

Trend Study 24-2-08

Study site name: Deer Creek Bench.

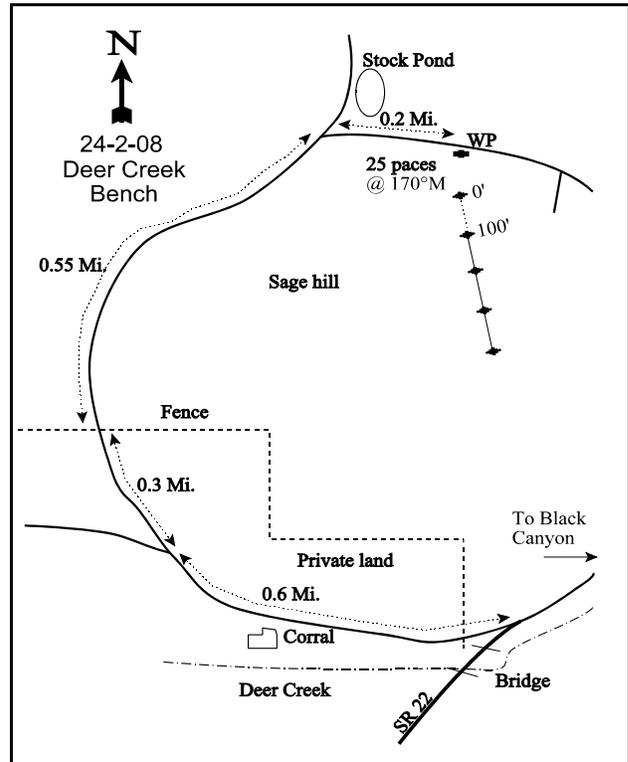
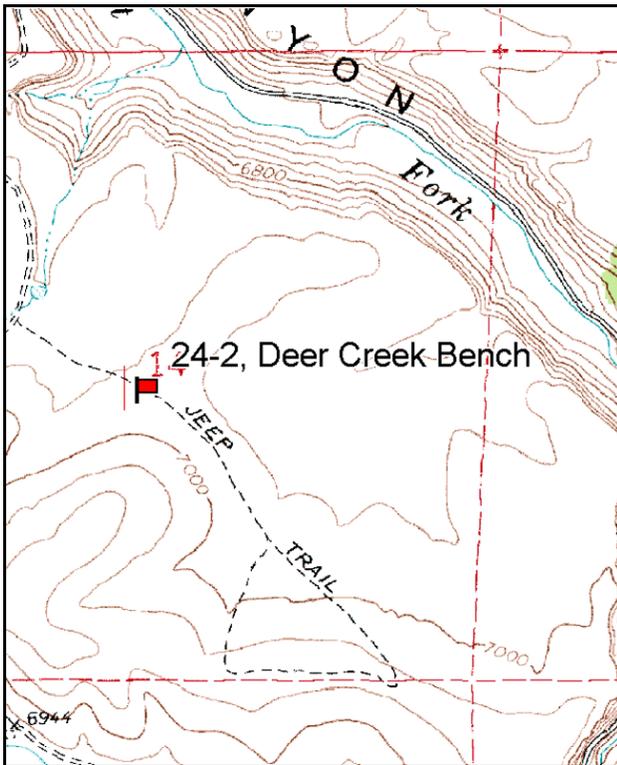
Vegetation type: Black Sagebrush.

Compass bearing: frequency baseline 168 degrees magnetic.

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

LOCATION DESCRIPTION

From SR22 in the southern end of Black Canyon, follow the highway up Deer Creek to a bridge. Immediately north of the bridge, turn hard left. Take this road, which crosses private land, northwest for 0.6 miles passing a corral to a fork. Bear right, go 0.3 miles to a fence. Continue 0.55 miles to a fork by a stockpond. Turn right onto the jeep trail and proceed 0.2 miles to the study area. There is a witness post located on the right side of the road. Walk approximately 25 paces bearing 170 degrees to the 0-foot baseline stake. The study is marked by 2-foot tall fence posts. The 0-stake is marked by browse tag #9100. The transect runs south up the hill.



Map Name: Antimony

Diagrammatic Sketch

Township 32S, Range 2W, Section 14

GPS: NAD 83, UTM 12S 414268 E 4208657 N

DISCUSSION

Deer Creek Bench - Trend Study 24-2

Study Information

The study is located on the east side of the unit and is important deer winter range, but also sees use from a growing herd of antelope. It is situated near the base of steeper slopes that rise up to the Sevier Plateau [elevation: 6,980 feet (2,128 m), slope: 11%-13%, aspect: north]. The area is covered with alluvial gravel and sand over bedrock. The key browse species is black sagebrush (*Artemisia nova*). Numerous deer pellet groups and several antler drops have been found in the area during each reading. Deer use was estimated to be high in 1997 (121 ddu/acre:289 ddu/ha), declining, but still showing moderately high use in 2003 (64 ddu/acre:159 ddu/ha), and increasing slightly again in 2008 (89 ddu/acre:147 ddu/ha). Elk use was estimated to be light in 1997 (8 edu/acre:20 edu/ha), no use in 2003, and minimal use in 2008 (1 edu/acre: 2 edu/ha). Several sage grouse pellets were also encountered in 2003 and 2008. Escape and thermal cover are not present on the site, but some is located one-half mile to the west. It appears that the area is used lightly by livestock with between 5 to 8 cow days use/acre (13 to 20 cdu/ha) estimated from 1997 to 2008. A stock pond is located about 1/4 of a mile to the north, and Deer Creek is 3/4 of a mile to the south of the study. There are no other known uses of the area and human pressure is assumed to be minimal during the year.

Soil

The soils are a coarse textured, sandy loam with a neutral reaction (pH 7.1). A large portion of the surface is covered with erosion pavement and rock. The soil is fairly deep with an effective rooting depth estimated at almost 14 inches, but the soils lack a well-developed A horizon. There is an abundance of small pebbles and large gravel on the surface and through the soil profile down to a depth of six to eight inches. Few rocks are found below eight inches. Relative combined vegetation and litter cover was constant at 44%-45% from 1997 to 2008, and the relative combined rock and pavement cover was constant at 41%-43% from 1997 to 2008. The relative bare ground cover has remained steady at 11%-14% since 1997, as well. The soil erosion condition rating was classified as stable in 2003 and 2008.

Browse

A fairly dense stand of black sagebrush occupies the site along with some pygmy sagebrush (*Artemisia pygmaea*). Density of black sagebrush has changed over the years with a high of 9,999 plants/acre in 1987, decreasing to a low of 5,980 plants/acre in 1997, increasing to 8,760 plants/acre in 2003, and decreasing again to 6,760 plants/acre in 2008. Recruitment was high at the onset of the study with young plants constituting 23% of the total population, but has decreased with young plants constituting only 1%-4% of the population in 2003 and 2008. Use was heavy in 1987 and 1991 but light to moderate in 1997, 2003, and 2008. Vigor has been classified as good on most plants during all readings except for 1991 when 21% of the plants sampled displayed poor vigor. The number of decadent plants also peaked at 55% in 1991, declined to 15% in 1997, and began to rise again with 24% in 2003, and 39% in 2008. Low growing pygmy sagebrush was first sampled with the larger sample used in 1997. Density was estimated at 2,500 plants/acre in 1997, 3,220 plants/acre in 2003, and 3,280 plants/acre in 2008. These shrubs average only 2 inches in height and are mostly unutilized.

Slenderbush eriogonum (*Eriogonum microthecum*) provides some additional forage on the site with an average density of 6,500 plants/acre since 1997. These shrubs are small averaging only 2 inches in height. Small numbers of winterfat (*Ceratoides lanata*), 20 plants/acre, also provide a small amount of additional forage. Narrowleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *stenophyllus*), a poor value increaser, is also abundant with an average density of 3,120 plants/acre since 1997. The population of rabbitbrush is mostly mature. Broom snakeweed (*Gutierrezia sarothrae*) is also found on the site and there may have been some identification problems between it and rabbitbrush during past readings.

Herbaceous Understory

Herbaceous plants are rare. Bottlebrush squirreltail (*Sitanion hystrix*), Indian ricegrass (*Oryzopsis hymenoides*), and needle-and-thread (*Stipa comata*) are the only perennial grasses found on the site. These three perennial species produced only 4% of the quadrat cover in 1997, increasing to about 7% in 2003, and to about 9% in 2008. Nine forb species were encountered in 1997, and only 6 species in 2003. Only trailing fleabane (*Erigeron pumilus*) and scarlet globemallow (*Sphaeralcea coccinea*) occur more than rarely. All forbs combined produced less than 1% cover in 1997, 2003, and 2008. They are probably of limited value to mule deer during the spring.

1991 TREND ASSESSMENT

Trend for browse has become somewhat more difficult to determine since the survey in 1987. Black sagebrush density has decreased from 9,999 down to 8,599 plants/acre. The amount of heavy hedging has decreased from 58% to 36% but the sagebrush displaying poor vigor increased from 2% to 21%. The number of decadent plants also increased from 29% to 55% of the population. Trend for browse is considered down slightly even with a notable decrease in the broom snakeweed population. An extended period of drought may have been responsible for much of this downward trend. The herbaceous understory is about the same for both the grasses and forbs.

browse - slightly down (-1) grass - stable (0) forb - stable (0)

1997 TREND ASSESSMENT

Trend for the key browse, black sagebrush, is slightly up. Density differences of browse species may be related to the larger sample area used in 1997, therefore, trend for browse was determined using other parameters. The number of sagebrush plants showing poor vigor has dropped from 21% to 7%, and decadence declined from 55% to 15%. Sagebrush seedlings and young plants have decreased steadily since 1987. Trend for the grasses is slightly up but still depleted with grasses producing only 4% total cover. There was a significant increase in the nested frequency of Indian ricegrass. Trend for the forbs went down slightly with a decrease in the nested frequency of perennial forbs.

winter range condition (DCI) - good (49) Low potential scale
browse - slightly up (+1) grass - slightly up (+1) forb - slightly down (-1)

2003 TREND ASSESSMENT

Trend for the key browse species, black sagebrush, remains stable. Density has remained similar since 1987. Sagebrush vigor was good on most plants, and decadence has remained moderately low at 24%. Recruitment is down however, with no seedlings encountered in 2003 and young plants accounting for only 1% of the sagebrush population. Trend for the grasses is up. Sum of nested frequency of perennial grasses increased by 38%, and cover of perennial grasses increased from 4% to 7%. Trend for the forbs is slightly down. Sum of nested frequency of perennial forbs has declined slightly. Cover of perennial grasses did increase from 4% to 7% but overall herbaceous cover remains poor.

winter range condition (DCI) - fair-good (46) Low potential scale
browse - stable (0) grass - up (+2) forb - slightly down (-1)

2008 TREND ASSESSMENT

Trend for the key browse species, black sagebrush, is slightly down. Density decreased slightly to 6,760 plants/acre with plants showing poor vigor increasing slightly, but still low at 10%. Recruitment remained low with young plants comprising 4% of the sagebrush population. Decadence continued to increase from 24% in 2003 to 39%. Trend for the grasses was up slightly with the sum of nested frequency of perennial grasses increasing. The total average cover of grasses is still low, but increased from 7% in 2003 to 9%. Trend for forbs was slightly up with the sum of nested frequency of perennial forbs increasing, and the sum of nested

frequency of annual forbs decreasing. Forbs still comprise less than 1% of the total average cover.

winter range condition (DCI) - fair-good (46) Low potential scale
browse - slightly down (-1) grass - slightly up (+1) forb - slightly up (+1)

HERBACEOUS TRENDS --
 Management unit 24 , Study no: 2

Type	Species	Nested Frequency					Average Cover %		
		'87	'91	'97	'03	'08	'97	'03	'08
G	Bromus tectorum (a)	-	-	a3	a2	b18	.00	.00	.03
G	Oryzopsis hymenoides	a9	a11	b73	bc93	c111	2.04	4.46	4.24
G	Sitanion hystrix	ab126	ab98	ab101	b138	a90	1.66	1.92	1.51
G	Stipa comata	a-	a7	a14	a28	b125	.26	.49	3.02
Total for Annual Grasses		0	0	3	2	18	0.00	0.00	0.03
Total for Perennial Grasses		135	116	188	259	326	3.96	6.88	8.79
Total for Grasses		135	116	191	261	344	3.97	6.88	8.82
F	Antennaria rosea	-	-	2	-	5	.00	-	.01
F	Arabis sp.	9	-	5	-	4	.01	-	.03
F	Astragalus sp.	b20	b24	a4	a-	a-	.01	-	-
F	Astragalus utahensis	-	-	6	-	-	.01	-	-
F	Castilleja sp.	-	-	-	-	3	-	-	.00
F	Chenopodium sp. (a)	-	-	b18	a-	a-	.04	-	-
F	Chenopodium leptophyllum(a)	-	-	-	-	3	-	-	.01
F	Cruciferae	5	-	-	-	-	-	-	-
F	Descurainia pinnata (a)	-	-	a-	b13	ab6	-	.08	.01
F	Erigeron pumilus	c48	ab19	c41	a8	bc39	.31	.05	.20
F	Gayophytum ramosissimum(a)	-	-	c35	b11	a-	.08	.03	-
F	Paronychia sp.	b19	b21	a-	a-	a-	-	-	-
F	Phlox hoodii	a-	ab8	a-	b13	b17	-	.06	.26
F	Phlox longifolia	13	12	6	12	5	.01	.05	.04
F	Senecio multilobatus	1	-	-	-	-	-	-	-
F	Sphaeralcea coccinea	b60	ab58	a31	ab37	a30	.20	.26	.13
F	Trifolium sp.	-	-	-	-	3	-	-	.00
Total for Annual Forbs		0	0	53	24	9	0.12	0.10	0.02
Total for Perennial Forbs		175	142	95	70	106	0.56	0.43	0.70
Total for Forbs		175	142	148	94	115	0.69	0.54	0.72

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

BROWSE TRENDS --

Management unit 24 , Study no: 2

Type	Species	Strip Frequency			Average Cover %		
		'97	'03	'08	'97	'03	'08
B	Artemisia nova	93	98	94	16.65	17.47	16.36
B	Artemisia pygmaea	22	23	19	.82	.88	.72
B	Ceratoides lanata	1	3	1	0.0	.03	.03
B	Chrysothamnus viscidiflorus stenophyllus	47	46	48	2.23	3.05	2.32
B	Eriogonum microthecum	53	52	55	1.14	.76	.81
B	Gutierrezia sarothrae	4	46	15	0.0	.45	.06
B	Opuntia sp.	4	5	2	0.0	0.0	0.0
B	Pediocactus simpsonii	0	1	0	-	.01	-
Total for Browse		224	274	333	20.87	22.68	20.30

CANOPY COVER, LINE INTERCEPT --

Management unit 24 , Study no: 2

Species	Percent Cover	
	'03	'08
Artemisia nova	17.89	19.41
Artemisia pygmaea	.73	.78
Chrysothamnus viscidiflorus stenophyllus	2.59	2.34
Eriogonum microthecum	.21	.95
Gutierrezia sarothrae	.70	.08

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 24 , Study no: 2

Species	Average leader growth (in)	
	'03	'08
Artemisia nova	1.1	0.6

BASIC COVER --

Management unit 24 , Study no: 2

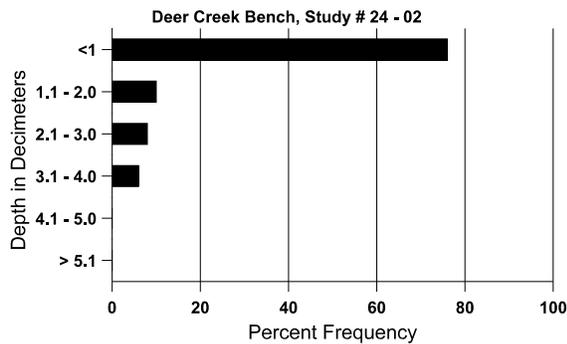
Cover Type	Average Cover %				
	'87	'91	'97	'03	'08
Vegetation	8.50	2.75	25.71	28.83	29.66
Rock	16.75	8.75	11.87	17.70	16.43
Pavement	30.00	45.25	27.52	27.36	30.75
Litter	24.50	17.00	16.72	18.10	19.31
Cryptogams	1.50	2.00	.34	.65	.66
Bare Ground	18.75	24.25	13.28	14.39	11.96

SOIL ANALYSIS DATA --

Management unit 24, Study no: 2, Study Name: Deer Creek Bench

Effective rooting depth (in)	Temp °F (depth)	pH	sandy loam			%OM	PPM P	PPM K	dS/m
			%sand	%silt	%clay				
13.9	62.7 (10.2)	7.1	61.0	23.1	15.9	1.8	13.6	92.8	0.5

Stoniness Index



PELLET GROUP DATA --

Management unit 24 , Study no: 2

Type	Quadrat Frequency		
	'97	'03	'08
Rabbit	2	11	48
Grouse	-	2	2
Elk	3	3	4
Deer	46	34	47
Cattle	3	6	4

Days use per acre (ha)		
'97	'03	'08
-	-	-
-	-	6 (52)
8 (20)	-	1 (2)
121 (299)	64 (159)	60 (147)
6 (15)	8 (20)	5 (13)

BROWSE CHARACTERISTICS --
Management unit 24 , Study no: 2

		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 nova</i>												
87	9999	1799	2333	4733	2933	-	23	58	29	.60	2	14/20
91	8599	666	1333	2533	4733	-	46	36	55	2	21	11/20
97	5980	220	780	4280	920	780	31	5	15	7	7	12/23
03	8760	-	100	6520	2140	900	18	0	24	4	4	11/22
08	6760	280	260	3880	2620	440	38	12	39	10	10	10/23
<i>Artemisia pygmaea</i>												
87	0	-	-	-	-	-	0	0	0	-	0	-/-
91	0	-	-	-	-	-	0	0	0	-	0	-/-
97	2500	100	160	2340	-	-	24	0	0	-	0	2/7
03	3220	-	80	3020	120	-	.62	0	4	-	0	2/6
08	3280	-	20	2200	1060	-	0	0	32	-	0	1/6
<i>Atriplex canescens</i>												
87	66	-	-	66	-	-	0	0	0	-	0	19/20
91	66	-	-	-	66	-	0	100	100	-	100	-/-
97	0	-	-	-	-	-	0	0	0	-	0	-/-
03	0	-	-	-	-	-	0	0	0	-	0	-/-
08	0	-	-	-	-	-	0	0	0	-	0	-/-
<i>Ceratoides lanata</i>												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
97	20	-	-	20	-	-	100	0	-	-	0	4/8
03	60	-	-	60	-	-	0	100	-	-	0	3/4
08	20	-	-	20	-	-	0	100	-	-	0	4/6
<i>Chrysothamnus viscidiflorus stenophyllus</i>												
87	66	-	-	66	-	-	0	0	0	-	0	8/12
91	66	-	-	-	66	-	0	0	100	-	0	-/-
97	3060	-	140	2880	40	-	1	0	1	.65	.65	6/12
03	3360	-	20	2980	360	-	0	0	11	3	3	6/12
08	2940	80	-	2120	820	-	7	0	28	7	8	6/11

		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>Eriogonum microthecum</i>												
87	3598	66	199	3399	-	-	0	0	-	-	0	3/3
91	2266	133	333	1933	-	-	32	15	-	-	0	2/2
97	5600	180	640	4960	-	-	4	0	-	-	0	3/5
03	7620	-	220	7400	-	60	11	2	-	-	0	2/4
08	6280	40	-	6280	-	-	5	.95	-	-	0	2/3
<i>Gutierrezia sarothrae</i>												
87	1932	-	666	1266	-	-	0	0	0	-	0	8/9
91	1133	66	-	1133	-	-	0	0	0	-	0	5/4
97	80	-	-	80	-	-	0	0	0	-	0	8/7
03	1920	20	200	1720	-	-	0	0	0	-	0	6/5
08	500	-	-	480	20	-	0	0	4	4	4	6/8
<i>Opuntia sp.</i>												
87	0	66	-	-	-	-	0	0	0	-	0	-/-
91	333	66	333	-	-	-	0	0	0	-	0	-/-
97	80	-	-	80	-	-	0	0	0	-	0	4/4
03	100	-	-	100	-	-	0	0	0	-	0	4/9
08	40	-	-	20	20	20	0	0	50	-	50	4/11
<i>Pediocactus simpsonii</i>												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
03	20	-	-	20	-	-	0	0	-	-	0	0/1
08	0	-	-	-	-	-	0	0	-	-	0	-/-