

Trend Study 9-10-05

Study site name: Toliver Creek Chaining.

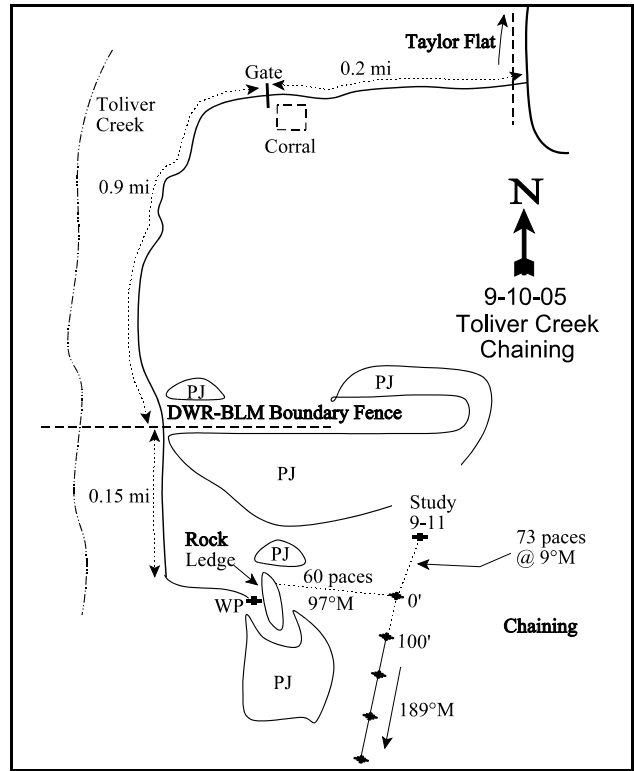
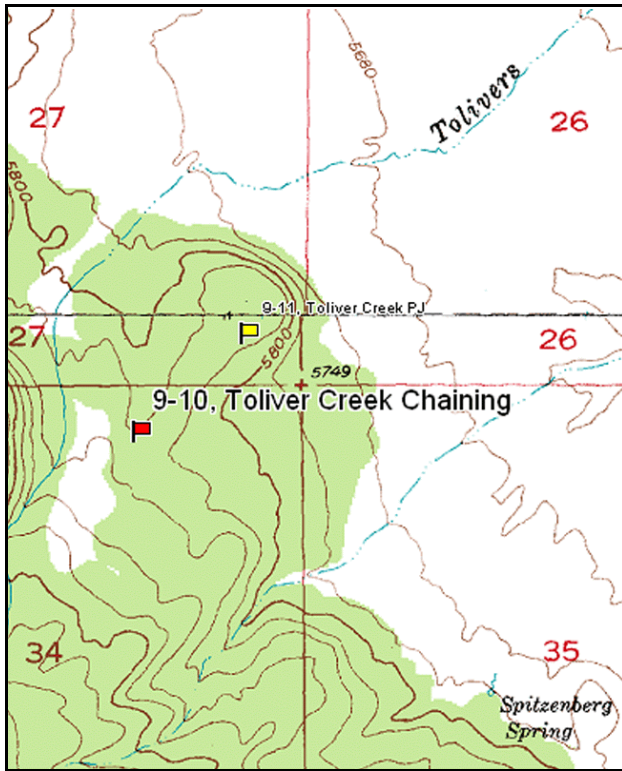
Vegetation type: Chained, Seeded P-J.

Compass bearing: frequency baseline 189 degrees magnetic.

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

LOCATION DESCRIPTION

From the north side of the Green River at the Taylor Flat bridge, go south across the river 1.75 miles. Turn right and go through a gate. Go 0.2 miles to a gate by a corral. Continue south and west 0.7 miles to the DWR-BLM boundary fence. Go through the gate and continue 0.15 miles to the end of the road. There is a P-J covered, rocky ledge about 75 feet east. From the ledge, walk 60 paces at 97°M into the chaining to a short green fencepost tagged #909 which marks the start of the frequency baseline.



Map Name: Warren Draw

Diagrammatic Sketch

Township 2N, Range 24E, Section 34

GPS: NAD 27, UTM 12T 4525860 N, 652609 E

DISCUSSION

Toliver Creek Chaining - Trend Study No. 9-10

The Toliver Creek Chaining study was established in 1988 to monitor a large pinyon-juniper chaining completed during the fall of 1986. It was two-way chained and seeded with grasses, forbs, and shrubs. This area is managed by the BLM and is considered critical deer winter range, as with all of the Browns Park area. Another study was established in the adjacent undisturbed pinyon-juniper stand to provide comparative baseline data for species composition and trend assessment. The study site is located in the foothills above Taylor Flat. This site has a northern aspect with a slope of 3-5% and lies at an elevation of 5,900 feet. Animal use appears light, although quadrat frequency of elk and deer pellets increased between 1995 and 2000. Pellet group data from 2000 estimated 25 deer, 7 elk, and 2 cow days use/acre (62 ddu/ha, 17 edu/ha, and 5 cdu/ha). Pellet group data from 2005 estimated 42 deer, 68 elk, and 20 cow days use/acre (103 ddu/ha, 167 edu/ha, and 48 cdu/ha). This area is in the Taylor Flat allotment which is usually grazed in the spring from April 1 to May 31 for 1,000 AUM's.

The sandy loam soils are fairly shallow and extremely rocky. Estimated effective rooting depth is just over 7 inches. Penetrometer readings to estimate the profile stoniness index showed nearly all probes hit rocks within the first 5 inches of the soil surface. Rock cover on the surface is high at 22%. Although rocky, this soil does support mountain big sagebrush, suggesting that the rock here is of a cobbly nature and does not prohibit root penetration. Vegetation and litter cover have been adequate to prevent serious erosion. The erosion condition class determined soil movement as stable in 2005.

Due to the shallow, rocky nature of the site, the control of pinyon and juniper by chaining was close to 100%. Few seedlings were observed and none were sampled in the density plots of 1988. Point-center quarter data from 2000 estimate 38 juniper and 12 pinyon trees/acre. Average diameter of juniper is 2.4 inches, while that of pinyon is only 1.5 inches. Fifteen percent of the juniper and 5% of the pinyon trees sampled consisted of live mature tipped trees which were not eradicated by the chaining treatment. Point-center quarter for 2005 estimated 35 junipers/acre with an average diameter of 2.1 inches.

Browse species are not abundant. The combined average cover for all browse species has been less than 5% all years. Mountain big sagebrush, fourwing saltbush, and rubber rabbitbrush do provide some forage, but not much. Mountain big sagebrush estimated 380 plants/acre in 1995, 520 in 2000, and 400 in 2005. Big sagebrush has good vigor, low decadency, and good recruitment from young plants. Use is light and average annual leader growth averaged 5 inches in 2000 and 4 inches in 2005. Fourwing saltbush estimated 160 plants/acre in 1995, 120 in 2000 and 100 in 2005. In 2000 and 2005, all saltbush plants were classified as mature. Use is light to moderate, vigor normal, with no decadent plants. Leader growth on fourwing averaged 5 inches in 2000 and 2005. White-stemmed rubber rabbitbrush estimated 60 plants/acre in 1995, 260 in 2000, and 100 in 2005. Although this species is not always an important forage source, it is palatable to browsing animals and may be more important due to the lack of a well developed shrub component. Use on rubber rabbitbrush is light with good vigor and low decadency. Increaser species, including prickly pear and broom snakeweed, are present with snakeweed showing a substantial decrease in 2005.

The herbaceous understory was dominated by cheatgrass in 1995 with an average total cover of 23%. In 2000, it declined significantly to 5% then even lower to less than 1% by 2005. A good mix of seeded native perennial grasses are present, but most remain infrequent. Crested wheatgrass significantly increased in nested frequency between 1995 and 2000. It was the dominant grass from 2000 on. Crested wheatgrass was mostly dried up in July of 2000. It exhibited moderate to heavy use. The decrease in cheatgrass appears correlated to the significant increase in crested wheatgrass, which increased from 4% average total cover in 1995, to 9% in 2000, and to 16% in 2005. Other perennial grasses that have been sampled include: intermediate wheatgrass, squirreltail, orchard grass, needle-and-thread, blue bunch wheatgrass, and Sandberg bluegrass. As a group,

perennial grasses increased in sum of nested frequency in 2000 mostly due to crested wheatgrass and remained similar in 2005. Forbs were scarce in 2000 with drought conditions and slightly increased in 2005 with a return to normal precipitation. The increase in forb cover was mainly due to annual forbs and not perennial forbs. All forbs combined provided less than 3% average cover in 2005. They have never exceeded 4% cover. In 1995, perennial forbs were more abundant than annual forbs. Eighteen species were sampled in 1995, 6 in 2000, and 13 in 2005.

1988 APPARENT TREND ASSESSMENT

Large rocks are prominent on the surface and account for 23% of the ground cover. Debris from the chaining provides a substantial amount of surface litter cover (54%). Bare ground is moderately high at 28%. Trend for soil appears stable at this time. There are low densities of shrubs on the site, but fourwing saltbush and mountain big sagebrush should increase in time. The herbaceous understory contains a good variety of seeded and native grasses although annual cheatgrass is currently the most abundant grass. Trend for grasses and forbs is improved from pre-chained conditions, however the abundance of annual grasses and forbs is a concern.

1995 TREND ASSESSMENT

Ground cover characteristics have improved since the chaining. Currently, there is only 5% bare soil and litter cover has remained moderately high at 54%. Although, more than 60% of the total vegetative cover is contributed by cheatgrass. This annual is not a very dependable provider of protective cover. Therefore, trend for soil is only slightly up. The browse trend has improved for sagebrush and fourwing saltbush. One negative aspect is the increase of broom snakeweed which has increased 90% since 1988. However, the population appears to be stabilizing with mostly mature plants and a much lower percent of seedlings to mature population. The herbaceous trend is down due to the dominance of annual grasses and forbs. Cheatgrass makes up 80% of the grass cover and 62% of the total vegetative cover. Annual forbs account for 39% of the forb cover. Drought conditions since 1987 have intensified this condition. Two perennial seeded grasses, crested and intermediate wheatgrass, did increase significantly in nested frequency since the last reading. These and other perennial grasses should eventually gain dominance. The Desirable Components Index rated this site as very poor with a score of 0 due to poor browse cover, low percent cover for perennial grass and forbs, and high annual grass cover.

TREND ASSESSMENT

soil - slightly up (+1)

browse - slightly up (+1)

herbaceous understory - down (-2)

winter range condition (DC Index) - Very poor (0) Mid-level Potential scale

2000 TREND ASSESSMENT

Trend for soil is slightly down. Bare ground increased from 5% to 22% and vegetation and litter cover both decreased. These changes in ground cover are due to drought and should reverse in the future with normal precipitation. Trend for browse is slightly up. Mountain big sagebrush slightly increased in density and has good vigor and low decadency. Recruitment from young sagebrush plants is also good at 12%. Fourwing saltbush remains stable, even though no young plants were sampled in 2000. However, drought conditions make it difficult for young shrubs to establish and persist. Normal precipitation in the future will hopefully increase the number of young sagebrush and fourwing plants at this site, resulting in population increases. Trend for the herbaceous understory is up as crested wheatgrass significantly increased in nested frequency, while cheatgrass significantly decreased in nested frequency. The understory is still limited and forbs are scarce. The Desirable Components Index rated this site as very poor with a score of 22, although much better than 1995. Browse cover is still low, but annual grasses decreased in cover, and perennial grass cover increased.

TREND ASSESSMENT

soil - slightly down (-1)

browse - slightly up (+1)

herbaceous understory - up (+2)

winter range condition (DC Index) - Very poor (22) Mid-level Potential scale

2005 TREND ASSESSMENT

Trend for soil is stable. Bare ground increased slightly in nested frequency and cover. Vegetation and litter cover remained similar to 2000 estimates even with a return to normal precipitation patterns. Erosion is minimal with abundant litter still on the ground from the chaining. Trend for key browse, mountain big sagebrush and fourwing saltbush, is slightly down. Density of sagebrush decreased from 520 plants/acre in 2000 to 400 in 2005. Recruitment is still good for sagebrush, but the population is still very small and not very resilient to changes. Saltbush density remained similar to 2000 and still no young or seedlings plants were recorded in the population. Trend for the herbaceous understory is stable. Sum of nested frequency for grasses did not change much, although cover for crested wheatgrass did increase from 10% in 2000 to 16% in 2005. Cheatgrass decreased significantly in nested frequency in 2000 and did so again in 2005. Cheatgrass cover is now less than 1%. Two of the perennial grasses, bottlebrush squirreltail and purple three-awn, increased significantly in nested frequency. Forbs still remain scarce. The Desirable Components Index rated this site as very poor with a score of 33 due to low browse cover, good perennial grass cover, and low annual grass cover.

TREND ASSESSMENT

soil - stable (0)

browse - slightly down (-1)

herbaceous understory - stable (0)

winter range condition (DC Index) - Very poor (33) Mid-level Potential scale

HERBACEOUS TRENDS --

Management unit 09 , Study no: 10

T y p e	Species	Nested Frequency				Average Cover %		
		'88	'95	'00	'05	'95	'00	'05
G	Agropyron cristatum	_a 84	_b 165	_c 248	_c 257	4.30	9.80	16.05
G	Agropyron intermedium	_a 3	_b 25	_{ab} 21	_{ab} 15	.55	.38	.31
G	Agropyron spicatum	_a -	_a 4	_b 25	_a -	.03	.17	-
G	Aristida purpurea	_a -	_a -	_a -	_b 9	.03	-	.12
G	Bromus tectorum (a)	_c 210	_d 363	_b 147	_a 62	22.82	4.74	.34
G	Dactylis glomerata	_c 73	_b 16	_b 22	_a -	.16	.71	.00
G	Oryzopsis hymenoides	_b 17	_a -	_a 2	_{ab} 6	-	.03	.06
G	Poa secunda	11	1	6	6	.00	.01	.01
G	Sitanion hystrix	_b 33	_a -	_a -	_b 20	.00	-	.38
G	Sporobolus cryptandrus	2	6	1	5	.01	.00	.15
G	Stipa comata	_a -	_b 20	_b 11	_b 14	.69	.11	.14
G	Unknown grass - perennial	39	-	-	-	-	-	-

Type	Species	Nested Frequency				Average Cover %		
		'88	'95	'00	'05	'95	'00	'05
G	<i>Vulpia octoflora</i> (a)	-	_a 22	_a 4	_b 61	.06	.01	.18
Total for Annual Grasses		210	385	151	123	22.89	4.75	0.51
Total for Perennial Grasses		262	237	336	332	5.79	11.23	17.24
Total for Grasses		472	622	487	455	28.68	15.98	17.76
F	<i>Calochortus nuttallii</i>	-	5	-	-	.01	-	-
F	<i>Chenopodium album</i> (a)	_b 7	_a -	_a -	_b 6	-	-	.02
F	<i>Chenopodium leptophyllum</i> (a)	_b 22	_a -	_a -	_a 4	-	-	.01
F	<i>Collinsia parviflora</i> (a)	-	-	-	2	-	-	.01
F	<i>Cymopterus longipes</i>	-	3	4	1	.01	.01	.01
F	<i>Descurainia pinnata</i> (a)	_b 19	_b 20	_a -	_b 16	.44	-	.08
F	<i>Draba reptans</i> (a)	_a 7	_b 83	_a -	_a 3	.23	-	.01
F	<i>Erodium cicutarium</i> (a)	-	_b 26	_a 6	_c 46	.41	.01	1.87
F	<i>Gilia sp.</i> (a)	-	_b 18	_a -	_b 15	.05	-	.04
F	<i>Lappula occidentalis</i> (a)	-	1	-	-	.00	-	-
F	<i>Lactuca serriola</i>	_a -	_b 70	_a -	_a -	.30	-	-
F	<i>Lepidium densiflorum</i> (a)	-	7	-	2	.01	-	.03
F	<i>Leucelene ericoides</i>	_b 37	_b 40	_{ab} 24	_a 23	.73	.18	.06
F	<i>Machaeranthera canescens</i>	-	4	-	3	.01	-	.00
F	<i>Melilotus officinalis</i>	-	7	-	-	.21	-	-
F	<i>Medicago sativa</i>	_b 24	_a 9	_a -	_a -	.34	-	-
F	<i>Phlox hoodii</i>	-	6	1	-	.06	.00	-
F	<i>Sanguisorba minor</i>	5	-	-	-	-	-	-
F	<i>Sisymbrium altissimum</i> (a)	-	_b 50	_a 2	_a 2	.48	.00	.02
F	<i>Sphaeralcea coccinea</i>	_a -	_b 23	_b 13	_b 26	.71	.05	.28
F	<i>Tragopogon dubius</i>	-	6	-	-	.04	-	-
F	Unknown forb-annual (a)	7	-	-	-	-	-	-
F	Unknown forb-perennial	9	3	-	-	.15	-	-
Total for Annual Forbs		62	205	8	96	1.64	0.01	2.10
Total for Perennial Forbs		75	176	42	53	2.59	0.24	0.36
Total for Forbs		137	381	50	149	4.24	0.26	2.46

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

BROWSE TRENDS --

Management unit 09 , Study no: 10

Type	Species	Strip Frequency			Average Cover %		
		'95	'00	'05	'95	'00	'05
B	<i>Artemisia tridentata vaseyana</i>	6	8	8	.33	.98	1.46
B	<i>Atriplex canescens</i>	5	5	5	.15	.66	.51
B	<i>Chrysothamnus depressus</i>	0	3	0	-	.15	-
B	<i>Chrysothamnus nauseosus hololeucus</i>	3	5	5	.41	-	.33
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	0	1	0	-	-	-
B	<i>Echinocereus sp.</i>	0	1	3	-	-	.18
B	<i>Gutierrezia sarothrae</i>	35	32	14	1.61	.38	.07
B	<i>Juniperus osteosperma</i>	0	5	6	.96	.73	1.81
B	<i>Opuntia sp.</i>	21	27	24	.57	.25	.27
B	<i>Pinus edulis</i>	0	1	1	-	-	-
Total for Browse		70	88	66	4.03	3.16	4.66

CANOPY COVER, LINE INTERCEPT --

Management unit 09 , Study no: 10

Species	Percent Cover
	'05
<i>Artemisia tridentata vaseyana</i>	1.66
<i>Atriplex canescens</i>	1.10
<i>Chrysothamnus nauseosus hololeucus</i>	1.61
<i>Echinocereus sp.</i>	.18
<i>Gutierrezia sarothrae</i>	.20
<i>Juniperus osteosperma</i>	2.65
<i>Opuntia sp.</i>	.55

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 09 , Study no: 10

Species	Average leader growth (in)
<i>Artemisia tridentata vaseyana</i>	4.0
<i>Atriplex canescens</i>	5.2

POINT-QUARTER TREE DATA --
 Management unit 09 , Study no: 10

Species	Trees per Acre	
	'00	'05
Juniperus osteosperma	38	35
Pinus edulis	12	-

Average diameter (in)	
'00	'05
2.4	2.1
1.5	-

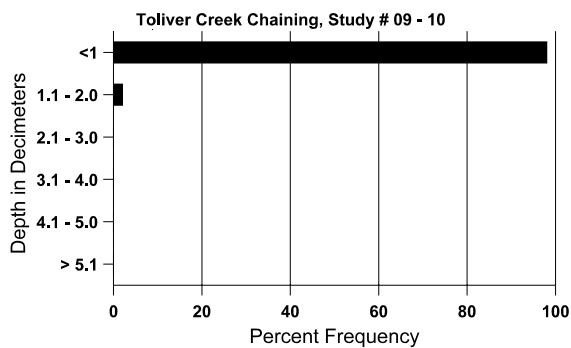
BASIC COVER --
 Management unit 09 , Study no: 10

Cover Type	Average Cover %			
	'88	'95	'00	'05
Vegetation	3.00	38.45	21.76	22.98
Rock	12.25	22.84	22.35	23.47
Pavement	1.50	.37	1.22	.59
Litter	54.75	54.20	42.52	34.02
Cryptogams	0	.09	1.69	.72
Bare Ground	28.50	5.06	22.23	27.58

SOIL ANALYSIS DATA --
 Herd Unit 09, Study # 10, Study Name: Toliver Creek Chaining

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	ppm P	ppm K	dS/m
7.4	68.8 (8.4)	7.3	69.4	17.0	13.6	4.5	14.3	288.0	0.9

Stoniness Index



PELLET GROUP DATA --
 Management unit 09 , Study no: 10

Type	Quadrat Frequency		
	'95	'00	'05
Rabbit	18	35	82
Elk	7	23	36
Deer	12	13	12
Cattle	3	5	3

Days use per acre (ha)	
'00	'05
-	-
7 (17)	68 (167)
26 (65)	42 (103)
2 (5)	20 (48)

BROWSE CHARACTERISTICS --
 Management unit 09 , Study no: 10

		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 vaseyana</i>												
88	33	-	33	-	-	-	0	0	0	-	0	-/-
95	380	120	280	100	-	-	11	0	0	-	0	13/16
00	520	-	60	440	20	-	0	0	4	-	0	14/18
05	400	-	60	340	-	-	15	10	0	-	0	22/31
<i>Atriplex canescens</i>												
88	133	133	133	-	-	-	0	0	-	-	0	-/-
95	160	-	40	120	-	-	0	0	-	-	0	27/36
00	120	-	-	120	-	-	17	0	-	-	0	28/37
05	100	-	-	100	-	-	20	0	-	-	0	38/47
<i>Chrysothamnus depressus</i>												
88	0	-	-	-	-	-	0	0	-	-	0	-/-
95	0	-	-	-	-	-	0	0	-	-	0	-/-
00	60	-	20	40	-	-	0	0	-	-	0	2/8
05	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Chrysothamnus nauseosus hololeucus</i>												
88	33	-	-	33	-	-	0	0	0	-	0	11/8
95	60	-	-	60	-	-	0	0	0	-	0	28/31
00	260	-	180	60	20	-	0	0	8	-	0	34/44
05	100	-	20	80	-	20	0	0	0	-	0	36/47
<i>Chrysothamnus viscidiflorus viscidiflorus</i>												
88	0	-	-	-	-	-	0	0	-	-	0	-/-
95	0	-	-	-	-	-	0	0	-	-	0	-/-
00	20	-	-	20	-	-	0	0	-	-	0	-/-
05	0	-	-	-	-	-	0	0	-	-	0	-/-

		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>Echinocereus</i> sp.												
88	0	-	-	-	-	-	0	0	-	-	0	-/-
95	0	-	-	-	-	-	0	0	-	-	0	2/3
00	20	-	20	-	-	-	0	0	-	-	0	3/6
05	80	-	-	80	-	-	0	0	-	-	0	3/6
<i>Gutierrezia sarothrae</i>												
88	200	-	-	200	-	-	0	0	0	-	0	4/6
95	1920	80	100	1820	-	-	0	0	0	-	0	11/17
00	2120	-	20	1900	200	200	0	0	9	8	50	4/7
05	320	-	-	300	20	-	0	0	6	6	6	7/11
<i>Juniperus osteosperma</i>												
88	0	-	-	-	-	-	0	0	-	-	0	-/-
95	0	-	-	-	-	-	0	0	-	-	0	-/-
00	120	-	100	20	-	-	0	0	-	-	0	-/-
05	120	-	40	80	-	60	0	0	-	-	0	-/-
<i>Opuntia</i> sp.												
88	1065	66	533	366	166	-	0	0	16	-	13	4/12
95	560	-	20	540	-	-	0	0	0	-	0	3/12
00	720	-	40	660	20	-	0	0	3	-	0	3/8
05	760	40	-	760	-	20	0	0	0	-	0	3/10
<i>Pinus edulis</i>												
88	0	-	-	-	-	-	0	0	-	-	0	-/-
95	0	-	-	-	-	-	0	0	-	-	0	-/-
00	20	-	20	-	-	-	0	0	-	-	0	-/-
05	20	-	20	-	-	60	0	0	-	-	0	-/-