

Trend Study 2-9-06

Study site name: Beirdneau .

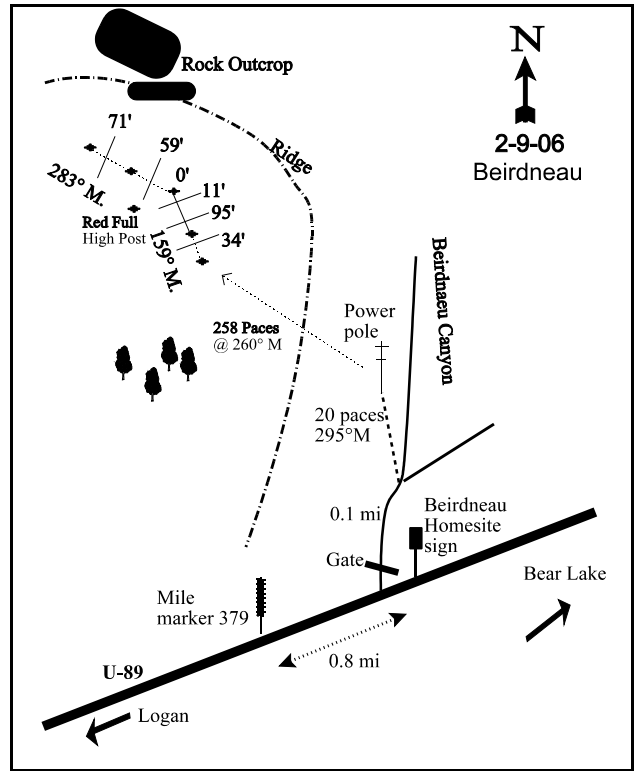
Vegetation type: Bitterbrush .

Compass bearing: frequency baseline 159 degrees magnetic.

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

LOCATION DESCRIPTION

Proceed up Logan Canyon to mile marker 379 and begin to note mileage. Continue 0.8 miles to the Forest Service sign "Beirdneau Summer Home Sites." Turn left here and proceed 0.1 miles to a fork and stop. Walk to the power pole on the left at a bearing of 295 degrees magnetic and about 20 paces. Take a bearing of 260 degrees magnetic from the pole and walk 258 paces to the 0-foot stake of the baseline marked by browse tag #7928. The baseline runs at 159 degrees magnetic. The second stake is placed 50 feet down the slope at the same bearing. The third and fourth stake are placed 100 feet apart above the 0-foot baseline stake at a bearing of 283 degrees magnetic.



Map Name: Mt. Elmer

Diagrammatic Sketch

Township 12N, Range 2E, Section 23

UTM NAD 27, UTM 12T 4623776 N, 441999 E

DISCUSSION

Beirdneau - Trend Study No. 2-9

Study Information

This study is located slightly north of the Beirdneau cabin area in Logan Canyon (elevation: 5,400 feet, slope: 55%, aspect: south). The area is considered a normal deer winter range that possesses a good mix of mountain big sagebrush and antelope bitterbrush, interspersed with juniper. Wildlife use was heavy in 1984, but has been light to moderate since. A pellet group transect read in 2001 estimated 17 deer and 3 elk days use/acre (41 ddu/ha and 8 edu/ha). Pellet group data in 2006 was estimated at 25 deer and 14 elk days use/acre (61 ddu/ha and 35 edu/ha). In 2006, a deer carcass was located near the transect and grouse pellets were seen.

Soil

The soil is a moderately deep (14 inches), rocky, and well-drained. It appears that some of the soil has been colluvially deposited and/or weathered-in-place from limestone parent material. Texture is a clay loam and is moderately alkaline (pH of 7.9). Vegetation and litter cover appear adequate to control runoff from all but the highest intensity summer storms. Vegetation cover decreased slightly, while bareground increased from 4% relative cover in 2001 to 11% in 2006. An erosion condition class was determined to be slight during the 2001 reading, but stable in 2006.

Browse

Browse composition consists of a mixture of bitterbrush and mountain big sagebrush. Bitterbrush has demonstrated moderate to heavy hedging since 1984. Prior to 1984, a die-off of bitterbrush and sagebrush was reported to have affected 10% to 20% of the population. Rodent activity in 1983-85 may have contributed to the die-off, as well as disease and insect infestation. Bitterbrush density was estimated at about 600 plants/acre in 1984 and 1990. In 1996, bitterbrush density was 380 plants/acre after sampling techniques were altered and the sample size was increased. Density rose to 560 plants/acre in 2001, then decreased by 68% to its lowest level of 180 plants/acre in 2006. The growth from may make it difficult to distinguish different individuals. Cover of bitterbrush changed very little. No seedlings and very few young plants have been encountered in all readings since 1984. High annual grass cover may be suppressing seedling and young plants from establishing (Hall et al. 1999). Bitterbrush cover was estimated at 9% in 1996 and 6% in 2001 and 2006. Decadence has declined from a high of 78% in 1984 to 11% in 2006. Annual leader growth averaged 3 inches in 2001 and 3.7 inches in 2006.

Mountain big sagebrush density was estimated at 1,199 plants/acre in 1984, but has steadily declined to 220 plants/acre in 2006. Sagebrush decadence has averaged over 50% since 1984, except in 2001 when it dropped to 27%. Decadence increased to 64% in 2006 and 36% of the population was classified as dying. Seedling and young recruitment have been a minor component of the population during each reading. Utilization has been light to moderate since 1990, but was heavy in 1984. Annual leader growth averaged 2.4 inches in 2006.

Herbaceous Understory

Grasses and forbs are irregularly distributed, but provide good cover. Composition is poor, because of the predominance of weedy annuals. Cheatgrass and Japanese brome cover averaged 26% in 1996 and 2001, but decreased to only 3% in 2006, but quadrat frequency for both species was still moderately high.. Bluebunch wheatgrass and bulbous bluegrass are the only moderately abundant perennial grasses. The forb component has fair diversity and quality. The most common forbs include yellow salsify, spring parsley, alfalfa, and yellow sweetclover. Most forbs showed some evidence of use in 1984. Annual and biennial weeds are common and include dyer's woad, a noxious weed in Utah.

1990 TREND ASSESSMENT

The trend for key browse, bitterbrush and mountain big sagebrush, was stable. The most preferred browse, bitterbrush, has increased in density while sagebrush has declined slightly. Both sagebrush and bitterbrush

tend to have a moderately hedged growth form. Canopy cover from bitterbrush was estimated at 6%, while sagebrush averaged only 1% cover. Trend for grasses is stable. Cheatgrass and Japanese brome are the most prevalent grass species. Bluebunch wheatgrass is still quite common. Trend for forbs is down. Overall, perennial forb nested frequency increased, but the increase is mainly from three weedy species: dyer's woad, houndstongue, and prickly lettuce.

browse - stable (0)

grasses - stable (0)

forbs - down (-2)

1996 TREND ASSESSMENT

The sagebrush and bitterbrush die-off, which started in the early 1980's, appears to have stabilized. Mountain big sagebrush is lightly utilized with improved vigor and declining decadence. Bitterbrush is moderately utilized with good vigor and no decadent plants sampled. No seedlings or young have been sampled during any reading. Trend for browse is considered stable with the decline in density counterbalanced by the lighter use and improved vigor. Some of the lower population estimates can also be attributed to the larger sample now being taken, which gives better estimates for populations that are discontinuous and/or clumped. Trend for grasses is stable. Sum of nested frequency for perennial grasses increased since 1990, but this increase comes largely from the appearance of bulbous bluegrass. Bluebunch wheatgrass remained similar to 1990. Annual grasses (cheatgrass and Japanese brome) were also included in the sample for the first time and they are very abundant. Trend for forbs is slightly down. Nested frequency for dyer's woad increased significantly since 1990. Both prickly lettuce and houndstongue decreased significantly, but preferred species like false dandelion and low penstemon also decreased in nested frequency. Yellow sweet clover increased significantly in nested frequency and cover was at a high of 5%. Annual forbs and grasses were first sampled in 1996 and dominate the herbaceous understory. The Desirable Components Index rated this study as very poor due to the high cover and nested frequency of annual grasses.

winter range condition (DC Index) - very poor (24) Mid-level potential scale

browse - stable (0)

grasses - stable (0)

forbs - slightly down (-1)

2001 TREND ASSESSMENT

Trend for the key browse species, bitterbrush and mountain big sagebrush, is considered stable. Bitterbrush shows moderate use, good vigor, and 21% decadence. Mountain big sagebrush numbers only 300 plants/acre. It displays light to moderate use, good vigor, and a declining decadence rate (44% to 27%). Trend for grasses is stable. The primary perennial grasses, bluebunch wheatgrass and bulbous bluegrass, have remained similar to previous estimates. Annual grasses have changed in composition from predominately Japanese brome to cheatgrass since 1996, but percent cover of annual grasses have remained similar. Trend for forbs is stable. The perennial forbs, yellow sweet clover and yellow salsify, have declined significantly in nested frequency. Dyer's woad also decreased significantly in nested frequency. The Desirable Components Index rated this study as very poor due to the high cover and nested frequency of annual grasses.

winter range condition (DC Index) - very poor (17) Mid-level potential scale

browse - stable (0)

grasses - stable (0)

forbs - stable (0)

2006 TREND ASSESSMENT

Trend for key browse species, bitterbrush and mountain big sagebrush, is slightly down. Bitterbrush density decreased from 560 plants/acre to 180 plants/acre, but identifying individuals may have been difficult. Bitterbrush cover remained similar. Use on bitterbrush also increased from moderate in 2001 to moderate-heavy in 2006. Mountain big sagebrush also decreased in density. Decadence increased from 27% to 64% and 36% of the population was classified as dying. Trend for grasses is slightly up. Bluebunch wheatgrass has remained similar to estimates in 2001, but annual grass cover decreased from 27% in 2001 to 3% in 2006. Nested frequency of cheatgrass decreased significantly in 2006, but still has the potential to come back. Trend for forbs is slightly up. Both yellow sweet clover and alfalfa increased significantly in nested frequency.

Dyer's woad has continually decreased with each reading since 1996. The Desirable Components Index rated this study as very poor due to the decrease in browse cover and increase in decadence. The score increased due to the decrease in annual grass cover.

winter range condition (DC Index) - very poor (33) Mid-level potential scale
browse - slightly down (-1) grasses - slightly up (+1) forbs - slightly up (+1)

HERBACEOUS TRENDS --
Management unit 02 , Study no: 9

Type	Species	Nested Frequency					Average Cover %		
		'84	'90	'96	'01	'06	'96	'01	'06
G	Agropyron spicatum	125	105	108	95	117	2.99	3.35	3.79
G	Agropyron trachycaulum	-	-	7	-	-	.06	-	-
G	Bromus brizaeformis (a)	-	-	a2	b10	a1	.00	.05	.00
G	Bromus japonicus (a)	-	-	b343	a152	a148	17.68	2.40	1.63
G	Bromus tectorum (a)	-	-	b204	c302	a177	8.41	24.20	1.76
G	Poa bulbosa	a-	a-	bc83	b73	c103	2.65	2.36	2.41
G	Poa pratensis	4	10	-	-	4	-	-	.00
G	Poa secunda	a-	b10	ab3	b19	ab6	.04	.09	.04
Total for Annual Grasses		0	0	549	464	326	26.10	26.65	3.40
Total for Perennial Grasses		129	125	201	187	230	5.74	5.82	6.26
Total for Grasses		129	125	750	651	556	31.85	32.48	9.66
F	Achillea millefolium	b14	a-	a-	ab8	ab5	-	.21	.06
F	Agoseris glauca	ab14	b26	a1	a1	ab10	.00	.03	.10
F	Allium acuminatum	c45	bc29	a6	bc26	ab14	.04	.17	.11
F	Alyssum alyssoides (a)	-	-	b137	b151	a35	.39	.71	.07
F	Artemisia ludoviciana	4	3	10	6	14	.26	.30	1.54
F	Astragalus beckwithii	a-	b13	a-	a-	a2	-	-	.03
F	Aster chilensis	b49	b40	a2	a4	a4	.00	.01	.09
F	Astragalus sp.	-	-	-	-	-	-	-	.03
F	Astragalus utahensis	1	3	2	1	1	.00	.03	.03
F	Balsamorhiza sagittata	5	5	3	5	2	.53	.22	.60
F	Camelina microcarpa (a)	-	-	-	6	5	-	.01	.01
F	Chaenactis douglasii	-	1	-	-	-	-	-	-
F	Cirsium undulatum	2	5	5	-	7	.33	-	.21
F	Comandra pallida	8	-	2	-	-	.03	-	-
F	Collinsia parviflora (a)	-	-	-	-	3	-	-	.00
F	Crepis acuminata	-	-	-	1	2	-	.02	.03
F	Cymopterus sp.	97	118	107	125	131	2.99	6.04	7.21
F	Cynoglossum officinale	a5	c27	a2	ab11	bc28	.00	.12	1.25

Type	Species	Nested Frequency					Average Cover %		
		'84	'90	'96	'01	'06	'96	'01	'06
F	<i>Epilobium brachycarpum</i> (a)	-	-	_b 46	_a 24	_b 38	.22	1.66	.24
F	<i>Erodium cicutarium</i> (a)	-	-	-	-	-	-	-	.15
F	<i>Galium aparine</i> (a)	-	-	_b 36	_a -	_c 59	.40	-	.36
F	<i>Gilia aggregata</i>	-	4	-	-	-	-	-	-
F	<i>Hackelia patens</i>	_a 1	_a 10	_a -	_b 47	_a 13	-	.79	.13
F	<i>Holosteum umbellatum</i> (a)	-	-	5	6	-	.01	.03	-
F	<i>Isatis tinctoria</i>	_a -	_c 23	_b 65	_c 25	_c 5	1.33	1.20	.11
F	<i>Lappula occidentalis</i> (a)	-	-	-	1	-	-	.00	-
F	<i>Lactuca serriola</i>	-	67	28	99	118	.15	.93	2.84
F	<i>Lepidium densiflorum</i> (a)	-	-	-	-	3	-	-	.03
F	<i>Linum lewisii</i>	20	22	29	15	21	.37	.16	.33
F	<i>Lithospermum ruderales</i>	10	8	9	11	7	.54	.58	.45
F	<i>Melilotus officinalis</i>	_a 2	_a 15	_b 100	_a 4	_c 68	5.01	.19	1.26
F	<i>Medicago sativa</i>	_a -	_a -	_a -	_a -	_b 24	-	-	2.07
F	<i>Microsteris gracilis</i> (a)	-	-	-	-	8	-	-	.02
F	<i>Penstemon humilis</i>	_{ab} 2	_b 10	_a 1	_{ab} 3	_{ab} 5	.03	.06	.12
F	<i>Phlox hoodii</i>	_b 12	_b 13	_a -	_a -	_{ab} 2	-	-	.03
F	<i>Ranunculus testiculatus</i> (a)	-	-	-	-	1	-	-	.00
F	<i>Tragopogon dubius</i>	_b 159	_b 163	_b 156	_a 102	_{ab} 124	2.96	1.90	1.79
F	<i>Trifolium</i> sp.	_a -	_a -	_a -	_c 32	_b 9	-	.45	.02
F	Unknown forb-perennial	-	-	1	-	-	.06	-	-
F	<i>Veronica biloba</i> (a)	-	-	_a 31	_b 103	_b 76	.11	.60	.63
F	<i>Zigadenus paniculatus</i>	-	-	-	-	1	-	-	.00
Total for Annual Forbs		0	0	255	291	228	1.15	3.03	1.54
Total for Perennial Forbs		450	605	529	526	617	14.70	13.46	20.50
Total for Forbs		450	605	784	817	845	15.85	16.49	22.05

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

BROWSE TRENDS --

Management unit 02 , Study no: 9

Type	Species	Strip Frequency			Average Cover %		
		'96	'01	'06	'96	'01	'06
B	<i>Artemisia tridentata vaseyana</i>	14	14	9	2.04	1.60	1.67
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	4	5	2	.30	.15	.15
B	<i>Gutierrezia sarothrae</i>	10	11	3	.43	.51	.15
B	<i>Juniperus scopulorum</i>	1	0	0	.85	-	-
B	<i>Purshia tridentata</i>	17	20	8	9.03	6.37	5.82
B	<i>Symphoricarpos oreophilus</i>	10	9	10	1.38	1.96	1.77
Total for Browse		56	59	32	14.05	10.60	9.57

CANOPY COVER, LINE INTERCEPT --

Management unit 02 , Study no: 9

Species	Percent Cover	
	'01	'06
<i>Artemisia tridentata vaseyana</i>	-	1.61
<i>Chrysothamnus viscidiflorus viscidiflorus</i>	-	.20
<i>Gutierrezia sarothrae</i>	-	.11
<i>Juniperus scopulorum</i>	1.00	-
<i>Purshia tridentata</i>	-	9.35
<i>Symphoricarpos oreophilus</i>	-	2.70

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 02 , Study no: 9

Species	Average leader growth (in)	
	'01	'06
<i>Artemisia tridentata vaseyana</i>	-	2.4
<i>Purshia tridentata</i>	3.0	3.7

BASIC COVER --

Management unit 02 , Study no: 9

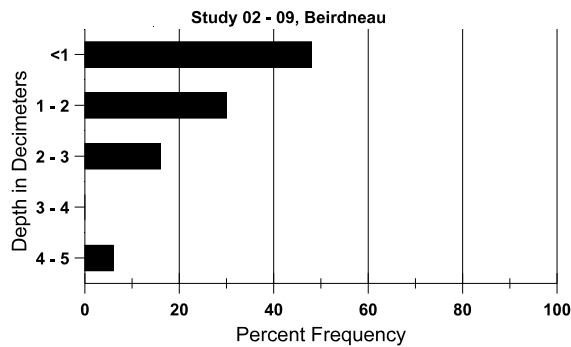
Cover Type	Average Cover %				
	'84	'90	'96	'01	'06
Vegetation	1.25	14.50	54.68	54.55	41.26
Rock	20.25	9.00	12.78	11.34	10.78
Pavement	19.50	31.00	5.56	16.53	16.43
Litter	48.00	39.00	48.74	43.50	31.27
Cryptogams	.25	0	.20	.07	0
Bare Ground	10.75	6.50	6.39	5.70	11.91

SOIL ANALYSIS DATA --

Herd Unit 02, Study no: 09, Beirdneau

Effective rooting depth (in)	Temp °F (depth)	PH	Clay loam			%OM	PPM P	PPM K	dS/m
			%sand	%silt	%clay				
13.8	64.6 (15.8)	7.9	26.7	38.0	35.3	3.2	8.7	211.2	0.5

Stoniness Index



PELLET GROUP DATA --

Management unit 02 , Study no: 9

Type	Quadrat Frequency		
	'96	'01	'06
Elk	-	-	6
Deer	1	6	8

Days use per acre (ha)	
'01	'06
3 (8)	14 (35)
17 (41)	25 (61)

BROWSE CHARACTERISTICS --
Management unit 02 , Study no: 9

		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)
Amelanchier alnifolia												
84	0	-	-	-	-	-	0	0	-	-	0	-/-
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	0	-	-	-	-	-	0	0	-	-	0	-/-
01	0	-	-	-	-	-	0	0	-	-	0	-/-
06	0	-	-	-	-	-	0	0	-	-	0	42/53
Artemisia tridentata vaseyana												
84	1199	-	66	333	800	-	6	94	67	-	17	22/27
90	733	-	-	333	400	-	9	0	55	3	18	24/32
96	360	-	20	180	160	300	33	0	44	6	6	23/40
01	300	-	-	220	80	360	13	0	27	-	0	30/45
06	220	-	-	80	140	100	45	9	64	36	36	28/40
Chrysothamnus nauseosus albicaulis												
84	0	-	-	-	-	-	0	0	-	-	0	-/-
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	0	-	-	-	-	-	0	0	-	-	0	45/61
01	0	-	-	-	-	-	0	0	-	-	0	-/-
06	0	-	-	-	-	-	0	0	-	-	0	54/72
Chrysothamnus viscidiflorus viscidiflorus												
84	0	-	-	-	-	-	0	0	0	-	0	-/-
90	199	66	133	66	-	-	0	0	0	-	0	25/30
96	100	-	20	80	-	-	0	0	0	-	0	28/41
01	140	-	-	120	20	-	0	0	14	-	0	24/21
06	60	-	-	60	-	-	0	0	0	-	0	16/28
Gutierrezia sarothrae												
84	1866	-	466	1400	-	-	0	0	-	-	0	15/19
90	66	-	-	66	-	-	0	0	-	-	0	9/14
96	400	-	-	400	-	-	0	0	-	-	0	14/17
01	580	-	-	580	-	-	0	0	-	-	0	13/17
06	60	-	-	60	-	-	0	0	-	-	0	14/23

		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	20	-	-	20	-	-	0	0	-	-	0	-/-	
01	0	-	-	-	-	-	0	0	-	-	0	-/-	
06	0	-	-	-	-	-	0	0	-	-	0	-/-	
Purshia tridentata													
84	599	-	-	133	466	-	0	100	78	-	0	45/53	
90	666	-	-	466	200	-	50	0	30	3	10	63/92	
96	380	-	-	380	-	100	74	5	0	-	0	52/88	
01	560	-	20	420	120	80	75	11	21	-	0	58/93	
06	180	-	-	160	20	60	33	44	11	-	0	53/81	
Symphoricarpos oreophilus													
84	333	-	200	133	-	-	40	0	0	-	0	32/31	
90	733	-	333	400	-	-	0	0	0	-	0	16/28	
96	240	-	60	160	20	-	8	0	8	-	17	24/51	
01	200	160	-	200	-	-	0	0	0	-	0	30/57	
06	300	-	-	300	-	-	7	0	0	-	0	29/49	