

Trend Study 13B-3-05

Study site name: Fish Park .

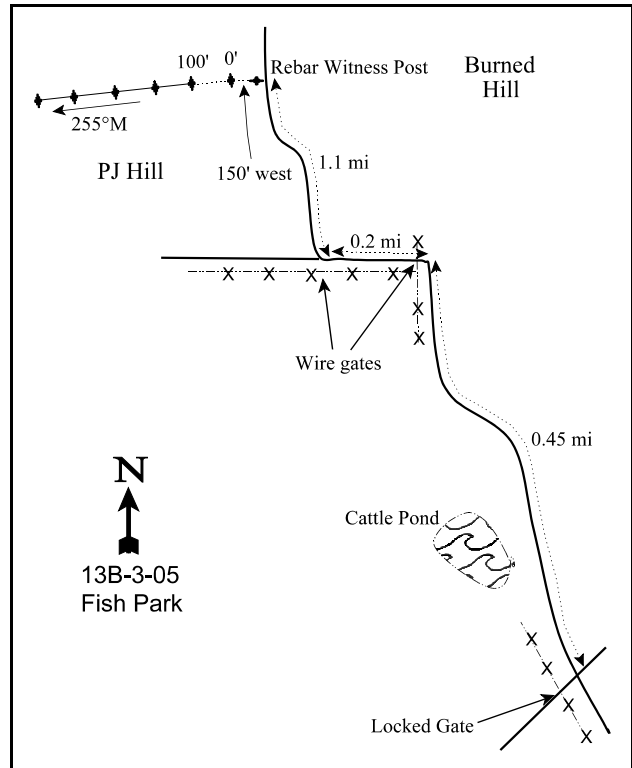
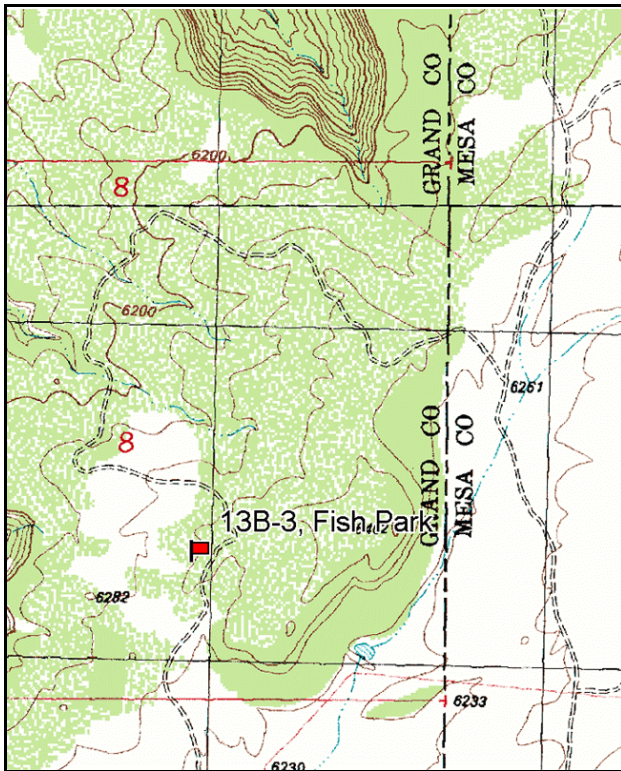
Vegetation type: Chained, Seeded P-J .

Compass bearing: frequency baseline 255 degrees magnetic.

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

LOCATION DESCRIPTION

Starting from the turnoff to the Picture Gallery Ranch (approximately 0.75 miles west of the Utah-Colorado state line out of Glade Park, CO), turn right off the main road and drive 0.1 mile to a fork. Take the right (upper) fork, go 1.2 miles to a ranch. Just past the first house, turn right and proceed northeast towards a hill. You are heading basically north-northwest towards the Juniper-covered hills. At 0.6 miles beyond the house, go through a gate and continue north 0.4 miles to another gate. Call Belle Chesnick to open this gate. After going through the locked gate turn left and go 0.45 miles to another wire gate. Go through the wire gate and continue 0.2 miles. Turn right onto a faint road that has been seeded over. This turn is opposite a gate in the fence. Continue 1.1 miles gradually climbing the hill. The road becomes very rocky toward the top. Pass a fencepost which is not the witness post. Once in the P-J look for a rebar witness post on the left side of the road. The 0-foot baseline stake, a rebar tagged #7874, is 150 feet west of the witness post.



Map Name: Marble Canyon

Diagrammatic Sketch

Township 21S, Range 26E, Section 8

GPS: NAD 27, UTM 12S 4317291 N, 667944 E

## DISCUSSION

### Fish Park - Trend Study No. 13B-3

The Fish Park study is at an elevation of 6,300 feet on the upper, eastern edge of a 2,600 acre BLM chaining and seeding completed in 1968. To the south and east are the pastures and fields in Fish Park. The gentle west-sloping country is cut by intermittent canyons which flow directly into the Colorado River. To accommodate the increased sample size and stay within the same vegetation type, the transect had to be repositioned. The chaining is part of the Fish Park allotment, which is administered by the Grand Junction BLM office. Livestock grazing pressure appears moderately light in the study area. Deer pellet groups were rarely encountered. Pellet group data estimated an average of 11 deer days use/acre (27 ddu/ha) from 1986 and 1995. The average for the whole herd unit is 15 deer days use/acre (37 ddu/ha) for the same period. A pellet-group transect read along the study site baseline in 2000 estimated 14 deer days use/acre (6 ddu/ha), less than 1 elk days use/acre (<1edu/ha), and 3 cow days use/acre (1 cdu/ha). In 2005, pellet group data estimated 13 deer, 23 elk, and 2 cow days use/acre ( 33 ddu/ha, 58 edu/ha, and 5 cdu/ha). Rabbit pellet group quadrat frequency was quite high in 1995 and 2005.

The soil is a loam with a neutral soil reaction (pH of 6.8). Effective rooting depth is almost 16 inches, at which depth is a bedrock of sandstone. The soil surface contains very few rocks or pavement, although there are large amounts of rock throughout the profile to about 16 inches. Phosphorus is 5.9 ppm and potassium is 61 ppm, where levels below 6 ppm of phosphorus and 60 ppm of potassium may hinder plant development and growth in wildland soils (Tiedemann and Lopez 2004). There is good vegetation cover on this site with some scattered bare interspaces between clumps of basin big sagebrush and pinyon-juniper trees. In the bare interspaces, erosion does not appear to be a problem. Annual plants and slight erosion can be found near the roadside where the soil has been disturbed. The erosion condition class determined soil movement as stable in 2005.

The size of the pinyon and juniper trees has noticeably increased since 1986 as evidenced by comparing photographs from each year. The point-center quarter method estimated 73 juniper and 13 pinyon trees/acre in 2000, which are very similar to the 1995 estimates. In 2005, 41 juniper and 34 pinyon trees/acre were estimated with average diameters between 5 and 6 inches. These densities are moderately low for a chaining this old. Much of the herbaceous understory on this site appeared to be around the drip line of the mature trees.

Basin big sagebrush is the key browse species on this chained site. Browse seed was provided by the Utah Division of Wildlife Resources, which included big sagebrush and four-wing saltbush. However, which sagebrush subspecies was included in the seed mix is not clear because both basin big sagebrush and Wyoming big sagebrush are present on the site. Basin big sagebrush appears dominant, therefore the data tables refer to all sagebrush as basin big sagebrush. In general, the sagebrush has been lightly hedged and vigorous with good seed production. The age structure has shifted from a young population to a more mature population with many decadent individuals. Sixty three percent of the plants were classified as mature in 1995, compared to only 24% in 1986. In 2000, the mature plants had increased to 75%, then decreased to 41% in 2005. The plants classified as decadent decreased in 1995 from 6 to 2%, increased slightly to 9% in 2000, and increased drastically to 57% in 2005. Young plants have decreased from 71% of the population in 1986 to 35% in 1995, to 16% in 2000, to 2% in 2005. Plants classified as dying have increased from 0% in 1995 to 2% in 2000, and up to 38% in 2005. The percentage of seedlings in the population has fluctuated over the years, but remains quite high (between 19 and 44%). Broom snakeweed and cactus are present. Their numbers have fluctuated through the years, yet these populations together have made up less than 1% total cover.

The sum of nested frequency for perennial grasses decreased from 1986 to 1995, increased slightly in 2000, then decreased again in 2005. Crested wheatgrass and galleta were the dominant perennial grasses in 1995 and

made up 50% of the total grass cover. Galleta decreased significantly from 1995 to 2005, giving way for other perennial species. The annual species, cheatgrass and sixweeks fescue, accounted for nearly all of the rest of the grass cover. With the dry fall of 1999 and the dry winter and summer of 2000, cheatgrass and sixweeks fescue did not do well, but had higher nested frequencies and percent covers in 2005 than ever before. The combined cover of cheatgrass and sixweeks fescue was only about 1% in 2000, but was nearly 19 times higher in 2005.

Forbs occur infrequently and account for only a small amount of the total vegetation cover (5-7%). Alfalfa was reported as large and vigorous in 1986, yet with the extended drought, it was not sampled in 1995, 2000, or 2005. Other forbs sampled include: timber milkvetch, longleaf phlox, scarlet globemallow, and woolly milkvetch. From 2000 to 2005, the nested frequencies for perennial forbs had decreased 20% while annual forbs increased 250%.

### 1986 APPARENT TREND ASSESSMENT

The area is currently in good condition. All signs indicate it will stay that way except for the possible gradual increase in juniper and pinyon. Selective hedging on the more palatable big sagebrush hybrids with Wyoming big sagebrush, may affect its reproductive potential. The pinyon and juniper are not dense enough to warrant chaining especially since basal diameters are mostly less than 4 inches, but other treatments such as selective application of herbicides, roller-chopping, or individual tree cutting could be practical alternatives. The entire chaining is in similar condition and treatment should be considered within the next 20 years. The soil appears stable because of good vegetation and litter cover.

### 1995 TREND ASSESSMENT

Vegetation cover and litter cover are moderately high with each having high nested frequency values indicating good distribution of protective cover, which appears to provide adequate soil protection. In areas where bare interspaces appear, there are no signs of erosion, therefore soil trend is considered stable. The sagebrush community has shifted to a more mature population with many seedlings and a decreased percentage of decadent plants. These combined factors indicate an upward browse trend. If the sagebrush population continues to expand it may begin to affect herbaceous understory when cover starts to exceed 15%. The sum of nested frequency of perennial grasses has decreased, nearly half of the grass cover is made up of annuals. Forbs are infrequent and add very little to the herbaceous understory. This leads to a slightly downward herbaceous understory trend. The decrease in perennials is likely due to the extended drought as well as competition with annuals and browse species. The Desirable Components Index rated this site as good with a score of 61 due to moderate perennial grass cover, low perennial forb cover, excellent recruitment of shrubs, moderate browse cover, low shrub decadence, and moderately low annual grass cover.

#### TREND ASSESSMENT

soil - stable (0)

browse - up (+2)

herbaceous understory - slightly down (-1)

winter range condition (DC Index) - Good (61) Lower Potential scale

### 2000 TREND ASSESSMENT

Vegetation and litter cover are still moderately high. The amount of bare soil has increased slightly with the extremely dry year, however the ratio of protective cover to bare soil is still more than 3:1, indicating that there is still very good protection from erosion. In areas where bare interspaces appear, there are no signs of erosion, and this is usually where crested wheatgrass occurs. Soil trend is considered stable at this time. The sagebrush community has shifted to an even more mature population (75% classified as mature).

The browse density has increased 20% from 3,240 to 4,040 plants/acre. Sagebrush cover also increased from 12 to 17%. Seedlings were also moderately high and percentage of decadent plants has risen slightly, but still lower than 10%. All these combined factors indicate an upward browse trend. The perennial grass sum of nested frequency has increased about 9%, while both annual grasses and forbs were much less abundant due to the dry conditions. Cheatgrass sum of nested frequency decreased significantly. Perennial forbs are infrequent and add little to the herbaceous understory. The increase of perennial grasses combined with the decline of cheatgrass more than compensates for the slight losses to the perennial forbs. The trend for the herbaceous understory is stable. The Desirable Components Index rated this site as good with a score of 61 due to good perennial grass cover, low perennial forb cover, moderate recruitment of shrubs, moderate browse cover, low shrub decadence, and low annual grass cover.

#### TREND ASSESSMENT

soil - stable (0)

browse - up (+2)

herbaceous understory - stable (0)

winter range condition (DC Index) - Good (61) Lower Potential scale

#### 2005 TREND ASSESSMENT

The soil trend is considered stable with relative percent bare soil remaining nearly the same as 2000. The ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground increased slightly. These slight changes were not enough to warrant a change in trend. The browse trend is down. The population decreased from 4,040 plants/acre in 2000 to 2,340 plants/acre in 2005, a decrease of 42%. As well, the percentage of decadent plants in the population increased from 9% in 2000 to 57% in 2005. Plants classified as dying increased from 2% of the population in 2000 to 38% in 2005, with only 2% young individuals in the population to replace the dying (16% of the population was young in 2000). Previous to 2000, the use on the shrubs was light, but has become moderate to heavy. seedlings were abundant and could provide a new population of young individuals if they survive the dry summer. The herbaceous understory trend is slightly down. The total nested frequency of annual grasses and forbs increased two and a half times from 2000 to 2005. The total cover of annual grasses and forbs increased from 1% in 2000 to 23% in 2005. The annual grasses cheatgrass and sixweek fescue increased significantly, as did a few annual forb species. This increase in annual grasses and forbs is coupled with a substantial decrease in the nested frequency of perennial grasses and forbs (a decrease of 16% from 2000 to 2005). The Desirable Components Index rated this site as poor with a score of 21 due to good perennial grass cover, low perennial forb cover, low recruitment of shrubs, fair browse cover, very high shrub decadence, and high annual grass cover.

#### TREND ASSESSMENT

soil -stable (0)

browse - down (-2)

herbaceous understory - slightly down (-1)

winter range condition (DC Index) - Poor (21) Lower Potential scale

HERBACEOUS TRENDS --  
Management unit 13B, Study no: 3

Type	Species	Nested Frequency				Average Cover %		
		'86	'95	'00	'05	'95	'00	'05
G	<i>Agropyron cristatum</i>	bc169	a115	c171	ab131	3.70	5.76	7.48
G	<i>Agropyron intermedium</i>	-	-	-	2	-	-	.03
G	<i>Bromus tectorum</i> (a)	-	b278	a125	b264	4.42	.77	12.88
G	<i>Hilaria jamesii</i>	b76	b97	b65	a27	3.12	.49	.38
G	<i>Poa bulbosa</i>	-	-	-	5	-	-	.04
G	<i>Poa fendleriana</i>	a-	b38	b24	b23	1.05	.12	.63
G	<i>Poa secunda</i>	a-	a-	a-	b27	-	-	1.50
G	<i>Sitanion hystrix</i>	9	1	-	8	.00	-	.21
G	<i>Sporobolus cryptandrus</i>	-	-	2	-	-	.00	-
G	<i>Stipa comata</i>	b70	a8	a21	a23	.02	.35	.66
G	<i>Vulpia octoflora</i> (a)	-	b186	a77	b234	1.23	.36	8.05
Total for Annual Grasses		0	464	202	498	5.65	1.13	20.94
Total for Perennial Grasses		324	259	283	246	7.91	6.74	10.95
Total for Grasses		324	723	485	744	13.57	7.88	31.89
F	<i>Agoseris glauca</i>	-	2	-	-	.00	-	-
F	<i>Allium</i> sp.	-	-	-	3	-	-	.00
F	<i>Astragalus convallarius</i>	b10	b14	ab9	a-	.44	.12	-
F	<i>Astragalus mollissimus</i>	a-	b13	ab4	ab5	.18	.06	.16
F	<i>Astragalus</i> sp.	-	-	-	5	-	-	.03
F	<i>Castilleja linariaefolia</i>	-	2	-	-	.03	.03	-
F	<i>Calochortus nuttallii</i>	-	2	-	5	.00	-	.01
F	<i>Cryptantha fulvocanescens</i>	5	-	-	-	-	-	-
F	<i>Cryptantha</i> sp.(a)	-	-	-	6	-	-	.04
F	<i>Cymopterus</i> sp.	-	2	-	2	.00	-	.00
F	<i>Descurainia pinnata</i> (a)	-	b22	a1	ab12	.04	.00	.66
F	<i>Draba nemorosa</i> (a)	-	b95	a6	a14	.20	.01	.03
F	<i>Erodium cicutarium</i> (a)	-	-	-	3	-	-	.03
F	<i>Erigeron pumilus</i>	5	8	8	8	.02	.05	.24
F	<i>Gayophytum ramosissimum</i> (a)	-	b31	a-	a7	.08	-	.01
F	<i>Gilia hutchinifolia</i> (a)	-	b43	a-	b42	.08	-	.13
F	<i>Haplopappus acaulis</i>	-	3	-	-	.00	-	-
F	<i>Ipomopsis aggregata</i>	-	1	-	-	.03	-	-
F	<i>Lappula occidentalis</i> (a)	-	b18	a-	b9	.06	-	.08
F	<i>Lepidium densiflorum</i> (a)	-	b21	a2	a4	.04	.00	.01
F	<i>Lithospermum</i> sp.	-	6	-	-	.01	-	-

Type	Species	Nested Frequency				Average Cover %		
		'86	'95	'00	'05	'95	'00	'05
F	<i>Lygodesmia spinosa</i>	-	2	-	-	.00	-	-
F	<i>Medicago sativa</i>	4	-	-	-	-	-	-
F	<i>Microsteris gracilis</i> (a)	-	a-	ab2	b12	-	.00	.08
F	<i>Petradoria pumila</i>	-	-	8	-	-	.06	-
F	<i>Phlox hoodii</i>	a-	a-	b23	a-	-	.26	-
F	<i>Phlox longifolia</i>	87	92	91	81	.33	.69	.93
F	<i>Plantago patagonica</i> (a)	-	b114	a51	b108	.27	.21	1.04
F	<i>Polygonum douglasii</i> (a)	-	9	-	-	.02	-	-
F	<i>Sisymbrium altissimum</i> (a)	-	8	-	-	.01	-	-
F	<i>Sphaeralcea coccinea</i>	ab23	b30	a14	a16	.27	.32	.14
F	<i>Streptanthus cordatus</i>	-	1	-	-	.00	-	-
F	<i>Trifolium</i> sp.	-	3	-	-	.00	-	-
Total for Annual Forbs		0	361	62	217	0.82	0.24	2.13
Total for Perennial Forbs		134	181	157	125	1.35	1.60	1.52
Total for Forbs		134	542	219	342	2.17	1.84	3.65

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

BROWSE TRENDS --

Management unit 13B, Study no: 3

Type	Species	Strip Frequency			Average Cover %		
		'95	'00	'05	'95	'00	'05
B	<i>Artemisia tridentata tridentata</i>	56	63	56	11.60	16.71	8.27
B	<i>Gutierrezia sarothrae</i>	8	17	5	.05	.64	.03
B	<i>Juniperus osteosperma</i>	0	7	8	6.21	6.83	7.33
B	<i>Opuntia</i> sp.	4	4	3	.38	.30	.30
B	<i>Pinus edulis</i>	0	3	2	2.67	5.52	1.86
Total for Browse		68	94	74	20.93	30.02	17.79

CANOPY COVER, LINE INTERCEPT --

Management unit 13B, Study no: 3

Species	Percent Cover	
	'00	'05
Artemisia tridentata tridentata	-	10.85
Juniperus osteosperma	6.59	12.10
Opuntia sp.	-	.16
Pinus edulis	3.00	3.54

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 13B, Study no: 3

Species	Average leader growth (in)
	'05
Artemisia tridentata tridentata	1.3

POINT-QUARTER TREE DATA --

Management unit 13B, Study no: 3

Species	Trees per Acre	
	'00	'05
Juniperus osteosperma	73	41
Pinus edulis	13	34

Average diameter (in)	
'00	'05
5.0	5.7
6.2	5.1

BASIC COVER --

Management unit 13B, Study no: 3

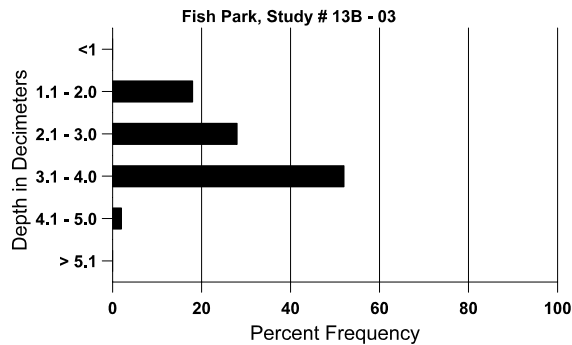
Cover Type	Average Cover %			
	'86	'95	'00	'05
Vegetation	16.50	37.57	40.97	50.97
Rock	0	.12	.33	.06
Pavement	0	.04	.18	.05
Litter	68.50	44.53	48.42	35.73
Cryptogams	0	5.65	10.93	2.52
Bare Ground	15.00	24.65	31.86	25.11

SOIL ANALYSIS DATA --

Herd Unit 13B, Study # 3, Study Name: Fish Park

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	ppm P	ppm K	dS/m
15.5	57.2 (16.1)	6.8	48.0	30.0	22.0	1.0	5.9	60.8	0.6

# Stoniness Index



## PELLET GROUP DATA --

Management unit 13B, Study no: 3

Type	Quadrat Frequency		
	'95	'00	'05
Rabbit	48	20	49
Elk	-	-	11
Deer	3	7	20
Cattle	5	1	-

Days use per acre (ha)	
'00	'05
-	-
1 (2)	23 (58)
14 (35)	13 (33)
3 (8)	2 (5)

## BROWSE CHARACTERISTICS --

Management unit 13B, Study no: 3

		Age class distribution (plants per acre)					Utilization					
Y	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	<b>2266</b>	933	1600	533	133	-	7	0	6	-	3	24/20
95	<b>3240</b>	1440	1140	2040	60	40	2	.61	2	-	4	29/42
00	<b>4040</b>	760	640	3040	360	40	29	8	9	2	2	28/38
05	<b>2340</b>	800	40	960	1340	400	44	10	57	38	38	29/41
<i>Gutierrezia sarothrae</i>												
86	<b>533</b>	-	100	400	33	-	0	0	6	-	0	7/8
95	<b>200</b>	-	60	140	-	-	0	0	0	-	0	10/12
00	<b>1640</b>	20	-	1640	-	20	0	0	0	-	0	7/9
05	<b>240</b>	-	40	200	-	-	0	0	0	-	0	9/11

		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>Juniperus osteosperma</b>												
86	<b>33</b>	-	-	33	-	-	0	0	0	-	0	61/44
95	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
00	<b>160</b>	-	20	140	-	20	0	0	0	-	0	-/-
05	<b>160</b>	-	20	120	20	-	0	0	13	13	13	-/-
<b>Opuntia sp.</b>												
86	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
95	<b>200</b>	-	-	180	20	-	0	0	10	10	10	4/18
00	<b>380</b>	-	-	380	-	-	0	0	0	-	0	4/10
05	<b>120</b>	-	-	120	-	-	0	0	0	-	0	5/24
<b>Pinus edulis</b>												
86	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
95	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
00	<b>100</b>	-	-	100	-	-	0	0	0	-	0	-/-
05	<b>40</b>	-	-	20	20	-	0	0	50	50	50	-/-