

Trend Study 11A-2-05

Study site name: Wirefence Canyon .

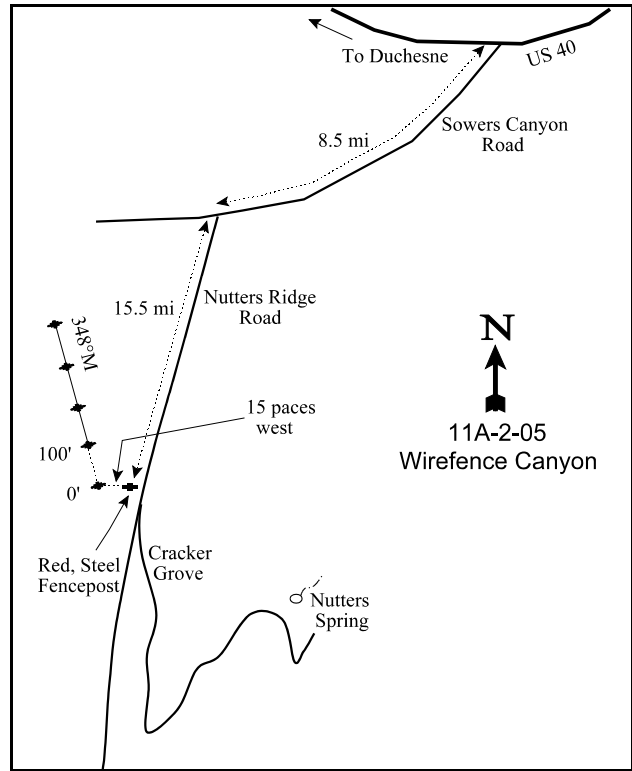
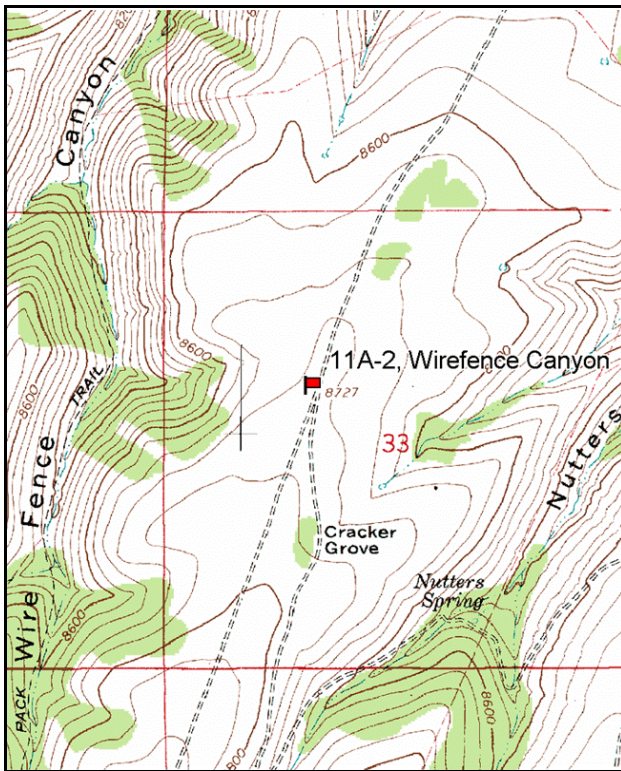
Vegetation type: Mountain big sagebrush-.

Compass bearing: frequency baseline 348 degrees magnetic.

Frequency belt placement: line 1 (16 & 86ft), line 2 (33ft), line 3 (52ft), line 4 (66ft). Belt 3 and belt 5 rebar @ 2ft.

LOCATION DESCRIPTION

From the junction of Highway U.S. 40 and the Sowers Canyon Road (near Bridgeland), drive south on the Sowers Canyon Road for 8.5 miles to the Nutters Ridge Road. Turn left here by an old ranch and proceed south along Nutters Ridge for 15.5 miles to a narrow “Y” in the road. Six paces west of the fork is a red steel fencepost. The 0-foot baseline stake is 15 paces west of the red fencepost. The baseline is marked by green, 12-18 inch tall fenceposts.



Map Name: Dyer Mountain

Diagrammatic Sketch

Township 6S, Range 5W, Section 33

GPS: NAD 27, UTM 12S 4418574 N, 546524 E

DISCUSSION

Wirefence Canyon - Trend Study No. 11A-2

The Wirefence Canyon trend study is located on summer range within a large sagebrush-grass park occupying a flat ridge between the uppermost reaches of Wirefence and Nutters Canyons. The elevation is 8,700 feet with a 3% slope and west aspect. This study is located immediately adjacent to an old permanent line-intercept study established in 1977 and is intended to replace it. After decades of season-long grazing by cattle and sheep from 1915 to 1944, a summer rest-rotation grazing system was established in 1972. This study is within the Anthro Mountain allotment and is now grazed by 481 head of cattle from June 1 to October 15 as a 7-unit rest-rotation system. Escape or thermal cover is lacking and the nearest cover is ½ mile away in Nutters Canyon or within an isolated, but badly depleted, aspen grove (Cracker Grove) approximately the same distance to the southeast. Use by wildlife was light in 2000 with 18 elk days use/acre (44 edu/ha) and 1 deer day use/acre (3 ddu/ha), according to estimates from pellet group transect data. Livestock use was moderate in 2000 with 52 cow days use/acre (128 cdu/ha). In 2005, use was higher for deer, but lower for elk and cattle. Pellet group data in 2005 was estimated at 7 elk, 34 deer, and 41 cow days use/acre (17 edu/ha, 84 ddu/ha, and 102 cdu/ha). All elk and deer pellets were from the current season. Also in 2005, 35 grouse pellet groups/acre were estimated.

Supplemental site information provided by the Ashley National Forest indicate that numerous treatments have been done on the Anthro Mountain allotment, including plowing and seeding on this particular study site (a 2,363 acre treatment) in 1958 and 1959. These old treatments have future plans for maintenance, which include burning and/or spraying, but have not occurred as of 2005.

Soil is a moderately shallow loam with an estimated effective rooting depth of less than 12 inches. Soils are neutral in reactivity (pH of 7.2). Phosphorus is low at 5.1 ppm, values less than 6 ppm may limit normal plant growth and development in wildland soils (Tiedemann and Lopez 2004). A hardpan is present about 6 inches below the soil surface. Due to the nearly level terrain, erosion has not been severe. Relative vegetation cover was estimated at 33% in 1995, then increased to 36% in 2000 and 2005. Earlier estimates were considerably lower as only basal vegetation cover was estimated prior to 1995. Relative cover from rock and pavement combined were estimated at 6% in 1995 and 2000, and 9% in 2005. Litter cover has decreased through time. Relative litter cover was estimated at 32% in 1995, 30% in 2000, and 21% in 2005. Percent bare ground has slowly increased from 29% in 1995 to 28% in 2000, to 35% in 2005. The erosion index measurement in 2005 rated the soil erosion as slight, mainly because of small pedestals surrounding shrubs and perennial grasses, minor surface rock and litter movement, small rills, as well as minor gullies and flow patterns between perennial species.

Mountain big sagebrush is the dominant overstory species. It has historically had light to moderate use and mostly good vigor. However in 2000, sagebrush displayed a dramatic increase in plants showing poor vigor (4% in 1995 to 41% in 2000) and showed a moderate increase in percent decadency (6% in 1995 to 19% in 2000). Many of the mature and decadent individuals in the population also displayed a chlorotic appearance. Therefore, they were classified as having poor vigor. In 2005, plants with poor vigor decreased to 13%, but the percentage of decadent individuals increased again to 31%. The drought in 2000 would be considered the major cause of this increase in poor vigor, which decreased somewhat after better precipitation in 2004. In 2000, the sagebrush population was composed of mostly mature individuals (70%) with a moderate level of young plant recruitment (11%) into the population. In 2005, the population had declined from 3,380 plants/acre in 2000 to 2,680. This decline was likely due to the mature age of the population and low percentage of young individuals. In 2005, the young individuals only constituted 14% of the population and plants classified as dying made up 13%. This small difference between young recruitment and dying plants may not successfully sustain the population. Average leader growth on sagebrush in 2000 was 3 inches and decreased to 1.6 inches in 2005. Mountain big sagebrush provided about 70% of the total browse cover in both 1995 and 2000, but had decreased to 51% in 2005.

Mountain low rabbitbrush density has remained relatively constant over all years with a mostly mature age structure. Mountain low rabbitbrush accounted for 28% of the total browse cover in 1995 and 2000, and 32% in 2005. Rabbitbrush density was estimated to be 4,4880 plants/acre in 1995, 3,920 in 2000, and 4,740 in 2005. Other browse includes: broom snakeweed, gray horsebrush, snowberry, and fringed sagebrush.

The understory is the key component on this summer range and it made up 69% of the total vegetation cover in 1995, 78% in 2000, and only 48% in 2005. Smooth brome is the dominant species; it has been sampled in every quadrat during all sampling periods and has remained at a fairly stable nested frequency. Smooth brome is more palatable when it is young and loses palatability with age, although fall green up does provide some forage later in the year (Stubbendieck et al 1992). Mutton bluegrass is the second most abundant grass. Other species include: sheep fescue, Sandberg bluegrass, Prairie junegrass, crested wheatgrass, intermediate wheatgrass, and bluebunch wheatgrass. There was no noticeable use on grasses in 2000 or 2005. No annual grasses have been sampled in any year. Perennial forbs are diverse, but the sum of nested frequency decreased in 2000 due to drought, then recovered somewhat in 2005. Looseflower milkvetch is the most abundant forb, which has provided between 4-7% average cover. Perennial forbs are diverse with 18 species identified in 1995, 11 in 2000, and 16 in 2005. Annual forbs are present, but occur infrequently.

1988 TREND ASSESSMENT

Ground cover percentages remained about the same between 1982 and 1988. The estimate for litter cover (51%) is good, especially considering the grazing pressure this site received in 1988 due to its close proximity to water and a salt lick. Percent cover for bare ground remains at 24%. Current observations indicate that the soil condition and trends have stabilized. Trend for browse is stable. Mountain big sagebrush remains at a stable density, displays a low percent decadency, and has a high rate of recruitment from young plants (46%). Trend for the herbaceous understory appears stable. Twenty-three perennial grass and forb species were sampled in 1988 making it an important component of this vegetation community.

TREND ASSESSMENT

soil - stable (0)

browse - stable (0)

herbaceous understory - stable (0)

1995 TREND ASSESSMENT

The bare interspaces between mountain big sagebrush individuals show some signs of erosion, but this is only slight. The level terrain helps keep the soil in place along with the vegetation and litter cover. Therefore, soil trend is considered stable. The mountain big sagebrush population is stable with moderate utilization and a low decadency rate. The broom snakeweed and mountain low rabbitbrush populations also appear stable with a mature age structure. The mature plants continue to increase in size. Browse trend is stable at this time. The herbaceous understory accounts for 69% of the total vegetation cover. The dominant species is smooth brome, which comprises 27% of the total vegetation cover. The sum of nested frequency for perennial forbs has increased slightly. Many of the forb species are not sought after by wildlife or livestock. Although sum of nested frequency has increased for forbs, a different composition may be desired. Herbaceous understory trend is slightly up.

TREND ASSESSMENT

soil - stable (0)

browse - stable (0)

herbaceous understory - slightly upward (+1)

winter range condition (DC Index) - not applicable, summer range

2000 TREND ASSESSMENT

Trend for soil is stable. Erosion appears minimal at the present time and the ratio of protective ground cover to bare ground remained at nearly the same level as in 1995. Trend for browse is down as the number of mountain big sagebrush with poor vigor sharply increased (4% to 41%). Sagebrush density has also decreased 17% since 1995 (4,080 to 3,380 plants/acre). There was also a moderate increase in those classified as decadent (6% to 19%) since 1995. Recruitment from young plants also decreased from 42% to 11%. Increases in poor vigor and decadency are due to the extremely dry conditions in 2000 and could improve with normal precipitation patterns. Trend for the herbaceous understory is down. The sum of nested frequencies for perennial grasses remained the same, but perennial forbs decreased 23%. The sum of nested frequency for perennial forbs decreased by almost 50%, which is most likely caused by the excessively dry conditions of 2000. Forbs should increase on this summer range with normal precipitation.

TREND ASSESSMENT

soil - stable (0)

browse - down (-2)

herbaceous understory - down (-2)

winter range condition (DC Index) - not applicable, summer range

2005 TREND ASSESSMENT

The trend for soil is stable. The ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground has remained relatively unchanged from 2000 to 2005. The trend for browse is down. The key browse, mountain big sagebrush, population decreased by 21% from 3,380 in 2000 to 2,680 plants/acre in 2005. The percentage of decadent individuals increased from 19% in 2000 to 31% in 2005. The individuals classified as dying increased from 4% to 13%. This decline in population and sagebrush health would mostly be attributed to the dry conditions experienced for many years. The percentage of young individuals is even with that of the dying individuals, therefore recruitment is very low. The herbaceous understory trend is up. The sum of grass and forb nested frequencies increased 23% from 2000 to 2005. Annual species only make up a small part of the community and there are no annual grass species on the site.

TREND ASSESSMENT

soil - stable (0)

browse - down (-2)

herbaceous understory - up (+2)

winter range condition (DC Index) - not applicable, summer range

HERBACEOUS TRENDS --
Management unit 11A, Study no: 2

Type	Species	Nested Frequency				Average Cover %		
		'88	'95	'00	'05	'95	'00	'05
G	<i>Agropyron cristatum</i>	a16	ab33	ab22	b39	.97	1.05	1.66
G	<i>Agropyron dasystachyum</i>	-	-	-	8	-	-	.09
G	<i>Agropyron intermedium</i>	b41	a3	a8	a-	.01	.16	-
G	<i>Agropyron spicatum</i>	a-	a-	b13	b14	-	.55	.78
G	<i>Bromus inermis</i>	330	337	334	340	9.80	16.74	14.69
G	<i>Elymus salina</i>	a34	b56	a4	b66	.68	.18	.77
G	<i>Festuca ovina</i>	a-	b45	c72	b37	.63	1.30	.43
G	<i>Koeleria cristata</i>	b52	b51	a27	b66	.73	.73	2.04
G	<i>Poa fendleriana</i>	c123	a66	bc120	ab83	1.52	2.95	2.32
G	<i>Poa secunda</i>	a-	b40	b39	b22	.60	.36	.45
Total for Annual Grasses		0	0	0	0	0	0	0
Total for Perennial Grasses		596	631	639	675	14.96	24.04	23.27
Total for Grasses		596	631	639	675	14.96	24.04	23.27
F	<i>Agoseris glauca</i>	-	2	-	-	.00	-	-
F	<i>Allium</i> sp.	-	3	-	2	.00	-	.01
F	<i>Androsace septentrionalis</i> (a)	-	b32	a7	a8	.06	.01	.07
F	<i>Arabis drummondii</i>	a4	b20	a1	ab9	.07	.00	.03
F	<i>Astragalus argophyllus</i>	a4	ab23	b33	ab12	.22	.46	.09
F	<i>Astragalus convallarius</i>	a4	ab12	a4	b17	.05	.03	.16
F	<i>Astragalus detritalis</i>	-	6	-	-	.03	-	-
F	<i>Astragalus tenellus</i>	ab132	a99	b167	ab132	4.39	6.58	4.72
F	<i>Aster</i> sp.	a-	b26	a-	a-	.70	-	-
F	<i>Castilleja flava</i>	b19	ab12	a5	a6	.14	.04	.09
F	<i>Chaenactis douglasii</i>	6	8	-	1	.16	-	.00
F	<i>Cymopterus longipes</i>	a-	d122	b33	c87	.77	.22	1.29
F	<i>Descurainia pinnata</i> (a)	-	3	-	2	.00	-	.00
F	<i>Eriogonum alatum</i>	-	-	-	-	.00	-	-
F	<i>Erigeron eatonii</i>	ab26	b30	a7	b42	.17	.06	.49
F	<i>Eriogonum umbellatum</i>	a15	b65	a26	ab46	1.56	.78	1.15
F	<i>Gilia</i> sp. (a)	-	-	-	2	-	-	.00
F	<i>Hedysarum boreale</i>	a-	c18	ab4	bc15	.25	.00	.22
F	<i>Hymenoxys acaulis</i>	-	1	-	3	.00	-	.03
F	<i>Ipomopsis aggregata</i>	8	-	1	2	-	.03	.00
F	<i>Linum lewisii</i>	ab2	a-	ab3	b8	.00	.01	.30
F	<i>Lupinus argenteus</i>	6	10	6	1	.16	.33	.00

Type	Species	Nested Frequency				Average Cover %		
		'88	'95	'00	'05	'95	'00	'05
F	<i>Machaeranthera canescens</i>	a-	b13	ab1	ab6	.27	.15	.19
F	<i>Oxytropis lambertii</i>	b40	a2	a-	a7	.01	-	.31
F	<i>Penstemon caespitosus</i>	c48	bc48	a5	ab23	.66	.09	.29
F	<i>Penstemon comarrhenus</i>	-	1	-	1	.15	-	.15
F	<i>Physaria acutifolia</i>	a-	b63	a7	a-	.23	.04	-
F	<i>Phlox longifolia</i>	11	21	9	18	.09	.04	.15
F	<i>Physaria</i> sp.	c40	a-	a-	b26	-	-	.33
F	<i>Potentilla</i> sp.	3	-	-	-	-	-	-
F	<i>Schoenocrambe linifolia</i>	ab5	ab7	a-	b12	.02	-	.09
F	<i>Senecio canus</i>	a-	ab7	ab2	b14	.06	.00	.36
F	<i>Thlaspi arvense</i> (a)	-	1	-	-	.00	-	-
Total for Annual Forbs		0	36	7	12	0.07	0.01	0.08
Total for Perennial Forbs		373	619	314	490	10.24	8.93	10.51
Total for Forbs		373	655	321	502	10.32	8.94	10.60

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

BROWSE TRENDS --

Management unit 11A, Study no: 2

Type	Species	Strip Frequency			Average Cover %		
		'95	'00	'05	'95	'00	'05
B	<i>Artemisia frigida</i>	2	1	4	.00	-	.15
B	<i>Artemisia tridentata vaseyana</i>	80	70	49	8.18	6.43	4.41
B	<i>Chrysothamnus viscidiflorus lanceolatus</i>	80	68	83	3.20	2.56	2.71
B	<i>Gutierrezia sarothrae</i>	33	23	45	.04	.27	1.04
B	<i>Symphoricarpos oreophilus</i>	1	0	1	-	-	-
B	<i>Tetradymia canescens</i>	9	15	16	.15	.03	.24
Total for Browse		205	177	198	11.58	9.30	8.57

CANOPY COVER, LINE INTERCEPT --
Management unit 11A, Study no: 2

Species	Percent Cover
	'05
Artemisia frigida	.08
Artemisia tridentata vaseyana	4.66
Chrysothamnus viscidiflorus lanceolatus	4.11
Gutierrezia sarothrae	.06
Tetradymia canescens	.06

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 11A, Study no: 2

Species	Average leader growth (in)
	'05
Artemisia tridentata vaseyana	1.6

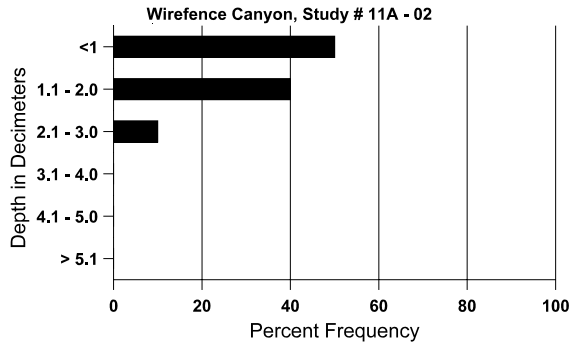
BASIC COVER --
Management unit 11A, Study no: 2

Cover Type	Average Cover %				
	'82	'88	'95	'00	'05
Vegetation	0	6.25	36.06	48.48	39.88
Rock	0	3.00	3.17	2.85	3.95
Pavement	0	15.50	3.07	5.52	5.61
Litter	0	51.25	34.34	40.47	23.03
Cryptogams	0	0	.15	.15	.04
Bare Ground	24.50	24.00	32.06	37.24	38.72

SOIL ANALYSIS DATA --
Herd Unit 11A, Study # 2, Study Name: Wirefince Canyon

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	ppm P	ppm K	dS/m
11.7	53.6 (13.9)	7.2	43.4	33.0	23.56	4.4	5.1	96.0	0.8

Stoniness Index



PELLET GROUP DATA --

Management unit 11A, Study no: 2

Type	Quadrat Frequency		
	'95	'00	'05
Rabbit	6	10	41
Grouse	-	-	1
Elk	15	10	22
Deer	1	6	19
Cattle	1	12	12

Days use per acre (ha)	
'00	'05
-	-
-	35/ac
18 (45)	7 (17)
4 (10)	34 (84)
52 (129)	41 (102)

BROWSE CHARACTERISTICS --

Management unit 11A, 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 frigida</i>												
82	0	-	-	-	-	-	0	0	-	-	0	-/-
88	0	-	-	-	-	-	0	0	-	-	0	-/-
95	40	20	-	40	-	-	50	0	-	-	0	4/10
00	20	-	-	20	-	-	0	0	-	-	0	3/4
05	120	-	-	120	-	-	0	0	-	-	0	12/10
<i>Artemisia tridentata vaseyana</i>												
82	3132	-	666	2466	-	-	2	0	0	-	4	15/18
88	4333	266	2000	2000	333	-	32	0	8	-	0	14/20
95	4080	120	1720	2120	240	160	41	9	6	2	4	14/26
00	3380	40	380	2360	640	180	49	4	19	4	41	13/25
05	2680	60	380	1460	840	620	43	11	31	13	13	10/20

		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)
Chrysothamnus viscidiflorus lanceolatus												
82	3932	-	466	3466	-	-	3	0	0	-	0	8/13
88	3798	-	866	2866	66	-	4	0	2	-	0	5/4
95	4880	20	540	4340	-	-	0	0	0	-	0	8/11
00	3920	20	540	3320	60	20	0	0	2	-	0	7/9
05	4740	-	380	4280	80	-	8	0	2	.84	.84	7/10
Eriogonum microthecum												
82	600	-	-	600	-	-	0	0	-	-	0	2/4
88	0	-	-	-	-	-	0	0	-	-	0	-/-
95	0	-	-	-	-	-	0	0	-	-	0	-/-
00	0	-	-	-	-	-	0	0	-	-	0	-/-
05	0	-	-	-	-	-	0	0	-	-	0	-/-
Gutierrezia sarothrae												
82	0	-	-	-	-	-	0	0	0	-	0	-/-
88	1733	-	-	1733	-	-	0	0	0	-	0	4/4
95	1580	60	140	1440	-	40	0	0	0	-	0	7/8
00	760	-	-	720	40	20	0	0	5	5	5	4/5
05	2440	20	580	1860	-	20	0	0	0	-	0	5/6
Symphoricarpos oreophilus												
82	0	-	-	-	-	-	0	0	-	-	0	-/-
88	0	-	-	-	-	-	0	0	-	-	0	-/-
95	20	-	-	20	-	-	0	0	-	-	0	12/15
00	0	-	-	-	-	-	0	0	-	-	0	9/20
05	20	-	-	20	-	-	0	0	-	-	0	11/16
Tetradymia canescens												
82	399	-	333	66	-	-	83	0	0	-	0	10/11
88	665	-	333	66	266	-	0	0	40	-	0	9/12
95	200	-	60	140	-	-	30	0	0	-	0	7/10
00	420	-	60	360	-	-	10	10	0	-	0	6/9
05	400	-	-	400	-	-	50	10	0	-	0	7/11