

Trend Study 10-26-05

Study site name: Bitter Creek .

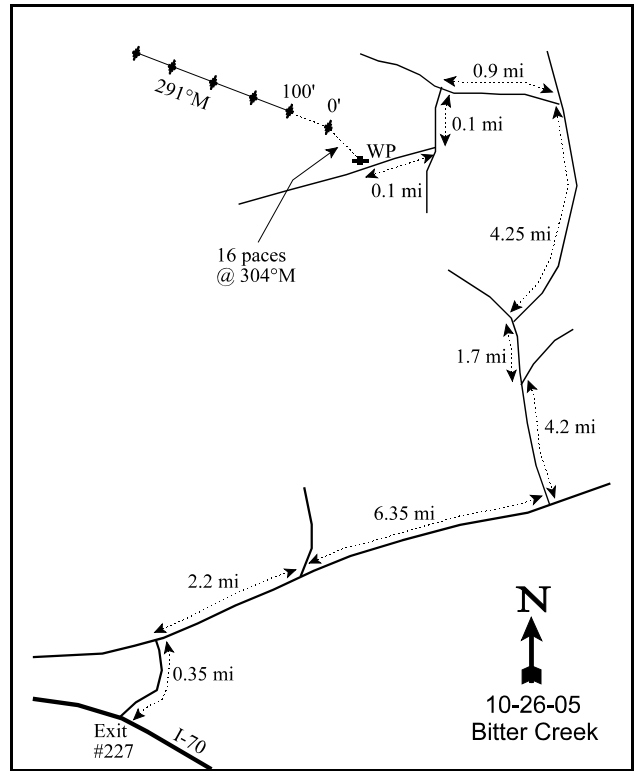
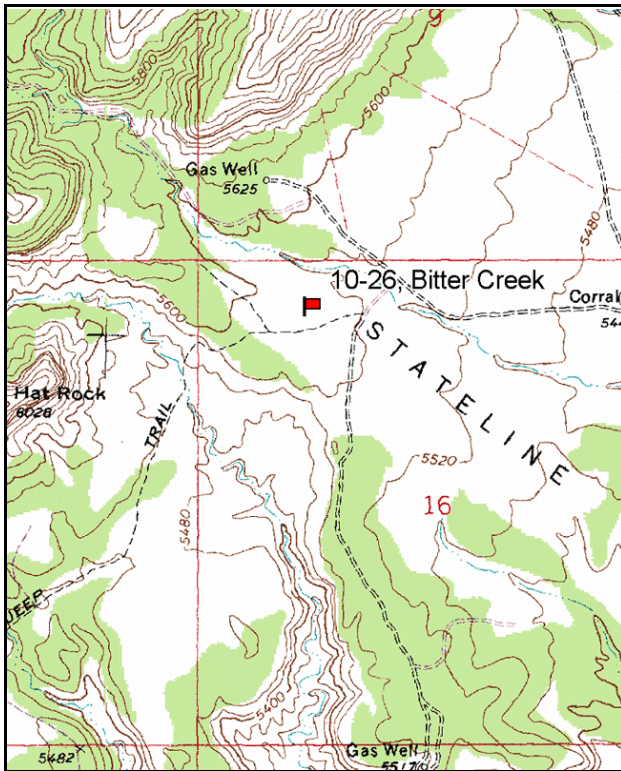
Vegetation type: Wyoming Big Sagebrush .

Compass bearing: frequency baseline 291 degrees magnetic.

Frequency belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

LOCATION DESCRIPTION

Take I-70 exit #225 Westwater and turn left to the Book Cliff area. Travel 0.35 miles to a “T” intersection and turn right (northeast). Proceed 2.2 miles to a fork and keep right. Stay on the main road for 6.35 miles to a dirt road on the left. Turn left traveling north-northwest. Proceed 4.2 miles and stay left on the main road. Continue 1.7 and turn right. Travel another 4.25 to a fork. Turn left at this fork and go 0.9 miles. At the next fork turn left and go 0.1 miles. Then take the right fork and go 0.1 miles to the witness post on the right side of the road. The 0-foot stake is 16 paces away at 304°M.



Map Name: Bryson Canyon .

Diagrammatic Sketch

Township 17S , Range 25E , Section 16

GPS: NAD 27, UTM 12S 4355232 N, 6586670 E

DISCUSSION

Bitter Creek - Trend Study No. 10-26

The Bitter Creek transect was established in 2000 to monitor essential winter range for big game, primarily elk. The site is located near the Utah-Colorado state line on the south Book Cliffs. The area has a gentle slope (5%) and a southeast exposure at an elevation of 5,500 feet. The transect was placed on the alluvial fan that was deposited where Bitter Creek comes off of the cliffs. The site lies in a Wyoming big sagebrush flat surrounded by pinyon-juniper woodland. This area is grazed as part of the San Arroyo BLM allotment, which grazes sheep. According to DWR biologists, a moderate herd of elk are year round residents to this area. Pellet group transect data from 2000 estimated high elk use at 82 elk days use/acre (203 edu/ha) and light use by deer at 4 deer days use/acre (10 ddu/ha). Data from 2005 estimated 8 elk days use/acre (20 edu/ha), 26 deer days use/acre (65 ddu/ha), and 67 sheep days use/acre (165 sdu/ha).

Soils have a sandy clay loam texture. Estimated effective rooting depth is only about 12 inches. A stoniness profile index shows the majority of rock to occur between 4-12 inches in depth. Phosphorus is low at 4.5 ppm, (Tiedemann and Lopez 2004). Soils are neutral in reactivity (pH of 7.1) and organic matter is very low at 0.4%. Shrub interspaces are bare except when cheatgrass is present, with pedestaling occurring around and underneath shrub canopies. Some heavy localized erosion was noted in the general area of this transect with deep gullies, but erosion is not as severe on the site because of the gentle slope. Vegetation and litter cover appear to be adequate to minimize erosion. An erosion condition class assessment rated erosion as stable in 2005.

Wyoming big sagebrush is the key browse species. Sagebrush cover was estimated at 20% with an estimated 5,320 plants/acre in 2000. Decadence was moderately high (56%) in 2000 and no young plants or seedlings were observed. A quarter of the population was classified as dying. Use was at a moderate to heavy level with 59% showing moderate use and 24% displaying heavy use. In 2005, after many years of drought, sagebrush density was a third lower at 3,540 plants/acre. Cover declined to 14%. Decadence increased to 75% and half of the population was classified as dying. This is a dry site and the sagebrush appears to be showing the effects of the extended drought. Some thinning of this population was probably good, but without any young plants to replace those that are dying this population may continue to decline. High amounts of cheatgrass make it difficult for sagebrush to establish young replacement plants. Other browse include: broom snakeweed and spiny hopsage in very small numbers.

Herbaceous vegetation was sparse in 2000 and was found mainly underneath sagebrush canopies. Cheatgrass was abundant in 2000, but not very robust at only 1% cover. In 2005, cheatgrass frequency increased from 72% of the quadrats to 100% and cover increased to 30%. Mutton bluegrass and bottlebrush squirreltail were the only perennial grasses sampled in each year and each declined significantly in 2005. Perennial forbs are infrequent. Annual forbs increased greatly in 2005. Historically excessive grazing practices have caused the loss of almost all of the cool season herbaceous species and the inevitable increases in sagebrush which eventually excludes herbaceous species other than winter annuals like cheatgrass to dominate the understory.

2000 APPARENT TREND ASSESSMENT

Trend for soil appears stable, but is somewhat vulnerable to high intensity thunderstorms with very little protective herbaceous cover on the site. The browse population appears to be in a state of decline with no recruitment, high decadence (56%), and 26% of the population classified as dying. Also, 27% of the sagebrush display poor vigor. Sagebrush density and cover are very high and need to be thinned to increase vigor and reproduction as well as to rejuvenate the understory. The understory is depleted and will remain so without some type of treatment to reduce sagebrush density and cover. The Desirable Components Index score rated this site as fair due to excellent browse cover and low annual grass cover.

winter range condition (DC Index) - fair (27) Lower potential scale

2005 TREND ASSESSMENT

The soil trend is considered stable. Increases in cheatgrass have reduced the amount of bare soil, but not enough to warrant a change in trend. The browse trend is down. Wyoming big sagebrush has declined due to drought conditions. Density declined 33%, while 75% of the population was classified as decadent. Sagebrush cover decreased from 20% to 14%. Recruitment is very poor as young and seedling plants are very rare. High amounts of cheatgrass will negatively effect sagebrush reproduction. Utilization was moderate to heavy and sign of sheep was high. The herbaceous understory trend is down. Cheatgrass increased drastically and is a fire hazard. Perennial grasses and forbs decreased, while annual forbs increased. The DCI score decreased to very poor due to an increase in annual grass cover and decrease in browse cover.

TREND ASSESSMENT

soil - stable (0)

browse - down (-2)

herbaceous understory - down (-2)

winter range condition (DC Index) - very poor (-2) Lower potential scale

HERBACEOUS TRENDS --

Management unit 10 , Study no: 26

Type	Species	Nested Frequency		Average Cover %	
		'00	'05	'00	'05
G	Bromus tectorum (a)	_a 203	_b 467	1.02	30.21
G	Poa secunda	_b 114	_a 83	1.09	1.87
G	Sitanion hystrix	_b 78	_a 38	1.04	.39
G	Vulpia octoflora (a)	_a 4	_b 186	.01	.86
Total for Annual Grasses		207	653	1.03	31.07
Total for Perennial Grasses		192	121	2.13	2.26
Total for Grasses		399	774	3.17	33.34
F	Astragalus sp.	-	2	-	.00
F	Calochortus nuttallii	-	6	-	.01
F	Descurainia pinnata (a)	_a -	_b 75	-	.39
F	Draba sp. (a)	-	3	-	.00
F	Erodium cicutarium (a)	3	1	.00	.00
F	Erigeron pumilus	_b 23	_a -	.07	-
F	Gilia sp. (a)	_a -	_b 61	-	.27
F	Lappula occidentalis (a)	-	6	-	.04
F	Leucelene ericoides	12	-	.05	-
F	Lepidium sp. (a)	_a -	_b 22	-	.07
F	Phlox longifolia	6	8	.01	.02
F	Plantago patagonica (a)	_a 2	_b 204	.00	.74
F	Schoenrambe linifolia	_b 23	_a 3	.06	.04

Type	Species	Nested Frequency		Average Cover %	
		'00	'05	'00	'05
F	Sisymbrium altissimum (a)	-	-	-	.00
Total for Annual Forbs		5	372	0.00	1.53
Total for Perennial Forbs		64	19	0.19	0.07
Total for Forbs		69	391	0.20	1.61

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

BROWSE TRENDS --

Management unit 10 , Study no: 26

Type	Species	Strip Frequency		Average Cover %	
		'00	'05	'00	'05
B	Artemisia tridentata wyomingensis	91	88	20.00	13.50
B	Grayia spinosa	1	1	-	.03
B	Gutierrezia sarothrae	8	0	.30	-
B	Juniperus osteosperma	0	1	-	-
B	Opuntia sp.	6	7	.18	.21
Total for Browse		106	97	20.48	13.73

CANOPY COVER, LINE INTERCEPT --

Management unit 10 , Study no: 26

Species	Percent Cover
	'05
Artemisia tridentata wyomingensis	13.31
Grayia spinosa	.20
Opuntia sp.	.68

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 10 , Study no: 26

Species	Average leader growth (in)
	'05
Artemisia tridentata wyomingensis	1.9

BASIC COVER --

Management unit 10 , Study no: 26

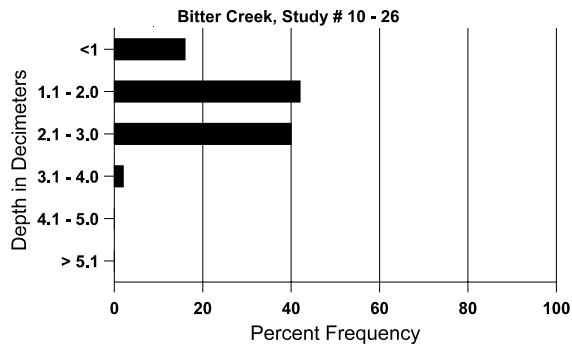
Cover Type	Average Cover %	
	'00	'05
Vegetation	27.48	45.09
Rock	.89	.97
Pavement	.75	.80
Litter	34.70	25.46
Cryptogams	14.39	4.30
Bare Ground	44.19	33.99

SOIL ANALYSIS DATA --

Herd Unit 10, Study # 26, Study Name: Bitter Creek

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	ppm P	ppm K	dS/m
11.8	62.8 (11.4)	7.1	60.0	17.4	22.6	0.4	4.5	99.2	0.5

Stoniness Index



PELLET GROUP DATA --

Management unit 10 , Study no: 26

Type	Quadrat Frequency		Days use per acre (ha)	
	'00	'05	'00	'05
Sheep	-	18	-	67 (165)
Rabbit	5	33	-	-
Elk	44	23	82 (203)	8 (20)
Deer	18	31	4 (10)	26 (65)

BROWSE CHARACTERISTICS --
 Management unit 10 , Study no: 26

		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 wyomingensis</i>												
00	5320	-	-	2340	2980	760	59	24	56	26	27	20/31
05	3540	-	20	880	2640	2000	47	50	75	51	51	23/37
<i>Chrysothamnus viscidiflorus stenophyllus</i>												
00	0	-	-	-	-	-	0	0	-	-	0	-/-
05	0	-	-	-	-	-	0	0	-	-	0	6/8
<i>Echinocereus sp.</i>												
00	0	-	-	-	-	-	0	0	-	-	0	-/-
05	0	-	-	-	-	-	0	0	-	-	0	7/18
<i>Grayia spinosa</i>												
00	20	-	-	20	-	20	0	0	-	-	0	10/16
05	20	-	-	20	-	-	0	0	-	-	0	24/27
<i>Gutierrezia sarothrae</i>												
00	620	80	120	420	80	100	0	0	13	13	13	8/9
05	0	-	-	-	-	-	0	0	0	-	0	-/-
<i>Juniperus osteosperma</i>												
00	0	-	-	-	-	-	0	0	-	-	0	-/-
05	20	-	20	-	-	-	0	0	-	-	0	-/-
<i>Opuntia sp.</i>												
00	120	-	-	120	-	-	0	0	0	-	0	5/16
05	140	-	-	120	20	-	0	0	14	14	29	6/28
<i>Sclerocactus sp.</i>												
00	0	-	-	-	-	-	0	0	-	-	0	-/-
05	0	-	-	-	-	-	0	0	-	-	0	7/4