

Trend Study 30-45-08

Study site name: Flat Top Mountain.

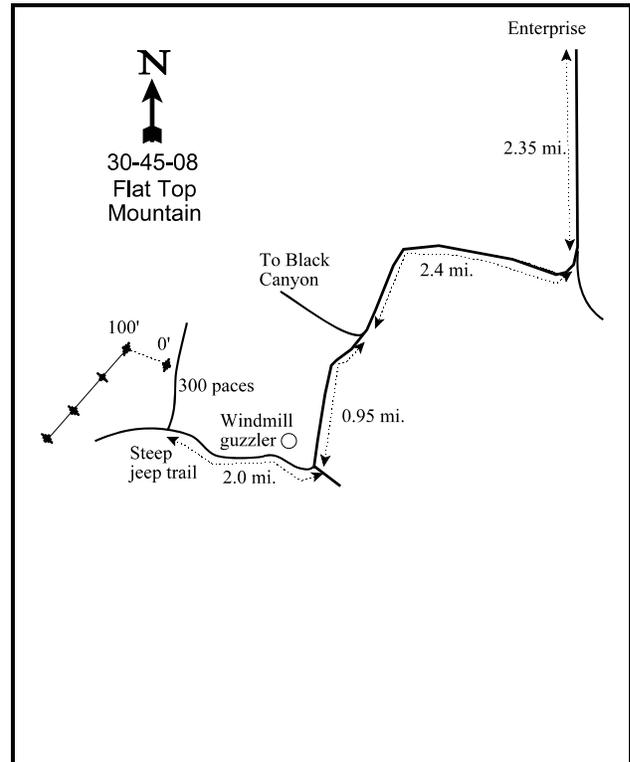
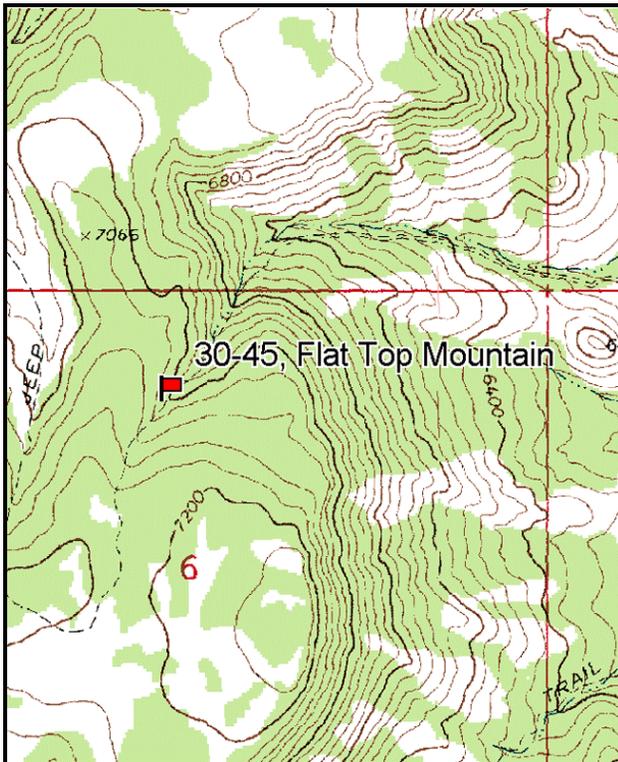
Vegetation type: Oakbrush.

Compass bearing: frequency baseline 285 degrees magnetic. (Lines 2-4, 220°M)

Frequency belt placement: line 1 (1 & 92ft), line 2 (59ft), line 3 (34ft), line 4 (71ft). Rebar: belt 1 on 8ft.

LOCATION DESCRIPTION

From the town of Enterprise, go south on 200 East for 2.45 miles, at which point there will be a fork in the road. Take a right and head towards Calf Springs. Stay on the main road for 2.3 miles until arriving at another fork in the road marked by a sign “Black Canyon.” Do not proceed towards Black Canyon. Take the left fork for 0.95 miles until arriving at another fork in the road. Take the right fork (F.S. Road 351) for 2.0 miles until the road turns into a steep jeep trail. Approximately 0.15 miles up the road from where it first becomes steep and rough will be an intersection (you can drive all the way to the intersection). Walk 14 paces at 230 degrees from the intersection. The 0-foot baseline stake is located 11 paces north of the road. The study is marked by green steel “T” fence posts approximately 12 to 18 inches in height.



Map Name: Hebron

Diagrammatic Sketch

Township 38S, Range 17W, Section 6

GPS: NAD 83, UTM 12S 252466 E, 4155606 N

DISCUSSION

Flat Top Mountain - Trend Study No. 30-45

Study Information

This study is within deer summer range on the east side of Flat Top Mountain [elevation: 7,000 (2,134 m), slope: 5%-25%, aspect: east]. The vegetation type is mountain brush intermixed with dense Gambel oak (*Quercus gambelii*) clones which vary in stature from 12 to 15 feet in some areas and waist high in others. There was a fire on the site between the 2003 and 2008 readings, likely the Hawkins Fire in 2004. Deer appeared to be utilizing the area in 1982 as pellet groups and bedding areas were abundant. Pellet group data estimated a moderate amount of deer use in 1998, 2003, and 2008 (40 deer days use/acre:99 ddu/ha, 68 ddu/acre:167 ddu/ha, and 50 ddu/acre:122 ddu/ha, respectively). The site was also being utilized by a small number of Mormon crickets in 2003.

Soil

Soil is derived from basalt parent material. Basalt rocks are common on the soil surface, especially on the ridge top. Soil depth is deep with an estimated effective rooting depth of 16 inches. Texture is a loam which is moderately acidic (pH 5.6). Soil organic matter is relatively high at 5.2%. Relative combined vegetation and litter cover has been high at 78% in 1998 and 74% in 2003, and after the fire decreased slightly to 60% in 2008. Relative bare ground cover was low at 4%-7% in 1998 and 2003, but increased to 18% in 2008. The erosion condition class was rated as stable in 2003 and slight in 2008 due primarily to surface litter movement and to flow patterns.

Browse

Being summer range, shrubs are not as important a forage source as grasses and forbs are. However, the most abundant browse species on the site is Gambel oak. It provided 65% of the browse cover in 1998, 84% in 2003, and 63% in 2008. Prior to the fire, oak varied in size from tall tree-like forms that are 12 to 15 feet in height, to lower growing forms that were only waist high. In 2008, oak density increased with a higher proportion of young and decadent plants. Prior to the fire, oak had shown mostly light to moderate use, displayed good vigor with few decadent plants. In 2008, the proportion of oak plants displaying poor vigor increased to 83% and decadent plants increased to 49%.

Understory shrubs include Utah serviceberry (*Amelanchier utahensis*), mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), and snowberry (*Symphoricarpos oreophilus*). Prior to the fire, mature serviceberry averaged about 5 feet in height in 2003. They were mostly heavily hedged where available, but they were in good vigor. Mountain big sagebrush occurred in limited numbers. They were classified as heavily hedged in 1998, but showed light to moderate use in 2003. Snowberry appeared to be unutilized. There were also a few antelope bitterbrush (*Purshia tridentata*) on the site that were not abundant enough to be adequately sampled. In 2008, mountain big sagebrush declined in density to just 80 plants/acre and the proportion of plants displaying poor vigor increased to 75%. The density of serviceberry remained similar to 2003 levels, but there was heavy utilization on 100% of the plants and plants displaying poor vigor increased to 33%. There was little change in snowberry measurements.

Herbaceous Understory

The herbaceous understory is dominated by forbs which provided 83% of the total herbaceous cover in 1998, and 74% in 2003 and 2008. Perennial grasses were represented by only one species, mutton bluegrass (*Poa fendleriana*) in 1998. Composition improved and mountain brome (*Bromus carinatus*), bottlebrush squirreltail (*Sitanion hystrix*), and subalpine needlegrass (*Stipa columbiana*) were encountered in 2008. The annual grass, cheatgrass (*Bromus tectorum*), was also encountered for the first time in 2008. Forbs are diverse and abundant with the primary species consisting of arrowleaf balsamroot (*Balsamorhiza sagittata*), western waterleaf (*Hydrophyllum occidentale*), tuber starwort (*Stellaria jamesiana*), an aster sp., and American vetch (*Vicia americana*).

1998 TREND ASSESSMENT

Trend for browse is stable. Differences in density of browse species may be related to the larger sample area used in 1998; therefore, trend for browse was determined using other parameters. Reproduction of the primary browse species, Utah serviceberry and mountain big sagebrush, appears adequate to maintain their populations. Data for herbaceous species from 1982 is limited to quadrat frequency. Trend for both grasses and forbs is up slightly. Quadrat frequency of mutton bluegrass increased from 2% in 1982 to 41%. Quadrat frequency of perennial forbs also increased.

browse - stable (0)

grass - slightly up (+1)

forb - slightly up (+1)

2003 TREND ASSESSMENT

Trend for browse is considered slightly down. Mountain big sagebrush density declined 31% from 1998 to 540 plants/acre and the number of decadent plants increased to 30% of the population. No sagebrush seedlings or young were sampled. Utah serviceberry density declined by 95% from 1998 to 40 plants/acre. Serviceberry vigor and decadence remained good. Gambel oak has nearly doubled in cover. The increase in oak could have a negative effect on understory shrubs. The most important aspect of this site is the herbaceous understory since this site is used primarily as summer range. Trend for grasses is stable. There was little change in the sum of nested frequency of perennial grasses from 1998, and cover of grasses remained similar. Trend for forbs is down. There was 41% decline in the sum of nested frequency for perennial species from 1998, and cover of perennial forbs declined from 28% in 1998 to 18%. The primary species, an aster spp., arrowleaf balsamroot, western waterleaf, tuber sandwort, and American vetch all declined significantly in nested frequency. Drought conditions for the past few years are the likely reason for these trends. An unknown amount of Mormon cricket use has also helped determine changes in trend.

browse - slightly down (-1)

grass - stable (0)

forb - down (-2)

2008 TREND ASSESSMENT

There was a fire on the site between the 2003 and 2008 reading. No data was available for the fire. Trend for browse is down. Mountain big sagebrush density declined 85% from 2003 to 80 plants/acre, and the proportion of plants displaying poor vigor increased to 75%. Serviceberry density remained similar to 2003 levels, but plants displaying poor vigor increased to 33%. Gambel oak density increased by 59% from 2003 to 25,240 stems/acre. Oak plants displaying poor vigor increased to 83% and decadence increased to 49% since 2003. Trend for grasses stable. There was little change in the sum of nested frequency of perennial grasses, though the nested frequency of mountain brome increased significantly. The invasive annual, cheatgrass, was

sampled for the first time in 2008. Trend for forbs is slightly up. Sum of nested frequency of perennial forbs has increased 18% since 2003, and cover of perennial forbs increased from 18% in 2003 to 21%.

browse - down (-2)

grass - stable (0)

forb - slightly up (+2)

HERBACEOUS TRENDS --

Management unit 30 , Study no: 45

Type	Species	Strip Frequency			Average Cover %		
		'98	'03	'08	'98	'03	'08
G	Bromus carinatus	a-	ab8	b19	-	.24	.77
G	Bromus tectorum (a)	a-	a-	b36	-	-	.74
G	Poa fendleriana	110	103	94	5.82	6.05	6.25
G	Sitanion hystrix	-	-	5	-	-	.09
G	Stipa columbiana	-	6	3	-	.10	.01
Total for Annual Grasses		0	0	36	0	0	0.74
Total for Perennial Grasses		110	117	121	5.82	6.40	7.13
Total for Grasses		110	117	157	5.82	6.40	7.87
F	Agoseris glauca	1	-	-	.00	-	-
F	Allium sp.	b44	a7	a21	.46	.02	.07
F	Arabis sp.	a1	a7	b81	.00	.04	1.85
F	Aster sp.	b49	ab32	a31	1.05	1.42	1.59
F	Astragalus sp.	-	-	2	-	-	.00
F	Balsamorhiza sagittata	c108	b85	a59	11.13	12.56	11.46
F	Calochortus nuttallii	1	-	2	.03	-	.00
F	Chenopodium fremontii (a)	a-	a7	b44	-	.01	.57
F	Conium maculatum	-	5	3	-	.42	.15
F	Comandra pallida	-	-	4	-	-	.00
F	Collinsia parviflora (a)	1	9	8	.00	.02	.02
F	Crepis acuminata	1	3	3	.00	.00	.03
F	Cymopterus sp.	9	-	-	.22	-	-
F	Erigeron eatonii	-	-	14	-	-	.36
F	Galium sp.	-	2	1	-	.00	.00
F	Hydrophyllum occidentale	b99	a45	a48	6.28	.91	2.62
F	Lappula occidentalis (a)	-	-	2	-	-	.00
F	Lithophragma tenella	-	-	5	-	-	.01
F	Lupinus argenteus	4	2	-	.15	.03	.03
F	Microsteris gracilis (a)	b34	b21	a1	.15	.13	.00
F	Nicotiana attenuata (a)	-	-	3	-	-	.03

T y p e	Species	Strip Frequency			Average Cover %		
		'98	'03	'08	'98	'03	'08
		F	Penstemon sp.	-	-	1	-
F	Petradoria pumila	8	7	-	.21	.24	-
F	Phlox austromontana	10	4	2	.45	.04	.03
F	Phlox longifolia	-	3	-	-	.03	-
F	Polygonum douglasii (a)	_a -	_a 3	_b 19	-	.00	.21
F	Senecio multilobatus	9	13	2	.24	.11	.01
F	Sphaeralcea grossulariifolia	_a -	_a -	_b 26	-	-	1.37
F	Stellaria jamesiana	_c 191	_b 121	_a 66	6.17	1.90	.41
F	Taraxacum officinale	3	-	1	.03	-	.00
F	Vicia americana	_b 77	_a 27	_b 61	1.09	.11	1.27
F	Zigadenus paniculatus	6	4	-	.03	.01	-
Total for Annual Forbs		35	40	77	0.15	0.17	0.84
Total for Perennial Forbs		621	367	433	27.60	17.88	21.35
Total for Forbs		656	407	510	27.76	18.06	22.20

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

BROWSE TRENDS --

Management unit 30 , Study no: 45

T y p e	Species	Strip Frequency			Average Cover %		
		'98	'03	'08	'98	'03	'08
		B	Amelanchier utahensis	9	2	3	.19
B	Artemisia tridentata vaseyana	16	13	2	2.12	1.44	.03
B	Chrysothamnus depressus	2	1	0	.00	.15	-
B	Chrysothamnus viscidiflorus viscidiflorus	1	0	0	.03	-	-
B	Opuntia sp.	3	3	0	.00	.00	-
B	Prunus virginiana	0	1	0	-	.00	-
B	Quercus gambelii	67	68	64	11.91	22.98	8.64
B	Symphoricarpos oreophilus	14	15	9	4.13	1.93	4.94
Total for Browse		112	103	78	18.40	27.33	13.65

CANOPY COVER, LINE INTERCEPT --

Management unit 30 , Study no: 45

Species	Percent Cover		
	'98	'03	'08
Amelanchier utahensis	-	2.40	.30
Artemisia tridentata vaseyana	-	2.25	-
Opuntia sp.	-	.33	-
Quercus gambelii	8.60	44.20	13.16
Symphoricarpos oreophilus	-	4.23	6.91

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 30 , Study no: 45

Species	Average leader growth (in)	
	'03	'08
Amelanchier utahensis	2.8	1.6
Artemisia tridentata vaseyana	1.0	1.1
Purshia tridentata	2.4	-

BASIC COVER --

Management unit 30 , Study no: 45

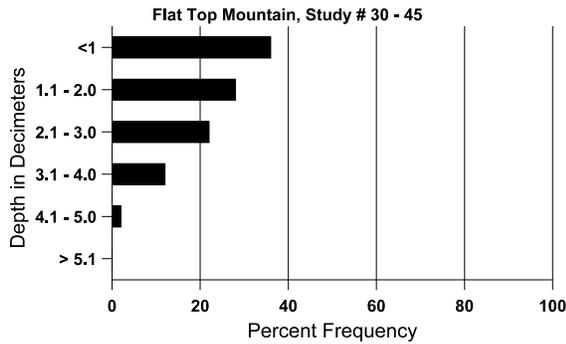
Cover Type	Average Cover %			
	'82	'98	'03	'08
Vegetation	0	46.23	48.97	40.34
Rock	0	21.60	22.73	22.74
Pavement	0	2.88	1.31	3.88
Litter	0	58.93	43.52	29.81
Bare Ground	6.25	5.19	8.32	20.83

SOIL ANALYSIS DATA --

Management unit 30, Study no: 45, Study Name: Flat Top Mountain

Effective rooting depth (in)	Temp °F (depth)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
			% sand	% silt	% clay				
16.3	37.0 (15.9)	5.6	38.0	37.4	24.5	5.2	52.1	435.2	0.6

Stoniness Index



PELLET GROUP DATA --

Management unit 30 , Study no: 45

Type	Quadrat Frequency		
	'98	'03	'08
Rabbit	-	1	4
Elk	-	-	-
Deer	17	9	36

Days use per acre (ha)		
'98	'03	'08
-	-	-
-	-	1 (2)
40 (99)	68 (167)	50 (122)

BROWSE CHARACTERISTICS --

Management unit 30 , Study no: 45

		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)
Amelanchier utahensis												
82	199	-	-	199	-	-	0	0	-	-	0	10/10
98	800	180	280	520	-	20	70	0	-	-	0	46/31
03	40	-	-	40	-	-	0	50	-	-	0	64/67
08	60	-	20	40	-	20	0	100	-	-	33	13/20
Artemisia tridentata vaseyana												
82	66	-	-	66	-	-	0	0	0	-	0	15/16
98	780	-	20	740	20	80	36	59	3	3	3	13/27
03	540	-	-	380	160	80	30	7	30	4	4	14/27
08	80	-	60	20	-	-	0	25	0	-	75	4/9
Chrysothamnus depressus												
82	133	-	-	133	-	-	100	0	-	-	0	7/16
98	440	-	420	20	-	-	0	0	-	-	0	8/15
03	20	-	-	20	-	-	100	0	-	-	0	7/19

		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)
08	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Chrysothamnus viscidiflorus viscidiflorus</i>												
82	0	-	-	-	-	-	0	0	-	-	0	-/-
98	20	-	20	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	30/61
08	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Opuntia sp.</i>												
82	0	-	-	-	-	-	0	0	-	-	0	-/-
98	80	-	-	80	-	-	0	0	-	-	75	8/17
03	100	-	-	100	-	-	0	0	-	-	0	6/15
08	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Prunus virginiana</i>												
82	1066	-	-	1066	-	-	0	0	-	-	0	10/5
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	20	-	20	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Purshia tridentata</i>												
82	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	20	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Quercus gambelii</i>												
82	7599	66	1133	6466	-	-	30	4	0	-	0	19/20
98	6760	160	1320	5320	120	740	21	0	2	-	0	44/30
03	10420	40	2780	6500	1140	1120	12	7	11	4	4	46/30
08	25240	500	3540	9400	12300	1040	7	.47	49	.39	83	25/15
<i>Symphoricarpos oreophilus</i>												
82	0	-	-	-	-	-	0	0	-	-	0	-/-
98	980	100	100	880	-	-	0	0	-	-	0	21/30
03	1160	-	180	980	-	-	0	5	-	-	0	17/42
08	740	20	20	720	-	-	0	0	-	-	0	23/60