

Trend Study 13B-6-05

Study site name: Ryan Creek .

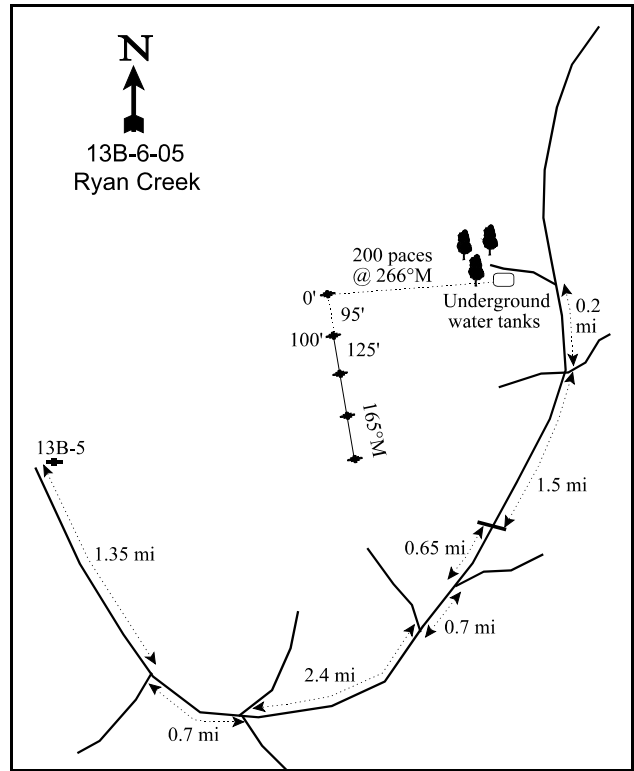
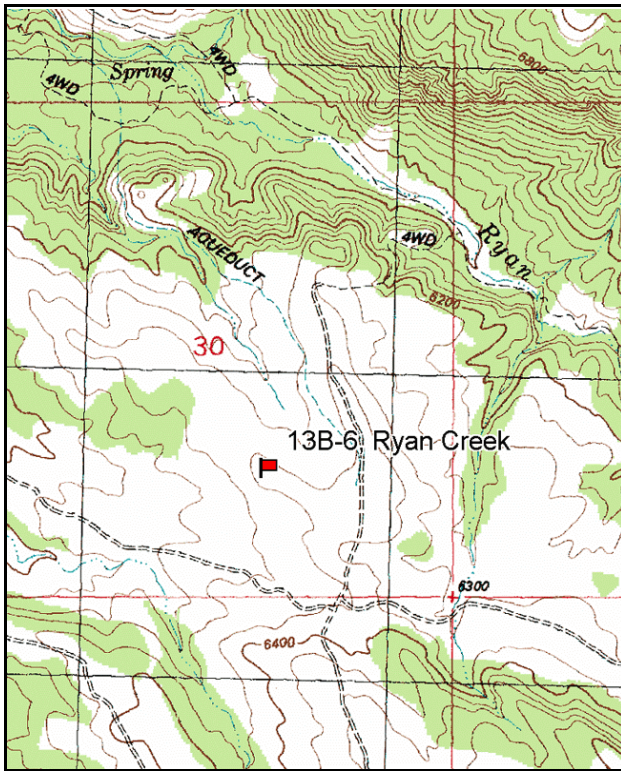
Vegetation type: Chained, Seeded P-J .

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

At the "Granary" intersection just 1.35 miles south of Buckhorn Draw, 13B-5 (Coates Creek 15-minute Quad; T23S, R25E, southeast quarter of section 3) bear left and go east 0.7 miles to a fork. Take the middle fork, go 2.4 miles and turn right at the next fork. Continue 0.7 miles to another fork. Turn left. Go 0.65 miles to a cattle guard. Continue 1.5 miles to a fork. Continue straight (north) and go 0.2 miles to a water development and a few lone junipers on the left. From here, walk up the small ridge to the west for 200 paces at 266°M to a full high fence post with browse tag #7678 attached. The transect runs south from the start of the baseline. All other plots are marked by rebar stakes.



Map Name: Steamboat Mesa

Diagrammatic Sketch

Township 22S, Range 26E, Section 30

GPS: NAD 27, UTM 12S 4302647 N, 666582 E

## DISCUSSION

### Ryan Creek - Trend Study No. 13B-6

The Ryan Creek study site is located within an old 1,800 acre pinyon-juniper chaining, which has been considered an important big game winter range. The area was chained and aurally seeded with crested wheatgrass, four-wing saltbush, big sagebrush, alfalfa, and bitterbrush in 1968. To help maintain the integrity of the chaining, the BLM used the herbicide tebuthiuron to eliminate the released population of pinyon-juniper trees on 300 acres of the chaining. The area burned in 1989, which eliminated nearly all of the browse on the site. The study is located near the top of a south-facing aspect with a slope averaging 10%, and an elevation of 6,300 feet. A nearby deer pellet group transect in Ryan Park, on the Utah side, averaged 8 deer days use/acre (20 ddu/ha) between 1986 and 1996. Pellet group data taken along the trend study site base line in 2000 estimated 20 deer days use/acre (49 ddu/ha), 9 elk days use/acre (22 edu/ha), and 10 cow day use/acre (25 cdu/ha). In 2005, the pellet group data estimated 27 deer, 9 elk, and 7 cow days use/acre (68 ddu/ha, 21 edu/ha, and 16 cdu/ha). Cattle grazing is managed as part of the large Buckhorn allotment.

The area is characterized as an upland shallow loam site. The surface soil has a sandy clay loam texture with an effective rooting depth just over 14 inches. Soil reaction is neutral (pH 7.3). Phosphorus levels are marginal at 7.7 ppm. Levels below 6 ppm may limit normal plant development and growth in wildland soils (Tiedemann and Lopez 2004). The relative cover of bare ground increased substantially from 11% in 1995 to 34% in 2000, and decreased slightly to 29% in 2005. However, the vegetation and litter have provided adequate protection for the soil and there has been no evidence of noticeable erosion. In fact, in 2005 the erosion condition class determined soil movement as stable.

Pinyon and juniper trees and a very low density of miscellaneous browse species, were eliminated from the site when it burned. Previously the estimated combined density of pinyon and juniper trees was about 198 trees/acre. The most numerous shrubs on the site after the burn were Harriman's yucca, broom snakeweed, white stemmed rabbitbrush, and a few scattered fourwing saltbush. The estimated cover for all browse species combined was about 1% in 2000 and 2005. Little change has occurred with the browse species since the fire. With the loss of the browse species, this site became less valuable critical winter range for wildlife.

In 1995, the dominant understory species was cheatgrass. At that time, it contributed 19% cover and had the potential of carrying another destructive fire. In 2000, it contributed to only 2% cover due to drought, but with increased fall and spring precipitation, it had increased to 9% cover in 2005. Crested wheatgrass is the dominant perennial species. Without the competition from cheatgrass and/or the timing of precipitation events, crested wheatgrass abundance was higher in 2000 than 1995 or 2005. Other grass species include: Indian ricegrass, galleta, purple threeawn, mutton bluegrass, sand dropseed, and bottlebrush squirreltail. In 1995, forbs were composed primarily of annual species (51% forb cover). In 2000, with dry conditions, only 14% of the forb cover were annual species. After increased precipitation in 2005, annual forb cover made up 77% of the total forb cover. The dominant perennial forb in 1995 was heath aster, which does not provide much forage for wildlife or livestock. In 2000 and 2005, alfalfa was the dominant perennial forb, providing about 2% cover. Alfalfa sum of nested frequency increased significantly in 2005.

### 1986 APPARENT TREND ASSESSMENT

Density of desirable browse species for deer is very low with little recruitment into their respective populations. However, there are good quantities of forage produced by the crested wheatgrass for the spring and fall. It will be interesting to follow the effects of the Savory grazing system on this particular chaining. Continued maintenance of the pinyon-juniper trees on this chaining is desirable for improving the health of the understory vegetation. Apparent trend for the site is stable, but will be greatly affected by ongoing management decisions and weather patterns.

## 1995 TREND ASSESSMENT

There is adequate cover provided by vegetation and litter to protect the soil surface from erosion. Therefore, the soil trend is considered stable. The herbaceous understory is comprised mostly of annual forbs and grasses, the majority of which is cheatgrass. Crested wheatgrass is abundant as well and may provide some forage later into the fall with some late precipitation. Tumble mustard is quite prevalent and most were knee-high in height. The vegetation provides abundant fine fuels for another wildfire. Trend for the herbaceous understory is stable. The perennial grasses declined slightly, while perennial forbs increased. There are very few, if any browse species that could provide winter forage for wildlife, so the trend for browse is down. The Desirable Components Index rated this site as very poor with a score of 4 due to fair perennial grass cover, fair perennial forb cover, no recruitment of shrubs, no browse cover, and high annual grass cover.

### TREND ASSESSMENT

soil - stable (0)

browse - down (-2)

herbaceous understory - stable (0)

winter range condition (DC Index) - Very Poor (4) Lower Potential scale

## 2000 TREND ASSESSMENT

Protective ground cover has declined since 1995 while percent cover of bare ground has more than doubled from 13% to 35%. The ratio of protective cover to bare ground decreased. Most of this change in cover can be explained by the decline in annual grasses and forbs. Cover of cheatgrass declined from 19% in 1995 to only 2%. Annual forbs declined from 6% cover to 3% cover. At the same time perennial grass cover increased from 6% to 17%. Sum of nested frequency for perennial grasses remained similar. There appears to be adequate cover provided by vegetation and litter to prevent most erosion but due to the increase in unprotected bare ground the soil trend is considered down. Trend for the herbaceous understory is slightly up because the perennial component of the grasses showed slight improvement with a substantial decrease in the abundance annual species. The forbs showed a decrease, however they only make up 14% of the herbaceous cover and this loss was easily compensated by the increase in perennial grass nested frequency values. There are very few, if any browse species that could provide winter forage for wildlife. Trend is considered stable but in very poor condition. The Desirable Components Index rated this site as fair with a score of 34 due to excellent perennial grass cover, fair perennial forb cover, no recruitment of shrubs, no browse cover, no shrub decadence, and low annual grass cover.

### TREND ASSESSMENT

soil - down (-2)

browse - stable (0)

herbaceous understory - slightly up (+1)

winter range condition (DC Index) - Fair (34) Lower Potential scale

## 2005 TREND ASSESSMENT

The trend for soil is stable. The ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground increased somewhat. Relative bare ground declined from 34% to 29% in 2005. This is not enough change to warrant a change in trend for soils. This reduction of bare ground is due to the increase of cheatgrass. The trend for browse is stable due to a lack of change in browse species, densities, and vigor. As of 2005, there continues to be few preferred browse species. The herbaceous understory trend is considered stable. Cheatgrass sum of nested frequency increased significantly and cover increased from 2 to 9%. This increases the potential for future wildfires. Despite this increase in cheatgrass, the weighted sum of nested frequency for perennial grasses and forbs have increased only by 3%. The Desirable Components Index rated this site as poor to fair

with a score of 22 due to good perennial grass cover, excellent perennial forb cover, no recruitment of shrubs, no browse cover, no shrub decadence, and moderate annual grass cover.

TREND ASSESSMENT

soil - stable (0)

browse - stable (0)

herbaceous understory - stable (0)

winter range condition (DC Index) - Poor to Fair (22) Lower Potential scale

HERBACEOUS TRENDS --

Management unit 13B, Study no: 6

Type	Species	Nested Frequency				Average Cover %		
		'86	'95	'00	'05	'95	'00	'05
G	Agropyron cristatum	<sub>b</sub> 286	<sub>a</sub> 215	<sub>b</sub> 255	<sub>a</sub> 194	5.60	14.70	9.10
G	Aristida purpurea	<sub>a</sub> -	<sub>a</sub> 1	<sub>b</sub> 7	<sub>a</sub> -	.00	.24	-
G	Bromus tectorum (a)	-	<sub>c</sub> 365	<sub>a</sub> 138	<sub>b</sub> 273	18.56	1.72	9.25
G	Hilaria jamesii	-	3	7	7	.15	.53	.21
G	Oryzopsis hymenoides	<sub>a</sub> -	<sub>a</sub> 12	<sub>a</sub> 12	<sub>b</sub> 80	.57	1.10	.52
G	Poa fendleriana	-	2	-	-	.03	-	-
G	Sitanion hystrix	2	4	4	-	.00	.18	-
G	Sporobolus cryptandrus	-	-	2	2	-	.15	.00
G	Stipa comata	-	-	-	-	-	-	.01
G	Vulpia octoflora (a)	4	3	-	-	.00	-	-
Total for Annual Grasses		4	368	138	273	18.57	1.72	9.25
Total for Perennial Grasses		288	237	287	283	6.37	16.90	9.85
Total for Grasses		292	605	425	556	24.95	18.63	19.10
F	Astragalus mollissimus	2	7	1	7	.02	.00	.05
F	Astragalus nuttallianus (a)	-	6	-	5	.02	-	.01
F	Calochortus nuttallii	-	-	-	2	-	-	.01
F	Chenopodium fremontii (a)	-	-	3	-	-	.00	-
F	Chorispora tenella (a)	-	-	-	2	-	-	.06
F	Cryptantha sp.	-	-	-	7	-	-	.21
F	Cymopterus sp.	-	3	6	6	.00	.01	.06
F	Descurainia pinnata (a)	-	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 22	-	-	.06
F	Draba nemorosa (a)	-	<sub>a</sub> 6	<sub>a</sub> 2	<sub>b</sub> 105	.01	.00	.59
F	Erodium cicutarium (a)	-	<sub>b</sub> 125	<sub>a</sub> 24	<sub>c</sub> 246	1.60	.39	13.15
F	Erigeron sp.	-	-	-	3	-	-	.03
F	Euphorbia sp.	-	14	13	15	.03	.10	.40
F	Gilia sp. (a)	-	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 33	-	-	.21
F	Heterotheca villosa	-	-	-	8	-	-	.16

Type	Species	Nested Frequency				Average Cover %		
		'86	'95	'00	'05	'95	'00	'05
F	Lappula occidentalis (a)	-	<sub>a</sub> 5	<sub>a</sub> 3	<sub>b</sub> 62	.01	.00	.65
F	Lactuca serriola	-	6	4	-	.02	.01	-
F	Leucelene ericoides	-	28	38	29	1.46	.79	1.60
F	Machaeranthera spp	-	<sub>b</sub> 127	<sub>a</sub> -	<sub>a</sub> 7	.28	-	.01
F	Medicago sativa	<sub>a</sub> 1	<sub>bc</sub> 24	<sub>ab</sub> 12	<sub>c</sub> 34	.84	1.60	2.12
F	Phlox longifolia	-	-	3	-	-	.00	-
F	Ranunculus testiculatus (a)	-	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 49	-	-	.40
F	Salsola iberica (a)	-	<sub>a</sub> 1	<sub>a</sub> -	<sub>b</sub> 42	.00	-	.12
F	Sisymbrium altissimum (a)	-	<sub>c</sub> 150	<sub>a</sub> 2	<sub>b</sub> 50	1.22	.01	.80
F	Silene sp.	-	5	-	2	.01	-	.01
F	Sphaeralcea coccinea	-	-	3	4	-	.03	.03
F	Unknown forb-perennial	2	-	-	-	-	-	-
Total for Annual Forbs		0	293	34	616	2.87	0.41	16.06
Total for Perennial Forbs		5	214	80	124	2.68	2.55	4.70
Total for Forbs		5	507	114	740	5.56	2.97	20.77

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

BROWSE TRENDS --

Management unit 13B, Study no: 6

Type	Species	Strip Frequency			Average Cover %		
		'95	'00	'05	'95	'00	'05
B	Chrysothamnus nauseosus hololeucus	1	1	1	.15	.15	.85
B	Gutierrezia sarothrae	1	4	3	.15	.15	.21
B	Yucca harrimaniae	5	4	0	.30	.30	-
Total for Browse		7	9	4	0.60	0.61	1.06

CANOPY COVER, LINE INTERCEPT --

Management unit 13B, Study no: 6

Species	Percent Cover
	'05
Chrysothamnus nauseosus hololeucus	.96

BASIC COVER --

Management unit 13B, Study no: 6

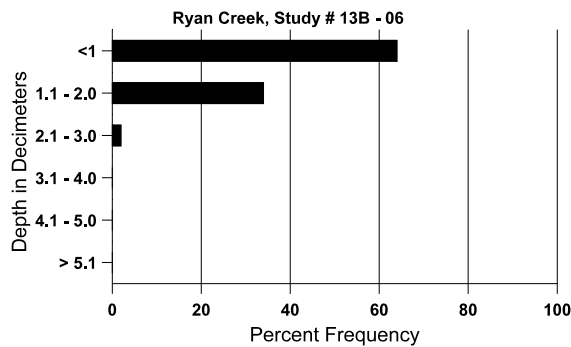
Cover Type	Average Cover %			
	'86	'95	'00	'05
Vegetation	7.25	41.22	23.49	35.27
Rock	4.00	13.35	16.52	17.92
Pavement	4.00	1.11	3.95	1.92
Litter	53.00	45.07	22.25	21.54
Cryptogams	2.25	.61	1.08	.71
Bare Ground	29.50	13.15	34.65	30.96

SOIL ANALYSIS DATA --

Herd Unit 13B, Study # 6, Study Name: Ryan Creek

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	ppm P	ppm K	dS/m
14.3	58.6 (15.9)	7.3	64.0	15.4	20.6	4.9	7.7	80.0	1.0

Stoniness Index



PELLET GROUP DATA --

Management unit 13B, Study no: 6

Type	Quadrat Frequency		
	'95	'00	'05
Rabbit	6	38	23
Elk	12	4	12
Deer	17	29	20
Cattle	3	4	8

Days use per acre (ha)	
'00	'05
-	-
9 (24)	9 (22)
20 (50)	27 (68)
10 (26)	7 (16)

BROWSE CHARACTERISTICS --  
Management unit 13B, Study no: 6

		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>												
86	33	-	-	-	33	-	0	100	100	-	0	-/-
95	0	-	-	-	-	-	0	0	0	-	0	-/-
00	0	-	-	-	-	-	0	0	0	-	0	-/-
05	0	-	-	-	-	-	0	0	0	-	0	-/-
<i>Atriplex canescens</i>												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
95	0	-	-	-	-	-	0	0	-	-	0	28/27
00	0	-	-	-	-	-	0	0	-	-	0	39/34
05	0	-	-	-	-	-	0	0	-	-	0	38/55
<i>Chrysothamnus nauseosus hololeucus</i>												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
95	20	-	-	20	-	-	0	0	-	-	0	30/46
00	20	-	-	20	-	-	0	0	-	-	0	36/63
05	20	-	-	20	-	-	0	0	-	-	0	42/64
<i>Ephedra viridis</i>												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
95	0	-	-	-	-	-	0	0	-	-	0	-/-
00	0	-	-	-	-	-	0	0	-	-	0	-/-
05	0	-	-	-	-	-	0	0	-	-	0	16/17
<i>Gutierrezia sarothrae</i>												
86	66	-	-	66	-	-	0	0	-	-	0	10/11
95	20	-	-	20	-	-	0	0	-	-	0	7/22
00	280	-	60	220	-	-	0	0	-	-	0	7/7
05	180	20	40	140	-	-	0	0	-	-	0	12/20
<i>Juniperus osteosperma</i>												
86	66	-	-	66	-	-	0	0	-	-	0	98/79
95	0	-	-	-	-	-	0	0	-	-	0	-/-
00	0	-	-	-	-	-	0	0	-	-	0	-/-
05	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	4/11

		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)
<b>Pinus edulis</b>												
86	<b>132</b>	-	66	66	-	-	0	0	-	-	0	78/50
95	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
00	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
05	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
<b>Yucca harrimaniae</b>												
86	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
95	<b>680</b>	-	-	660	20	80	0	0	3	-	0	10/14
00	<b>240</b>	-	-	100	140	40	0	0	58	33	33	13/19
05	<b>0</b>	-	-	-	-	200	0	0	0	-	0	-/-