

Trend Study 13B-2-05

Study site name: Upper Westwater-Dolores.

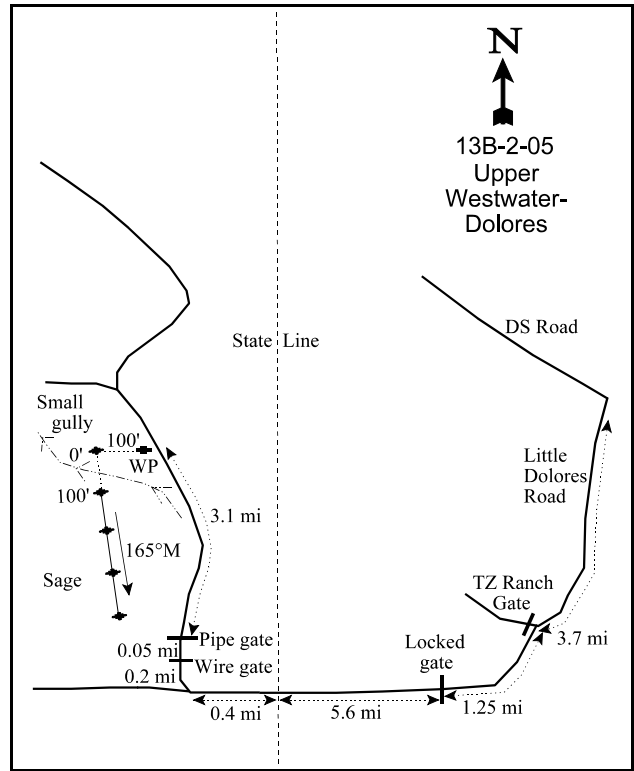
Vegetation type: Burn.

Compass bearing: frequency baseline 165 degrees magnetic.

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

LOCATION DESCRIPTION

From the intersection of the DS Road and A Road west of Glade Park, Colorado, go down A Road 3.7 miles to the TZ Ranch gate. Turn left and go 1.25 miles to a locked gate (necessary to obtain permission and key). Continue 5.6 miles through the valley to the state line. Proceed 0.4 miles to a cabin, turn right and go along the edge of a field 0.2 miles to a wire gate. Go 0.05 miles to a locked pipe gate, and then 3.1 miles on the main road to the transect. There is a witness post (rebar) off the left side of the road 10-15 feet. The 0-foot baseline stake, a rebar tagged #7957, is 100 feet due west of the witness post.



Map Name: Westwater 4SE

Diagrammatic Sketch

Township 20S, Range 26E, Section 19

GPS: NAD 27, UTM 12S 4324545 N, 665745 E

DISCUSSION

Upper Westwater - Dolores - Trend Study No. 13B-2

The Upper Westwater study is in the northeast portion of the Dolores Triangle. When this site was established in 1986 it sampled a big sagebrush flat surrounded by juniper woodland. A fire burned the site between 1986 and 1995, which has left the site as an annual grassland. The Colorado River is approximately 1.5 miles to the west. The site is at 4,600 feet with a 3-5% slope and a northwest exposure. The area is grazed by cattle in winter and early spring (2,791 AUM's are presently allocated on the allotment). The number of deer pellet groups found at the site are low and scattered. The pellet group data in 2000 estimated 8 deer days use/acre (20 ddu/ha) (winter use) and 51 cow days use/acre (126 cdu/ha) (winter and spring use). In 2005, 6 deer days use/acre (15 ddu/ha) and 57 cow days use/acre (142 cdu/ha) were estimated for this site. All of the deer pellets were from the previous winter and the cow pats were from mainly from winter with a few from spring. The livestock use appears to be quite heavy.

The soil is a reddish, sandy loam, which appears to be moderately deep with a neutral pH (7.2). The effective rooting depth is a little more than 14 inches. Phosphorus could be a limiting factor at 8.4 ppm, where levels below 6 ppm may hinder normal plant development and growth in wildland soils (Tiedemann and Lopez 2004). Relative litter cover was fairly abundant (48%) in 1995, but was essentially contributed by only annual species. This kind of cover characteristically can be lost with drought, as illustrated by the fact that continued drought attributed to decreased relative litter cover from 1995 to 2005 (48% in 1995 to 33% in 2000, then 19% in 2005). There was a low amount of relative bare ground (11%) in 1995, due to the high amounts of cover from litter and annual vegetation. Relative bare ground then more than doubled to around 27% in 2000 and 2005. No rock and very little pavement has been sampled. Cryptogamic crust only contributed 2% of the total relative cover in 1995, increased to 15% in 2000, then decreased to 6% in 2005. The erosion condition class determined soil movement as stable in 2005.

In the past, basin big sagebrush was the dominant browse species with an estimated density of 2,199 plants/acre in 1986. Sometime after the 1986 reading, the sagebrush population was lost to a wildfire. Annual species then dominated the site. The fire appears to have burned very hot with the fine fuels provided by annual species leaving very little sign that sagebrush once dominated the site. There is no indication that the sagebrush population is going to return in the future. Other associated browse species (four-wing saltbush and spiny hopsage) are also gone with no signs of reestablishment. Around the periphery of the site, there are juniper trees that survived the fire.

Annual cheatgrass dominated the understory in 1986. Although dense that year, cheatgrass appeared to be infected by a fungus that in many areas of the state had greatly reduced seed production during the wet years of 1983-85. Since the destructive wildfire, annuals have accounted for as much as 96-99% of the total vegetation cover on the site. Grasses provided 70% of the vegetation cover in 1995, decreased to 37% in 2000, then increased slightly to 44%. Forbs increased in total vegetation cover from 30% in 1995, to 63% in 2000, then decreased slightly to 56% in 2005. In 1995 and 2005, the dominant grass was cheatgrass, which accounted for 12-57% of the total vegetation cover and sixweeks fescue, also present, contributed 11-30% vegetation cover. These two grasses combined accounted for between one to two-thirds of the total vegetation cover and provided large quantities of fine fuel. Galleta and purple threeawn are also present, but in very low numbers. Tumblemustard and woolly Indian wheat have been the predominant forbs on the site and also contribute to the high fuel loads of the site. In 2000, much of the cheatgrass did not germinate due to the dry fall and winter. It decreased in total cover from 16% in 1995 to less than 1% in 2000, then increased to 6% in 2005.

1986 APPARENT TREND ASSESSMENT

Browse trend appears stable. The basin big sagebrush is healthy and it has adequate reproduction. An increase in species diversity for shrubs would be desirable to supplement the sagebrush. However, a more palatable species would be severely hedged even though browsing pressure is low on this site. The juniper appear to be increasing, but are not in densities that would form a closed canopy. There is little sign of erosion and the soil trend appears stable, although an increase in perennial grass species would provide needed diversity and a more reliable ground cover than annual cheatgrass. The high amount of annuals makes this community very susceptible to fire and loss of the critical browse component.

1995 TREND ASSESSMENT

Annual vegetation and litter provide ample cover for the soil. Although the soil is protected, they also provide abundant fine fuel to carry another destructive fire. Therefore, soil trend is stable but with poor cover composition. The recent fire removed all browse species from the area and there are apparently no seedlings at this time. The browse trend is down. Deer will likely use this area in the spring when the plants are succulent, but can no longer rely on the area as a source for browse species in moderate or severe winters. The herbaceous understory trend is stable, but with very poor composition. Perennial species diversity and abundance need to increase for the site to stabilize, which will help mitigate the effects of future wildfires. The Desirable Components Index rated this site as very poor with a score of -13 due to low perennial grass cover, no recruitment of shrubs, no browse cover, and very high annual grass cover.

TREND ASSESSMENT

soil - stable (0)

browse - down (-2)

herbaceous understory - stable (0)

winter range condition (DC Index) - Very Poor (-13) Lower Potential scale

2000 TREND ASSESSMENT

Annual vegetation and litter still provide fair protective cover for the soil. Although the soil has some protection, the annual species also provide abundant fine fuels to carry another fire. The amount of bare soil has increased (from 14% in 1995 to 29% in 2000) with significantly lower vegetation and litter cover values. The ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground decreased 15%. Therefore, soil trend is slightly down because of the continued dominance of annual species and much higher amounts of bare soil. There are still no signs of any kind of browse reproduction on this site which is not surprising in light of the severe competition for soil moisture from the dominance of annual species and the moderately high soil temperatures which is very disadvantageous to the sagebrush seedlings to ever become established through the summer. It would be safe to say that we will not see sagebrush reestablished here in our lifetime. Deer will likely use this area in the spring when the plants are succulent, but can no longer rely on the area as a source for browse species in moderate or severe winters. The herbaceous understory trend is stable because of little change in the poor cover composition. The nested frequencies of annual grasses and forbs decreased slightly, a response to lower precipitation. The nested frequencies of perennial species remained relatively stable, although they could not get too much lower. Perennial species diversity and abundance need to increase for the site to improve which could mitigate the effects of future wildfires. The Desirable Components Index rated this site as very poor with a score of 1 due to low perennial grass cover, no recruitment of shrubs, no browse cover, and moderate annual grass cover.

TREND ASSESSMENT

soil - slightly down (-1)

browse - stable (0)

herbaceous understory - stable (0)

winter range condition (DC Index) - Very Poor (1) Lower Potential scale

2005 TREND ASSESSMENT

The soil trend is stable. The ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground decreased slightly. This is due mainly to a substantial decrease (56%) in the cryptogamic crust cover from 2000 to 2005, which has a tendency to fluctuate according to precipitation patterns. The nested frequency and total percent cover of annual grasses and forbs increased substantially from 2000 to 2005, but this only temporarily stabilizes the soil. There continued to be no browse species on the site. The herbaceous trend is stable. The nested frequency of annual grasses increased 14% from 2000 to 2005 and annual forbs increased 50% during the same period. This change in annual population increases the risk of fire, as well as decreases the likelihood of basin big sagebrush re-establishing. The increase in nested frequency of the annual species is mirrored by a doubling of the cover of both annual grasses and forbs. Perennial grass nested frequency remained steady, but the total percent cover was half of that in 2000. There was, however, an 176% increase in the nested frequency of perennial forbs from 2000 to 2005, but this was mainly from an increase in sego lily, which has little winter range forage value. The Desirable Components Index rated this site as very poor with a score of -11 due to low perennial grass cover, low perennial forb cover, no recruitment of shrubs, no browse cover, and high annual grass cover.

TREND ASSESSMENT

soil - stable (0)

browse - stable (0)

herbaceous understory - stable (0)

winter range condition (DC Index) - Very Poor (-11) Lower Potential scale

HERBACEOUS TRENDS --

Management unit 13B, Study no: 2

T y p e	Species	Nested Frequency				Average Cover %		
		'86	'95	'00	'05	'95	'00	'05
G	Aristida purpurea	a-	a2	b6	a-	.03	.21	-
G	Bromus tectorum (a)	-	c371	a187	b250	16.27	.89	5.99
G	Hilaria jamesii	45	40	33	29	.65	.95	.35
G	Sporobolus cryptandrus	a-	a-	b15	b28	-	.93	.65
G	Vulpia octoflora (a)	-	a277	b326	b334	3.01	5.39	15.00
Total for Annual Grasses		0	648	513	584	19.29	6.29	20.99
Total for Perennial Grasses		45	42	54	57	0.69	2.09	1.01
Total for Grasses		45	690	567	641	19.98	8.38	22.00
F	Astragalus nuttallianus (a)	-	b15	a-	a9	.08	-	.19
F	Calochortus nuttallii	-	a3	a-	b45	.00	-	.20
F	Chenopodium fremontii (a)	-	a-	b12	a-	-	.03	-
F	Cryptantha sp.	-	1	-	-	.00	-	-

T y p e	Species	Nested Frequency				Average Cover %		
		'86	'95	'00	'05	'95	'00	'05
F	Descurainia pinnata (a)	-	a-	a-	b35	-	-	.14
F	Draba sp. (a)	-	a-	b24	c67	-	.04	.32
F	Eriogonum cernuum (a)	-	2	-	-	.00	-	-
F	Erodium cicutarium (a)	-	44	213	344	.14	9.74	20.87
F	Erigeron sp.	-	2	-	-	.00	-	-
F	Lepidium densiflorum (a)	-	b70	a10	a3	.15	.05	.00
F	Machaeranthera canescens	-	6	-	5	.01	-	.04
F	Navarretia intertexta (a)	-	b51	a11	a2	.15	.02	.00
F	Plantago patagonica (a)	-	b276	a6	a10	1.93	.01	.02
F	Salsola iberica (a)	-	a-	a10	b260	-	.02	3.79
F	Sisymbrium altissimum (a)	-	c307	b241	a58	5.85	3.69	.78
F	Sphaeralcea coccinea	a2	c54	b25	b9	.27	.72	.52
F	Sphaeralcea parvifolia	a-	a-	a-	b10	-	-	.61
Total for Annual Forbs		0	765	527	788	8.33	13.62	26.12
Total for Perennial Forbs		2	66	25	69	0.30	0.72	1.38
Total for Forbs		2	831	552	857	8.63	14.35	27.50

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

BROWSE TRENDS --

Management unit 13B, Study no: 2

T y p e	Species	Strip Frequency			Average Cover %		
		'95	'00	'05	'95	'00	'05
B	Artemisia tridentata tridentata	0	0	0	-	-	-
B	Gutierrezia sarothrae	0	1	0	-	.03	-
Total for Browse		0	1	0	0	0.03	0

BASIC COVER --

Management unit 13B, Study no: 2

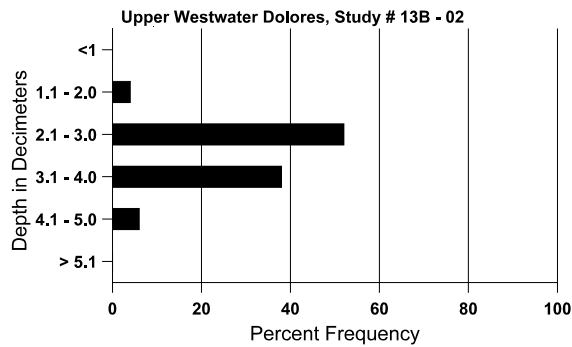
Cover Type	Average Cover %			
	'86	'95	'00	'05
Vegetation	10.50	47.54	26.79	49.97
Rock	0	.00	.00	0
Pavement	0	0	.01	0
Litter	69.50	59.21	36.02	20.01
Cryptogams	3.50	3.03	16.78	6.24
Bare Ground	16.50	13.90	29.22	29.78

SOIL ANALYSIS DATA --

Herd Unit 13B, Study # 2, Study Name: Upper Westwater Dolores

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	ppm P	ppm K	dS/m
14.4	65.6 (17.9)	7.2	56.0	26.0	18.0	0.4	8.4	163.2	0.5

Stoniness Index



PELLET GROUP DATA --

Management unit 13B, Study no: 2

Type	Quadrat Frequency		
	'95	'00	'05
Rabbit	9	2	7
Deer	10	9	7
Cattle	9	25	29

Days use per acre (ha)	
'00	'05
-	-
8 (20)	6 (15)
51 (126)	57 (142)

BROWSE CHARACTERISTICS --
 Management unit 13B, 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 tridentata tridentata</i>												
86	2199	-	666	400	1133	-	0	0	52	-	0	28/27
95	0	-	-	-	-	-	0	0	0	-	0	-/-
00	0	-	-	-	-	-	0	0	0	-	0	-/-
05	0	-	-	-	-	-	0	0	0	-	0	-/-
<i>Gutierrezia sarothrae</i>												
86	0	-	-	-	-	-	0	0	0	-	0	-/-
95	0	-	-	-	-	-	0	0	0	-	0	-/-
00	20	-	-	-	20	-	0	0	100	100	100	6/12
05	0	-	-	-	-	-	0	0	0	-	0	-/-
<i>Opuntia sp.</i>												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
95	0	-	-	-	-	-	0	0	-	-	0	-/-
00	0	-	-	-	-	-	0	0	-	-	0	-/-
05	0	-	-	-	-	-	0	0	-	-	0	7/50