

Trend Study 16C-18-04

Study site name: East Mountain .

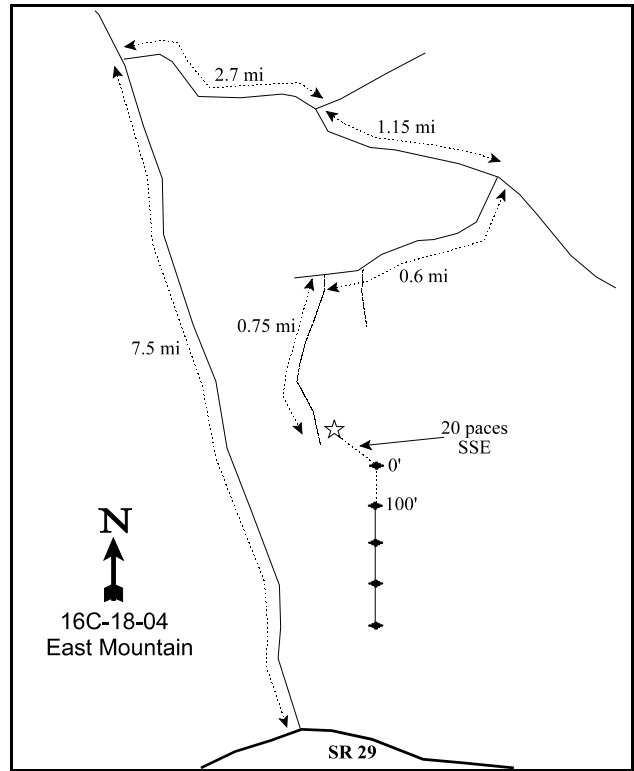
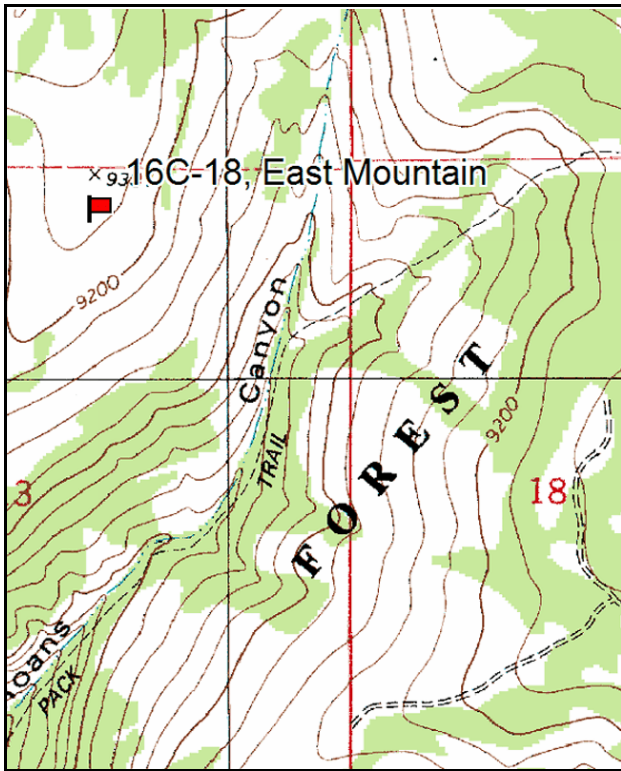
Vegetation type: Mountain Big Sagebrush .

Compass bearing: frequency baseline 180 degrees magnetic.

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

LOCATION DESCRIPTION

From Orangeville, go up Straight Canyon to a major fork at Cottonwood Creek. Bear right up Cottonwood Creek approximately 7.5 miles to Mill Canyon. Turn right and go up Mill Canyon 2.7 miles to a fork at the top of East Mountain. Bear right on the main road 0.6 miles to a fork to Pine Springs - Snow Lake. Continue on the main road 0.55 miles. Turn right here down off the main road. Go 0.15 miles to a spring. Continue 0.15 miles to the creek at the bottom of the dugway. Go 0.3 miles to a fork past the first patch of aspen clones to the second patch (2nd faint road), bear left on the 2nd faint road. Wind down through the trees and out onto the sage/grass ridge for 0.75 miles. There is a witness post on the left side of the road. From the witness post, walk 20 paces SSE to a 18" fencepost marked by a red browse tag, #7162. This is the 0-foot baseline stake.



Map Name: Mahogany Point

Diagrammatic Sketch

Township 17S, Range 6E, Section 13

GPS: NAD 27, UTM 12S 4355373 N, 483675 E

DISCUSSION

East Mountain - Trend Study No. 16C-18

The East Mountain trend study is located on a low point on the west side of the plateau above Roans Canyon and Cottonwood Creek. It is on Forest Service land, on the East Mountain allotment which is grazed by 341 cattle from June 21 to September 10. Much of the area was sprayed to kill sagebrush in the late 1960's. The site is located on a slope where the majority of the mountain big sagebrush was not affected. The lower end of the study baseline was affected more by the treatment and showed a lower density of mountain big sagebrush than the beginning of the transect line. The study site is on a south-southwest slope of 6-8%. The elevation is 9,200 feet. Elk winter on the points and windswept south-facing slopes. Deer sign was only occasionally observed. Pellet group data from 1999 estimated 17 deer and 55 elk days use/acre (42 ddu/ha and 136 edu/ha). Pellet group data from 2004 was very similar with 56 elk and 21 deer days use/acre estimated (137 edu/ha and 53 ddu/ha).

The loose surface soil has a clay loam texture and neutral pH (7.3). It is relatively deep with an effective rooting depth of just over 17 inches. There are few rocks in the profile, except near the rocky, shallow ridge top. Phosphorus is limited with a value of only 3.8 ppm. Values less than 10 ppm can limit normal plant growth and development. Scattered small gullies which begin on the upper portions of the slope converge and deepen on the steeper side hills. Bare spots on the study site show obvious soil movement with soil pedestalled around shrubs and bunch grasses. The erosion condition class determined erosion as slight in 2004.

The dominant browse species is mountain big sagebrush which provide about three-fourths of the browse cover on the site. The population has slowly increased in density from 3,060 plants/acre in 1994 to 3,700 by 2004. The rather small statured plants show good vigor with moderate use. The number of decadent plants has steadily increased from 22% in 1988, to 30% in 1999, and 43% by 2004. Recruitment for young plants is marginal and the proportion of the population that are dead has increased from 8% in 1994 to 15% by 2004. Some additional forage is available from species like low rabbitbrush, snowberry, and gray horsebrush, which show light to moderate hedging.

The herbaceous understory is abundant and diverse. Large bunches of Salina wildrye dominant the grass component. It provided 84% of the grass cover in 1994, 51% in 1999, and 44% in 2004. Associated grass species are mutton and Sandberg bluegrass, slender wheatgrass, and Carex. Twenty-three forb species were identified in 1994, 26 in 1999, and 24 in 2004. Desert phlox, looseflower milkvetch, silvery lupine, narrowleaf Indian paintbrush, and a penstemon are the most common species. Some of these forbs showed light use in 1999, while paintbrush was moderately to heavily utilized in 2004.

1994 TREND ASSESSMENT

Ground cover characteristics changed only slightly since 1988. Bare ground is nearly the same with only a slight increase. Litter has decreased, while rock and pavement have increased. There appears to be ample litter and vegetative cover, with the soil trend appearing stable. Mountain big sagebrush is the key browse. It exhibits a stable mature population. The small stature of the mountain big sagebrush may indicate that the site is marginal for this plant. There is a decrease in the number of seedling and young plants compared to 1988, but this is likely due to a lack of precipitation. The number of decadent plants has stayed relatively stable with more of the plants being moderately hedged. Trend for browse is stable. Herbaceous understory shows a decrease in sum of nested frequency for both grasses and forbs. Many of the grasses and forbs have significantly decreased in sum of nested frequency since 1988, which would indicate a slightly downward trend. The Desirable Components Index rated (see methods) this site as fair with a score of 59 due to high decadence, few young shrubs, and fair perennial grass and forb cover.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - down slightly (2)

winter range condition (DC Index) - 59 (fair) Mountain big sagebrush type

1999 TREND ASSESSMENT

Trend for soil continues to be stable. Percent cover of litter declined slightly since 1994, but cover bare ground also declined. Vegetation cover increased and herbaceous plants have a stable sum of nested frequency value. Trend for the key browse species, mountain big sagebrush, is stable. Population density has remained similar, although use is heavier and percent decadence has increased from 23% to 30%. Recruitment is marginal but there is just enough young plants to replace decadent & dying plants. The proportion of dead plants in the population has increased from 8% to 18% since 1994. Trend for the herbaceous understory is stable. Sum of nested frequency of perennial grasses has gone down slightly, while frequency of perennial forbs increased slightly. Nested frequency of Salina wildrye declined significantly since 1994, but frequency of the more preferred western wheatgrass increased significantly. Cover of perennial grasses increased from 9% to 10%, with forb cover more than doubling (7% to 17%) since 1994. Currently forbs provide 62% of the herbaceous cover. The Desirable Components Index rated this site as fair with a score of 64 due to increasing high decadence, but young shrubs increased along with shrub cover.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

winter range condition (DC Index) - 64 (fair) Mountain big sagebrush type

2004 TREND ASSESSMENT

Trend for soil is considered stable as the slight increase in bare ground does not warrant a downward change in trend. There were also some very minor changes in vegetation and litter cover. There are signs of ongoing erosion in the form of soil pedestalling, rills, and soil movement down slope but erosion is not severe and the erosion condition class was determined to be slight. Trend for the key browse species, mountain big sagebrush, is stable. Density increased slightly since 1999 but the number of shrubs displaying poor vigor rose slightly and the number of decadent plants increased to 43%. Young recruitment is good and adequate to replace most of the decadent sagebrush classified as dying. Utilization continues to be moderate to heavy but annual leader growth was fair, averaging about 2 inches. Seed production was also fair in 2004. Gray horsebrush and snowberry also provide some additional forage on the site. Many of these shrubs showed heavy use in 2004. Trend for the herbaceous understory is down slightly. Sum of nested frequency of perennial grasses rose slightly but frequency of perennial forbs declined by 30% and average cover dropped nearly two-fold. Preferred forbs, looseflower milkvetch, silvery lupine, Indian paintbrush, and dusty penstemon, declined more than three-fold in average cover since 1999. Drought conditions for the past 3 years, especially during the spring periods (April to June) of 2002 and 2003, are the likely cause of this downward trend in perennial forbs. A return to normal precipitation patterns should reverse this trend. The Desirable Components Index rated this site as fair with a score of 63 due to increasing high decadence, while young shrubs and shrub cover remained at previous levels.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - down slightly (2)

winter range condition (DC Index) - 63 (fair) Mountain big sagebrush type

HERBACEOUS TRENDS --

Management unit 16C, Study no: 18

Type	Species	Nested Frequency				Average Cover %		
		'88	'94	'99	'04	'94	'99	'04
G	Agropyron smithii	c69	a13	bc44	ab34	.02	.55	.61
G	Agropyron spicatum	-	-	-	5	-	-	.06
G	Bromus anomalus	ab12	a-	ab7	b12	-	.09	.24
G	Bromus japonicus (a)	-	-	-	-	-	.00	-
G	Carex spp.	24	18	37	22	.38	1.39	1.61
G	Elymus salina	a115	b167	a115	a125	7.71	5.26	5.10
G	Oryzopsis hymenoides	-	-	2	-	-	.00	-
G	Poa fendleriana	68	80	63	97	.89	2.28	2.46
G	Poa pratensis	-	-	-	7	-	-	.53
G	Poa secunda	b92	a24	a13	a4	.06	.02	.03
G	Sitanion hystrix	-	-	-	1	-	-	.00
G	Stipa lettermani	15	7	14	17	.07	.69	.96
Total for Annual Grasses		0	0	0	0	0	0.00	0
Total for Perennial Grasses		395	309	295	324	9.14	10.31	11.63
Total for Grasses		395	309	295	324	9.14	10.31	11.63
F	Antennaria rosea	-	-	-	4	-	-	.01
F	Androsace septentrionalis (a)	-	9	14	3	.30	.05	.03
F	Arabis spp.	b7	a-	ab3	a-	-	.01	-
F	Astragalus convallarius	-	3	5	4	.00	.01	.03
F	Astragalus megacarpus	b9	a1	ab4	a-	.00	.03	.03
F	Astragalus tenellus	a26	a13	b48	a26	.72	3.22	1.52
F	Aster spp.	-	-	2	-	-	.00	-
F	Caulanthus crassicaulis	5	-	-	-	-	-	-
F	Castilleja linariaefolia	a88	ab59	b79	a27	.45	3.53	.76
F	Chaenactis douglasii	b17	ab4	ab13	a3	.01	.08	.00
F	Comandra pallida	ab3	a2	b14	ab9	.01	.12	.12
F	Crepis acuminata	1	-	-	-	-	-	-
F	Eriogonum alatum	a-	b11	b10	b7	.08	.24	.13
F	Eriogonum spp.	-	-	1	-	-	.00	-
F	Erigeron pumilus	12	6	3	5	.01	.00	.06

Type	Species	Nested Frequency				Average Cover %		
		'88	'94	'99	'04	'94	'99	'04
F	<i>Eriogonum racemosum</i>	-	-	2	-	-	.03	-
F	<i>Eriogonum umbellatum</i>	14	17	16	20	.07	.40	.35
F	<i>Hymenopappus filifolius</i>	-	-	-	7	-	-	.33
F	<i>Hymenoxys richardsonii</i>	_a 39	_b 94	_a 36	_a 44	1.32	.61	.76
F	<i>Ipomopsis aggregata</i>	_b 9	_a -	_{ab} 1	_{ab} 2	-	.00	.00
F	<i>Lesquerella alpina</i>	_a 11	_{ab} 20	_b 35	_a 13	.10	.22	.03
F	<i>Linum lewisii</i>	5	10	12	6	.02	.08	.22
F	<i>Lupinus sericeus</i>	_c 71	_{ab} 32	_b 42	_a 5	1.83	3.08	.42
F	<i>Machaeranthera canescens</i>	-	5	5	-	.01	.06	-
F	<i>Machaeranthera grindelioides</i>	11	4	3	3	.04	.03	.18
F	<i>Penstemon comarrhenus</i>	_{ab} 23	_a 10	_b 38	_b 39	.06	1.39	.60
F	<i>Penstemon watsonii</i>	_b 13	_b 14	_a -	_b 7	.16	-	.31
F	<i>Phlox austromontana</i>	_b 160	_a 108	_a 108	_a 87	2.11	3.28	3.23
F	<i>Phlox longifolia</i>	_c 42	_b 10	_a -	_b 18	.02	-	.06
F	<i>Senecio multilobatus</i>	11	1	8	5	.00	.02	.02
F	<i>Taraxacum officinale</i>	8	2	7	2	.00	.07	.01
F	<i>Tragopogon dubius</i>	1	2	-	-	.00	-	-
Total for Annual Forbs		0	9	14	3	0.30	0.05	0.03
Total for Perennial Forbs		586	428	495	343	7.10	16.60	9.24
Total for Forbs		586	437	509	346	7.41	16.65	9.27

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

BROWSE TRENDS --

Management unit 16C, Study no: 18

Type	Species	Strip Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
B	<i>Artemisia frigida</i>	19	16	15	.08	.43	.55
B	<i>Artemisia tridentata vaseyana</i>	68	71	76	13.11	15.06	13.92
B	<i>Chrysothamnus viscidiflorus</i>	53	38	49	.65	.34	1.47
B	<i>Gutierrezia sarothrae</i>	28	23	31	.37	.43	.39
B	<i>Rosa woodsii</i>	0	1	1	-	-	-
B	<i>Symphoricarpos oreophilus</i>	21	22	30	1.24	.52	.60
B	<i>Tetradymia canescens</i>	25	30	34	1.64	1.42	1.44
Total for Browse		214	201	236	17.10	18.23	18.37

CANOPY COVER, LINE INTERCEPT --
Management unit 16C, Study no: 18

Species	Percent Cover
	'04
Artemisia frigida	.28
Artemisia tridentata vaseyana	13.19
Chrysothamnus viscidiflorus	1.53
Gutierrezia sarothrae	.55
Symphoricarpos oreophilus	1.01
Tetradymia canescens	1.63

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 16C, Study no: 18

Species	Average leader growth (in)
	'04
Artemisia tridentata vaseyana	2.1

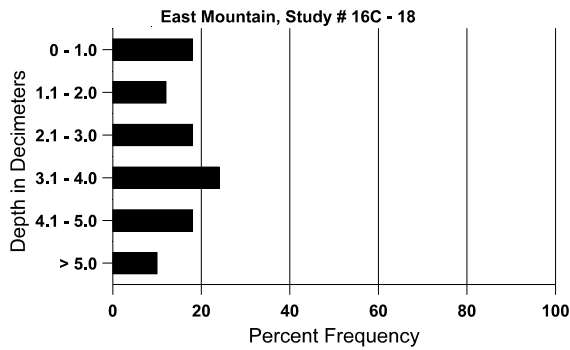
BASIC COVER --
Management unit 16C, Study no: 18

Cover Type	Average Cover %			
	'88	'94	'99	'04
Vegetation	10.75	31.36	37.50	34.54
Rock	2.50	5.98	8.07	6.71
Pavement	0	1.34	1.92	1.00
Litter	45.25	34.56	29.52	28.28
Cryptogams	0	.43	.09	.03
Bare Ground	41.50	43.59	35.87	44.90

SOIL ANALYSIS DATA --
Management unit 16C, Study no: 18, Study Name: East Mountain

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
17.4	51.3 (10.5)	7.3	40.0	27.4	32.6	2.8	3.8	99.2	0.6

Stoniness Index



PELLET GROUP DATA --

Management unit 16C, Study no: 18

Type	Quadrat Frequency		
	'94	'99	'04
Rabbit	20	10	8
Elk	36	24	45
Deer	2	4	4
Cattle	-	-	1

Days use per acre (ha)	
'99	'04
-	-
55 (136)	56 (137)
17 (42)	21 (53)
-	-

BROWSE CHARACTERISTICS --

Management unit 16C, Study no: 18

		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)
Artemisia frigida												
88	266	-	-	200	66	-	25	25	25	-	25	4/2
94	560	-	60	500	-	-	0	0	0	-	0	5/4
99	660	40	140	520	-	-	0	0	0	-	0	5/7
04	520	-	20	500	-	-	12	4	0	-	0	6/7
Artemisia tridentata vaseyana												
88	4265	133	1266	2066	933	-	38	5	22	-	2	13/31
94	3060	40	160	2200	700	260	41	1	23	7	7	15/32
99	3140	140	220	1980	940	680	61	10	30	6	10	16/33
04	3700	160	420	1680	1600	640	42	15	43	14	14	14/31
Chrysothamnus nauseosus												
88	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	0	-	-	-	-	-	0	0	-	-	0	-/-
04	0	-	-	-	-	-	0	0	-	-	0	16/28

		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)
Chrysothamnus viscidiflorus												
88	2466	333	933	1000	533	-	22	14	22	-	0	5/5
94	2420	-	60	2360	-	-	0	0	0	-	0	7/9
99	1460	20	280	1100	80	-	0	1	5	1	1	7/11
04	2060	20	60	1720	280	-	8	2	14	3	4	7/11
Gutierrezia sarothrae												
88	0	-	-	-	-	-	0	0	0	-	0	-/-
94	1480	-	40	1320	120	-	0	0	8	-	0	6/6
99	1240	-	120	1120	-	-	0	0	0	-	0	7/8
04	1240	-	20	1220	-	-	0	0	0	-	0	7/9
Rosa woodsii												
88	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	10/18
99	60	-	-	60	-	-	0	0	-	-	0	9/12
04	80	-	80	-	-	-	0	0	-	-	0	5/4
Symphoricarpos oreophilus												
88	866	200	600	200	66	-	23	0	8	-	0	13/21
94	1240	60	520	700	20	-	15	0	2	-	0	10/20
99	1060	120	300	620	140	-	34	0	13	-	0	11/26
04	1520	-	200	1060	260	-	18	13	17	1	1	9/16
Tetradymia canescens												
88	0	66	-	-	-	-	0	0	0	-	0	-/-
94	1440	-	60	1320	60	-	0	0	4	1	1	7/11
99	1120	100	180	900	40	20	18	0	4	4	4	8/11
04	1680	-	140	1400	140	20	37	13	8	2	2	7/10