

Trend Study 17-47-07

Study site name: Tie Fork East.

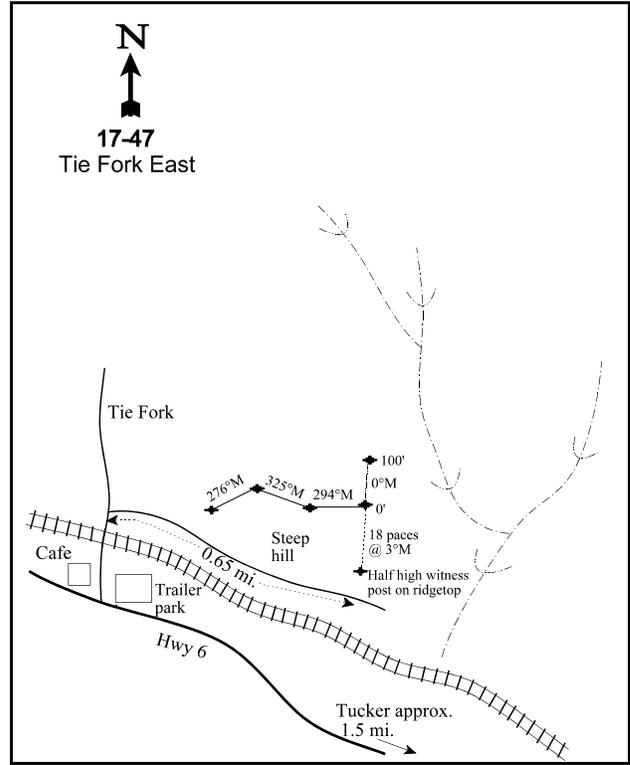
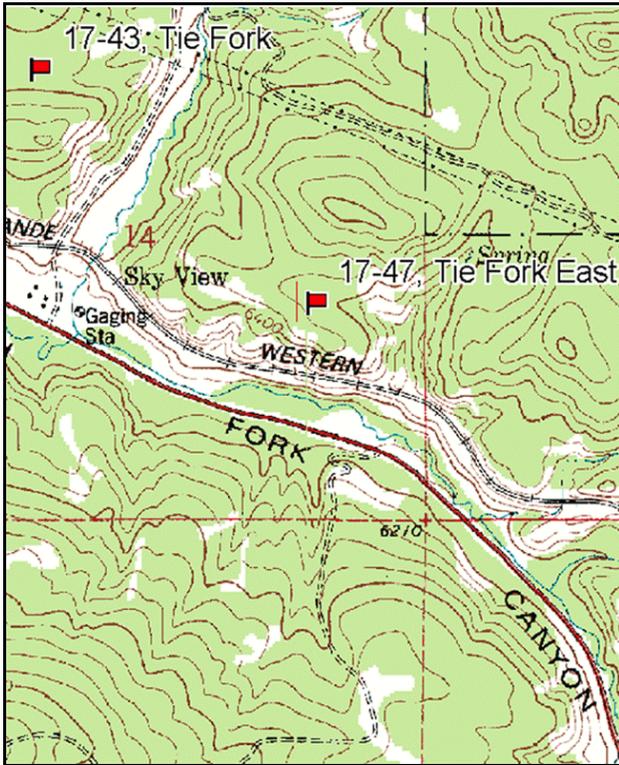
Vegetation type: Mountain Brush.

Compass bearing: frequency baseline 0 degrees magnetic (line 2 @ 294°M, line 3 @ 325°M, line 4 @ 286°M).

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

LOCATION DESCRIPTION

From the intersection of Highway U.S. 6 and Tie Fork at Sky View in Spanish Fork Canyon, go north up to the railroad tracks. Cross the tracks and turn right. Follow the road along the railroad tracks for 0.65 miles. Stop at a pullout at the mouth of a small side canyon with a huge pit on the north side of the road. Walk up the ridge to the west 200 yards to a witness post in a small rock outcrop on the bare ridgetop, by some mahogany. From the witness post, walk 18 paces north (3 degrees) to the 0-foot baseline stake.



Map Name: Tucker

Diagrammatic Sketch

Township 10S, Range 6E, Section 14

GPS: NAD 83, UTM 12S 482147 E 4422199 N

DISCUSSION

Tie Fork East - Trend Study No. 17-47

Study Information

This study is located on the north side of US-6, just to the east of the community of Sky View [elevation: 6,400 feet (1,951 m), slope: 15%-25%, aspect: north]. It was established in 1989 and takes the place of the Tie Fork study (17-43). This study is more xeric than Tie Fork, and supports a scattered Utah juniper (*Juniperus osteosperma*) community with a mountain brush understory. The nearest perennial sources of water are Tie Fork 0.4 miles (0.6 km) to the east and Spanish Fork 750 feet (230 m) to the south. However, Spanish Fork is on the opposite side of US-6. No livestock are currently grazed in the area but sheep are thought to trail through. Deer use is heavy and elk use is light-moderate. Quadrat frequency of deer pellet groups was 38% in 1997, 33% in 2002, and 47% in 2007. From the pellet group transect data, deer use was estimated at 76 days use/acre (187 ddu/ha) in 2002 and 66 days use/acre (164 ddu/ha) in 2007. Elk use was estimated at 8 days use/acre (20 edu/ha) in 2002 and 17 days use/acre (43 edu/ha) in 2007. All of the deer and elk pellet groups appear to be from winter use. Quadrat frequency of rabbit pellet groups was 23% in 1997, 21% in 2002, and increased to 37% in 2007.

Soil

The soil has a clay loam texture with a neutral soil reaction (pH of 7.3). Relative bare ground cover increased from 14% in 1997 to 24% by 2007. Relative litter cover has decreased from 47% in 1997 to 36% in 2007. There are areas of localized erosion with active gullies forming below the site. The soil erosion condition class was determined to be slight in 2002 and 2007 due to moderate amount of surface litter movement, pedestalling, flow paths, and rills.

Browse

The browse community is a combination of large Utah juniper and pinyon pine (*Pinus edulis*) in association with a shrub understory. Canopy cover of juniper was 4% in 2002 and 15% in 2007. Many of the juniper are largely unavailable to browsing due to height and previous high-lining. Although the average tree height was 4-8 feet (1.2-2.4 m) in 2007, there are numerous trees that are more than 25 feet (7.6 m) tall. From point-center quarter data, density was estimated at 106 trees/acre (262 trees/ha) in 1997, 174 trees/acre (430 trees/ha) in 2002, and 209 trees/acre (517 trees/ha) in 2007. The average diameter of juniper has decreased from 8.9 inches (22.6 cm) in 1997 to 6.3 inches (15.6 cm) in 2007. Pinyon trees are less common, comprising 2% canopy cover in 2002 and 2007. The density increased from 22 trees/acre (54 trees/ha) in 1997 to 30 trees/acre (74 trees/ha) in 2002 and 2007. The average diameter of pinyon decreased from 8.8 inches (22.4 cm) in 1997 to 4.8 inches (12.2 cm) in 2002, and increased to 6.4 inches (16.3 cm) in 2007.

Several preferred forage species occur in the understory including serviceberry (*Amelanchier alnifolia*), mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), true mountain mahogany (*Cercocarpus montanus*). Serviceberry canopy cover was less than 1% in 2002 and 2007. The estimated density has decreased from 433 plants/acre (1,072 plants/ha) in 1989 to 180 plants/acre (446 plants/ha) in 2007. Seedlings were only sampled in 2007. However, young plants have been abundant, comprising 54% of the population in 1989, 87% in 1997, and approximately 44% in 2002 and 2007. Decadent plants accounted for 23% of the population in 1989, 0% in 1997 and 2002, and 11% in 2007. Dead serviceberry plants were first sampled in 2002, having a density of 20 plants/acre (50 plants/ha). In 2007, the density of dead plants increased to 40 plants/acre (99 plants/ha). Vigor has been good, and browse use has ranged from light to light-moderate.

The canopy cover of sagebrush was less than 1% in 2002 and 2007. The density was 499 plants (1,235 plants/ha) in 1989, which decreased to 160 plants/acre (396 plants/ha) in 1997, and increased to 260 plants/acre (644 plants/ha) in 2002. By 2007, the density had decreased again to 160 plants/acre (396 plants/ha). Seedling plants were only sampled in 1989. Young plants comprised 33% of the population in

1989, 0% in 1997, 15% in 2002, and 38% in 2007. Decadence has been high, ranging from 38% of the population to 50%. Since 1997, the density of dead plants has been greater than the density of live plants. Plants with poor vigor have increased from 7% of the population in 1989 to 25% in 2007, and since 1997, all of the plants with poor vigor have been classified as dying. Browse use was light in 1989 and 2007, and light-moderate in 1997 and 2002.

The canopy cover of true mountain mahogany was 3% in 2002 and 2007. The estimated density of mahogany decreased from 633 plants/acre (1,567 plants/ha) in 1989 to 540 plants/acre (1,337 plants/ha) in 1997, and increased to 700 plants/acre (1,733 plants/ha) in 2002. In 2007, the density decreased to 580 plants/acre (1,436 plants/ha). Seedling mahogany were only sampled in 1989. Young plants comprised 32% of the population in 1989, decreased to 6% by 2002, and increased to 14% in 2007. Decadence decreased from 16% of the population in 1989 to 11% in 1997, and increased to 34% by 2007. Vigor has been good each sample year. The average annual leader growth of mahogany was 1.6 inches (4.1 cm) in 2002 and 1.5 inches (3.8 cm) in 2007. Browse use was moderate-heavy in 1989, 1997, and 2007, and was heavy in 2002.

Snowberry (*Symphoricarpos oreophilus*) is the most abundant shrub species and provided 18% canopy cover in 2002 and 20% in 2007. The estimated density increased from 4,732 plants/acre (11,713 plants/ha) in 1989 to 6,200 plants/acre (15,347 plants/ha) in 2002. In 2007, there were 3,320 plants/acre (8,218 plants/ha). Some of the decrease in 2007 may have been caused by the difficulty in differentiating the individual plants from within the large clumps of snowberry that were present. Snowberry use was light-moderate in 1989, and has been light in subsequent sample years. Gambel oak (*Quercus gambelii*) is also present and provided 2% canopy cover in 2002 and 3% in 2007. Browse use on oak was light-moderate in 1997 and 2002, and decreased to light in 2007. Other scattered browse species include white rubber rabbitbrush (*Chrysothamnus nauseosus* ssp. *albicaulis*), stickleaf rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*), antelope bitterbrush (*Purshia tridentata*), Woods' rose (*Rosa woodsii*), and gray horsebrush (*Tetradymia canescens*).

Herbaceous Understory

Total herbaceous cover is relatively low. Cover of perennial grasses was 8% in 1997, and 5% in 2002 and 2007. Between seven and eight perennial species have been sampled in each sample year. The dominant perennial species include bluebunch wheatgrass (*Agropyron spicatum*), sedge (*Carex* sp.), and Indian ricegrass (*Oryzopsis hymenoides*). Cheatgrass (*Bromus tectorum*) and Japanese brome (*Bromus japonicus*) have both been sampled. Cheatgrass cover was less than 1% in 1997 and 2002, and increased to 1% in 2007.

Perennial forb diversity is moderate, but most species are not abundant. Perennial forb cover has been approximately 5% since 1997, and between 14 and 20 perennial species have been sampled. The dominant perennial species include Wasatch penstemon (*Penstemon cyananthus*) and spotted stickseed (*Hackelia patens*). Two noxious weeds, musk thistle (*Carduus nutans*) and houndstongue (*Cynoglossum officinale*) are present. Both species have decreased in cover since the study was established and have been scarce since 2002.

1997 TREND ASSESSMENT

The browse trend is slightly down. The density of sagebrush decreased 68%. However, some of the changes in density are likely the result of the larger area sampled beginning in 1997. Thus, trend was determined from other parameters. For example, no seedling sagebrush were sampled, and young plants decreased from 33% of the population to 0%. Decadence changed little, increasing slightly from 47% to 50%. Dead plants were sampled at a density of 260 plants/acre (644 plants/ha), which was higher than the density of live plants. Browse use on sagebrush shifted from light to light-moderate. Despite the increase in browsing, the average sagebrush crown width increased 22 inches (56 cm). The density of serviceberry decreased 31%, but young plants increased from 54% of the population to 87%, and decadence decreased from 23% to 0%. The estimated density of mahogany decreased 15%. Additionally, no seedling mahogany were sampled, and young plants decreased from 32% of the population to 11%. Although mahogany decadence decreased from

16% of the population to 11%, the population consisted of considerably smaller shrubs. The average height and crown width measurements of mahogany decreased by 34 inches (86 cm) and 50 inches (127 cm), respectively. The grass trend is slightly up. The sum of nested frequency of perennial grasses increased 20%. The nested frequencies of bluebunch wheatgrass and Letterman needlegrass (*Stipa lettermani*) significantly increased, while that of Indian ricegrass significantly decreased. The forb trend is up. Excluding houndstongue, the sum of nested frequency of perennial forbs increased 84%, and the number of perennial species sampled increased from 14 to 20. There was a significant increase in the nested frequency of Wasatch penstemon, and a significant decrease in houndstongue. Musk thistle was sampled for the first time, though it is likely to have been present before 1997, and not recorded because it is an annual species. The Desirable Components Index (DCI) score was fair due to low browse cover, but high browse recruitment and low decadence, as well as moderate perennial grass and forb cover. The presence of two noxious weed species also lowered the score.

winter range condition (DCI) - fair (52) Mid-level potential scale
browse - slightly down (-1) grass - slightly up (+1) forb - up (+2)

2002 TREND ASSESSMENT

The browse trend is stable. The density of sagebrush increased 63%, but abundance continued to be low. Young plants were sampled again, comprising 15% of the population, and decadence decreased to 38%. The density of dead plants increased to 320 plants/acre (792 plants/ha). Dying sagebrush plants increased to 23% of the population. The serviceberry density decreased 7%, and young plants decreased to 43% of the population. No decadent plants were sampled and vigor continued to be good. Heavily browsed serviceberry plants increased from 7% of the population to 29%. The density of mahogany increased 30%. Young plants decreased to 6% of the population, and decadence increased to 23%. Heavily browsed mahogany plants increased to 74% of the population. The grass trend is slightly down. The sum of nested frequency of perennial grasses decreased 23%, including a significant decrease in the nested frequency of bluebunch wheatgrass. However, there was also a significant decrease in the nested frequency of cheatgrass, and quadrat frequency decreased from 38% to 5%. The forb trend is slightly down. Excluding houndstongue, the sum of nested frequency of perennial forbs decreased 29%. There were significant decreases in the nested frequencies of thistle (*Cirsium* sp.) and Wasatch penstemon. However, there was also a significant decrease in the nested frequency of houndstongue. Additionally, the quadrat frequency of houndstongue decreased from 19% to 1%, and cover decreased from 1% to 0%. Quadrat frequency of musk thistle increased from 7% to 11%. The DCI score declined to very poor because browse cover decreased below the threshold of 5%, and perennial grass cover also decreased.

winter range condition (DCI) - very poor (19) Mid-level potential scale
browse - stable (0) grass - slightly down (-1) forb - slightly down (-1)

2007 TREND ASSESSMENT

The browse trend is down. The density of sagebrush decreased 38%. Young plants increased to 38% of the population, but decadence increased to 50%. The density of dead plants decreased to 200 plants/acre (495 plants/ha), which was greater than the density of live plants. The proportion of dying sagebrush plants changed little, increasing to 25% of the population, and browse use shifted from light-moderate to light. Heavily browsed plants decreased from 23% of the population to 0%. The density of serviceberry decreased 36%. Young plants comprised 44% of the population, and decadence increased to 11%. All of the decadent plants had poor vigor, were classified as dying, and had been heavily browsed. The density of mahogany decreased 17%. Although young plants increased to 14% of the population, decadence increased to 34%. Mahogany vigor remained good, and browse use shifted from heavy to moderate-heavy. Heavily browsed plants decreased to 41% of the population. The grass trend is slightly down. The sum of nested frequency of perennial grasses changed little, increasing 2%. However, cheatgrass increased significantly in nested frequency, and the quadrat frequency increased from 5% to 33%. Japanese brome was also sampled for the

first time, but only in 1% of the quadrats. The forb trend is up. Excluding houndstongue, the sum of nested frequency of perennial forbs increased 16%. Additionally, both noxious weeds had a low abundance. There was a significant decrease in the nested frequency of musk thistle, and that of houndstongue remained constant. The DCI score remained very poor.

winter range condition (DCI) - very poor (21) Mid-level potential scale
browse - down (-2) grass - slightly down (-1) forb - up (+2)

HERBACEOUS TRENDS --
Management unit 17 , Study no: 47

T y p e	Species	Nested Frequency				Average Cover %		
		'89	'97	'02	'07	'97	'02	'07
G	Agropyron spicatum	a8	b42	a12	a25	2.20	.31	1.20
G	Bromus japonicus (a)	-	-	-	1	-	-	.00
G	Bromus tectorum (a)	-	b101	a11	b89	.48	.03	1.19
G	Carex sp.	a6	ab25	b34	b33	1.14	.78	1.07
G	Oryzopsis hymenoides	b121	a77	a77	a82	3.03	3.55	1.56
G	Poa fendleriana	-	-	4	-	-	.16	-
G	Poa pratensis	a24	a19	a10	a6	.13	.10	.41
G	Poa secunda	-	a6	-	a2	.30	-	.03
G	Sitanion hystrix	a7	a16	a11	a12	.13	.14	.57
G	Stipa columbiana	a10	a7	a8	a3	.41	.04	.15
G	Stipa lettermani	a1	b20	ab8	a4	.67	.21	.18
Total for Annual Grasses		0	101	11	90	0.48	0.03	1.19
Total for Perennial Grasses		177	212	164	167	8.05	5.30	5.17
Total for Grasses		177	313	175	257	8.53	5.33	6.37
F	Achillea millefolium	a5	a6	a4	a6	.18	.01	.18
F	Agoseris glauca	-	a1	a11	-	.00	.02	-
F	Alyssum alyssoides (a)	-	-	-	100	-	-	1.05
F	Antennaria rosea	a7	a7	-	-	.41	-	-
F	Astragalus convallarius	a3	a8	a10	a6	.02	.08	.07
F	Castilleja linariaefolia	a2	a-	a4	a-	.01	.03	.00
F	Carduus nutans (a)	-	ab13	b23	a5	.42	.30	.07
F	Chenopodium album (a)	-	1	-	-	.00	-	-
F	Chaenactis douglasii	a7	a4	-	a3	.03	-	.03
F	Cirsium sp.	ab4	b21	a2	ab15	.28	.03	.32
F	Collinsia parviflora (a)	-	a13	a8	b32	.03	.01	.18
F	Crepis acuminata	-	-	-	3	-	-	.00
F	Cryptantha sp.	a4	a1	a12	a5	.03	.22	.01
F	Cynoglossum officinale	c107	b50	a2	a2	.99	.00	.01

T y p e	Species	Nested Frequency				Average Cover %		
		'89	'97	'02	'07	'97	'02	'07
F	<i>Delphinium nuttallianum</i>	-	1	-	-	.00	-	-
F	<i>Descurainia pinnata</i> (a)	-	_b 29	_a 2	_c 63	.09	.00	.28
F	<i>Epilobium brachycarpum</i> (a)	-	_a 3	_a 4	-	.00	.03	-
F	<i>Erigeron</i> sp.	-	_a 2	-	_a 5	.01	-	.01
F	<i>Gayophytum ramosissimum</i> (a)	-	-	_a 1	_b 7	-	.03	.04
F	<i>Hackelia patens</i>	-	_a 16	_a 21	_a 29	.41	.44	1.08
F	<i>Lappula occidentalis</i> (a)	-	_a 1	-	_a 9	.00	-	.01
F	<i>Lactuca serriola</i>	-	-	2	-	-	.00	-
F	<i>Lithospermum ruderales</i>	-	-	2	-	-	.06	-
F	<i>Machaeranthera canescens</i>	_a 11	_a 27	_a 9	_a 10	.13	.03	.07
F	<i>Melilotus officinalis</i>	-	1	-	-	.00	-	-
F	<i>Penstemon cyananthus</i>	_a 58	_b 101	_a 69	_{ab} 78	1.96	2.35	3.26
F	<i>Penstemon humilis</i>	_a 16	-	_a 2	_a 6	-	.03	.15
F	<i>Phlox hoodii</i>	-	-	1	-	-	.00	-
F	<i>Phlox longifolia</i>	_a 3	_a 3	-	_a 4	.01	-	.03
F	<i>Ranunculus testiculatus</i> (a)	-	_a 3	_a 3	_a 5	.00	.00	.03
F	<i>Schoenocrambe linifolia</i>	-	_b 16	_{ab} 9	_a 5	.16	.04	.07
F	<i>Senecio multilobatus</i>	_a 3	_a 2	-	_a 3	.03	-	.01
F	<i>Streptanthus cordatus</i>	-	-	-	-	.00	-	-
F	<i>Taraxacum officinale</i>	-	_a 2	-	_a 10	.00	-	.04
F	<i>Tragopogon dubius</i>	-	_a 6	_a 3	_a 2	.04	.01	.01
F	Unknown forb-perennial	3	-	-	-	-	-	-
F	<i>Verbascum thapsus</i>	-	_a 7	_a 4	_a 1	.07	.18	.00
Total for Annual Forbs		0	63	41	221	0.56	0.39	1.67
Total for Perennial Forbs		233	282	167	193	4.82	3.57	5.41
Total for Forbs		233	345	208	414	5.39	3.97	7.09

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

BROWSE TRENDS --

Management unit 17 , Study no: 47

Type	Species	Strip Frequency			Average Cover %		
		'97	'02	'07	'97	'02	'07
B	Amelanchier alnifolia	13	9	7	.21	.09	.24
B	Artemisia tridentata vaseyana	8	8	7	.45	.36	.12
B	Cercocarpus montanus	22	26	21	2.58	2.12	1.87
B	Chrysothamnus nauseosus albicaulis	1	2	1	-	.00	-
B	Chrysothamnus viscidiflorus viscidiflorus	4	8	5	.06	.06	.00
B	Juniperus osteosperma	10	12	6	2.23	4.59	2.69
B	Mahonia repens	1	1	2	-	-	.00
B	Opuntia sp.	3	1	1	-	-	-
B	Pinus edulis	0	2	0	-	-	.63
B	Purshia tridentata	1	0	0	.01	-	-
B	Quercus gambelii	9	8	10	2.01	1.16	2.01
B	Ribes sp.	0	1	0	-	-	-
B	Rosa woodsii	11	12	4	.57	.22	.03
B	Symphoricarpos oreophilus	58	67	62	11.46	13.06	11.52
B	Tetradymia canescens	2	3	3	-	.15	-
Total for Browse		240	162	136	19.61	21.84	19.14

CANOPY COVER, LINE INTERCEPT --

Management unit 17 , Study no: 47

Species	Percent Cover	
	'02	'07
Amelanchier alnifolia	.08	-
Artemisia tridentata vaseyana	.26	.15
Cercocarpus montanus	2.63	3.38
Chrysothamnus viscidiflorus viscidiflorus	.41	.10
Juniperus osteosperma	4.43	14.50
Pinus edulis	1.61	2.00
Quercus gambelii	1.96	3.08
Rosa woodsii	.06	.10
Symphoricarpos oreophilus	18.33	19.61

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 17 , Study no: 47

Species	Average leader growth (in)	
	'02	'07
Cercocarpus montanus	1.6	1.5

POINT-QUARTER TREE DATA --

Management unit 17 , Study no: 47

Species	Trees per Acre		Average diameter (in)	
	'02	'07	'02	'07
Juniperus osteosperma	174	209	7.8	6.3
Pinus edulis	30	30	4.8	6.4

BASIC COVER --

Management unit 17 , Study no: 47

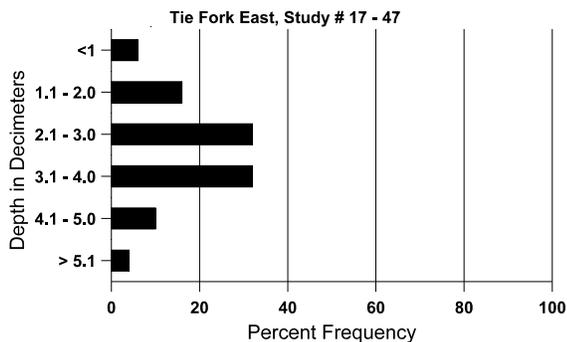
Cover Type	Average Cover %			
	'89	'97	'02	'07
Vegetation	7.25	31.06	31.76	33.81
Rock	2.25	4.31	4.36	5.40
Pavement	13.50	4.74	8.36	4.43
Litter	50.50	50.47	48.48	40.59
Cryptogams	0	.70	3.32	.84
Bare Ground	26.50	15.30	24.68	27.17

SOIL ANALYSIS DATA --

Herd Unit 17, Study no: 47, Tie Fork East

Effective rooting depth (in)	Temp °F (depth)	pH	Clay loam			%OM	ppm P	ppm K	dS/m
			%sand	%silt	%clay				
16.1	45.4 (15.4)	7.3	26.7	34.4	38.8	4.5	8.3	112.0	.5

Stoniness Index



PELLET GROUP DATA --

Management unit 17 , Study no: 47

Type	Quadrat Frequency		
	'97	'02	'07
Sheep	-	1	-
Rabbit	23	21	37
Elk	12	3	-
Deer	38	33	47

Days use per acre (ha)	
'02	'07
-	-
-	-
8 (20)	17 (43)
76 (187)	66 (164)

BROWSE CHARACTERISTICS --

Management unit 17 , Study no: 47

		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>Amelanchier alnifolia</i>												
89	433	-	233	100	100	-	23	8	23	8	8	27/20
97	300	-	260	40	-	-	7	7	0	-	0	26/29
02	280	-	120	160	-	20	7	29	0	-	0	22/18
07	180	40	80	80	20	40	0	11	11	11	11	24/35
<i>Artemisia tridentata vaseyana</i>												
89	499	66	166	100	233	-	7	7	47	7	7	20/10
97	160	-	-	80	80	260	38	13	50	13	13	27/32
02	260	-	40	120	100	320	31	23	38	23	23	23/31
07	160	-	60	20	80	200	13	0	50	25	25	29/33
<i>Cercocarpus montanus</i>												
89	633	33	200	333	100	-	5	63	16	-	5	67/79
97	540	-	60	420	60	20	37	44	11	-	0	33/29
02	700	-	40	500	160	20	9	74	23	6	11	31/26
07	580	-	80	300	200	-	38	41	34	7	10	32/28
<i>Chrysothamnus nauseosus albicaulis</i>												
89	199	-	33	66	100	-	17	33	50	-	0	35/22
97	20	-	-	-	20	-	0	0	100	-	0	24/23
02	40	-	20	-	20	-	0	0	50	-	0	24/23
07	20	-	-	20	-	-	0	0	0	-	0	20/15
<i>Chrysothamnus viscidiflorus viscidiflorus</i>												
89	1966	-	1033	700	233	-	0	0	12	-	0	18/24
97	100	-	-	100	-	-	0	0	0	-	0	12/12
02	280	-	20	260	-	-	29	0	0	-	0	11/16
07	140	-	-	140	-	-	0	0	0	-	0	11/14

		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)
Juniperus osteosperma												
89	99	33	66	33	-	-	0	33	0	-	0	197/122
97	220	-	120	100	-	-	0	0	0	-	0	3/5
02	280	40	80	160	40	-	0	0	14	7	29	-/-
07	120	60	40	80	-	-	0	0	0	-	17	-/-
Mahonia repens												
89	0	-	-	-	-	-	0	0	-	-	0	-/-
97	20	-	-	20	-	-	0	0	-	-	0	3/5
02	20	-	-	20	-	-	0	0	-	-	0	2/3
07	40	-	20	20	-	-	0	0	-	-	0	3/4
Opuntia sp.												
89	99	-	33	66	-	-	0	0	0	-	0	5/6
97	60	-	20	20	20	20	0	0	33	33	33	5/7
02	20	-	-	20	-	-	0	0	0	-	0	6/16
07	20	-	20	-	-	-	0	0	0	-	0	5/8
Pinus edulis												
89	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
02	40	-	40	-	-	-	0	0	-	-	0	-/-
07	0	-	-	-	-	-	0	0	-	-	0	-/-
Purshia tridentata												
89	0	-	-	-	-	-	0	0	-	-	0	-/-
97	20	-	-	20	-	-	100	0	-	-	0	12/24
02	0	-	-	-	-	20	0	0	-	-	0	13/33
07	0	-	-	-	-	-	0	0	-	-	0	8/18
Quercus gambelii												
89	0	33	-	-	-	-	0	0	0	-	0	-/-
97	820	40	280	520	20	60	24	0	2	-	0	49/29
02	1000	-	120	840	40	160	24	0	4	2	18	33/18
07	1280	-	520	680	80	80	6	0	6	-	0	33/16
Rhus trilobata												
89	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
02	0	-	-	-	-	-	0	0	-	-	0	-/-
07	0	-	-	-	-	-	0	0	-	-	0	30/71

		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)
Ribes sp.												
89	66	-	-	66	-	-	100	0	-	-	0	18/22
97	0	-	-	-	-	-	0	0	-	-	0	-/-
02	20	-	20	-	-	-	0	0	-	-	0	-/-
07	0	-	-	-	-	-	0	0	-	-	0	-/-
Rosa woodsii												
89	0	-	-	-	-	-	0	0	0	-	0	-/-
97	660	80	460	180	20	-	0	3	3	-	0	22/14
02	420	-	280	120	20	-	0	0	5	5	5	6/6
07	140	-	120	20	-	-	0	0	0	-	0	11/7
Symphoricarpos oreophilus												
89	4732	33	766	3866	100	-	22	5	2	-	0	20/26
97	5300	140	580	4720	-	80	15	4	0	-	0	43/62
02	6200	-	240	5640	320	40	5	9	5	2	2	18/35
07	3320	-	140	3100	80	60	4	0	2	.60	.60	18/45
Tetradymia canescens												
89	0	-	-	-	-	-	0	0	0	-	0	-/-
97	60	-	-	60	-	-	100	0	0	-	0	13/11
02	60	-	-	60	-	-	0	0	0	-	0	13/16
07	60	-	-	20	40	-	33	0	67	-	0	11/14