

Trend Study 2-19-06

Study site name: Right Fork Logan Canyon .

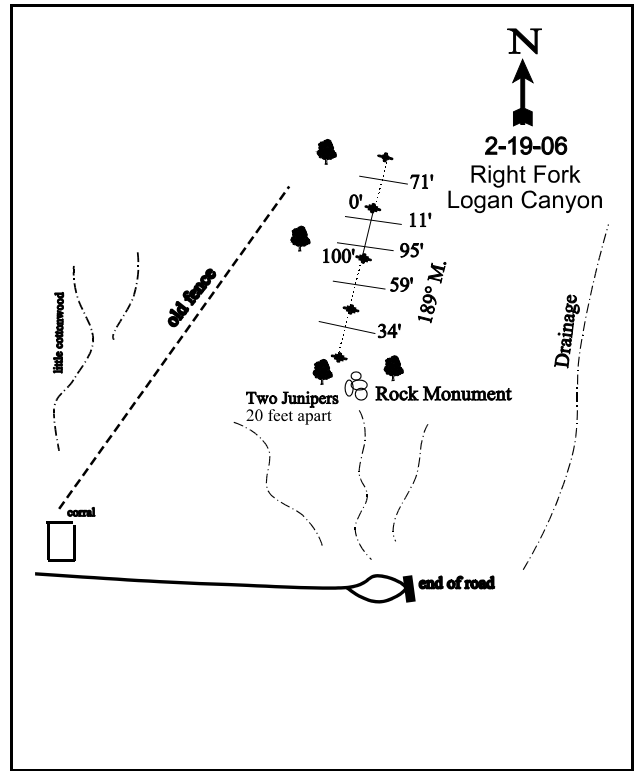
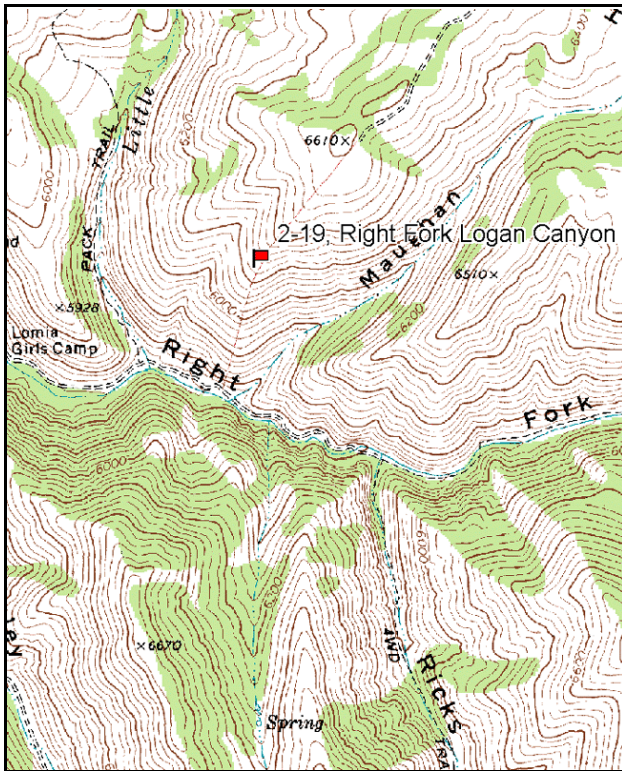
Vegetation type: Bitterbrush .

Compass bearing: frequency baseline 189 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (59ft), line 3 (34ft), line 4 (71ft). Rebar: belt 1 on 8 ft, belt 3 on 1 ft, belt 5 on 8 ft.

LOCATION DESCRIPTION

Drive up the Right Fork of Logan Canyon. Bear left at the girls camp. Go 0.6 miles to the end of the road just past the corral. Hike up the ridge to the north, going about 3/4 mile towards the ridgeline. Look for a rock monument between two junipers that are 20 feet apart. The hike from the bottom to the study is about 600 feet in elevation gain. The baseline runs 189 degrees magnetic. Lines 2 and 3 continue south from the 100 foot baseline. Line 4 runs off the 0-foot baseline stake at 9 degrees magnetic.



Map Name: Temple Peak

Diagrammatic Sketch

Township 12N, Range 3E, Seciton 16

UTM NAD 27, UTM 12T 4625144 N, 449598 E

DISCUSSION

Right Fork Logan Canyon - Trend study No. 2-19

Study Information

This study was established in 1990 and samples important elk and deer winter range that extends from Cowley to Willow Canyon (elevation: 6,200 feet, slope: 35-40%, aspect: south). The land is administered by the U.S. Forest Service. Judging by pellet group data this area serves as important elk winter range. Elk pellet groups were common in 1996 with a quadrat frequency of 47%, while deer sign was moderately abundant with a quadrat frequency of 22%. For part of the summer, cattle graze the Little Cottonwood drainage, but mainly stay off of the upper steep slopes. In 1996 and 2001, cows were seen near the top of the hill where the slope is more gentle. Pellet group transect data taken in 2001, estimated 17 deer, 83 elk, and 2 cow days use/acre (41 ddu/ha, 205 edu/ha, and 4 cdu/ha). Most of the elk use appeared to be from late winter. Pellet group data from 2006 was estimated at 6 deer, 158 elk, and 3 cow days use/acre (15ddu/ha, 390 edu/ha, and 7 cdu/ha).

Soil

The soil is moderately shallow and very rocky with a slightly alkaline soil reactivity (pH of 7.6). Texture is a clay loam. Effective rooting depth was estimated at about 8 inches with a layer of rock encountered at that depth. The presence of deeper rooted shrubs suggests that this layer of rock has cracks and long fissures, allowing deeper rooted plants to become established. Rock and pavement comprise about one-third of the ground cover. The ratio of protective cover (vegetation, litter, and cryptograms) to bare ground was fair at 3.6:1 in 2006, leaving 13-14% bare ground cover. There is evidence of some soil movement as most shrubs are pedestalled, but the erosion condition class was determined to be slight in 2001 and stable in 2006. Erosion is inevitable due to the steep slopes.

Browse

Browse forage is limited with all species combined producing less than 8% cover in 2001 and 2006. The key browse species is bitterbrush. Density steadily increased from 232 plants/acre in 1990 to 380 in 2001, but decreased in 2006 to 220 plants/acre. Cover was averaged at 2% in 1996 and 2001, but increased in 2006 to 4%. All of the bitterbrush sampled in 1990 displayed heavy use. Utilization was moderate to heavy in 1996 and 2001, then increased to heavy in 2006. Decadence was extremely high in 1990 at 72% of the population, but has declined to 19% in 1996, 11% in 2001, and 9% in 2006. Young recruitment has been minimal during all readings and seedlings have never been observed. Annual leader growth in 2001 averaged 3.0 inches and only 1.5 inches in 2006.

A few serviceberry and mountain big sagebrush offer additional preferred forage, but they occur in small numbers. Serviceberry has displayed moderate to heavy use since 1990, while mountain big sagebrush use has been light to moderate. Snowberry is abundant, but mostly unutilized. The differences in snowberry density from 1990 to 1996 was likely the result of the larger sample used in 1996. This is suspected because there were no dead plants found in the population resultant of a large decline. Several of the junipers scattered across the slope have been highlined.

Herbaceous Understory

The area supports a vigorous stand of bluebunch wheatgrass, but bulbous bluegrass is the most abundant species. It made up 69% of the grass cover and 41% of the total herbaceous cover in 2006 and has averaged 17% cover since 1996. Annual grasses such as cheatgrass and rattlesnake brome are also present, but not abundant. Forbs are diverse and moderately productive with on average about 10% cover of perennials since 1996. Perennial forbs are primarily early season species, yet are numerous enough to provide some spring forage. By far the most abundant perennial forb is gray lomatium, which made up 71% of the forb cover in 1996, 61% in 2001, and 84% in 2006. Arrowleaf balsam root, tapertip hawksbeard, and yellow salsify are also moderately abundant.

1996 TREND ASSESSMENT

Trend for the key browse is slightly up. The bitterbrush population received heavy use in 1990, but heavy use has declined from 100% to 44%, vigor has improved, and decadence has declined from 72% to 19%. The differences in density may be due in most part to the larger sample used in 1996. Mountain big sagebrush did not appear in the smaller sample, but was observed in the larger sample. Trend for grasses is stable. Bluebunch wheatgrass nested frequency increased significantly even though bulbous bluegrass is still dominant and increased significantly in nested frequency. Sandberg bluegrass decreased significantly, but a misidentification may have occurred between the two bluegrasses. Trend for forbs is slightly down. Tapertip hawksbeard nested frequency decreased significantly, while yellow salsify increased significantly. Overall, perennial forb sum of nested frequency decreased by 14%. The Desirable Components Index rated this study as very poor-poor due to low browse cover, but perennial grass cover was good. This area is used predominately by elk, which prefer more grasses than shrubs.

winter range condition (DC Index) - very poor-poor (35) Mid-level potential scale
browse - slightly up (+1) grasses - stable (0) forbs - slightly down (-1)

2001 TREND ASSESSMENT

Trend for browse is stable. The key species, antelope bitterbrush, displays a stable population density. It is moderate to heavily utilized yet has good vigor and low decadence (11%). There is no recruitment in the form of seedlings and young even though annual leader growth of mature bitterbrush averaged 3 inches in 2001. Secondary browse species, serviceberry and mountain big sagebrush, appear to have stable populations with moderate use, improved vigor, and declining decadence. Trend for grasses is stable. Sum of nested frequency of perennial grasses and forbs have remained similar to 1996. Bulbous bluegrass still dominates the herbaceous understory by providing 65% of the grass cover and 43% of the total herbaceous cover. It has remained stable in frequency since 1996. Cheatgrass nested frequency decreased significantly, but cover remained near 1%. Bluebunch wheatgrass, the second most abundant perennial grass, also remained stable. Trend for forbs is stable. Very little changed in the sum of nested frequency for perennial forbs. The Desirable Components Index rated this study as very poor-poor due to low browse cover, but perennial grass cover was good. This area is used predominately by elk, which prefer more grasses than shrubs.

winter range condition (DC Index) - very poor-poor (34) Mid-level potential scale
browse - stable (0) grasses - stable (0) forbs - stable (0)

2006 TREND ASSESSMENT

Trend for key browse, bitterbrush and mountain big sagebrush, is down. Density of both bitterbrush and sagebrush decreased. Bitterbrush decreased from 380 plants/acre in 2001 to 220 plants/acre in 2006. Young recruitment for both species is very minimal and is not replacing dying plants. Percent decadence in both species is within acceptable limits. Bitterbrush had heavy use in 2006 compared to moderate to heavy use during the previous two readings. Trend for grasses is stable. Bluebunch wheatgrass has remained similar to previous readings, while bulbous bluegrass nested frequency decreased. Trend for forbs is slightly down. Yellow salsify nested frequency decreased significantly, which is a palatable forb for deer and elk. The Desirable Components Index rated this study as very poor-poor due to low browse cover, but perennial grass cover was good. This area is used predominately by elk, which prefer more grasses than shrubs.

winter range condition (DC Index) - very poor-poor (32) Mid-level potential scale
browse - down (-2) grasses - stable (0) forbs - slightly down (-1)

HERBACEOUS TRENDS --
Management unit 02 , Study no: 19

Type	Species	Nested Frequency				Average Cover %		
		'90	'96	'01	'06	'96	'01	'06
G	<i>Agropyron spicatum</i>	a161	b229	b180	b173	10.63	6.05	6.98
G	<i>Bromus brizaeformis</i> (a)	-	a14	ab27	b36	.23	.53	.11
G	<i>Bromus tectorum</i> (a)	-	b148	a83	a90	1.09	.92	.58
G	<i>Poa bulbosa</i>	a208	c342	c340	b283	17.93	14.90	18.02
G	<i>Poa pratensis</i>	2	-	3	6	-	.15	.09
G	<i>Poa secunda</i>	b144	a10	a36	a27	.07	.26	.18
Total for Annual Grasses		0	162	110	126	1.33	1.45	0.69
Total for Perennial Grasses		515	581	559	489	28.64	21.38	25.28
Total for Grasses		515	743	669	615	29.97	22.83	25.97
F	<i>Agoseris glauca</i>	-	-	1	5	-	.00	.01
F	<i>Alyssum alyssoides</i> (a)	-	b179	c253	a35	.48	2.07	.08
F	<i>Allium</i> sp.	5	-	-	3	-	-	.00
F	<i>Aster chilensis</i>	-	3	-	4	.15	-	.01
F	<i>Astragalus utahensis</i>	8	2	3	6	.06	.06	.06
F	<i>Balsamorhiza sagittata</i>	a-	ab1	a-	b6	.71	.42	.39
F	<i>Chaenactis douglasii</i>	-	-	-	-	.00	-	-
F	<i>Cirsium undulatum</i>	-	1	1	2	.00	.00	.03
F	<i>Collomia linearis</i> (a)	-	3	-	-	.00	-	-
F	<i>Comandra pallida</i>	2	5	8	7	.07	.19	.09
F	<i>Collinsia parviflora</i> (a)	-	6	-	-	.03	-	-
F	<i>Crepis acuminata</i>	b89	a29	a45	a34	.62	.76	.68
F	<i>Cymopterus</i> sp.	234	205	209	203	7.01	7.31	8.52
F	<i>Descurainia pinnata</i> (a)	-	2	-	-	.00	-	-
F	<i>Epilobium brachycarpum</i> (a)	-	7	-	-	.01	-	-
F	<i>Erodium cicutarium</i> (a)	-	3	-	-	.00	-	-
F	<i>Hackelia patens</i>	2	-	2	-	-	.03	-
F	<i>Isatis tinctoria</i>	-	-	-	-	-	-	.00
F	<i>Lactuca serriola</i>	ab15	a4	b15	a4	.01	.13	.02
F	<i>Machaeranthera canescens</i>	-	2	3	-	.03	.03	-
F	<i>Microsteris gracilis</i> (a)	-	-	-	1	-	-	.00
F	<i>Penstemon humilis</i>	9	17	7	7	.12	.07	.09
F	<i>Phacelia</i> sp.	-	2	-	-	.03	-	-
F	<i>Phlox longifolia</i>	-	-	1	-	-	.00	-
F	<i>Sisymbrium altissimum</i> (a)	16	-	15	3	-	.14	.01
F	<i>Tragopogon dubius</i>	a7	b48	b41	a12	.42	.63	.08

Type	Species	Nested Frequency				Average Cover %		
		'90	'96	'01	'06	'96	'01	'06
F	Veronica biloba (a)	-	3	-	3	.00	-	.00
Total for Annual Forbs		16	203	268	42	0.55	2.22	0.10
Total for Perennial Forbs		371	319	336	293	9.26	9.68	10.01
Total for Forbs		387	522	604	335	9.81	11.90	10.11

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

BROWSE TRENDS --

Management unit 02 , Study no: 19

Type	Species	Strip Frequency			Average Cover %		
		'96	'01	'06	'96	'01	'06
B	Amelanchier alnifolia	3	2	2	.18	.03	-
B	Artemisia tridentata vaseyana	6	6	3	.03	.66	.18
B	Chrysothamnus viscidiflorus viscidiflorus	15	17	11	.48	1.38	.24
B	Mahonia repens	4	5	7	.21	.16	.09
B	Purshia tridentata	12	15	9	2.35	2.59	4.30
B	Sambucus cerulea	2	1	1	.38	.63	.63
B	Symphoricarpos oreophilus	8	6	6	2.04	2.04	1.95
Total for Browse		50	52	39	5.68	7.52	7.39

CANOPY COVER, LINE INTERCEPT --

Management unit 02 , Study no: 19

Species	Percent Cover
	'06
Amelanchier alnifolia	.36
Artemisia tridentata vaseyana	.81
Chrysothamnus viscidiflorus viscidiflorus	.06
Mahonia repens	.03
Purshia tridentata	7.51
Sambucus cerulea	.35
Symphoricarpos oreophilus	2.91

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 02 , Study no: 19

Species	Average leader growth (in)	
	'01	'06
Artemisia tridentata vaseyana	-	2.1
Purshia tridentata	3.0	1.5

BASIC COVER --

Management unit 02 , Study no: 19

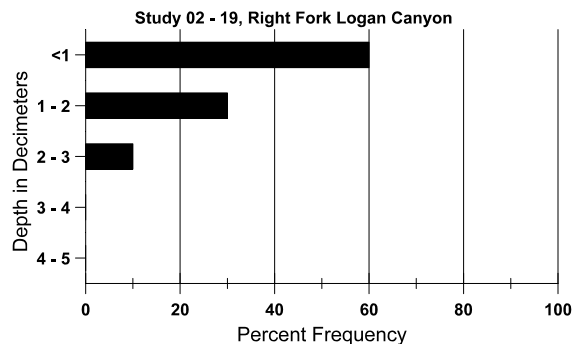
Cover Type	Average Cover %			
	'90	'96	'01	'06
Vegetation	10.00	42.68	46.01	42.00
Rock	31.50	23.11	21.66	19.88
Pavement	12.50	3.64	5.80	4.00
Litter	26.25	30.87	20.84	17.52
Cryptogams	1.00	1.75	3.45	3.77
Bare Ground	18.75	13.05	14.32	12.17

SOIL ANALYSIS DATA --

Herd Unit 02, Study no: 19, Right Fork Logan Canyon

Effective rooting depth (in)	Temp °F (depth)	PH	Clay loam			%OM	PPM P	PPM K	dS/m
			%sand	%silt	%clay				
8.4	63.4 (10.3)	7.6	27.6	34.4	38.0	4.2	13.8	115.2	0.7

Stoniness Index



PELLET GROUP DATA --

Management unit 02 , Study no: 19

Type	Quadrat Frequency		
	'96	'01	'06
Elk	47	53	55
Deer	22	22	18
Cattle	1	-	1

Days use per acre (ha)	
'01	'06
83 (205)	158 (390)
17 (41)	6 (15)
2 (4)	3 (7)

BROWSE CHARACTERISTICS --
Management unit 02 , Study no: 19

		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)
Amelanchier alnifolia												
90	66	33	66	-	-	-	50	50	0	-	0	-/-
96	60	-	-	40	20	-	67	33	33	-	100	25/28
01	40	-	-	40	-	-	100	0	0	-	0	29/33
06	60	-	20	40	-	-	0	67	0	-	0	30/33
Artemisia tridentata vaseyana												
90	0	-	-	-	-	-	0	0	0	-	0	-/-
96	160	-	40	100	20	120	25	0	13	-	13	28/45
01	140	-	-	140	-	40	29	14	0	-	0	27/34
06	60	-	-	60	-	40	0	0	0	-	0	26/43
Chrysothamnus viscidiflorus viscidiflorus												
90	599	-	66	533	-	-	28	22	0	-	0	13/15
96	340	-	40	300	-	-	0	0	0	-	0	15/26
01	400	-	40	320	40	-	5	0	10	-	0	15/26
06	220	-	-	220	-	-	0	0	0	-	0	13/22
Mahonia repens												
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	520	-	40	480	-	-	0	0	-	-	0	3/4
01	760	-	60	700	-	-	0	0	-	-	0	3/6
06	940	-	-	940	-	-	0	0	-	-	0	2/4
Purshia tridentata												
90	232	-	-	66	166	-	0	100	72	-	14	29/56
96	320	-	20	240	60	160	56	44	19	-	0	40/74
01	380	-	-	340	40	80	37	42	11	-	0	43/72
06	220	-	-	200	20	-	18	82	9	9	9	41/67
Sambucus cerulea												
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	40	-	-	40	-	-	0	0	-	-	0	29/44
01	40	-	-	40	-	-	0	0	-	-	0	37/77
06	20	-	-	20	-	-	100	0	-	-	0	47/69
Symphoricarpos oreophilus												
90	1533	-	233	1200	100	-	11	2	7	-	7	26/21
96	200	-	20	180	-	-	0	0	0	-	10	27/50
01	120	-	-	120	-	-	0	0	0	-	0	33/50
06	180	-	-	160	20	-	0	0	11	-	33	28/48

		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)
Tetradymia canescens												
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	0	-	-	-	-	-	0	0	-	-	0	-/-
01	0	-	-	-	-	-	0	0	-	-	0	-/-
06	0	-	-	-	-	-	0	0	-	-	0	13/27