavy. Other browse species include a small population of heavily used antelope bitterbrush (*Purshia tridentata*), mountain low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *lanceolatus*), gray horsebrush (*Tetradymia canescens*) and low numbers of broom snakeweed (*Gutierrezia sarothrae*) (Table - Browse Characteristics). Mountain low rabbitbrush provided as much cover as mountain big sagebrush in 2010 (Table - Browse Trends).

Herbaceous Understory: Grasses are abundant and diverse on the site, but cheatgrass (*Bromus tectorum*) was abundant on the site in 2010. Cheatgrass was most prevalent in the rocky, shallow soils dispersed throughout the site. Perennial grasses remained abundant in the deeper soils on the site, however. Perennial grass cover increased following the fire. The most common perennial grass species have included needle-and-thread (*Stipa comata*), Letterman needlegrass (*S. lettermani*), bluebunch wheatgrass (*Agropyron spicatum*), thickspike wheatgrass (*A. dasystachyum*), mutton bluegrass (*Poa fendleriana*), Sandberg bluegrass (*P. secunda*) and prairie junegrass (*Koeleria cristata*). Prior to the fire, forbs were abundant, but decreased substantially in cover since 1995. Forbs provided 36% of the vegetation cover with 27 perennial and 7 annual species sampled in 1995. Several desirable forbs including sulfur eriogonum (*Eriogonum umbellatum*) and silvery lupine (*Lupinus argenteus*) also decreased significantly in 2005 and remained rare on the site in 2010. Forbs have been fairly rare on the site since 2000 (Table - Herbaceous Trends).

Soil: The soil texture is a sandy loam with a neutral soil reaction (pH 6.8). Phosphorus may have limited availability for plant growth and development at 4.5 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Bed rock is exposed in many places on the surface, and rock and pavement provide a good amount of protective ground cover. Bare ground cover was high in 2000, but has been low in all other sample years (Table - Basic Cover). The soil erosion condition was classified stable in 2005 and 2010.

Trend Assessments

Browse:

- **1982 to 1988 - up (+2):** The density of the primary browse species, mountain big sagebrush, increased by 45% from 6,265 plants/acre to 9,065 plants/acre. However, decadence also increased from 9% to 25% of the population. Recruitment of young plants remained excellent at 28% of the population.
- **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 of mountain big sagebrush decreased to 11%, but recruitment of young plants also decreased to 12%.

- **1995 to 2000 - down (-2):** The prescribed fire removed nearly all of the shrubs from the site. Mountain big sagebrush decreased by 94% from 5,200 plants/acre to 320 plants/acre and cover decreased from 15% to 1%. Decadence of sagebrush increased to 44%, and there was no new recruitment of young plants.
- **2000 to 2005 - slightly down (-1):** The density of mountain big sagebrush decreased slightly to 240 plants/acre and cover decreased to less than 1%. Decadence of sagebrush decreased slightly, but remained high at 33%. Recruitment of young sagebrush plants comprised 33% of the small population.
- **2005 to 2010 - stable (0):** The mountain big sagebrush density increased to 440 plants/acre, but cover decreased slightly and remained less than 1%. Decadence of sagebrush decreased, but was still moderately high at 23%. Poor vigor also increased from 8% to 23% in the sagebrush population.

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 - down (-2):** The sum of nested frequency of perennial grasses decreased by 32%.
- **1995 to 2000 - slightly up (+1):** The perennial grass sum of nested frequency increased by 18% and cover increased from 8% to 14%.
- **2000 to 2005 - slightly up (+1):** There was only a 6% increase in the sum of nested frequency of perennial grasses, but cover increased to 36% due to a large increase in the cover of needle-and-thread.
- **2005 to 2010 - down (-2):** The sum of nested frequency of perennial grasses decreased by 29% and cover decreased to 25%. Cheatgrass increased significantly in nested frequency and cover increased from less than 1% to 16%.

Forb:

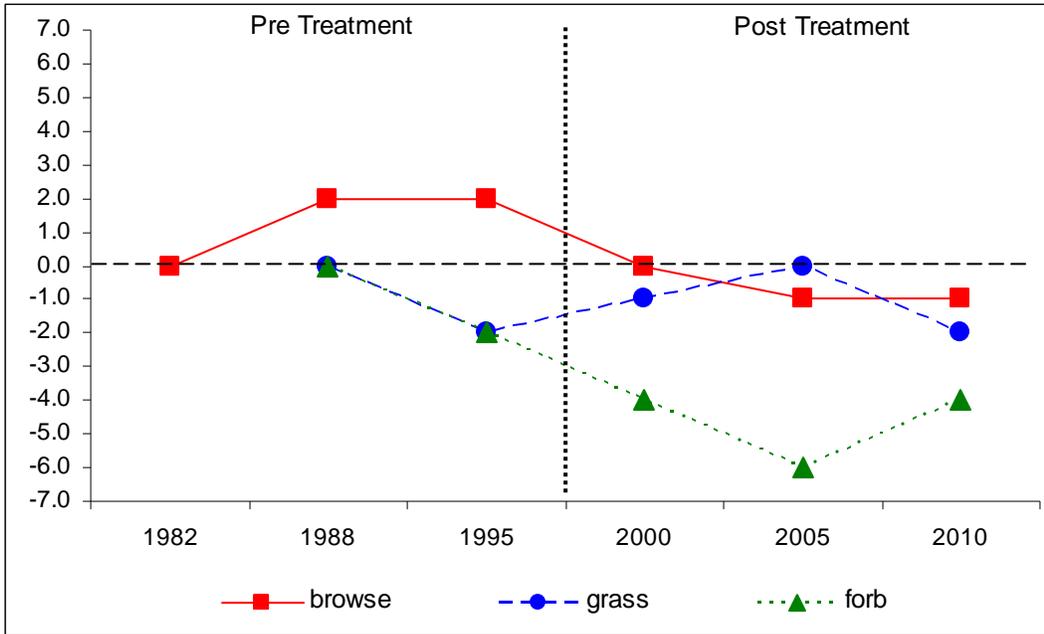
- **1982 to 1988 - no trend (NT):** Only quadrat frequency data for forbs are available from 1982, so no trend was given.
- **1988 to 1995 - down (-2):** The sum of nested frequency of perennial forbs decreased by 21%.
- **1995 to 2000 - down (-2):** There was a 42% decrease in the sum of nested frequency of perennial forbs and cover decreased from 12% to 7%. There was a significant decrease in the nested frequency of sulfur eriogonum.
- **2000 to 2005 - down (-2):** The perennial forb sum of nested frequency decreased by 88% and cover decreased to 1%. The nested frequency of many desirable forbs decreased significantly. Perennial forbs were rare on the site.
- **2005 to 2010 - up (+2):** The sum of nested frequency of perennial forbs increased more than two-fold, but remained below 2000 levels. The cover of perennial forbs increased slightly to 3%, and perennial forbs remained fairly rare.

DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --
Management unit 8B, study no: 3

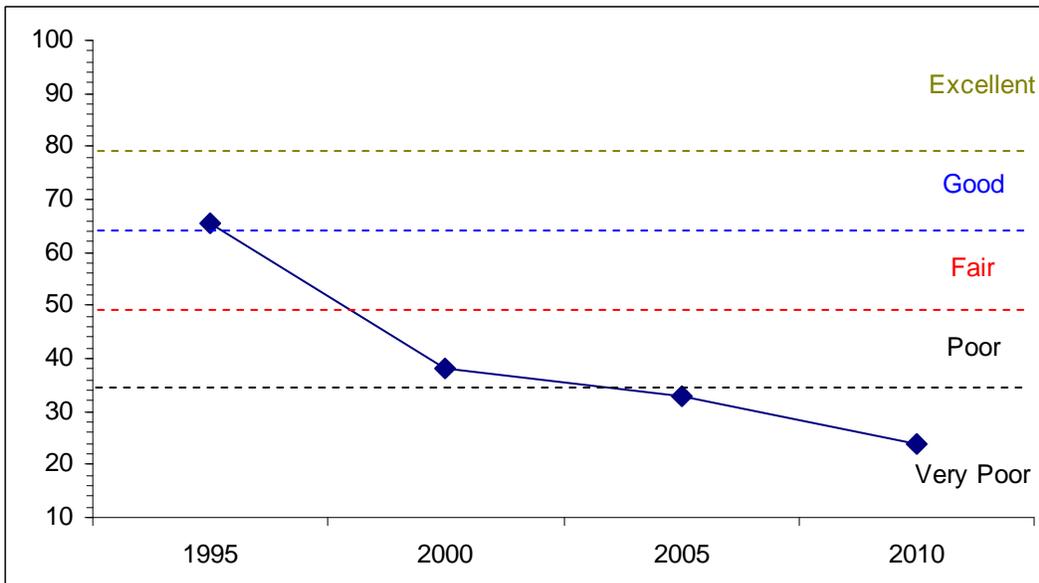
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
95	22.2	12.2	5.1	16.3	-0.2	10.0	0.0	65.6	Fair-Good
00	1.6	0.0	0.0	27.0	-0.5	10.0	0.0	38.1	Poor
05	1.0	0.0	0.0	30.0	-0.1	2.1	0.0	33.0	Very Poor-Poor
10	0.8	0.0	0.0	30.0	-12.3	5.1	0.0	23.7	Very Poor

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 8B, Study no: 3



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL--
Management unit 8B, Study no: 3



HERBACEOUS TRENDS--
Management unit 08B, Study no: 3

T y p e	Species	Nested Frequency					Average Cover %			
		'88	'95	'00	'05	'10	'95	'00	'05	'10
G	Agropyron dasystachyum	a-	c118	d191	d174	b75	1.03	2.88	3.44	1.90
G	Agropyron spicatum	b208	a77	a68	a49	a69	.96	1.82	3.37	3.53
G	Bromus inermis	a-	a-	a-	ab7	b13	-	.00	.53	.65
G	Bromus tectorum (a)	-	a26	a55	a44	b226	.21	.65	.11	16.34
G	Carex sp.	b72	a17	a16	a8	a30	.15	.52	.37	1.02
G	Koeleria cristata	c119	ab13	a9	b29	ab20	.09	.04	1.47	1.21
G	Oryzopsis hymenoides	-	-	-	-	7	-	-	-	.04
G	Poa fendleriana	111	128	129	84	106	2.51	2.37	4.01	4.33
G	Poa secunda	c166	ab105	bc136	bc132	a83	1.27	1.12	4.26	3.59
G	Sitanion hystrix	ab14	bc41	bc34	c57	a2	.45	.82	1.69	.06
G	Sporobolus cryptandrus	-	7	-	-	-	.15	-	-	-
G	Stipa comata	bc129	a82	ab111	c176	ab103	1.50	3.74	16.06	6.36
G	Stipa lettermani	c39	a-	ab2	bc21	b16	-	.15	1.10	1.75
Total for Annual Grasses		0	26	55	44	226	0.20	0.65	0.10	16.34
Total for Perennial Grasses		858	588	696	737	524	8.15	13.49	36.33	24.47
Total for Grasses		858	614	751	781	750	8.36	14.14	36.44	40.81
F	Agoseris glauca	a-	b27	c63	a-	a-	.05	.48	-	-
F	Allium sp.	a-	b10	a-	a-	a-	.03	-	-	-
F	Androsace septentrionalis (a)	-	2	-	-	-	.01	-	-	-
F	Antennaria rosea	c124	b41	ab30	a4	ab21	.86	.33	.06	.89
F	Arabis sp.	11	3	2	1	5	.00	.00	.00	.01
F	Arenaria sp.	ab7	b17	a3	ab6	ab6	.23	.15	.02	.09
F	Aster sp.	a-	b23	a-	a2	ab9	.12	-	.03	.07
F	Astragalus convallarius	7	14	-	1	6	.10	-	.00	.09
F	Astragalus sp.	-	-	-	2	-	-	-	.03	-
F	Balsamorhiza sagittata	ab5	b9	b11	a-	a-	.69	.68	-	-
F	Calochortus nuttallii	-	3	-	-	-	.00	-	-	-
F	Collinsia parviflora (a)	-	a148	a100	b39	b50	2.28	.30	.13	.20
F	Comandra pallida	a-	ab13	b14	a-	a3	.25	.09	-	.03
F	Crepis acuminata	a-	b9	a-	a-	a1	.03	-	-	.00
F	Cymopterus sp.	a-	b10	a-	a-	a-	.05	-	-	-
F	Descurainia pinnata (a)	-	a-	a1	b55	a1	-	.00	.20	.00
F	Draba sp. (a)	a-	ab12	a1	b20	a-	.02	.00	.04	-
F	Erigeron flagellaris	-	2	5	-	3	.00	.06	-	.03
F	Erigeron pumilus	c83	b20	ab6	a-	a-	.19	.04	-	-
F	Eriogonum umbellatum	c79	c78	b30	a4	a7	2.25	1.48	.78	.96
F	Gayophytum ramosissimum(a)	-	a8	a7	b32	b26	.02	.01	.07	.06
F	Heterotheca villosa	bc31	c50	b20	a-	a-	.83	.22	-	-
F	Lepidium sp. (a)	-	b9	a-	a-	ab4	.02	-	-	.01
F	Linum lewisii	b38	a4	a6	a3	a2	.01	.01	.01	.03
F	Lithospermum ruderales	b18	ab4	ab8	a-	a2	.19	.04	-	.03
F	Lupinus argenteus	c176	b100	b91	a1	a2	1.97	1.92	.00	.03
F	Lychnis drummondii	a-	a-	a-	a1	b8	-	-	.03	.10

Type	Species	Nestled Frequency					Average Cover %			
		'88	'95	'00	'05	'10	'95	'00	'05	'10
F	<i>Machaeranthera canescens</i>	7	-	-	-	5	-	-	-	.03
F	<i>Mertensia fusiformis</i>	-	-	1	-	-	-	.00	-	-
F	<i>Orthocarpus tolmiei</i> (a)	-	b35	a7	a	a	.15	.04	-	-
F	<i>Penstemon humilis</i>	b11	a-	a1	a-	a-	-	.03	-	-
F	<i>Petradoria pumila</i>	b7	c31	bc17	a-	a-	1.41	.86	-	-
F	<i>Phlox longifolia</i>	b59	a3	a7	a2	a1	.01	.04	.00	.00
F	<i>Phlox multiflora</i>	c66	bc66	b30	a-	a3	2.30	.26	-	.03
F	<i>Polygonum douglasii</i> (a)	-	c60	a-	b5	c87	.13	-	.02	.86
F	<i>Sedum lanceolatum</i>	b76	b100	a24	a12	a1	.42	.10	.03	.03
F	<i>Senecio integerrimus</i>	-	-	6	-	-	-	.01	-	-
F	<i>Trifolium gymnocarpon</i>	18	16	7	6	20	.03	.01	.04	.08
F	<i>Zigadenus</i> sp.	4	-	-	-	-	-	-	-	-
Total for Annual Forbs		0	274	116	151	168	2.65	0.37	0.47	1.13
Total for Perennial Forbs		827	653	382	45	105	12.10	6.86	1.05	2.57
Total for Forbs		827	927	498	196	273	14.75	7.24	1.52	3.71

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

BROWSE TRENDS--

Management unit 08B, Study no: 3

Type	Species	Strip Frequency				Average Cover %			
		'95	'00	'05	'10	'95	'00	'05	'10
B	<i>Artemisia tridentata vaseyana</i>	88	9	8	11	14.65	1.29	.80	.66
B	<i>Ceanothus fendleri</i>	0	1	1	1	-	.18	-	.03
B	<i>Chrysothamnus viscidiflorus lanceolatus</i>	25	21	13	15	.75	.20	.15	.78
B	<i>Gutierrezia sarothrae</i>	3	4	9	15	-	.21	.36	.51
B	<i>Juniperus osteosperma</i>	0	0	0	1	.15	-	-	-
B	<i>Pediocactus simpsonii</i>	10	6	1	1	.01	.02	-	.03
B	<i>Purshia tridentata</i>	6	1	1	1	2.59	.01	-	-
B	<i>Tetradymia canescens</i>	4	1	4	5	.03	.00	.33	.56
Total for Browse		136	43	37	50	18.19	1.91	1.64	2.57

CANOPY COVER, LINE INTERCEPT--

Management unit 08B, Study no: 3

Species	Percent Cover	
	'05	'10
<i>Artemisia tridentata vaseyana</i>	.43	.33
<i>Chrysothamnus viscidiflorus lanceolatus</i>	.30	1.35
<i>Gutierrezia sarothrae</i>	.23	1.03
<i>Pediocactus simpsonii</i>	-	.03
<i>Purshia tridentata</i>	.06	.21
<i>Tetradymia canescens</i>	.08	.61

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 08B, Study no: 3

Species	Average leader growth (in)	
	'05	'10
Artemisia tridentata vaseyana	1.8	1.9

BASIC COVER--

Management unit 08B, Study no: 3

Cover Type	Average Cover %					
	'82	'88	'95	'00	'05	'10
Vegetation	12.00	12.00	38.31	27.03	42.22	50.84
Rock	1.00	4.75	11.07	13.54	11.35	10.62
Pavement	0	0	.04	.57	.02	0
Litter	58.25	59.75	46.33	23.65	38.11	58.27
Cryptogams	2.25	4.50	3.25	.76	.18	1.70
Bare Ground	26.50	19.00	16.85	49.63	16.60	7.84

SOIL ANALYSIS DATA --

Management unit 8B, Study no: 3, Study Name: Bear Top Mountain

Effective rooting depth (in)	pH	sandy loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
10.4	6.8	65.4	19.7	14.9	2.2	4.5	201.6	0.9

PELLET GROUP DATA--

Management unit 08B, Study no: 3

Type	Quadrat Frequency			
	'95	'00	'05	'10
Rabbit	3	6	26	2
Moose	-	15	-	-
Grouse	-	2	2	1
Elk	7	5	14	9
Deer/Antelope /Big Horn	16	9	6	9
Cattle	-	-	1	-

Days use per acre (ha)		
'00	'05	'10
-	-	-
16 (39)	-	-
9/acre	9/acre	-
7 (18)	29 (71)	21 (51)
24 (60)	7 (18)	27 (66)
-	-	-

BROWSE CHARACTERISTICS--
Management unit 08B, Study no: 3

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>Amelanchier utahensis</i>									
82	0	0	0	-	-	0	0	0	-/-
88	0	0	0	-	-	0	0	0	-/-
95	0	0	0	-	-	0	0	0	13/21
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	-/-
10	0	0	0	-	-	0	0	0	-/-
<i>Artemisia tridentata vaseyana</i>									
82	6265	24	67	9	66	21	1	2	15/24
88	9065	28	47	25	-	42	1	2	16/18
95	5200	12	77	11	40	33	60	4	15/29
00	320	0	56	44	20	38	0	6	12/29
05	240	33	33	33	140	17	50	8	12/26
10	440	32	45	23	-	9	55	23	13/26
<i>Ceanothus fendleri</i>									
82	0	0	0	-	-	0	0	0	-/-
88	0	0	0	-	-	0	0	0	-/-
95	0	0	0	-	-	0	0	0	-/-
00	20	0	100	-	-	0	0	0	8/18
05	20	0	100	-	-	0	0	0	5/18
10	20	0	100	-	-	100	0	0	7/28
<i>Chrysothamnus viscidiflorus lanceolatus</i>									
82	2331	46	37	17	66	0	0	17	8/12
88	3531	57	32	11	-	8	2	9	9/11
95	940	4	94	2	-	0	0	0	10/15
00	880	34	66	0	-	0	0	0	4/5
05	360	0	100	0	-	0	0	0	9/14
10	380	0	100	0	-	0	0	0	14/24
<i>Gutierrezia sarothrae</i>									
82	0	0	0	0	-	0	0	0	-/-
88	66	0	100	0	-	0	0	0	5/6
95	60	33	67	0	-	0	0	0	4/4
00	140	0	100	0	-	0	0	0	6/13
05	1080	61	37	2	-	0	0	0	7/12
10	860	28	60	12	220	0	0	12	7/13

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
Juniperus osteosperma									
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	20	100	0	-	-	0	0	0	-/-
Pediocactus simpsonii									
82	0	0	0	0	-	0	0	0	-/-
88	0	0	0	0	-	0	0	0	-/-
95	220	9	91	0	-	0	0	0	2/2
00	160	25	63	13	20	0	0	13	2/16
05	20	0	100	0	-	0	0	0	1/2
10	20	0	100	0	-	0	0	0	2/3
Purshia tridentata									
82	0	0	0	-	-	0	0	0	-/-
88	0	0	0	-	-	0	0	0	-/-
95	120	0	100	-	-	33	50	0	20/78
00	20	0	100	-	40	0	0	0	4/9
05	20	0	100	-	-	0	100	0	11/39
10	20	0	100	-	-	0	100	0	14/40
Tetradymia canescens									
82	199	0	33	67	-	0	0	67	17/8
88	133	0	100	0	-	100	0	0	13/18
95	120	0	83	17	-	0	0	0	10/13
00	80	0	100	0	-	0	0	0	-/-
05	80	25	75	0	-	0	0	0	8/16
10	120	0	100	0	-	83	0	0	11/18