

Trend Study 28-3-08

Study site name: Bear Valley .

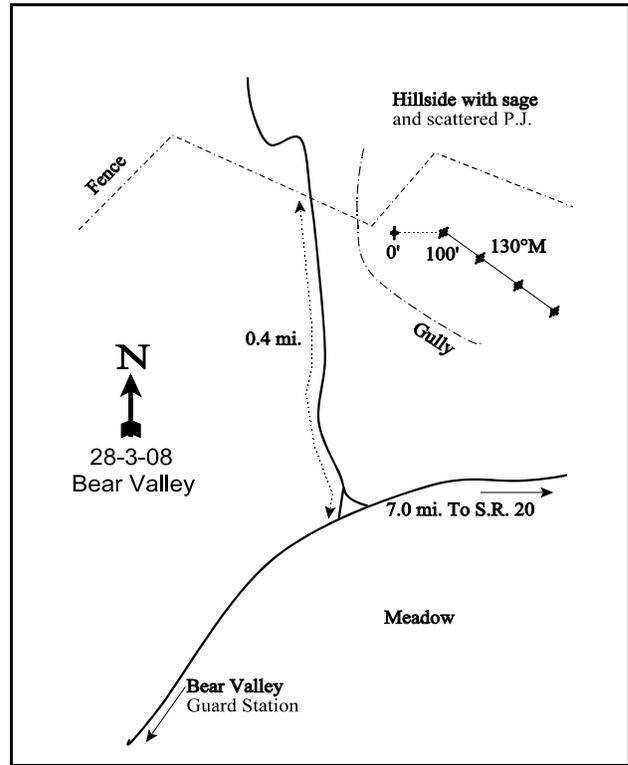
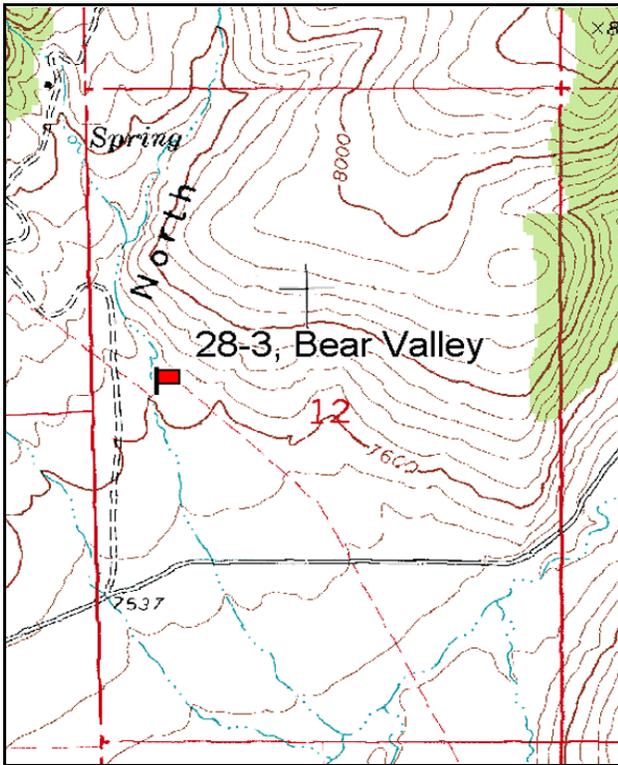
Vegetation type: Chained Shrubland .

Compass bearing: frequency baseline 77 degrees magnetic. (Lines 2-4 130°M).

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

LOCATION DESCRIPTION

From the US 89-SR 20 Junction, go approximately 7.0 miles west on SR 20 to a corral past mile marker 14. Turn left on the Little Creek Road that leads to Bear Valley. Travel 7.0 miles south on the main road to a minor fork. Turn right and go 0.4 miles to a fence and wire gate. Stop here and walk east along the fenceline to the corner. Walk 4 paces east from the fence corner to a short red fencepost tagged #7163 which is the 0-foot baseline stake. The 100-foot stake is rebar.



Map name: Little Creek Peak

Diagrammatic Sketch

Township 33S, Range 6 1/2W, Section 5

GPS: NAD 83, UTM 12S 360496 E, 4202117 N

DISCUSSION

Bear Valley - Trend Study No. 28-3

Study Information

This study samples a seeded range in the bottom of a large valley at the north end of Upper Bear Valley [elevation: 7,600 feet (2,316 m), slope: 3%-5%, aspect: southeast]. The area is at the upper limits of normal deer winter range and is also used by elk. Several cabins can be found a few miles from the transect and a stream and stock pond are found within a half mile. Pellet group transect data collected on site in 1998 estimated 3 elk, 19 deer, and 65 cow days use/acre (7 ddu/ha, 47 edu/ha, and 161 cdu/ha). Deer use remained low in 2003 at an estimated 11 days use/acre (28 ddu/ha) while cattle declined to only 22 days use/acre (56 cdu/ha). Pellet data in 2008 estimated 3 elk day use/acre (8 edu/ha), 5 deer days/acre (12 ddu/ha), 11 cow day use/acre (27 cdu/ha), and 17 sage grouse pellets/acre. Rabbit pellets were very abundant on the site in 2003 and were sampled in 82% of the sampling quadrats.

Soil

Soil analysis indicates a sandy loam texture with a moderately acidic pH (5.8). The soil is fairly deep with an average effective rooting depth of more than 17 inches (43 cm). Since 1998, relative combined vegetation and litter cover ranged from 59%-66%, and relative combined rock and pavement cover has been 5%-10%. Relative bare ground cover has ranged from 25%-36% since 1998. An erosion condition class assessment rated soils to be stable in 2003 and 2008.

Browse

Browse is not a prominent forage component on this seeding. Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) is the only preferred browse species on the site. Sagebrush increased in density between 1992 and 1998 due to the abundance of young plants in the population (1,200 plants/acre) in 1998. With drought prior to and including 2003, the number of young declined to only 20 plants/acre, and overall sagebrush density declined with an increase in decadence in the population. In 2008, sagebrush density decreased further to 700 plants/acre, but recruitment and decadence improved. Use was mostly light to moderate in all sample years. Big sagebrush is much more abundant on the slopes that surround this seeded valley bottom.

Stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) is the most abundant browse on the site. Density has decreased from a high of 17,080 plants/acre in 1992 to 5,880 plants/acre in 2008. Stickyleaf low rabbitbrush plants are vigorous and most show light use. Other shrubs sampled on the site in low densities include rubber rabbitbrush (*Chrysothamnus nauseosus*), gray horsebrush (*Tetrademia canescens*), and broom snakeweed (*Gutierrezia sarothrae*).

Herbaceous Understory

As mentioned above, mountain big sagebrush is abundant on the slopes that surround the valley bottom, although the transect samples the valley bottom which is dominated by seeded grasses, primarily crested wheatgrass (*Agropyron cristatum*). Crested wheatgrass has maintained a nearly stable frequency over the years and has been sampled in 98-100% of the quadrats in all readings. Crested wheatgrass has provided at least 90% of the total grass cover on the site since 1992. Western wheatgrass (*Agropyron smithii*) is second in abundance to crested wheatgrass. The wheatgrasses were noted as being large and vigorous with light to moderate utilization in 1998. Blue grama (*Bouteloua gracilis*) and a sedge (*Carex* sp.) are scattered throughout the site and both show a significant decline in nested frequency since 1987.

Forbs were diverse and moderately abundant from 1987-1998. In 2003, with drought conditions, perennial forbs declined in sum of nested frequency by nearly 90%, and annual forbs declined by nearly 98%. Forbs showed a slight recovery in 2008 with an increase in the sum of nested frequency of perennial forbs and the total forb cover increasing from 1% in 2003 to 4%. Although forbs are less important as winter forage, silvery

lupine (*Lupinus argenteus*), yellow salsify (*Tragopogon dubius*), lobeleaf groundsel (*Senecio multilobatus*), and dandelion (*Taraxacum officinale*) provide desirable spring and summer feed.

1992 TREND ASSESSMENT

Trend for browse is stable. Density differences may be related to the larger sample area used in 1992; therefore trend for browse was determined using different parameters. The vigor of mountain big sagebrush remains good and decadence was low. The less desirable stickyleaf low rabbitbrush has a high density of 17,080 plants/acre and maintains a dynamic young class. Trend for both the grasses and forbs is stable. The sums of nested frequency of perennial grasses and perennial forbs showed little change.

winter range condition (DCI) - poor (38) Mid-level potential scale
browse - stable (0) grass - stable (0) forb - stable (0)

1998 TREND ASSESSMENT

The browse trend is slightly up. The mountain big sagebrush density has increased 92% since 1992 from 120 plants/acre to 1,540 plants/acre, but this is a mostly young population that still needs to become established. The proportion of sagebrush plants displaying poor vigor increased to 21% from 1992, but there were no decadent plants sampled. The stickyleaf low rabbitbrush population density declined by 34% since 1992 to 11,320 plants/acre. The trend for grasses is slightly down. The sum of nested frequency of perennial grasses increased slightly from 1992, but cover remained similar. There was a significant increase in the nested frequency of Kentucky bluegrass (*Poa pratensis*) and a significant decrease in the nested frequency of needle-and-thread grass (*Stipa comata*). The trend for forbs is slightly up. The sum of nested frequency of perennial forbs increased nearly two-fold since 1992, though the sum of nested frequency of annual forbs increased markedly as well. There were significant increases in the nested frequency of silvery lupine, longleaf phlox (*Phlox longifolia*), and yellow salsify.

winter range condition (DCI) - poor (40) Mid-level potential scale
browse - slightly up (+1) grass - slightly down (-1) forb - slightly up (+2)

2003 TREND ASSESSMENT

Trend for browse is down. The mountain big sagebrush population declined in density from 1998 to 940 plants/acre, and decadence increased to 40%. Recruitment into the population by young plants was very high in 1998 at 78%, but declined to only 2%. Trend for the grasses is stable. Perennial grasses have changed little in sum of nested frequency, though production of perennial grasses increased as average cover increased from 19% in 1998 to 27%. There was a significant decrease in the nested frequency of Kentucky bluegrass. Trend for forbs is down. The sum of nested frequency declined 88% from 1998, and production of perennial forbs declined from 5% total cover in 1998 to 1%. Yellow salsify, dandelion, and silvery lupine declined significantly in nested frequency with only silvery lupine being sampled. These are important species that provide spring and summer forage.

winter range condition (DCI) - very poor - poor (35) Mid-level potential scale
browse - down (-2) grass - stable (0) forb - down (-2)

2008 TREND ASSESSMENT

Trend for browse is slightly up. Mountain big sagebrush density declined by 26% from 2003 to 700 plants/acre, but decadence also declined to 11% and vigor remained good in the population. Sagebrush cover has increased to 4% and plants have grown larger as the population matures. Recruitment improved with young plants comprising 23% of the population. The density of the other dominant shrub, stickyleaf low rabbitbrush, has decreased to 5,880 plants/acre, the lowest density since sampling began. Trend for grasses is stable. The sum of nested frequency of perennial grasses changed little from 2003. Trend for forbs is slightly up. The sum of nested frequency of perennial forbs increased slightly from 2003, and production of perennial

forbs increased to 3% of the total cover. Forbs are still somewhat rare however.

winter range condition (DCI) - poor (40) Mid-level potential scale
browse - slightly up (+1) grass - stable (0) forb - slightly up (+1)

HERBACEOUS TRENDS --
 Management unit 28 , Study no: 3

T y p e	Species	Nested Frequency					Average Cover %			
		'87	'92	'98	'03	'08	'92	'98	'03	'08
G	Agropyron cristatum	320	297	299	318	322	17.26	17.40	25.88	28.31
G	Agropyron smithii	ab ⁴¹	b ⁷³	ab ⁵⁸	ab ⁴²	a ²⁹	.31	.45	.34	.71
G	Bouteloua gracilis	c ³²	bc ²⁵	ab ⁷	a ³	a ⁴	.43	.21	.15	.03
G	Bromus inermis	-	-	-	-	5	-	-	-	.18
G	Bromus tectorum (a)	-	-	a ¹⁸	a ³⁸	b ⁷²	-	.52	.76	.58
G	Carex sp.	b ¹⁹	ab ¹⁰	a ⁻	a ³	a ⁻	.02	-	.00	-
G	Elymus junceus	3	1	2	3	-	.00	.00	.15	-
G	Poa pratensis	ab ⁵	a ²	b ¹²	ab ⁻	b ¹⁶	.03	.37	-	.16
G	Stipa comata	ab ²⁷	b ⁴⁴	a ¹³	a ⁹	a ¹⁵	1.10	.37	.26	.44
Total for Annual Grasses		0	0	18	38	72	0	0.52	0.76	0.58
Total for Perennial Grasses		447	452	391	378	391	19.17	18.82	26.78	29.84
Total for Grasses		447	452	409	416	463	19.17	19.34	27.54	30.42
F	Agoseris glauca	a ⁻	a ⁻	a ²	a ²	b ³⁹	-	.00	.03	.23
F	Androsace septentrionalis (a)	-	b ¹⁵	c ¹⁶²	a ⁻	b ¹³	.03	2.82	-	.14
F	Arabis sp.	2	-	-	-	-	-	-	-	-
F	Artemisia ludoviciana	11	3	11	3	6	.00	.56	.00	.06
F	Astragalus panguicensis	3	8	2	-	5	.02	.01	-	.01
F	Castilleja linariaefolia	-	-	-	10	-	-	-	.18	-
F	Chaenactis douglasii	3	-	-	-	-	-	-	-	-
F	Cirsium sp.	-	8	4	5	8	.04	.15	.04	.36
F	Collinsia parviflora (a)	-	-	112	-	85	-	.91	-	.21
F	Crepis acuminata	-	-	4	-	-	-	.01	-	-
F	Delphinium nuttallianum	-	-	-	-	2	-	-	-	.00
F	Descurainia pinnata (a)	-	-	2	1	-	-	.00	.00	-
F	Dracocephalum parviflorum	-	-	3	-	-	-	.01	-	-
F	Epilobium brachycarpum (a)	-	-	1	-	-	-	.00	-	-
F	Eriogonum cernuum (a)	-	4	-	-	1	.01	-	-	.00
F	Erigeron flagellaris	1	-	-	-	-	-	-	-	-
F	Erigeron pumilus	-	-	-	2	-	-	-	.00	-
F	Euphorbia sp.	-	-	3	-	-	-	.03	-	-

Type	Species	Nested Frequency					Average Cover %			
		'87	'92	'98	'03	'08	'92	'98	'03	'08
F	Gayophytum ramosissimum(a)	-	-	a-	a-	b110	-	-	-	.81
F	Ipomopsis aggregata	-	-	1	-	-	-	.00	-	-
F	Lappula occidentalis (a)	-	a12	c116	a12	b35	.03	1.89	.04	.17
F	Lactuca serriola	-	-	-	-	1	-	-	-	.00
F	Lepidium sp. (a)	-	2	-	-	-	.00	-	-	-
F	Lupinus argenteus	c91	b70	c109	a7	a9	2.97	1.35	.30	.04
F	Lygodesmia spinosa	a10	b16	ab14	ab12	ab11	.27	.39	.39	.60
F	Microsteris gracilis (a)	-	a3	c216	a3	b125	.00	2.27	.00	.45
F	Oenothera coronopifolia	-	-	10	-	-	-	.07	-	-
F	Oenothera pallida	b35	a9	ab27	a-	a4	.05	.31	-	.01
F	Penstemon sp.	-	-	1	-	-	-	.00	-	-
F	Phlox longifolia	b50	b61	c140	a7	b67	.15	.86	.16	.48
F	Polygonum douglasii (a)	-	bc31	c94	a-	b13	.07	1.00	-	.03
F	Senecio douglasii	b30	b27	a-	a-	b19	.54	-	-	.70
F	Senecio multilobatus	-	-	1	-	2	-	.00	-	.03
F	Sphaeralcea coccinea	-	-	9	-	2	-	.07	-	.00
F	Taraxacum officinale	b11	ab5	b12	a-	a-	.01	.06	-	.00
F	Tragopogon dubius	b18	ab1	c55	a-	a-	.00	.62	-	-
F	Unknown forb-annual (a)	-	-	37	-	-	-	.12	-	-
Total for Annual Forbs		0	67	740	16	382	0.15	9.05	0.04	1.84
Total for Perennial Forbs		265	208	408	48	175	4.06	4.56	1.12	2.57
Total for Forbs		265	275	1148	64	557	4.21	13.61	1.17	4.41

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

BROWSE TRENDS --

Management unit 28 , Study no: 3

Type	Species	Strip Frequency				Average Cover %			
		'92	'98	'03	'08	'92	'98	'03	'08
B	Artemisia tridentata vaseyana	5	31	19	21	.13	1.25	2.79	4.26
B	Chrysothamnus nauseosus	1	19	0	0	.15	1.25	-	-
B	Chrysothamnus viscidiflorus viscidiflorus	99	99	86	78	4.56	10.96	2.63	2.57
B	Gutierrezia sarothrae	0	0	2	3	-	-	.00	.03
B	Tetradymia canescens	5	6	5	8	.44	.21	.30	.33
Total for Browse		110	155	112	110	5.28	13.68	5.73	7.20

CANOPY COVER, LINE INTERCEPT --

Management unit 28 , Study no: 3

Species	Percent Cover	
	'03	'08
Artemisia tridentata vaseyana	1.31	4.91
Chrysothamnus viscidiflorus viscidiflorus	2.08	2.98
Tetradymia canescens	.05	.16

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 28 , Study no: 3

Species	Average leader growth (in)	
	'03	'08
Artemisia tridentata vaseyana	1.2	2.6

BASIC COVER --

Management unit 28 , Study no: 3

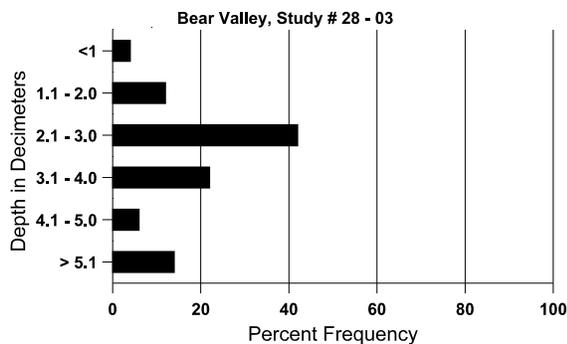
Cover Type	Average Cover %				
	'87	'92	'98	'03	'08
Vegetation	7.00	28.50	45.32	34.58	42.25
Rock	4.75	6.33	.26	.27	.03
Pavement	11.50	0	11.18	5.51	7.40
Litter	58.50	25.89	48.66	24.17	34.70
Cryptogams	0	0	.00	0	.03
Bare Ground	18.25	37.15	28.85	42.65	27.33

SOIL ANALYSIS DATA --

Management unit 28, Study no: 3, Study Name: Bear Valley

Effective rooting depth (in)	Temp °F (depth)	pH	sandy loam			%OM	PPM P	PPM K	ds/m
			% sand	% silt	% clay				
17.3	62.0 (12.9)	5.8	64.2	20.0	15.8	2.3	19.9	1542.4	0.3

Stoniness Index



PELLET GROUP DATA --
Management unit 28 , Study no: 3

Type	Quadrat Frequency			
	'92	'98	'03	'08
Rabbit	88	19	82	96
Elk	-	2	-	1
Deer	10	23	9	2
Cattle	3	29	8	25

Days use per acre (ha)		
'98	'03	'08
-	-	-
3 (7)	-	3 (8)
19 (47)	11 (28)	5 (12)
65 (161)	23 (56)	11 (27)

BROWSE CHARACTERISTICS --
Management unit 28 , Study no: 3

		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 vaseyana</i>												
87	932	-	333	599	-	-	36	7	0	-	7	7/6
92	120	40	20	100	-	-	50	0	0	-	0	-/-
98	1540	160	1200	340	-	40	9	0	0	-	21	21/28
03	940	20	20	540	380	60	26	17	40	2	2	22/27
08	700	60	160	460	80	140	3	6	11	3	9	25/34
<i>Chrysothamnus nauseosus</i>												
87	265	-	66	199	-	-	0	0	-	-	0	20/13
92	20	-	-	20	-	-	100	0	-	-	100	-/-
98	560	-	100	460	-	-	0	0	-	-	0	11/17
03	0	-	-	-	-	20	0	0	-	-	0	24/34
08	0	-	-	-	-	-	0	0	-	-	0	38/56
<i>Chrysothamnus viscidiflorus viscidiflorus</i>												
87	10664	133	6466	3599	599	-	.62	0	6	-	6	17/12
92	17080	480	9060	7500	520	-	12	1	3	.23	.93	-/-
98	11320	160	4260	6860	200	140	3	0	2	.35	2	14/16
03	6580	20	920	4800	860	180	2	11	13	4	4	9/8
08	5880	80	980	3920	980	40	12	10	17	3	3	9/11
<i>Gutierrezia sarothrae</i>												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
92	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	100	-	-	100	-	-	0	0	-	-	0	3/4
08	100	-	20	80	-	-	0	0	-	-	0	3/3

		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>Symphoricarpos oreophilus</i>												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
92	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	16/14
03	0	-	-	-	-	-	0	0	-	-	0	37/82
08	0	-	-	-	-	-	0	0	-	-	0	32/61
<i>Tetradymia canescens</i>												
87	0	-	-	-	-	-	0	0	0	-	0	-/-
92	240	-	80	140	20	-	8	0	8	-	0	-/-
98	180	-	20	160	-	-	11	0	0	-	0	14/21
03	200	-	-	140	60	-	10	10	30	-	0	11/13
08	320	-	60	200	60	-	6	0	19	-	0	9/12