

STAEMBOAT MESA SOUTH - TREND STUDY NO. 13B-8-10

Vegetation Type: Wyoming Big Sagebrush

Range Type: Crucial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: Not Available

Land Ownership: BLM

Elevation: 6500 ft. (1982 m)

Aspect: Southwest

Slope: 4%

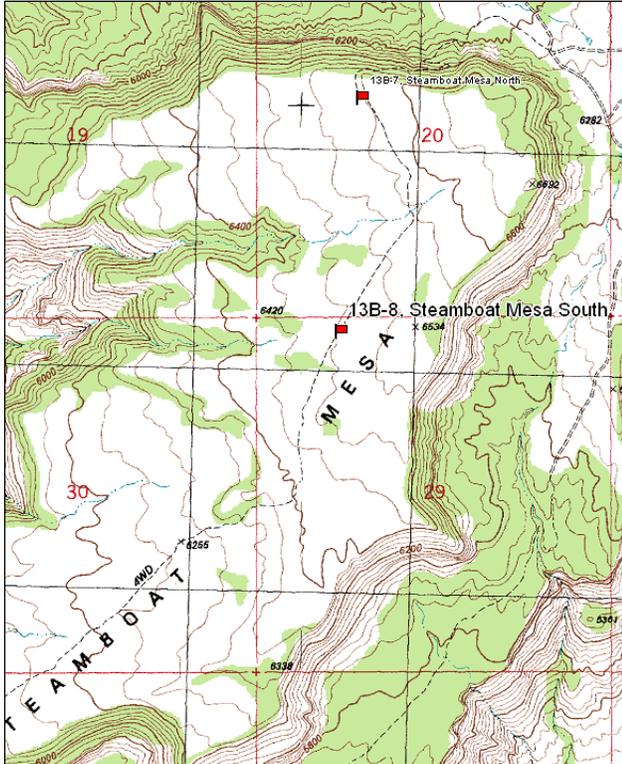
Transect bearing: 165° magnetic

Belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

Directions:

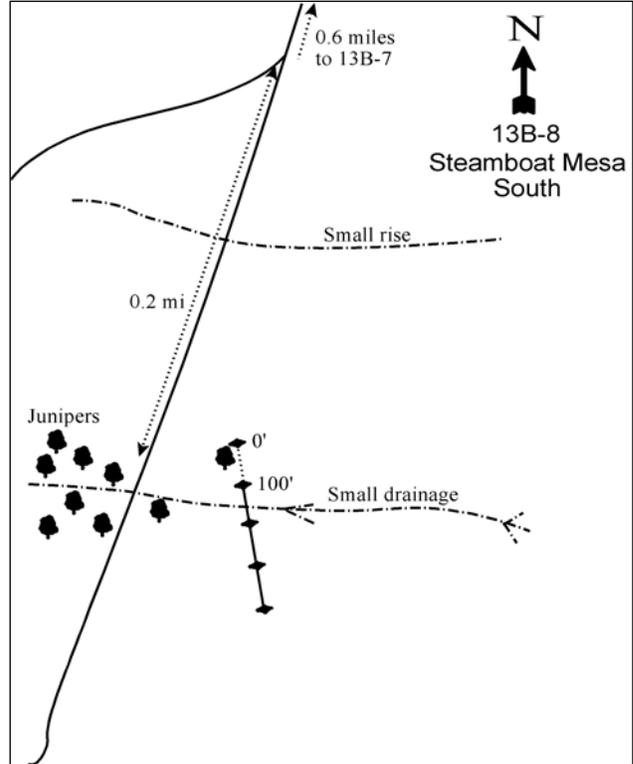
Start from site number 13B-7, Steamboat Mesa North. Continue south on the same road for 0.6 miles to a fork. Proceed straight 0.2 miles (halfway to an enclosure) to a large Juniper in a sagebrush-grass flat. The baseline 0-foot stake (tag #7812) is located north of the tree.

Map Name: Steamboat Mesa



Township: 23S Range: 26E Section: 29

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 666589 E 4294353 N

STEAMBOAT MESA SOUTH - TREND STUDY NO. 13B-8

Site Information

Site Description: Located approximately three-quarters of a mile south of study site 13B-7, the Steamboat Mesa South site samples a habitat type once dominated by native vegetation, although not in a completely natural condition. This open rolling site may be an example of a former sagebrush park undergoing a conversion to an annual grass-sagebrush type due to excessive livestock use. A large enclosure is located to the south of the study. The Steamboat Mesa fire burned 172 acres on and around the site in the summer of 2009, removing nearly all of the browse species. Grazing in the area is managed by the Bureau of Land Management (BLM) as part of the Steamboat Mesa allotment. Two pellet group transects are also located on Steamboat Mesa. The lower elevation transect (6,300 feet) showed an average of 27 deer days use/acre (67 ddu/ha) between 1986 and 1997. The pellet transect located at 6,700 feet, and closer to this study, averaged 23 deer days use/acre (56 ddu/ha) for the same time period. Pellet group data collected along the transect indicated heavy deer use in 2000, light deer use in 2005, and moderately heavy deer use in 2010. The estimated cattle use has decreased from moderate use in 2000 to light use in 2010. Estimated elk use has been very light since 2005 (Table - Pellet Group Data).

Browse: Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) was the key browse species before the 2009 burn. Prior to the fire, the sagebrush population was comprised of a mixture of young and smaller mature plants with moderate to very heavy use. Following the fire, only several young sagebrush plants were sampled and there was no measurable cover (Table - Browse Trends). Winterfat (*Ceratoides lanata*) was also sampled on this site, but in very low numbers (Table - Browse Characteristics). Escape and thermal cover is provided by scattered Utah juniper (*Juniperus osteosperma*) trees along washes and ridge tops. Most of the trees have been highlined and many were burnt in the fire.

Herbaceous Understory: Grasses are fairly diverse, but are dominated by the annual species cheatgrass (*Bromus tectorum*). The native perennial species needle and thread (*Stipa comata*) has been prevalent, but has fluctuated substantially in nested frequency and cover over the sample years. Other common perennial species include galleta (*Hilaria jamesii*), Indian ricegrass (*Oryzopsis hymenoides*) and Sandberg bluegrass (*Poa secunda*). The weedy species bulbous bluegrass (*Poa bulbosa*) became more abundant in 2010, following the fire. Forbs are diverse on the site, but are not overly abundant. Scarlet globemallow (*Sphaeralcea coccinea*) is the dominant perennial forb, and the only forb that provided over 1% cover (Table - Herbaceous Trends). It was noted in 2010 that many of the herbaceous plants had vigorous growth, likely from released resources from the fire.

Soil: The soil texture is a sandy clay loam with a neutral soil reaction (pH 6.9). Phosphorous may have limited availability for plant growth and development at only 4.9 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Bare ground cover has fluctuated with the increases and decreases of vegetation cover that is provided primarily by annual species (Table - Basic Cover). This helps illustrate the point that you cannot depend on annuals to provide consistent litter or vegetation cover from year to year. 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. The levels of decadence and poor vigor remained good in the primary browse species, Wyoming big sagebrush. Recruitment of young sagebrush plants was very high at nearly half of the population.
- **1995 to 2000 - stable (0):** The density of Wyoming big sagebrush increased by 53% from 1,620 plants/acre to 2,480 plants/acre, but there was little change in cover. Much of the increase in density is due to an increase in the recruitment of young sagebrush plants, which is very high at 50%.

- **2000 to 2005 - slightly down (-1):** Wyoming big sagebrush density decreased 38% to 1,540 plants/acre, though cover again remained similar. The change in density was due to a large decrease in the recruitment of young plants, but recruitment remained good at 13%. However, decadence in sagebrush increased to 21% and plants displaying poor vigor increased to 23%.
- **2005 to 2010 - down (-2):** A wildfire removed nearly all of the browse from this site.

Grass:

- **1986 to 1995 - slightly down (-1):** The sum of nested frequency of perennial grasses remained similar, but there was a negative change in the composition of perennial grasses. There was a significant decrease in the nested frequency of needle and thread and a significant increase in the low growing, early germinating species Sandberg bluegrass.
- **1995 to 2000 - up (+2):** The perennial grass sum of nested frequency increased by 31% and cover increased from 3% to 20%. There was a significant increase in the nested frequency of needle and thread and a significant decrease in the nested frequency of cheatgrass.
- **2000 to 2005 - down (-2):** The sum of nested frequency of perennial grasses decreased by 52% and cover decreased to 5%. There was a significant increase in the nested frequency of cheatgrass and cheatgrass cover increased from 3% to 52%.
- **2005 to 2010 - slightly up (+1):** There was a 15% increase in the sum of nested frequency of perennial grasses and cover increased to 6%. Cheatgrass decreased significantly in nested frequency and cover decreased to 15%.

Forb:

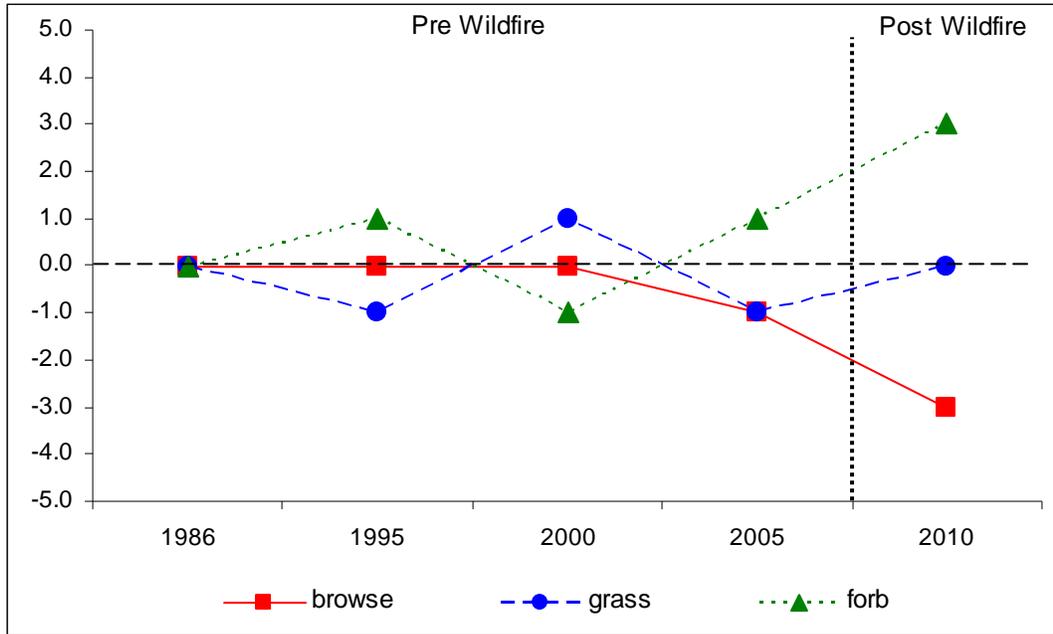
- **1986 to 1995 - slightly up (+1):** The sum of nested frequency of perennial forbs increased by 20% due to a significant increase in the nested frequency of segolily (*Calochortus nuttallii*), woolly milkvetch (*Astragalus mollissimus*) and prickly lettuce (*Lactuca serriola*). However, there was a significant decrease in the dominant perennial forb scarlet globemallow.
- **1995 to 2000 - down (-2):** The perennial forb sum of nested frequency decreased by 81% and cover decreased from 2% to less than 1%. There was also a substantial decrease in annual forb frequency.
- **2000 to 2005 - up (+2):** There was over a two-fold increase in the sum of nested frequency of perennial forbs and cover increased to 3%. Almost all of the increase was due to a significant increase in the nested frequency of scarlet globemallow.
- **2005 to 2010 - up (+2):** The perennial forb sum of nested frequency again increased more than two-fold and cover increased to 7%. Again, most of the increase was due to a significant increase in the nested frequency of scarlet globemallow, but the nested frequency of segolily increased significantly as well.

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --
Management unit 13B, study no: 8

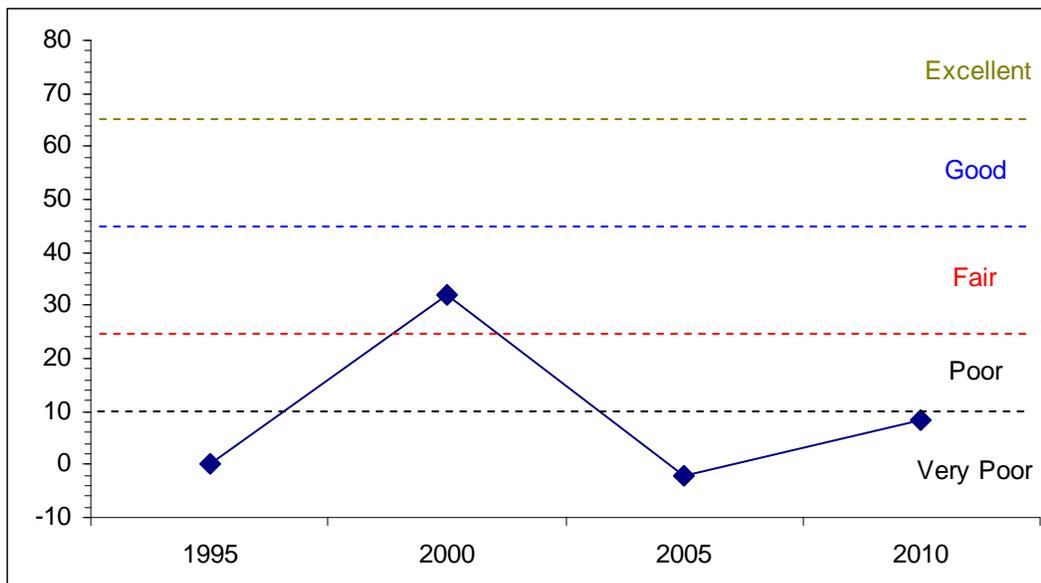
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
95	1.9	0.0	0.0	6.0	-12.1	4.4	0.0	0.2	Very Poor
00	2.9	0.0	0.0	30.0	-2.3	1.4	0.0	32.0	Fair
05	3.1	0.0	0.0	8.7	-20.0	6.2	0.0	-2.0	Very Poor
10	0.0	0.0	0.0	9.4	-11.1	10.0	0.0	8.3	Very Poor-Poor

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 13B, Study no: 8



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--
Management unit 13B, Study no: 8



HERBACEOUS TRENDS--
Management unit 13B, Study no: 8

Type	Species	Nested Frequency					Average Cover %			
		'86	'95	'00	'05	'10	'95	'00	'05	'10
G	Agropyron cristatum	a-	a7	a-	a2	b27	.01	-	.38	.82
G	Bromus tectorum (a)	-	c341	a181	d379	b302	15.05	3.09	51.76	14.73
G	Hilaria jamesii	a17	b52	b52	a18	a10	.79	1.58	.25	.06
G	Oryzopsis hymenoides	6	20	7	14	14	.77	.21	.60	.19
G	Poa bulbosa	a-	a-	a-	a6	b29	-	-	.18	1.52
G	Poa fendleriana	c26	bc16	ab5	a-	ab3	.05	.16	.00	.03
G	Poa secunda	a-	c117	b54	b53	c101	.65	.52	.78	2.44
G	Sitanion hystrix	b11	a-	a-	a-	a-	-	-	-	-
G	Sporobolus cryptandrus	a7	a-	b19	a-	a-	-	.81	-	-
G	Stipa comata	c257	b91	c260	b98	a36	.70	16.47	2.30	1.16
G	Vulpia octoflora (a)	-	b231	a6	a25	a21	1.08	.01	.40	.05
Total for Annual Grasses		0	572	187	404	323	16.14	3.11	52.16	14.78
Total for Perennial Grasses		324	303	397	191	220	2.99	19.77	4.51	6.23
Total for Grasses		324	875	584	595	543	19.14	22.88	56.68	21.01
F	Astragalus mollissimus	a-	b29	a-	b15	b12	.24	-	.09	.03
F	Astragalus sp.	-	-	-	-	4	-	-	-	.01
F	Calochortus nuttallii	a-	c59	a-	b14	a78	.14	-	.04	1.20
F	Cymopterus sp.	-	6	-	-	10	.01	-	-	.16
F	Descurainia pinnata (a)	-	-	-	6	2	-	-	.02	.00
F	Draba nemorosa (a)	-	b15	c51	a-	b14	.02	.16	-	.04
F	Erigeron pumilus	a-	a-	b11	a-	c30	.00	.02	-	.55
F	Erodium cicutarium (a)	-	a-	b16	a-	b15	-	.03	-	.57
F	Gilia hutchinifolia (a)	-	b32	a2	a1	b30	.08	.00	.00	.26
F	Grindelia squarrosa	-	1	-	-	-	.00	-	-	-
F	Hedysarum sp.	-	6	-	-	-	.18	-	-	-
F	Heterotheca villosa	-	-	-	-	3	-	-	-	.00
F	Lactuca serriola	a-	b30	a-	a2	a9	.08	-	.00	.02
F	Lappula occidentalis (a)	-	b16	a-	a-	c32	.06	-	-	.18
F	Lepidium densiflorum (a)	-	c201	a-	d236	b38	.95	-	2.82	.10
F	Leucelene ericoides	-	9	10	6	-	.16	.33	.30	-
F	Lupinus sp.	-	-	-	-	5	-	-	-	.01
F	Machaeranthera grindelioides	a-	b10	a-	ab3	a-	.03	-	.01	-
F	Microsteris gracilis (a)	-	-	-	-	1	-	-	-	.00
F	Phlox hoodii	-	4	-	-	-	.03	-	-	-
F	Phlox longifolia	-	4	-	2	-	.01	-	.00	-
F	Plantago patagonica (a)	-	c232	b64	c248	a2	2.34	.22	5.65	.00
F	Polygonum douglasii (a)	-	2	-	-	4	.00	-	-	.01
F	Ranunculus testiculatus (a)	-	3	-	-	7	.00	-	-	.02
F	Schoenocrambe linifolia	a-	b35	a-	a5	a5	.08	-	.09	.01
F	Sisymbrium altissimum (a)	-	c50	a-	c58	b8	.18	-	.59	.05
F	Sphaeralcea coccinea	c207	b108	a45	b111	c168	1.09	.34	2.56	5.05
F	Tragopogon dubius	c69	b21	a-	a-	a-	.05	-	-	-
F	Trifolium sp.	-	2	-	-	4	.00	-	-	.06

Type	Species	Nested Frequency					Average Cover %			
		'86	'95	'00	'05	'10	'95	'00	'05	'10
F	Unknown forb-perennial	b15	b24	a-	a-	a-	.06	-	-	-
F	Zigadenus paniculatus	-	-	-	-	3	-	-	-	.00
Total for Annual Forbs		0	551	133	549	153	3.66	0.41	9.10	1.25
Total for Perennial Forbs		291	348	66	158	331	2.20	0.69	3.11	7.13
Total for Forbs		291	899	199	707	484	5.86	1.11	12.22	8.39

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

BROWSE TRENDS--

Management unit 13B, Study no: 8

Type	Species	Strip Frequency				Average Cover %			
		'95	'00	'05	'10	'95	'00	'05	'10
B	Artemisia tridentata wyomingensis	40	45	40	1	1.53	2.34	2.50	-
B	Ceratoides lanata	2	2	0	1	-	-	.00	-
B	Gutierrezia sarothrae	0	0	1	0	-	-	-	-
B	Juniperus osteosperma	0	1	0	0	-	-	.00	-
B	Pinus edulis	0	1	1	0	1.82	.98	-	-
Total for Browse		42	49	42	2	3.36	3.32	2.51	0

CANOPY COVER, LINE INTERCEPT--

Management unit 13B, Study no: 8

Species	Percent Cover		
	'00	'05	'10
Artemisia tridentata wyomingensis	-	2.66	-
Ceratoides lanata	-	.51	-
Juniperus osteosperma	3.40	3.79	1.91
Pinus edulis	1.39	1.60	-

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 13B, Study no: 8

Species	Average leader growth (in)	
	'05	'10
Artemisia tridentata wyomingensis	2.1	2.9

BASIC COVER--

Management unit 13B, Study no: 8

Cover Type	Average Cover %				
	'86	'95	'00	'05	'10
Vegetation	6.00	44.37	29.38	70.27	35.05
Rock	0	0	0	0	0
Pavement	0	0	0	0	0
Litter	67.00	60.84	51.45	35.38	37.30
Cryptogams	0	1.98	.86	.05	.68
Bare Ground	27.00	14.81	43.76	10.03	38.33

SOIL ANALYSIS DATA --

Management unit 13B, Study no: 8, Study Name: Steamboat Mesa South

Effective rooting depth (in)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
13.0	6.9	54.6	23.1	25.3	1.4	4.9	67.2	0.5

PELLET GROUP DATA--

Management unit 13B, Study no: 8

Type	Quadrat Frequency				Days use per acre (ha)		
	'95	'00	'05	'10	'00	'05	'10
Rabbit	5	41	2	9	-	-	-
Elk	-	-	1	4	-	2 (5)	13 (33)
Deer	18	33	5	22	86 (212)	13 (33)	68 (167)
Cattle	21	17	12	2	46 (113)	23 (56)	4 (11)

BROWSE CHARACTERISTICS--

Management unit 13B, Study no: 8

		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	2331	51	46	3	133	46	37	0	17/12
95	1620	46	52	2	160	27	1	2	17/25
00	2480	50	48	2	20	28	44	2	14/21
05	1540	13	66	21	20	10	75	23	15/21
10	40	100	0	0	-	0	0	0	11/17
<i>Ceratoides lanata</i>									
86	66	0	100	-	-	0	100	0	14/11
95	60	67	33	-	-	0	0	0	11/16
00	100	0	100	-	-	0	0	0	14/15
05	0	0	0	-	-	0	0	0	16/19
10	20	0	100	-	-	0	0	0	12/22
<i>Chrysothamnus nauseosus</i>									
86	0	0	0	-	-	0	0	0	-/-
95	0	0	0	-	-	0	0	0	-/-
00	0	0	0	-	-	0	0	0	19/28
05	0	0	0	-	-	0	0	0	-/-
10	0	0	0	-	-	0	0	0	-/-
<i>Gutierrezia sarothrae</i>									
86	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	-/-
10	0	0	0	-	-	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>Opuntia</i> sp.										
86	0	0	0	-	-	0	0	0	-/-	
95	0	0	0	-	-	0	0	0	-/-	
00	20	100	0	-	-	0	0	0	-/-	
05	0	0	0	-	-	0	0	0	4/15	
10	0	0	0	-	-	0	0	0	5/15	
<i>Pinus edulis</i>										
86	0	0	0	-	-	0	0	0	-/-	
95	0	0	0	-	-	0	0	0	-/-	
00	20	0	100	-	-	0	0	0	-/-	
05	20	0	100	-	-	0	0	0	-/-	
10	0	0	0	-	-	0	0	0	-/-	