

Trend Study 16B-13-07

Study site name: Oak Creek Ridge Aspen .

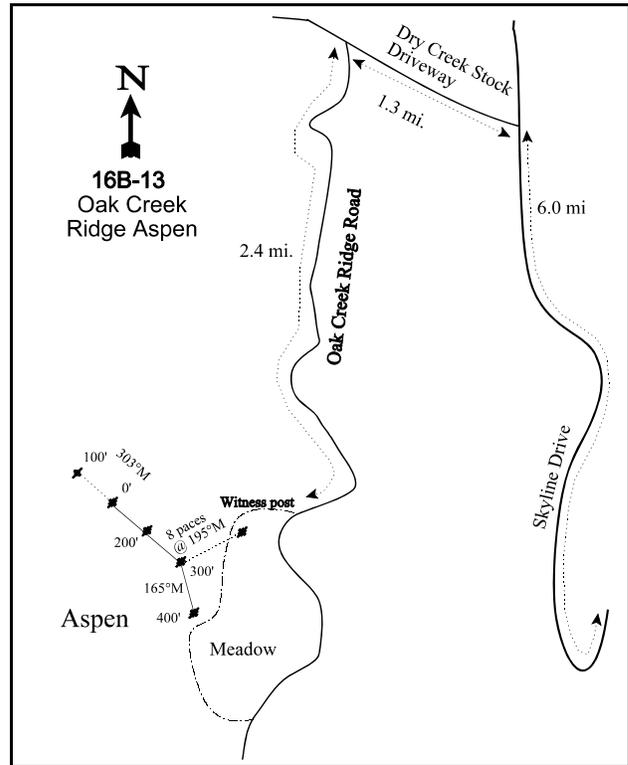
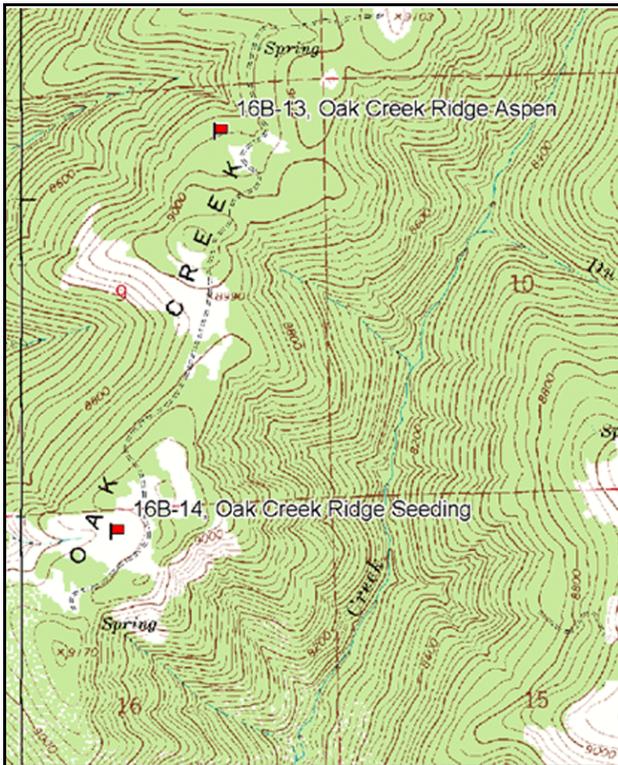
Vegetation type: Quaking Aspen .

Compass bearing: frequency baseline 303 degrees magnetic (line 4 @ 165°M).

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

LOCATION DESCRIPTION

From the intersection of Highways 89 and 31 in Fairview, take Highway 31 eastward 8.4 miles to Skyline Drive. Turn north on Skyline Drive and go approximately 6 miles, passing the Gooseberry Road. Turn west onto the Dry Creek Stock Driveway and go 1.3 miles to a fork. Take the left fork (south) through a fence and stay on the Oak Creek Ridge Road for 2.4 miles passing numerous side roads (staying left) until a sign is reached. The sign reads, “seeded area”, and is on the west side of the road in a clearing. The witness post is back in the clearing. From this post the 300-foot baseline stake is 8 paces away at an azimuth of 195 degrees magnetic.



Map Name: Fairview Lakes

Diagrammatic Sketch

Township 13S, Range SE, Section 9

GPS: NAD 83, UTM 12S 468554 E 4395677 N

DISCUSSION

Oak Creek Ridge Aspen - Trend Study No. 16B-13

Study Information

One of two studies on Oak Creek Ridge, this study samples an aspen community in an area that is thought to be important spring elk range [elevation: 8,900 feet (2,713 m), slope: 5%-10%, aspect: northwest]. Oak Creek Ridge is a Forest Service allotment that allows cattle grazing. The allotment was rested for two seasons following the meadow seeding in 1988. The closest water sources are Oak Creek 0.6 miles (1 km) to the east, and a stock pond 0.9 miles (1.4 km) to the north. Pellet group frequency data since 1997 suggested light use by elk, deer, and cattle. From the pellet group transect, there were an estimated 3 deer days use/acre (7 ddu/ha) in both 2002 and 2007. Elk use was estimated at 2 days use/acre (5 edu/ha) in 2002 and 3 days use/acre (7 edu/ha) in 2007. Cattle use was estimated at 15 days use/acre (36 cdu/ha) in 2002 and decreased to 4 days use/acre (9 cdu/ha) in 2007. The 2007 deer and elk pellet groups were from that spring, and the cattle pats were from the summer/fall of 2006.

Soil

Soil texture is a clay with a neutral pH (6.8). Organic matter is prevalent in the rich soil. The soil is relatively deep and has few rocks in the profile. A humus-rich layer extends down to a depth of 4 to 6 inches (10 to 15 cm), followed by a clay horizon which extends down to about 20 inches (51 cm). Compaction and erosion are not a problem, although gopher activity is significant. The ground cover composition has shifted each year since 1997 to higher vegetation and bare ground cover, and less litter cover. The erosion condition was classified as stable in 2002 and 2007.

Browse

This aspen (*Populus tremuloides*) stand is mostly mature, with few seedling or young trees. The population consists of tall trees, most of which are unavailable to browsing due to their height. Because aspen does not provide a significant source of browse, it is not considered as an indicator of browse trend for this study. Point quarter data from 2002 estimated 590 trees/acre (1,460 trees/ha) with an average diameter of 8 inches (20 cm). Point quarter and tree diameter data were not collected in 2007. Overhead canopy cover was 70% in 2002 and decreased to 61% in 2007.

Understory shrubs consist of elderberry (*Sambucus racemosa*) and very few mountain snowberry (*Symphoricarpos oreophilus*). Elderberry density was estimated at 1,133 plants/acre (2,805 plants/ha) in 1989, but has ranged from 60 to 240 plants/acre (149 to 594 plants/ha) since 1997. The change in density is attributed to the much larger sample area used in 1997. The larger sample area gives a better density estimate for species that are characteristically clumped or discontinuous in their distributions. The population has been composed almost exclusively of young and mature plants. Fewer than 10% of the elderberry shrubs have ever exhibited poor vigor. Browse use in 1997 was moderate to heavy, but light in 2002 and 2007. Few snowberry plants have been sampled in the shrub density strips, resulting in density estimates of 20 to 40 plants/acre (50 to 100 plants/ha).

Herbaceous Understory

The dense herbaceous understory is the key component being monitored. Grass cover increased from 6% in 1997 to 15% in 2002, and decreased to 9% in 2007. The number of grass species present has steadily increased each sample year. Only two species of grass, slender wheatgrass (*Agropyron trachycaulum*) and big mountain brome (*Bromus carinatus*), were sampled in 1989. Since then, Kentucky bluegrass (*Poa pratensis*) was first sampled in 1997, subalpine needlegrass (*Stipa columbiana*) was first sampled in 2002, and intermediate wheatgrass (*Agropyron intermedium*) was first sampled in 2007. Mountain brome and slender wheatgrass remained the dominant species through 2002. In 2007, mountain brome was the dominant species. Subalpine needlegrass has been sampled in the more open areas. Annual grasses have not been sampled.

Forbs account for the majority of the vegetative cover and represent the most significant vegetative component. Forb cover increased from 39% in 1997 to 43% in 2002 and 2007. Since 1997, forb species richness has ranged from 22 to 28. Common species include bedstraw (*Galium aparine*), ballhead waterleaf (*Hydrophyllum capitatum*), sweet anise (*Osmorhiza occidentalis*), tuber starwort (*Stellaria jamesiana*), American vetch (*Vicia americana*), western coneflower (*Rudbeckia occidentalis*), and slenderleaf collomia (*Collomia linearis*). No animal use was noticed on either grasses or forbs in 2002 and 2007.

1997 TREND ASSESSMENT

The browse trend is stable. The density of elderberry decreased by 79%. The decrease is attributed to the larger sample area used in 1997, and therefore trend was determined from other parameters. The plants showing moderate and heavy browse use increased from 21% to 59%. The age class distribution shifted from predominantly young plants to mature plants. Decadency and plants with poor vigor both increased from 0% to 8%. The trend for grass is slightly down. The sum of nested frequency for perennial grasses decreased by 19%, and there was a significant decrease in the nested frequency of big mountain brome. However, Kentucky bluegrass was sampled for the first time. The forb trend is up. The sum of nested frequency for perennial forbs increased by 45%. Forb species richness increased from 13 to 19. The Desirable Components Index (DCI) does not apply to this study because it is located on summer range.

winter range condition (DCI) - Not applicable, summer range
browse - stable (0) grass - slightly down (-1) forb - up (+2)

2002 TREND ASSESSMENT

The browse trend is down. The estimated elderberry density declined from 240 plants/acre (594 plants/ha) to 60 plants/acre (149 plants/ha). Young plants comprised 67% of the population and mature plants comprised the remaining 33%. There was no decadency or poor vigor evident on any of the plants, and all browse use was classified as light. The trend for grass is slightly up. The sum of nested frequency for perennial grasses increased by 17% and subalpine needlegrass was sampled for the first time. Although the nested frequency of mountain brome changed little, cover increased from 3% to 9%. The forb trend is down. The sum of nested frequency for annual forbs increased by 41%, while perennial forb frequency decreased by 39%. The decrease in perennial forbs was likely the result of the drought conditions (Utah Climate Summaries 2007).

winter range condition (DCI) - Not applicable, summer range
browse - down (-2) grass - slightly up (+1) forb - down (-2)

2007 TREND ASSESSMENT

The browse trend is up. The estimated elderberry density increased nearly four-fold to 220 plants/acre (545 plants/ha). Though shrub density remained low, this was a marked improvement. Elderberry shrubs had good vigor and good regrowth from summer browsing in 2006. The number of young plants doubled since 2002, and there were still no decadent plants. Half of the few snowberry plants sampled had heavy browse use, though the bite marks suggested that the use was probably from rodent-like animals and not from deer or elk. The grass trend is down. The sum of nested frequency decreased by 26%, due to significant declines in the nested frequencies of subalpine needlegrass and slender wheatgrass. Grasses had good vigor in 2007 but showed no wildlife use. The forb trend is stable. The sum of nested frequency for perennial forbs changed little, decreasing 7%, and cover decreased by nearly 10%. However, the combined annual and perennial cover remained unchanged. The sum of nested frequency for annual forbs increased 49%, and annual forb cover increased by nearly 10%. Annual forbs have been an increasingly larger component of total forb nested frequency since 1997. It was noted that all forbs had good vigor and flower production, except American vetch, which had few flowers. There was little or no wildlife use on forbs in 2007.

winter range condition (DCI) - Not applicable, summer range
browse - up (+2) grass - down (-2) forb - stable (0)

HERBACEOUS TRENDS --
Management unit 16B, Study no: 13

Type	Species	Nested Frequency				Average Cover %		
		'89	'97	'02	'07	'97	'02	'07
G	<i>Agropyron intermedium</i>	-	-	-	3	-	-	.01
G	<i>Agropyron trachycaulum</i>	_b 141	_b 137	_b 146	_a 32	2.03	3.86	.66
G	<i>Bromus carinatus</i>	_b 301	_a 175	_a 182	_a 203	3.23	8.60	7.64
G	<i>Poa pratensis</i>	-	_a 48	_a 64	_a 64	.67	1.89	.72
G	<i>Stipa columbiana</i>	-	-	_b 29	_a 10	-	.90	.36
Total for Annual Grasses		0	0	0	0	0	0	0
Total for Perennial Grasses		442	360	421	312	5.94	15.27	9.41
Total for Grasses		442	360	421	312	5.94	15.27	9.41
F	<i>Achillea millefolium</i>	-	_b 33	_b 47	_a 2	1.35	2.78	.06
F	<i>Agoseris glauca</i>	-	_a 8	_a 9	_a 8	.04	.07	.09
F	<i>Aquilegia sp.</i>	-	-	_a -	_a 3	-	.03	.00
F	<i>Aster sp.</i>	-	16	-	-	.54	-	-
F	<i>Chenopodium sp. (a)</i>	-	_a 15	-	_a 22	.20	-	.10
F	<i>Cirsium sp.</i>	-	2	-	-	.15	-	-
F	<i>Claytonia lanceolata</i>	-	_b 182	_a 12	_a 6	1.44	.07	.03
F	<i>Collomia linearis (a)</i>	-	_a 15	_b 138	_c 240	.22	2.00	4.17
F	<i>Cynoglossum officinale</i>	-	-	_a 5	_b 39	-	.21	1.22
F	<i>Descurainia californica</i>	_b 125	-	-	_a 2	-	-	.00
F	<i>Epilobium brachycarpum (a)</i>	-	-	_a 40	_a 39	-	.29	.29
F	<i>Erodium cicutarium (a)</i>	-	-	-	3	-	-	.03
F	<i>Erigeron eatonii</i>	-	_a -	_b 20	_{ab} 7	.00	.98	.07
F	<i>Eriogonum racemosum</i>	-	-	_a -	_a 1	-	.00	.03
F	<i>Fritillaria atropurpurea</i>	-	22	-	-	2.68	-	-
F	<i>Frasera speciosa</i>	-	-	5	-	-	.01	-
F	<i>Galium aparine (a)</i>	-	_b 249	_a 169	_b 264	8.15	5.34	12.70
F	<i>Hackelia patens</i>	66	-	-	-	-	-	-
F	<i>Hedysarum boreale</i>	-	-	_a 2	_a 1	-	.03	.00
F	<i>Helenium hoopesii</i>	_a 9	_b 39	_b 46	_a 8	1.65	3.51	.33
F	<i>Hydrophyllum capitatum</i>	-	_c 188	_a 32	_b 79	4.03	.31	.75
F	<i>Lappula occidentalis (a)</i>	-	-	_a -	_a 1	-	.03	.03
F	<i>Madia glomerata (a)</i>	-	_a 4	_c 72	_b 34	.01	.89	.30
F	<i>Mertensia ciliata</i>	-	13	-	-	.12	-	-
F	<i>Medicago sativa</i>	2	-	-	-	-	-	-
F	<i>Osmorhiza occidentalis</i>	_a 60	_{ab} 60	_b 89	_{ab} 65	1.37	2.53	2.34
F	<i>Phacelia sp.</i>	-	-	_a 4	_a 3	-	.15	.18

Type	Species	Nested Frequency				Average Cover %		
		'89	'97	'02	'07	'97	'02	'07
F	<i>Polygonum douglasii</i> (a)	-	_a 3	-	_b 20	.01	-	.04
F	<i>Rudbeckia occidentalis</i>	_b 175	_a 79	_a 89	_a 72	3.59	7.43	4.66
F	<i>Senecio serra</i>	_a 4	_a -	_a 5	_a 4	.00	.78	.53
F	<i>Stellaria jamesiana</i>	_b 242	_b 243	_a 170	_{ab} 202	7.25	5.82	8.68
F	<i>Taraxacum officinale</i>	_a 3	_b 48	_b 34	_a 12	.88	1.74	.74
F	<i>Thalictrum fendleri</i>	_a 6	_a 1	-	-	.03	-	-
F	<i>Tragopogon dubius</i>	-	-	-	-	-	-	.00
F	Unknown forb-annual (a)	-	11	-	-	.48	-	-
F	Unknown forb-perennial	-	75	-	-	1.80	-	-
F	<i>Vaccinium caespitosum</i>	-	3	-	-	.01	-	-
F	<i>Vicia americana</i>	_{ab} 107	_a 82	_b 134	_{ab} 118	1.31	6.46	4.60
F	<i>Viguiera multiflora</i>	_a 13	_b 68	_a 10	_a 25	.37	.42	.59
F	<i>Viola</i> sp.	_a 54	_b 91	_a 58	_a 58	1.10	.70	.81
Total for Annual Forbs		0	297	419	623	9.08	8.56	17.68
Total for Perennial Forbs		866	1253	771	715	29.76	34.10	25.77
Total for Forbs		866	1550	1190	1338	38.84	42.66	43.45

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

BROWSE TRENDS --

Management unit 16B, Study no: 13

Type	Species	Strip Frequency			Average Cover %		
		'97	'02	'07	'97	'02	'07
B	<i>Abies concolor</i>	0	0	0	.00	-	-
B	<i>Populus tremuloides</i>	31	29	26	.21	.36	.30
B	<i>Sambucus racemosa</i>	10	2	8	.18	.03	.45
B	<i>Symphoricarpos oreophilus</i>	1	1	2	.15	.15	.15
Total for Browse		42	32	36	0.55	0.53	0.89

CANOPY COVER, LINE INTERCEPT --

Management unit 16B, Study no: 13

Species	Percent Cover	
	'02	'07
<i>Populus tremuloides</i>	70.59	60.56
<i>Sambucus racemosa</i>	-	.61
<i>Symphoricarpos oreophilus</i>	-	.08

POINT-QUARTER TREE DATA --
Management unit 16B, Study no: 13

Species	Trees per Acre		Average diameter (in)	
	'02	'07	'02	'07
Populus tremuloides	590	-	8.3	-

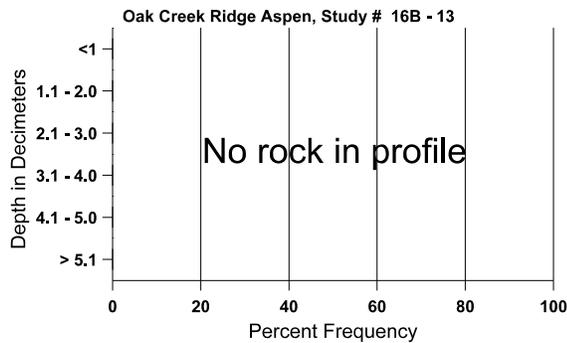
BASIC COVER --
Management unit 16B, Study no: 13

Cover Type	Average Cover %			
	'89	'97	'02	'07
Vegetation	15.25	48.09	56.34	62.00
Rock	.25	.66	.59	.44
Pavement	0	.10	.05	.04
Litter	64.50	63.64	53.44	31.69
Cryptogams	0	.00	0	0
Bare Ground	20.00	8.44	10.53	17.03

SOIL ANALYSIS DATA --
Herd Unit 16B, Study no: 13, Oak Creek Ridge Aspen

Effective rooting depth (in)	Temp °F (depth)	pH	Clay			%OM	ppm P	ppm K	dS/m
			% sand	% silt	% clay				
20.1	38.6 (17.7)	6.8	24.0	27.8	48.2	6.7	22.3	182.4	.4

Stoniness Index



PELLET GROUP DATA --
 Management unit 16B, Study no: 13

Type	Quadrat Frequency		
	'97	'02	'07
Rabbit	3	-	-
Grouse	-	1	-
Elk	1	1	1
Deer	2	-	1
Cattle	2	4	1

Days use per acre (ha)	
'02	'07
-	-
-	-
2 (5)	3 (7)
3 (7)	3 (7)
15 (36)	4 (9)

BROWSE CHARACTERISTICS --
 Management unit 16B, Study no: 13

		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 nauseosus												
89	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
02	0	-	-	-	-	-	0	0	-	-	0	-/-
07	0	-	-	-	-	-	0	0	-	-	0	22/32
Populus tremuloides												
89	499	33	133	366	-	-	0	0	-	-	0	393/158
97	800	20	-	800	-	160	3	0	-	-	0	-/-
02	660	-	20	640	-	140	0	0	-	-	0	-/-
07	560	-	20	540	-	120	0	0	-	-	0	-/-
Sambucus racemosa												
89	1133	-	900	233	-	-	21	0	0	-	0	79/39
97	240	-	20	200	20	-	42	17	8	8	8	31/14
02	60	-	40	20	-	20	0	0	0	-	0	15/17
07	220	-	80	140	-	-	0	18	0	-	9	22/21
Symphoricarpos oreophilus												
89	0	-	-	-	-	-	0	0	-	-	0	-/-
97	20	-	20	-	-	-	0	0	-	-	0	-/-
02	20	-	-	20	-	-	0	0	-	-	0	7/12
07	40	-	-	40	-	-	0	50	-	-	0	8/11