

Trend Study 1-7-06

Study site name: South Side Emigrant Pass .

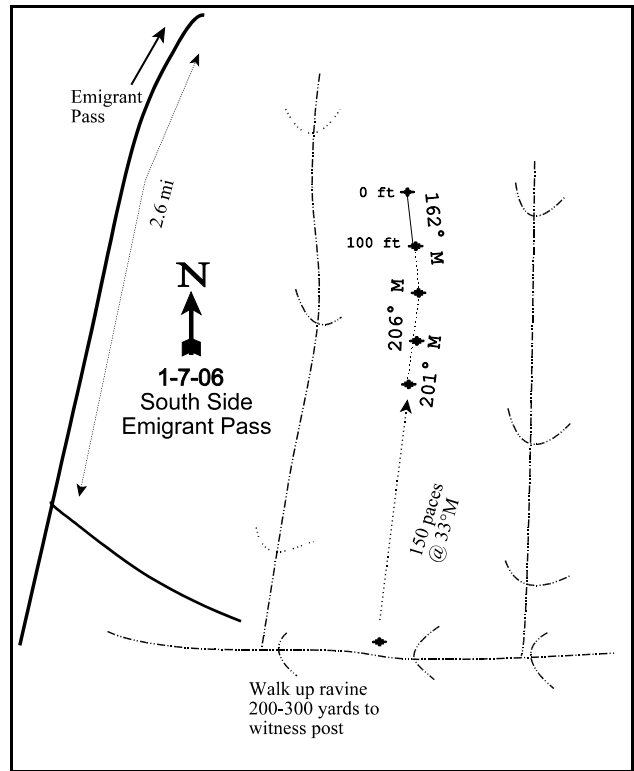
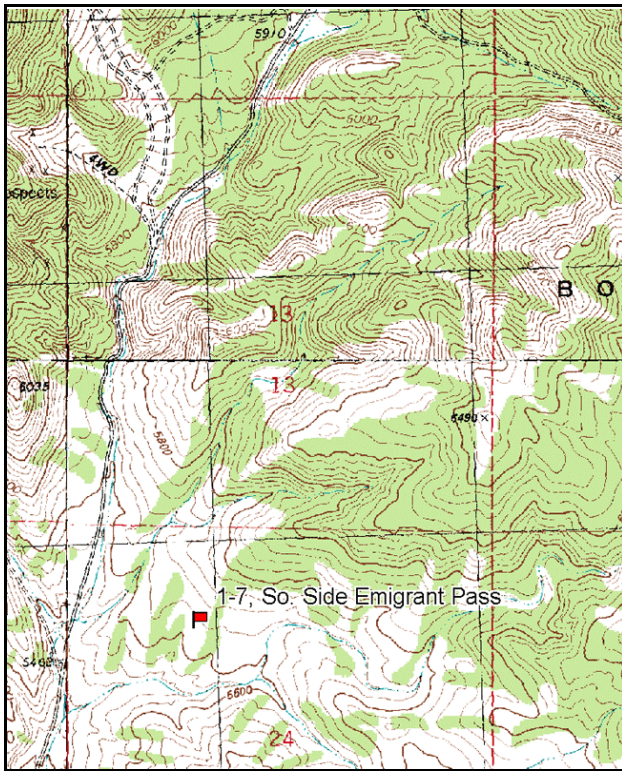
Vegetation type: Black Sagebrush .

Compass bearing: frequency baseline 162 degrees magnetic.

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

LOCATION DESCRIPTION

From the cattleguard at the summit of Emigrant Pass Road, travel 2.6 miles southwest to a cheatgrass flat on the east side of the road. Turn left crossing the flat and drive east to the wash. Walk up the wash approximately 200-300 yards to a witness post. Take a bearing of 33 degrees magnetic and walk 150 paces up the ridge to the 400-foot stake of the baseline. The 0-foot stake is marked with a red browse tag, #7911. The baseline runs at a bearing of 162 degrees magnetic. The 300-foot baseline runs 206 degrees magnetic. The 400-foot baseline runs 201 degrees magnetic.



Map Name: Bovine

Diagrammatic Sketch

Township 9N, Range 17W, Section 24

UTM NAD 27, UTM 12T 4596664 N, 270911 E

DISCUSSION

South Side Emigrant Pass - Trend Study No. 1-7

Study Information

This trend study samples a black sagebrush ridge within critical deer winter range on Emigrant Pass (elevation: 5,620 feet, slope: 5-15%, aspect: southwest). Shallow draws containing a few junipers are located to either side of the study area. This area only receives 10-12 inches of annual precipitation (USDA et al. 1999). The area is also used as winter sheep range as part of the White Lake allotment. This allotment is grazed from December 1 to March 31. A pellet group transect in 2001 estimated 5 deer days use/acre and 71 elk days use/acre (13 ddu/ha and 175 edu/ha). In 2006, animal use was estimated to be 27 deer days use/acre and 2 cow days use/acre (66 ddu/ha and 4 cdu/ha). Sage grouse pellets were also sampled in 2006.

Soil

The soil is part of the Tosser series, which consists of very deep, well drained, moderately rapidly permeable soils formed in mixed alluvium from limestone, rhyolite and chert on dissected fan terraces, bars and beach plains (USDA-NRCS 2006). The surface is very rocky and appears almost armored with extensive areas of erosion pavement. The soil is relatively shallow with an estimated effective root depth of only about 10 inches. The soil is a sandy-clay with a slightly alkaline soil reaction (7.7 pH). Phosphorus is low (3.9 ppm), which could limit plant growth (Tiedemann and Lopez 2004). Litter cover is scarce and vegetation cover is limited almost exclusively to black sagebrush crowns. Pedestalling around sagebrush plants is common but not extreme. The erosion condition classification was stable in 2001 and slight in 2006 due to moderate pedestalling and soil movement.

Browse

Black sagebrush is the key browse species and has been stable. Black sagebrush cover was 17% in 1996, 19% in 2001, and increased to nearly 24% in 2006. Seedlings and young plants were numerous and decadence was low (9%) in 1996. However, in 2001 seedlings and young decreased substantially and decadence doubled (18%). In 2006 density was slightly lower and decadence increased to 22%. Young plants were rare, but seedlings were extremely numerous. Mature shrubs average less than one foot in height and tend to be evenly spaced. Black sagebrush exhibits good vigor. Shadscale density has declined at each reading. Shadscale density was 920 plants/acre in 1996 and decreased to 680 plants/acre by 2006. Other associated shrub species include: narrowleaf low rabbitbrush, bud sagebrush, and green molly summer cypress.

Herbaceous Understory

Herbaceous plants make up only about 14% of the total vegetation cover. Competition with shrubs for resources limits the amount of herbaceous production. The most abundant species are two low-growing, low value forbs, cryptantha and longleaf phlox. Longleaf phlox is a beneficial species for pre-laying sage grouse hens (Barnett and Crawford 1994). Grasses occur infrequently and produce on average about 2% cover. The most common species are Indian ricegrass, bottlebrush squirreltail, and annual cheatgrass which has significantly increased at each reading. Cheatgrass cover was still low in 2006, at only 1%, but quadrat frequency increased from 36% in 2001 to 88% in 2006.

1990 TREND ASSESSMENT

Trend for browse appears stable even after drought. The shrubs showed mostly light hedging. Canopy cover from black sagebrush averages about 13%. Low rabbitbrush has not increased, although the population remains dominated by young plants. There is a high frequency of forbs, but none of the native species are especially valuable as forage. Herbaceous vegetation is somewhat restricted by the extensive pavement cover on the ground surface. Some soil loss through sheet erosion is evident. Indian ricegrass increased significantly as quadrat frequency increased from 14% to 31% and is the most common grass on the site.

browse - stable (0)

grass - up (+2)

forb - stable (0)

1996 TREND ASSESSMENT

Trend for the key browse species, black sagebrush, is stable. Differences in density are likely due to the increased sample size taken in 1996. Utilization is moderate to heavy with 29% of the population displaying heavy use. Vigor is good and decadence has declined from 30% to 9%. The proportion of young plants declined from 41% to 25% and the number of seedlings dropped, but there are still sufficient numbers to maintain the population. Trend for grasses is slightly up with an increase in the sum of nested frequency. Unfortunately cheatgrass was also sampled. The forb trend is up. The dominant forbs, cryptantha and longleaf phlox, both increased significantly in nested frequency values. However, the herbaceous understory is still depleted and in poor condition. The DCI score is rated as good.

winter range condition (DC Index) - good (59) Lower potential scale
browse - stable (0) grass - slightly up (+1) forb - up (+2)

2001 TREND ASSESSMENT

Trend for the key browse species, black sagebrush, is stable with a slight increase in density offset with slight increases in percent decadence and an increase in proportion of dead plants within the population. Utilization is mostly light to moderate with good vigor. The proportion of young plants continues to decline for the third reading in a row (1990, 1996, and 2001). There still appears to be sufficient numbers of young and seedlings to maintain the population. Trend for grasses is slightly up. Perennial grasses were more abundant as Sandberg bluegrass and bluebunch wheatgrass increased significantly in sum of nested frequency. Unfortunately Indian ricegrass decreased significantly and cheatgrass increased significantly. The forb trend is down. The dominant forbs include cryptantha, cymopterus, and longleaf phlox. The herbaceous understory is still depleted and in poor condition. The DCI score was still rated as good, but scored lower with higher shrub decadence and fewer young plants.

winter range condition (DC Index) - good (48) Lower potential scale
browse - stable (0) grass - slightly up (+1) forb - down (-2)

2006 TREND ASSESSMENT

The browse trend is slightly down. Black sagebrush density declined about 10%. Young plants were rare, but seedlings were very numerous. Decadence was slightly higher from 18% to 22% of the population, but overall vigor remains good. Shadscale is a minor component, but has declined with each reading. Shadscale density has declined 26% since 1996. The grass trend is down. Bluebunch wheatgrass frequency was significantly lower. Cheatgrass significantly increased again. Quadrat frequency was only 21% in 1996 and 36% in 2001, but increased to 88% in 2006. Cover is still low at only 1%. The forb trend is also down as perennial forb nested frequency was lower. The DCI score declined to fair-good with greater shrub decadence, fewer young plants, and increased cheatgrass cover.

winter range condition (DC Index) - fair-good (46) Lower potential scale
browse - slightly down (-1) grass - down (-2) forb - down (-2)

HERBACEOUS TRENDS --
Management unit 01 , Study no: 7

T y p e	Species	Nested Frequency					Average Cover %		
		'84	'90	'96	'01	'06	'96	'01	'06
G	<i>Agropyron spicatum</i>	a-	a2	a-	b35	a1	.00	.32	.03
G	<i>Bromus tectorum</i> (a)	-	-	a51	b99	c249	.13	.60	1.21
G	<i>Oryzopsis hymenoides</i>	a26	c70	bc54	a20	ab29	.84	.37	.83
G	<i>Poa secunda</i>	a3	a6	ab19	c43	bc28	.23	.74	.39
G	<i>Sitanion hystrix</i>	a15	a9	ab31	b45	b43	.26	.49	.58
Total for Annual Grasses		0	0	51	99	249	0.12	0.60	1.21
Total for Perennial Grasses		44	87	104	143	101	1.34	1.93	1.84
Total for Grasses		44	87	155	242	350	1.47	2.53	3.06
F	<i>Allium</i> sp.	5	-	3	-	-	.00	-	-
F	<i>Astragalus newberryi</i>	a-	a-	b23	a6	a16	.18	.02	.06
F	<i>Astragalus utahensis</i>	ab18	b23	a9	a4	a4	.01	.04	.01
F	<i>Balsamorhiza hookeri</i>	-	-	1	4	3	.00	.03	.15
F	<i>Castilleja chromosa</i>	5	-	-	-	-	.00	-	-
F	<i>Caulanthus crassicaulis</i>	a-	a-	b14	a-	a-	.06	-	-
F	<i>Crepis acuminata</i>	3	-	-	-	-	-	-	-
F	<i>Cryptantha</i> sp.	c116	b58	c92	a18	ab35	.47	.13	.12
F	<i>Cymopterus</i> sp.	a-	a-	a8	b30	a-	.01	.13	-
F	<i>Descurainia pinnata</i> (a)	-	-	-	1	3	-	.00	.00
F	<i>Erigeron argentatus</i>	-	2	1	-	1	.00	-	.01
F	<i>Erigeron</i> sp.	-	-	3	-	-	.03	-	-
F	<i>Eriogonum</i> sp.	-	-	-	-	3	-	-	.00
F	<i>Eriogonum ovalifolium</i>	-	-	3	6	-	.00	.02	-
F	<i>Erigeron pumilus</i>	a-	a-	a3	b39	a-	.00	.29	-
F	<i>Gilia</i> sp. (a)	-	-	b38	b34	a-	.08	.10	-
F	<i>Haplopappus acaulis</i>	a4	b32	ab18	a6	ab19	.08	.03	.24
F	<i>Malcolmia africana</i>	-	-	5	-	-	.01	-	-
F	<i>Phlox hoodii</i>	ab57	b43	ab34	ab28	a23	.37	.22	.23
F	<i>Phlox longifolia</i>	a90	ab124	b133	ab126	a96	.56	.32	.46
F	<i>Ranunculus testiculatus</i> (a)	-	-	2	16	14	.00	.03	.03
F	<i>Sphaeralcea coccinea</i>	-	2	-	-	-	-	-	-
F	<i>Sphaeralcea grossulariifolia</i>	1	-	-	-	-	-	-	-
Total for Annual Forbs		0	0	40	51	17	0.08	0.13	0.03
Total for Perennial Forbs		299	284	350	267	200	1.84	1.25	1.32
Total for Forbs		299	284	390	318	217	1.93	1.39	1.35

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

BROWSE TRENDS --

Management unit 01 , Study no: 7

Type	Species	Strip Frequency			Average Cover %		
		'96	'01	'06	'96	'01	'06
B	Artemisia nova	99	99	100	17.45	19.28	23.78
B	Atriplex confertifolia	33	24	21	1.37	.95	1.18
B	Chrysothamnus viscidiflorus stenophyllus	75	68	72	2.51	2.30	2.02
B	Ephedra nevadensis	0	22	2	-	.10	-
B	Juniperus osteosperma	0	1	0	-	-	-
B	Kochia americana	23	0	25	.06	-	.29
B	Pinus edulis	0	0	0	-	-	.00
B	Tetradymia nuttallii	14	14	10	.30	1.83	.39
Total for Browse		244	228	230	21.71	24.48	27.70

CANOPY COVER, LINE INTERCEPT --

Management unit 01 , Study no: 7

Species	Percent Cover
	'06
Artemisia nova	26.58
Atriplex confertifolia	.16
Chrysothamnus viscidiflorus stenophyllus	3.31
Kochia americana	.08
Tetradymia nuttallii	.13

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 01 , Study no: 6

Species	Average leader growth (in)	
	'01	'06
Artemisia nova	0.8	0.6

BASIC COVER --

Management unit 01 , Study no: 7

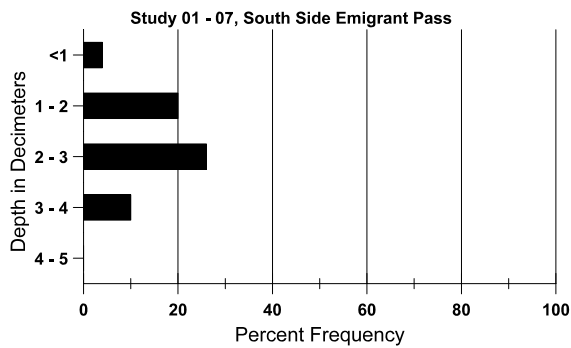
Cover Type	Average Cover %				
	'84	'90	'96	'01	'06
Vegetation	3.25	9.75	25.04	30.18	30.17
Rock	5.75	11.00	11.69	5.50	8.19
Pavement	62.75	56.00	33.71	46.00	39.92
Litter	23.50	14.75	12.81	13.06	16.79
Cryptogams	1.50	1.50	2.55	2.16	1.70
Bare Ground	3.25	7.00	8.89	11.87	13.94

SOIL ANALYSIS DATA --

Herd Unit 01, Study no: 07, South Side Emigrant Pass

Effective rooting depth (in)	Temp °F (depth)	PH	Sandy clay			%OM	PPM P	PPM K	dS/m
			%sand	%silt	%clay				
10.2	62.8 (9.7)	7.7	55.9	9.1	35.0	1.44	3.9	172.8	0.6

Stoniness Index



PELLET GROUP DATA --

Management unit 01 , Study no: 7

Type	Quadrat Frequency		
	'96	'01	'06
Rabbit	16	5	48
Elk	-	48	1
Deer	17	-	18
Cattle	-	-	-
Sage Grouse	-	-	-

Days use per acre (ha)	
'01	'06
-	-
71 (175)	-
5 (12)	27 (66)
-	2 (4)
-	9 groups/acre

BROWSE CHARACTERISTICS --
Management unit 01 , Study no: 7

		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 nova												
84	10466	1866	4600	4333	1533	-	49	18	15	-	10	8/11
90	9665	2533	3933	2866	2866	-	5	0	30	.41	2	11/14
96	11500	340	2880	7620	1000	240	52	29	9	2	2	9/23
01	12380	60	560	9580	2240	620	42	10	18	4	4	7/18
06	11160	50020	380	8280	2500	720	42	19	22	9	9	9/21
Artemisia spinescens												
84	1932	-	600	1266	66	-	31	34	3	-	3	6/8
90	0	-	-	-	-	-	0	0	0	-	0	-/-
96	0	-	-	-	-	-	0	0	0	-	0	7/13
01	0	-	-	-	-	-	0	0	0	-	0	-/-
06	0	-	-	-	-	-	0	0	0	-	0	-/-
Atriplex confertifolia												
84	2599	-	733	866	1000	-	49	33	38	.76	26	7/10
90	1866	333	66	400	1400	-	0	0	75	12	43	10/8
96	920	40	120	760	40	20	41	9	4	-	0	9/15
01	840	20	220	240	380	100	0	0	45	19	19	8/12
06	680	40	140	460	80	20	6	3	12	3	3	10/16
Chrysothamnus viscidiflorus stenophyllus												
84	2866	66	1600	1133	133	-	14	28	5	-	2	7/11
90	3333	200	1800	533	1000	-	0	0	30	1	4	11/13
96	3100	300	180	2520	400	20	3	0	13	2	3	8/15
01	2580	20	100	1540	940	100	2	2	36	10	10	5/10
06	2940	180	220	1980	740	60	9	13	25	12	13	7/13
Ephedra nevadensis												
84	0	-	-	-	-	-	0	0	0	-	0	-/-
90	0	-	-	-	-	-	0	0	0	-	0	-/-
96	0	-	-	-	-	-	0	0	0	-	0	16/19
01	1120	20	480	560	80	-	4	0	7	4	4	5/6
06	40	-	-	40	-	-	0	100	0	-	0	11/13

		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)
Juniperus osteosperma												
84	0	-	-	-	-	-	0	0	-	-	0	-/-
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	0	20	-	-	-	-	0	0	-	-	0	-/-
01	20	-	20	-	-	-	0	0	-	-	0	-/-
06	0	20	-	-	-	-	0	0	-	-	0	-/-
Kochia americana												
84	1866	-	1066	600	200	-	11	14	11	1	11	2/2
90	400	-	400	-	-	-	0	0	0	-	0	-/-
96	960	100	380	580	-	-	0	0	0	-	0	4/6
01	0	-	-	-	-	-	0	0	0	-	0	-/-
06	1340	120	120	1220	-	-	51	4	0	-	0	5/6
Pinus edulis												
84	0	-	-	-	-	-	0	0	-	-	0	-/-
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	0	-	-	-	-	-	0	0	-	-	0	-/-
01	0	-	-	-	-	-	0	0	-	-	0	-/-
06	0	20	-	-	-	-	0	0	-	-	0	-/-
Tetradymia nuttallii												
84	266	-	66	-	200	-	25	25	75	-	50	-/-
90	866	66	333	-	533	-	0	0	62	7	23	-/-
96	280	-	-	40	240	120	7	0	86	36	36	16/24
01	280	-	20	80	180	220	7	0	64	50	50	13/15
06	200	-	20	100	80	80	0	0	40	10	10	17/21