Trend Study 2-25-06

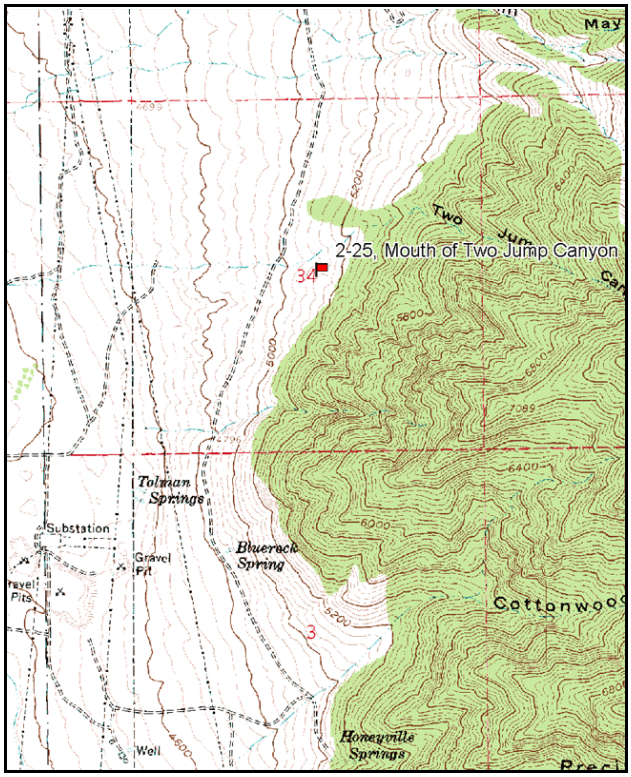
Study site name: Mouth of Two Jump Canyon . Vegetation type: Big Sagebrush .

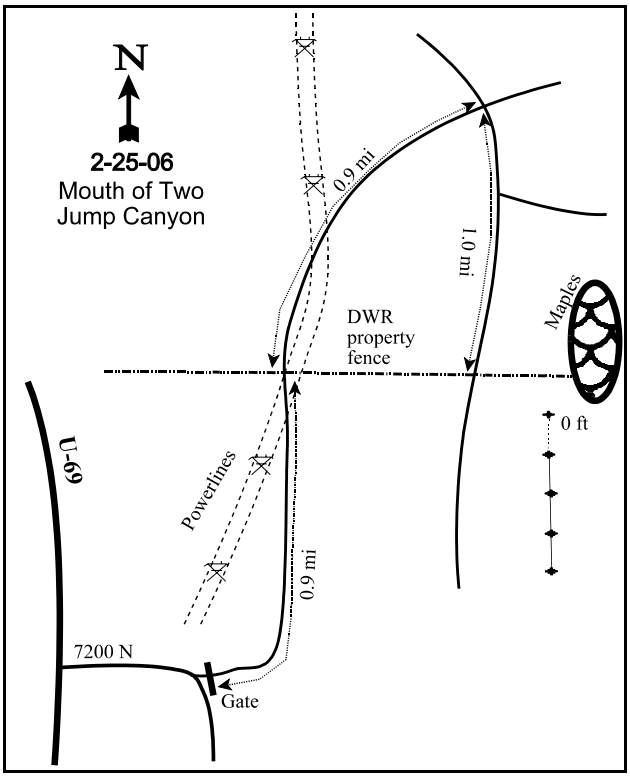
Compass bearing: frequency baseline 165 degrees magnetic.

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

LOCATION DESCRIPTION

From the junction of 7200 North and U-69 in Honeyville, proceed east and north for 0.55 miles to a gate. Proceed 0.9 miles to the north to a fence. Continue another 0.9 miles and turn right (south) and travel 1.0 mile to a fence running east and west. Walk east along the fence (approximately 200 yards) past one maple stand, and stopping at the second which the fence passes through. From where the fence enters the maples walk 16 paces at 244 degrees magnetic to the 0-foot stake of the baseline marked with browse tag #7923.





Map Name: Honeyville

Diagrammatic Sketch

Township 11N , Range 2W , Section 34

UTM NAD 27, UTM 12T 4611016 N, 412202 E

DISCUSSION

Mouth of Two Jump Canyon - Trend Study No. 2-25

Study Information

This study is located east of Honeyville, just south of Two Jump Canyon (elevation: 5,100 feet, slope: 25-30%, aspect: west). It samples one of the better mountain big sagebrush types in the unit. The area received heavy winter use by deer in 1984 and 1990. Use was lighter in 1996 with pellet group quadrat frequency low at only 7% for deer. A pellet group transect read in 2001 estimated 45 deer and 3 cow days use/acre (111 ddu/ha and 7 cdu/ha). Pellet group data from 2006 was estimated at 29 deer days use/acre (71 ddu/ha).

Soil

Soil is classified in the Sterling series, which is well drained and formed in alluvium, colluvium, and lacustrine deposits derived mainly from limestone and other sedimentary rocks. Sterling soils are on alluvial fans, fan remnants, stream terraces, lake terraces, and hills (USDA-NRCS 2006). Effective rooting depth was estimated at nearly 15 inches. The soil is extremely rocky throughout the profile with a strong calcareous layer at a depth of 6 to 8 inches. Soil texture is a loam with a soil reaction that is moderately alkaline (pH of 7.9). The ratio of protective cover (vegetation, litter, and cryptograms) to bare ground was good at 7.7:1 in 2006, which effectively limits erosion. The erosion condition class was determined to be stable in 2001 and 2006.

Browse

Mountain big sagebrush is the key browse species and density was estimated at 2,065 plants/acre in 1984. The density decreased to 1,465 plants/acre in 1990 with 73% of those plants classified as decadent. From 1996 to 2001, the population declined from 1,860 plants/acre in 1996 to 1,460 plants/acre in 2001. Density has remained similar in 2006 with some fluctuation in young recruitment. Seedlings were abundant in 2006 and young recruitment was estimated at 6%, which was a decrease from 23% in 1996 and 15% in 2001. Decadence was high in 1996 and 2001 at 41% and 52%, but decreased to 24% in 2006. Utilization was heavy in 1984 and moderate to heavy in 1990. Since then, use has been light to moderate.

The most numerous shrub is broom snakeweed, which had an estimated density of 5,580 plants/acre in 1996. During the 2001 reading, density of broom snakeweed increased by 25% to 7,460 plants/acre. By 2006, the population decreased to 3,120 plants/acre. A few other shrub species occur rarely in clumps or patches. They include blueberry elder, Rocky Mountain maple, Rocky Mountain smooth sumac, and a few Utah junipers.

Herbaceous Understory

Rattlesnake brome, Japanese brome, and cheatgrass (annual grasses) dominate the herbaceous understory. Combined, they produced nearly 30% cover in 1996, but declined to 17% in 2001 and 10% in 2006. Perennial grasses are represented by moderate amounts of Sandberg bluegrass and bluebunch wheatgrass, which significantly increased in 2006. Bulbous bluegrass is a mat-forming grass and has increased from less than 1% cover in 1996 and 2001 to 7% in 2006. The bulbous bluegrass may be out competing cheatgrass. Forbs are diverse and contain some desirable species which include: arrowleaf balsamroot, paintbrush, Utah sweetvetch, gray lomatium, and sulfur eriogonum.

1990 TREND ASSESSMENT

This study samples an area of suitable winter range, with an adequate amount of browse forage production. The mountain big sagebrush plants are generally moderately hedged and have fair vigor. Seventy-three percent of the population was classified as decadent, and sagebrush decreased in density. Snakeweed is abundant in the understory and its density increased three-fold. The browse trend is considered down. Trend for grasses is up. Perennial grass sum of nested frequency increased almost three-fold, mainly due to a significant increase in Sandberg bluegrass. Trend for forbs is up. Perennial forb sum of nested frequency doubled mainly due to an increase in gray lomatium and arrowleaf balsamroot. Composition was also greater in 1990 with 19 species compared to only 10 in 1984.

browse - down (-2) grasses - up (+2) forbs - up (+2)

1996 TREND ASSESSMENT

Trend for the key browse, mountain big sagebrush, is slightly up. Utilization is lighter, vigor is improved, decadence decreased from 73% to 41%, and recruitment has improved. Sagebrush density was higher, but this may be due to the increased sample size utilized since 1992. The high proportion of dead plants coupled with the decline in decadence suggests that the sagebrush population is in a process of changing from an old, mature population to a younger more vigorous one. If reproduction remains good in the future and utilization remains light to moderate, the sagebrush stand will be able to maintain itself. One negative aspect of the browse trend is the abundance and dynamic reproductive potential of broom snakeweed. Trend for grasses is stable. All species remained similar to previous reading. Annual grasses were included in the sample for the first time and they are abundant averaging 27% cover. Trend for forbs is stable. Perennial frobs remained similar to previous readings, except for gray lomatium, which significantly declined. The Desirable Components Index rated this study as poor due to moderate browse cover and fair perennial grass and forb cover. Annual grass cover is high and negatively affects the score.

winter range condition (DC Index) - poor (39) Mid-level potential scale
browse - slightly up (+1) grasses - stable (0) forbs - stable (0)

2001 TREND ASSESSMENT

Trend for the key browse species, mountain big sagebrush, is down and appears to be suffering the effects of drought. Density has declined slightly while utilization is mostly light. Decadence has increased from 41% to 52%. Twenty-one percent of the population sampled were classified as dying. Reproduction is still good with 15% of the population consisting of young plants. Seedlings are also moderately abundant. Drought conditions also appear to be effecting the broom snakeweed population. Its density has increased 25% since 1996 to 7,460 plants/acre, but 16% of the plants sampled are chlorotic or have partial crown death. The population is now mostly mature. Trend for grasses is up. Perennial grass sum of nested frequency increased by 50%, mostly due to an increase in Sandberg bluegrass. Annuals grasses also decreased. Cheatgrass, rattlesnake brome, and rattail fescue nested frequencies all decreased significantly and annual grass cover decreased from 27% to 17%. Cheatgrass quadrat frequency is still high at 95% and is still a fire hazard. Trend for forbs is up. Perennial forb sum of nested frequency increased by 65%, mainly due to an increased yellow salsify and wild onion. Annual forb nested frequency also increased nearly three-fold, but cover is less than 2%. The Desirable Components Index rated this study as very poor due to a decrease in browse cover with high decadence, but still has fair perennial grass and forb cover. Annual grass cover decreased, but is still high and is negatively affecting the score.

winter range condition (DC Index) - very poor (33) Mid-level potential scale
browse - down (-2) grasses - up (+2) forbs - up (+2)

2006 TREND ASSESSMENT

Trend for key browse, mountain big sagebrush, is stable. Density of mature and decadent plants remained the same at 1,240 plants/acre. The young population was not as abundant in 2006 compared to 2001, but seedling production was very good. Decadence decreased from a high of 52% in 2001 to 24% in 2006, which is the lowest it has ever been during all 5 sample years. Broom snakeweed density also decreased from 7,460 plants/acre in 2001 to 3,120 plants/acre in 2006. Trend for grasses is slightly up. Bluebunch wheatgrass nested frequency increased significantly and cover increased from 2% in 2001 to 6% in 2006. Sandberg bluegrass nested frequency decreased significantly, while bulbous bluegrass increased significantly. Cover of bulbous bluegrass increased from less than 1% to 7%. Cheatgrass nested frequency decreased significantly again and cover declined from 15% to 7%, but cheatgrass is still widely distributed across the site. Trend for forbs is stable. Perennial forb sum of nested frequency remained similar to values in 2001. The Desirable Components Index rated this study as poor due to moderate browse cover with fair perennial grass and forb cover. Annual

grass cover decreased, but is still moderate and is negatively affecting the score.

winter range condition (DC Index) - poor (40) Mid-level potential scale
browse - stable (0) grasses - slightly up (+1) forbs - stable (0)

HERBACEOUS TRENDS --
Management unit 02 , Study no: 25

Type	Species	Nested Frequency					Average Cover %		
		'84	'90	'96	'01	'06	'96	'01	'06
G	Agropyron spicatum	a43	a65	a39	a43	b98	3.73	2.10	6.35
G	Bromus brizaeformis (a)	-	-	c267	a174	b219	4.28	1.18	2.80
G	Bromus japonicus (a)	-	-	67	72	49	1.12	.83	.71
G	Bromus tectorum (a)	-	-	c373	b334	a263	20.85	15.16	6.76
G	Festuca myuros (a)	-	-	c47	a-	b8	1.13	-	.07
G	Koeleria cristata	-	-	5	6	-	.09	.15	-
G	Poa bulbosa	a-	a-	ab6	b26	c161	.04	.24	6.85
G	Poa fendleriana	-	-	-	-	3	-	-	.03
G	Poa secunda	a24	b100	b136	c208	b105	4.36	6.32	2.19
Total for Annual Grasses		0	0	754	580	539	27.40	17.17	10.36
Total for Perennial Grasses		67	165	186	283	367	8.22	8.83	15.43
Total for Grasses		67	165	940	863	906	35.63	26.00	25.80
F	Achillea millefolium	12	16	11	8	11	.33	.06	.24
F	Agoseris glauca	-	-	-	-	3	-	-	.00
F	Alyssum alyssoides (a)	-	-	a152	b260	a171	1.00	1.56	.32
F	Allium sp.	a-	a2	a7	b73	a12	.07	.20	.06
F	Ambrosia psilostachya	27	39	31	33	56	.62	.38	1.66
F	Apocynum androsaemifolium pumilum	a-	b10	a-	b15	b14	-	.18	.43
F	Arabis sp.	-	1	1	-	-	.00	-	-
F	Arenaria fendleri	-	-	-	2	-	-	.03	-
F	Artemisia ludoviciana	22	24	16	29	28	.52	.38	1.39
F	Astragalus sp.	1	-	5	3	-	.04	.03	-
F	Astragalus utahensis	-	-	5	6	6	.18	.45	.30
F	Balsamorhiza sagittata	a33	b73	b64	b67	ab57	5.22	4.31	6.48
F	Castilleja linariaefolia	-	-	3	-	-	.03	-	-
F	Calochortus nuttallii	-	-	-	5	3	-	.01	.00
F	Cirsium undulatum	a-	ab1	ab1	ab4	b11	.04	.06	.54
F	Comandra pallida	a-	a2	a6	a6	b29	.09	.04	.37
F	Cryptantha sp.	a-	ab5	ab3	ab3	b8	.03	.00	.29
F	Cymopterus sp.	-	-	-	-	5	-	-	.30

Type	Species	Nested Frequency					Average Cover %		
		'84	'90	'96	'01	'06	'96	'01	'06
F	Draba sp. (a)	-	-	$_{a}$-	$_{b}$48	$_{b}$32	-	.14	.05
F	Epilobium brachycarpum (a)	-	-	1	3	13	.00	.00	.05
F	Erodium cicutarium (a)	-	-	2	-	-	.06	-	-
F	Eriogonum umbellatum	$_{a}$5	$_{a}$6	$_{ab}$16	$_{b}$25	$_{ab}$16	.40	.15	.54
F	Gilia sp. (a)	-	-	-	4	-	-	.00	-
F	Hackelia patens	$_{a}$-	$_{b}$18	$_{ab}$11	$_{a}$3	$_{a}$2	.25	.00	.01
F	Hedysarum boreale	$_{a}$-	$_{b}$12	$_{a}$-	$_{ab}$1	$_{ab}$8	.06	.15	.48
F	Holosteum umbellatum (a)	-	-	$_{a}$17	$_{c}$113	$_{b}$65	.03	.22	.16
F	Lactuca serriola	-	-	1	-	4	.00	-	.01
F	Lithospermum ruderale	$_{ab}$4	$_{ab}$4	$_{b}$19	$_{ab}$22	$_{a}$4	.64	.70	.36
F	Lomatium grayi	$_{a}$-	$_{c}$64	$_{ab}$8	$_{b}$21	$_{c}$49	.07	.58	.73
F	Machaeranthera canescens	$_{a}$-	$_{a}$-	$_{a}$-	$_{a}$2	$_{b}$12	-	.00	.37
F	Machaeranthera grindelioides	-	-	-	2	-	-	.00	-
F	Melilotus officinalis	-	-	-	-	5	-	-	.03
F	Microsteris gracilis (a)	-	-	$_{a}$-	$_{b}$12	$_{b}$18	-	.04	.04
F	Penstemon sp.	$_{b}$7	$_{ab}$1	$_{a}$-	$_{ab}$3	$_{a}$-	.00	.00	-
F	Petradoria pumila	-	-	-	-	2	-	-	.00
F	Phacelia sp.	$_{c}$32	$_{b}$3	$_{b}$7	$_{a}$-	$_{a}$-	.12	-	-
F	Phlox longifolia	-	6	2	4	4	.03	.06	.04
F	Polygonum douglasii (a)	-	-	2	-	3	.00	-	.00
F	Ranunculus testiculatus (a)	-	-	-	2	-	-	.00	-
F	Tragopogon dubius	$_{a}$1	$_{a}$7	$_{a}$7	$_{b}$34	$_{b}$51	.10	.49	.62
F	Veronica biloba (a)	-	-	-	-	8	-	-	.01
F	Zigadenus paniculatus	-	-	-	-	1	-	-	.00
Total for Annual Forbs		0	0	174	442	310	1.10	1.99	0.65
Total for Perennial Forbs		144	294	224	371	401	8.90	8.33	15.32
Total for Forbs		144	294	398	813	711	10.01	10.32	15.97

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

BROWSE TRENDS --
Management unit 02 , Study no: 25

Type	Species	Strip Frequency			Average Cover %		
		'96	'01	'06	'96	'01	'06
B	Artemisia tridentata vaseyana	63	55	49	12.42	7.53	6.60
B	Eriogonum microthecum	1	0	0	-	-	-
B	Gutierrezia sarothrae	75	83	57	3.33	4.02	1.79
B	Purshia tridentata	0	0	3	-	-	.78
B	Rhus glabra cismontana	0	0	0	1.37	-	-
Total for Browse		139	138	109	17.13	11.56	9.18

CANOPY COVER, LINE INTERCEPT --
Management unit 02 , Study no: 25

Species	Percent Cover
	'06
Artemisia tridentata vaseyana	10.26
Gutierrezia sarothrae	2.65

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 02 , Study no: 25

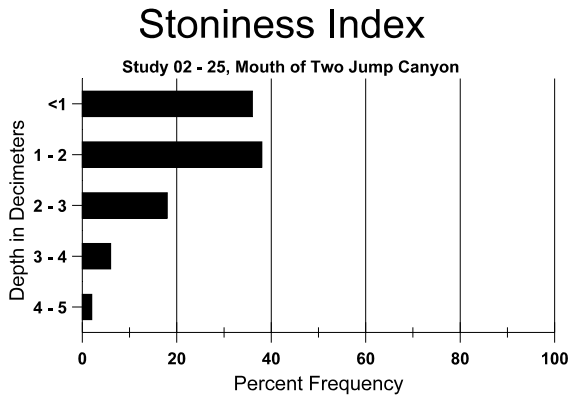
Species	Average leader growth (in)	
	'01	'06
Artemisia tridentata vaseyana	1.3	1.8

BASIC COVER --
Management unit 02 , Study no: 25

Cover Type	Average Cover %				
	'84	'90	'96	'01	'06
Vegetation	1.50	7.00	56.31	56.03	50.77
Rock	18.00	16.75	14.04	12.02	12.39
Pavement	21.25	13.75	3.66	3.74	4.63
Litter	57.50	55.75	65.69	49.71	43.88
Cryptogams	.50	.25	.70	.48	.93
Bare Ground	1.25	6.50	.44	.28	4.53

SOIL ANALYSIS DATA --
Herd Unit 02, Study no: 25, Mouth of Two Jump Canyon

Effective rooting depth (in)	Temp °F (depth)	PH	Loam			%0M	PPM P	PPM K	dS/m
			%sand	%silt	%clay				
14.8	73.4 (14.7)	7.9	43.4	33.4	23.3	3.5	13.3	70.4	0.6



PELLET GROUP DATA --
Management unit 02 , Study no: 25

Type	Quadrat Frequency		
	'96	'01	'06
Rabbit	1	6	18
Elk	-	-	4
Deer	7	14	12
Cattle	2	-	1

Days use per acre (ha)	
'01	'06
-	-
1 (3)	-
45 (111)	29 (71)
3 (7)	-

BROWSE CHARACTERISTICS --
Management unit 02 , Study no: 25

		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)
Artemisia tridentata vaseyana												
84	**2065**	266	66	1466	533	-	23	77	26	.96	6	42/43
90	**1465**	66	66	333	1066	-	41	23	73	10	45	27/33
96	**1860**	200	340	760	760	960	32	2	41	13	15	27/41
01	**1460**	100	220	480	760	940	12	0	52	21	21	26/35
06	**1320**	840	80	920	320	1040	5	0	24	9	17	28/41

		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)
Eriogonum microthecum												
84	**0**	-	-	-	-	-	0	0	-	-	0	-/-
90	**0**	-	-	-	-	-	0	0	-	-	0	-/-
96	**40**	-	-	40	-	-	0	0	-	-	0	18/22
01	**0**	-	-	-	-	-	0	0	-	-	0	-/-
06	**0**	-	-	-	-	-	0	0	-	-	0	9/20
Gutierrezia sarothrae												
84	**3066**	-	-	3066	-	-	0	0	0	-	0	13/10
90	**9665**	66	5333	3866	466	-	0	0	5	.62	2	11/12
96	**5580**	3820	1380	4200	-	-	0	0	0	-	0	11/14
01	**7460**	20	40	6580	840	160	0	0	11	1	16	11/13
06	**3120**	100	240	2600	280	40	10	6	9	3	3	9/12
Purshia tridentata												
84	**0**	-	-	-	-	-	0	0	-	-	0	-/-
90	**0**	-	-	-	-	-	0	0	-	-	0	-/-
96	**0**	-	-	-	-	-	0	0	-	-	0	-/-
01	**0**	-	-	-	-	-	0	0	-	-	0	-/-
06	**80**	-	-	80	-	-	100	0	-	-	0	32/72
Rhus glabra cismontana												
84	**0**	-	-	-	-	-	0	0	-	-	0	-/-
90	**0**	-	-	-	-	-	0	0	-	-	0	-/-
96	**0**	420	-	-	-	-	0	0	-	-	0	70/107
01	**0**	-	-	-	-	-	0	0	-	-	0	-/-
06	**0**	-	-	-	-	-	0	0	-	-	0	-/-