

Trend Study 22-8-08

Study site name: Muley Point .

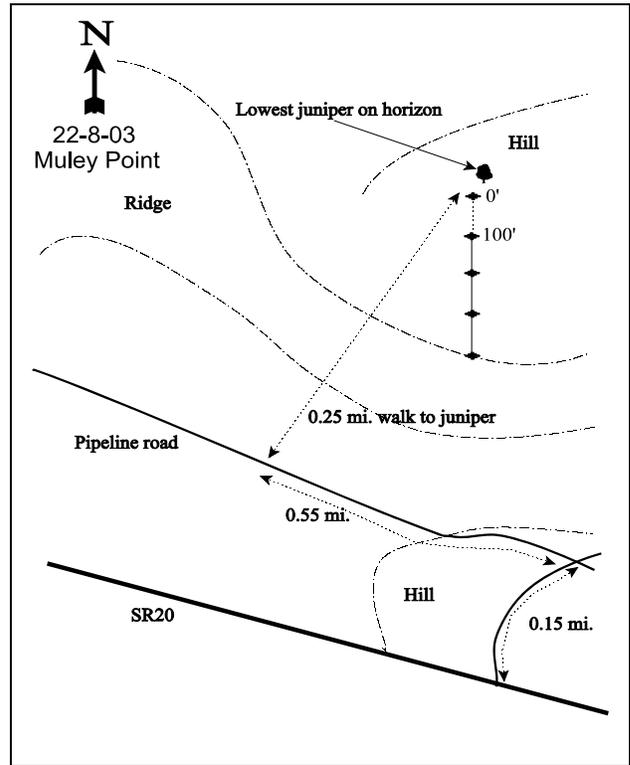
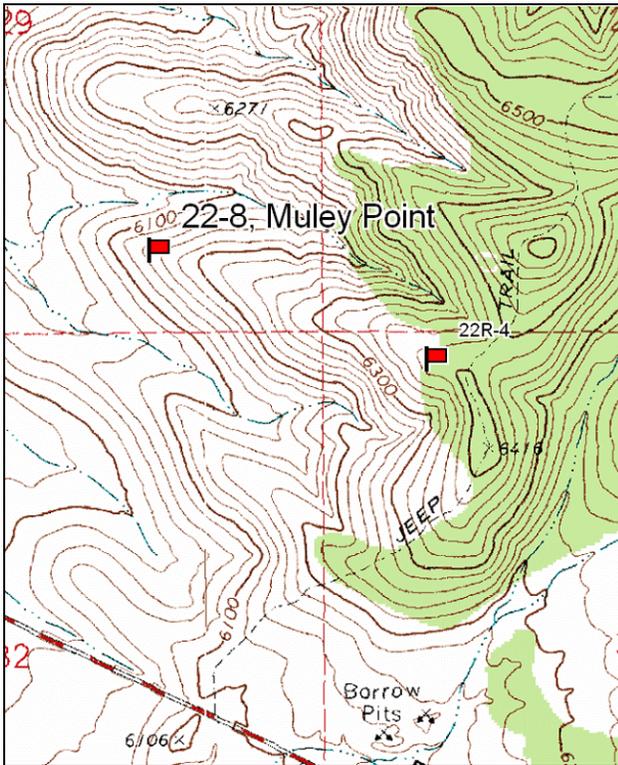
Vegetation type: Wyoming Big Sagebrush .

Compass bearing: frequency baseline 180 degrees magnetic.

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

LOCATION DESCRIPTION

*This site is on private property. Call 435-628-0868 (H&L) for permission. From exit #95 on I-15 (junction with SR 20), go to the east side of the freeway, then go 1.2 miles east from the cattleguard on SR 20 to a small wooden H in the fence on the left. Go north through the gate for 0.15 miles to a 4-way intersection. Turn left on the pipeline road and go 0.55 miles then stop. On the ridge to the north locate the lowest juniper on the skyline. Walk to the juniper which is about 1/4 mile away. The baseline starts 10 feet south of the juniper. The 0-foot stake consists of a 3-foot rebar with browse tag #7051 attached.



Map Name: Buckhorn Flat

Diagrammatic Sketch

Township 31S, Range 7W, Section 29

GPS: NAD 83, UTM 12S 353599 E, 4215390 N

DISCUSSION

Muley Point - Trend Study No. 22-8

Study Information

The Muley Point trend study is located on BLM administered land which lies about one mile east of Interstate 15 and three-fourths of a mile north of Highway 20 [elevation: 6,200 feet (1,890 m), slope: 17-25%, aspect: southwest]. The main vegetation type is Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), although the Lee's Wash Fire consumed nearly all of the sagebrush in 2005. The fire was started by lightning and burned 195 acres. The BLM flew seed onto the burn and harrowed some of the bottoms. It appears that the trend study was not harrowed. The winter range on the adjacent Panguitch unit (28) is increasingly threatened by the elimination of sagebrush and conversion to agricultural fields where deer are excluded. This in effect, concentrates deer use on the remainder of the public land on unit 22 (Beaver). Pinyon-juniper density gradually increases to the east as you approach the mountains and gain elevation. Moderately heavy deer use occurs in the winter as evidenced by pellet group transect data. Deer use was estimated at 80 days use/acre (198 ddu/ha) in 1998 and 83 days use/acre (205 ddu/ha) in 2003. After the fire deer use declined to only 3 deer days use/acre (8 ddu/ha). A few cattle pats were sampled in 2003.

Soil

The soil is classified within the Muleypoint series (USDA-NRCS 2007). Soils from this series were formed in alluvium and colluvium from basic and intermediate igneous rocks. The series consists of shallow soil with a carbonate cemented hardpan, well drained, moderately slowly permeable soils. Soils have a sandy clay loam texture and a neutral pH (7.3). Plant development may be limited due to relatively low amounts of phosphorous (5.8 ppm) (Tiedemann and Lopez 2004). The soil surface is heavily armored by rock and pavement cover which provide on average about 50% combined cover. Rock and pavement are also present throughout the soil profile. Erosion is minimal with little bare soil. After the fire most cover is provided by cheatgrass (*Bromus tectorum*). Litter cover is only fair on this site. The hardpan is about 12 inches below the soil surface which could be limiting to root development. Soils were rated as stable from an erosion condition class assessment completed in 2003 and again in 2008. However, since the fire there are some signs of soil and litter movement.

Browse

Due to the fire this area has lost much of its value as deer winter range. Wyoming big sagebrush was the dominant species prior to the fire. In 1998 and 2003, sagebrush density averaged about 3,200. Decadence has also been high. Sagebrush cover was about 15% prior to the fire. After the fire cover was about 2%. The remaining live sagebrush occurs at the bottom end of the transect and was not burned. Sagebrush density was reduced to 360 plants/acre in 2008. The Above Fremont Wash (22R-4) transect is located about a half mile to the east and is a good comparison site as it was not burned.

Herbaceous Understory

The herbaceous understory continues to be rather sparse and stunted. Photographs from 1985 and 1991 show no or little cheatgrass (*Bromus tectorum*) was present on the site. In 1998 and 2003, cheatgrass was by far the most common grass and provided a fire hazard throughout the shrub interspaces. Frequency and cover of cheatgrass did decline in 2003 with the drought conditions, but was still abundant enough that with normal precipitation presented a serious fire hazard. In 2008, after the wildfire, cheatgrass cover increased to the highest value recorded of 16%. Most of the other grasses and forbs that were found growing under the protection of sagebrush canopies which are no longer present. No seeded species were sampled after the fire.

The most common perennial grasses have been Indian ricegrass (*Oryzopsis hymenoides*) and bottlebrush squirreltail (*Sitanion hystrix*). Indian ricegrass increased in frequency in 2003 while squirreltail declined.

Since the wildfire, there were significant decreases for Indian ricegrass and bottlebrush squirreltail. Several desirable perennial forbs occur on the site including scarlet globemallow (*Sphaeralcea coccinea*).

1991 TREND ASSESSMENT

The key browse species, Wyoming big sagebrush, has decreased in density by 40%, while decadence has more than doubled to 75%. With the high density of 8,132 plants/acre in 1985, this poor site in conjunction with the extended drought has caused a great deal of thinning within the community. Trend for browse is down. The narrative for the herbaceous understory is similar. The sum of nested frequency for both grasses and forbs has dropped substantially since 1985. The only event that can help improve this site is an end to prolonged drought.

browse - down (-2)

grass - down (-2)

forb - down (-2)

1998 TREND ASSESSMENT

The browse trend is stable. Wyoming big sagebrush decadence has declined from a high of 75% in 1991 to 37% in 1998, although this is still higher than an acceptable value of less than 20%. The differences in density between 1991 and 1998 may be due to the change in sampling method. The dense carpet of cheatgrass in the shrub interspaces provides excessive competition for sagebrush seed production and the establishment of seedlings. The trend for perennial grasses is slightly up. There was a slight increase in perennial forb nested frequency, but this cannot compensate for the dominance of cheatgrass. The dense carpet of cheatgrass that was not present in the past is a severe fire hazard which could ultimately eliminate the Wyoming big sagebrush population and the value of this area as deer winter range. The abundance of perennial grasses and forbs needs to increase to help decrease the possibility of a devastating fire.

Winter Range Condition (DCI) - fair (32) low-level potential scale

browse - stable (0)

grass - slightly up (+1)

forb - slightly up (+1)

2003 TREND ASSESSMENT

Trend for browse is stable. Wyoming big sagebrush density declined slightly (6%) due mostly to a decreasing young age class. Trend for the perennial grasses is slightly down with nested frequency values slightly down, but none of the individual downward changes were significant. Perennial forbs sum of nested frequency decreased substantially since the last reading and its trend would be determined as slightly down. One would initially get the impression that cheatgrass was on the decline as cover decreased from 13% down to 5%, however, quadrat frequency still remained at almost 90%. With the right conditions because of its high abundance, it could come back with even higher cover values.

Winter Range Condition (DCI) - fair (30) low level potential scale

browse - stable (0)

grass - slightly down (-1)

forb - slightly down (-1)

2008 TREND ASSESSMENT

Trend for browse is down as the wildfire removed 86% of the Wyoming big sagebrush. Sagebrush quadrat cover has gone from 15% down to only 2%. About 80% of the transect was burned by the wildfire. Trend for the perennial grasses is down as sum of nested frequency has decreased by 60% and is lower than any other reading. Trend for perennial forbs is up. Since the fire, cheatgrass is back to dominating the site by providing 16% cover and nearly 100% quadrat frequency. Without cheatgrass there would not be very much herbaceous cover. The DCI is only 12 because of the wildfire.

Winter Range Condition (DCI) - very poor (-3) low-level potential scale

browse - down (-2)

grass - down (-2)

forb - up (+2)

HERBACEOUS TRENDS --
Management unit 22 , Study no: 8

T y p e	Species	Nested Frequency					Average Cover %		
		'85	'91	'98	'03	'08	'98	'03	'08
G	Aristida purpurea	a-	b11	b26	ab6	a8	.32	.15	.21
G	Bromus tectorum (a)	-	-	b342	a238	b323	13.36	4.50	15.92
G	Hilaria jamesii	a-	a-	ab8	b9	b10	.19	.07	.16
G	Oryzopsis hymenoides	ab44	abc67	bc77	c101	a35	2.42	3.80	.41
G	Poa secunda	-	-	-	-	7	-	-	.01
G	Sitanion hystrix	c179	b101	bc91	b57	a8	1.56	.63	.04
G	Stipa comata	11	-	4	1	1	.04	.01	.01
Total for Annual Grasses		0	0	342	238	323	13.36	4.50	15.92
Total for Perennial Grasses		234	179	206	174	69	4.53	4.68	0.86
Total for Grasses		234	179	548	412	392	17.90	9.18	16.78
F	Astragalus calycosus	-	-	-	-	4	-	-	.39
F	Astragalus cibarius	ab18	b21	b37	a2	a-	5.86	.01	-
F	Astragalus lentiginosus	-	-	-	-	2	-	-	.18
F	Astragalus sp.	a-	a2	a-	a-	b44	-	-	.49
F	Castilleja linariaefolia	-	-	-	-	4	-	-	.03
F	Chaenactis douglasii	b21	b15	a4	a-	a-	.02	-	-
F	Collinsia parviflora (a)	-	-	-	-	5	-	-	.01
F	Cryptantha sp.	-	3	-	-	-	-	-	-
F	Descurainia pinnata (a)	-	-	2	3	5	.03	.01	.01
F	Eriogonum cernuum (a)	bc39	ab10	a1	c41	bc33	.00	.37	.48
F	Erodium cicutarium (a)	-	-	-	1	3	-	.00	.00
F	Gilia sp. (a)	-	-	a-	c28	b11	-	.26	.05
F	Holosteum umbellatum (a)	-	-	-	3	-	-	.00	-
F	Leucelene ericoides	a-	a-	b10	b12	a4	.12	.37	.03
F	Lupinus sp. (a)	-	-	-	-	6	-	-	.04
F	Mentzelia sp.	-	-	-	-	5	-	-	.01
F	Oenothera caespitosa	-	-	-	-	3	-	-	.00
F	Phlox hoodii	-	-	-	1	-	-	.00	-
F	Phlox longifolia	-	-	4	4	1	.01	.01	.00
F	Sisymbrium altissimum (a)	-	-	a-	a-	b159	-	-	4.05
F	Sphaeralcea coccinea	a4	a4	b20	b21	b20	.31	.38	.87
F	Unknown forb-perennial	b14	a-	a-	a-	a-	-	-	-
Total for Annual Forbs		39	10	3	76	222	0.03	0.66	4.65
Total for Perennial Forbs		57	45	75	40	87	6.34	0.78	2.04

T y p e	Species	Nested Frequency					Average Cover %		
		'85	'91	'98	'03	'08	'98	'03	'08
	Total for Forbs	96	55	78	116	309	6.38	1.44	6.69

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

BROWSE TRENDS --

Management unit 22 , Study no: 8

T y p e	Species	Strip Frequency			Average Cover %		
		'98	'03	'08	'98	'03	'08
B	<i>Artemisia tridentata wyomingensis</i>	81	71	12	14.77	14.80	2.32
B	<i>Chrysothamnus viscidiflorus stenophyllus</i>	0	1	1	-	.00	.00
B	<i>Opuntia whipplei</i>	1	0	0	.00	-	-
	Total for Browse	82	72	13	14.77	14.80	2.32

CANOPY COVER, LINE INTERCEPT --

Management unit 22 , Study no: 8

Species	Percent Cover	
	'03	'08
<i>Artemisia tridentata wyomingensis</i>	13.88	.96

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 22 , Study no: 8

Species	Average leader growth (in)	
	'03	'08
<i>Artemisia tridentata wyomingensis</i>	0.9	-

BASIC COVER --

Management unit 22 , Study no: 8

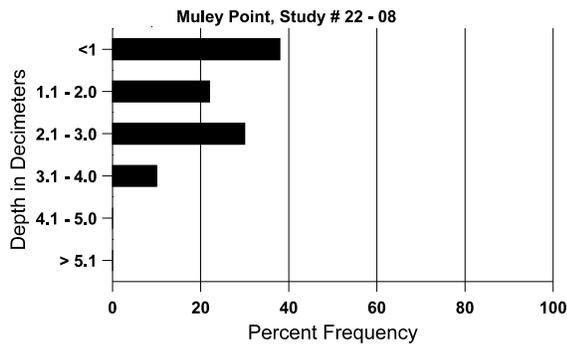
Cover Type	Average Cover %				
	'85	'91	'98	'03	'08
Vegetation	2.00	1.00	33.02	28.21	29.23
Rock	16.25	17.75	17.63	17.90	11.86
Pavement	46.25	42.25	33.62	42.55	26.64
Litter	24.25	28.25	29.89	19.68	39.87
Cryptogams	0	0	.01	.22	.00
Bare Ground	11.25	10.75	11.50	6.22	5.61

SOIL ANALYSIS DATA --

Management unit 22, Study no: 8, Study Name: Muley Point

Effective rooting depth (in)	Temp °F (depth)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
			%sand	%silt	%clay				
11.2	62.4 (13.0)	7.3	52.0	27.4	20.6	1.3	5.8	156.8	0.6

Stoniness Index



PELLET GROUP DATA --

Management unit 22 , Study no: 8

Type	Quadrat Frequency		
	'98	'03	'08
Rabbit	29	14	86
Deer	53	18	9
Cattle	-	-	-

Days use per acre (ha)		
'98	'03	'08
-	-	-
80 (198)	83 (205)	3 (8)
-	1 (2)	-

BROWSE CHARACTERISTICS --
Management unit 22 , Study no: 8

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Artemisia tridentata wyomingensis</i>												
85	8131	133	1199	4666	2266	-	42	0	28	-	6	17/22
91	4865	333	66	1133	3666	-	41	19	75	4	15	17/19
98	3340	40	380	1720	1240	860	63	1	37	14	14	22/28
03	3140	-	40	1880	1220	720	64	24	39	12	13	23/31
08	360	-	40	260	60	120	83	0	17	6	6	19/23
<i>Chrysothamnus viscidiflorus stenophyllus</i>												
85	66	-	-	66	-	-	0	0	-	-	0	9/4
91	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	20	-	-	20	-	-	0	0	-	-	0	6/9
08	20	-	-	20	-	-	0	0	-	-	0	4/6
<i>Coryphantha vivipara</i>												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	11/24
08	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Juniperus osteosperma</i>												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	20	0	0	-	-	0	-/-
<i>Opuntia whipplei</i>												
85	199	-	-	199	-	-	0	0	-	-	0	7/7
91	66	-	-	66	-	-	0	0	-	-	0	8/11
98	20	-	-	20	-	-	0	0	-	-	0	7/12
03	0	-	-	-	-	-	0	0	-	-	0	5/12
08	0	-	-	-	-	-	0	0	-	-	0	-/-