Trend Study 16B-14-07

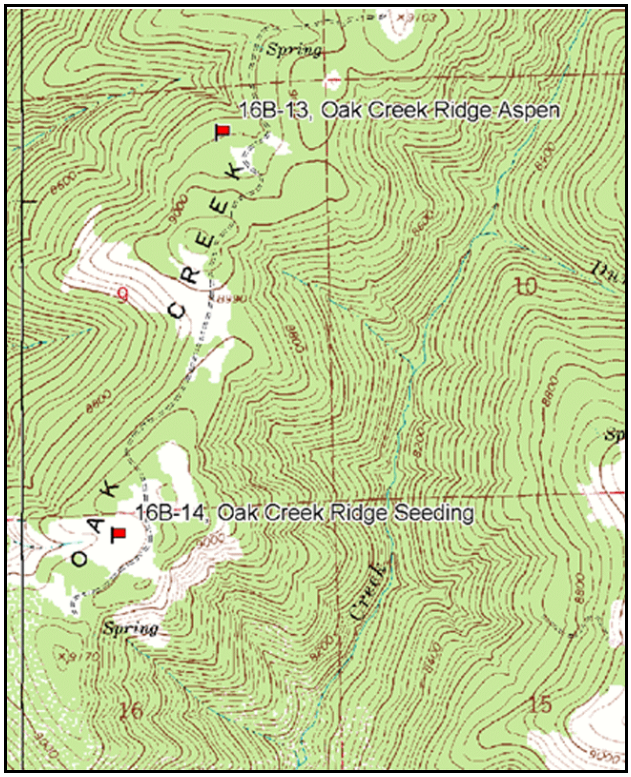
Study site name: Oak Creek Ridge Seeding . Vegetation type: Dry Meadow .

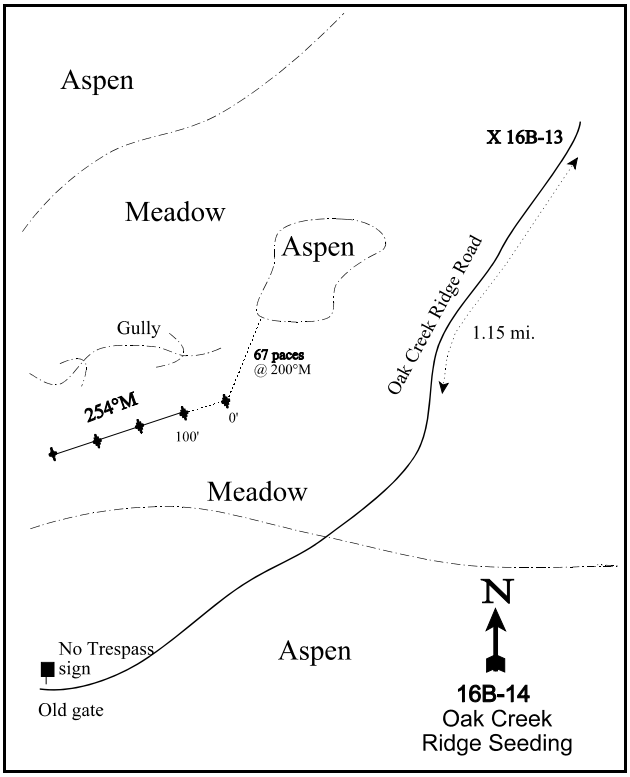
Compass bearing: frequency baseline 254 degrees magnetic.

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. Go north on Skyline Drive for approximately 6 miles and turn left towards the Dry Creek Stock Driveway (FS road #138). Go 0.35 miles to an intersection, continue straight for mile to the fence marking the boundary of the Oak Creek Ridge Allotment. Drive 2.4 miles to the witness post for study #16B-13. Continue on the main road 1.15 miles to a large meadow. This is the last meadow on the ridge. The 0' baseline stake is about 100 yards into the meadow and is marked by browse tag #257. (From the edge of the aspen patch the 0-foot baseline stake is 67 paces away at an azimuth of 200 degrees magnetic). Do not confuse the transect with a U.S.F.S. study that runs southwest/northeast and is marked by orange and green fenceposts.





Map Name: Fairview Lakes

Diagrammatic Sketch

Township 13S , Range 5E , Section 16

GPS: NAD 83, UTM 12S 468141 E 4394109 N

DISCUSSION

Oak Creek Ridge Seeding - Trend Study No. 16B-14

Study Information

This study samples one of several meadows on Oak Creek Ridge that were part of a 1988 restoration project [elevation: 9,050 feet (2,758 m), slope: 5%, aspect: west]. The project included a weed treatment and subsequent re-seeding. Located on the end of the ridge, it is the largest meadow in the project and appeared to have better grass establishment than some of the other meadows when first sampled in 1989. Previously, these aspen openings had an abundance of tarweed (*Madia glomerata*). This meadow is also monitored by a Forest Service photo-point transect. The nearest water sources are Oak Creek, which lies in a valley 0.6 miles (1 km) to the east, and a stock pond is located 2 miles (3.2 km) to the north. Pellet group data since 1997 has indicated moderately low elk and cattle use, with light use by deer. From the pellet group transect, there were an estimated 2 deer days use/acre (5 ddu/ha) in 2002, and 3 deer days use/acre (7 ddu/ha) in 2007. Elk use was estimated at 7 days use/acre (17 edu/ha) in 2002 and 10 days use/acre (25 edu/ha) in 2007. Cattle use was fairly high at an estimated 43 days use/acre (106 cdu/ha) in 2002 and decreased to 9 days use/acre (23 cdu/ha) in 2007. A doe and fawn were seen at the study in 2007.

Soil

There are few rocks in the soil profile. The soil has a clay texture and is slightly acidic (pH 6.5). The two largest components of ground cover are vegetation and bare ground, and they account for 80% to 90% of ground cover. Vegetation cover was lowest in 1989 (13%) and increased in later years (40% to 51%). Bare ground cover was highest in 1989 (84%) and has been lower in subsequent sample years (42% to 53%). The bare ground cover was higher in 1989 because the seeding had just taken place the previous year and vegetation wasn't completely established yet. There were definite signs of erosion across the meadow and down the adjacent gully in 1989. Additionally, sheet erosion and small rills occurred on the gentle slope. The erosion condition was classified as stable in 2002 and 2007. Gopher activity is prominent and, as a result, the soil does not appear to be compact.

Browse

The meadow is surrounded by mature aspen (*Populus tremuloides*) stands with an abundant herbaceous understory. The browse component in the meadow itself is virtually non-existent with only one mature mountain snowberry (*Symphoricarpos oreophilus*) plant sampled in 2002.

Herbaceous Understory

The seeded understory species were not well established in 1989. There was ample space for germination and the spread of rhizomatous species. The intermediate wheatgrass (*Agropyron intermedium*) plants that had established were large and some had been grazed. In 1997, the seeded species appeared to be more abundant, and the sum of nested frequency for grasses doubled, mostly due to smooth brome (*Bromus inermis*) and orchardgrass (*Dactylis glomerata*). Japanese brome (*Bromus japonicus*) was sampled once in 1989 and has not been present since. Grass cover was 10% in 1997, 24% in 2002, and 15% in 2007.

Like the nearby Oak Creek Aspen study, forbs are the dominant vegetation type. The forb composition is poor in that many of the species have poor forage value. The study was originally treated to reduce tarweed, which provided 18% cover in 1997, 3% in 2002, and 7% in 2007. Other common species include wavyleaf thistle (*Cirsium undulatum*), western aster (*Aster chilensis*), lanceleaf springbeauty (*Claytonia lanceolata*), and slenderleaf collomia (*Collomia linearis*). Seeded forbs are uncommon. Houndstongue (*Cynoglossum officinale*), a noxious weed, has also been present during all sample years. Since 1997, houndstongue cover has been 1%-2%.

1997 TREND ASSESSMENT

Browse were absent, so the trend is considered to be stable. The grass trend is up. The sum of nested frequency of perennial species increased two-fold. Much of the increase is attributed to smooth brome and orchardgrass, two species that were not present in 1989. The forb trend is slightly down. The sum of nested frequency for perennial forbs increased more than seven-fold, but most of that increase was from wavyleaf thistle and houndstongue. Additionally, there was a significant increase in tarweed nested frequency. Tarweed was found in 98% of the quadrats and accounted for nearly half (46%) of the vegetative cover. Despite these changes, the number of perennial species sampled increased from 14 to 19.

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

2002 TREND ASSESSMENT

Browse continues to be stable with no browse species sampled. The grass trend is slightly up. The sum of nested frequency of perennial grasses increased by 18%, including significant increases of intermediate wheatgrass and slender wheatgrass (*Agropyron trachycaulum*). The ground cover occupied by intermediate wheatgrass increased from 2% to 20%. Conversely, there were significant decreases in the nested frequencies of smooth brome and orchardgrass. The decrease of these mesic grass species was likely from dry conditions (Utah Climate Summaries 2007) and/or competition from other perennial grasses. The trend for the forbs is slightly up. The sum of nested frequency for perennial forbs decreased by 6%. However, there was a statistically significant decrease in the nested frequencies of two undesirable species, houndstongue and tarweed. The amount of ground cover occupied by tarweed decreased from 18% to 3% .

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

2007 TREND ASSESSMENT

Browse continues to be stable with no browse species sampled. The grass trend is slightly down. The sum of nested frequency for perennial grasses decreased by 13%, including a significant decrease in intermediate wheatgrass nested frequency. There were also four fewer grass species sampled in 2007 than in 2002. The grasses all looked vigorous and were beginning to produce inflorescences when the study was sampled. The forb trend is stable. The sum of nested frequency increased for perennial forbs by 11%, which was mostly attributed to a significant increase in showy goldeneye (*Viguiera multiflora*). There were also significant increases in the nested frequency of two annuals; slenderleaf collomia and Douglas knotweed (*Polygonum douglasii*). Tarweed nested frequency and quadrat frequency slightly decreased, yet tarweed cover slightly increased. When the study was sampled, there was no apparent animal use on grasses or forbs, even though elk and deer pellets were from spring and summer of 2007.

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

HERBACEOUS TRENDS --
Management unit 16B, Study no: 14

Type	Species	Nested Frequency				Average Cover %		
		'89	'97	'02	'07	'97	'02	'07
G	Agropyron cristatum	-	-	1	-	-	.00	-
G	Agropyron intermedium	a87	b99	d256	c207	2.26	19.62	10.73
G	Agropyron trachycaulum	-	a12	b54	b73	.22	1.70	1.62
G	Bromus carinatus	-	-	a4	a5	-	.18	.03
G	Bromus inermis	-	b100	a36	a44	3.39	1.58	2.01
G	Bromus japonicus (a)	1	-	-	-	-	-	-
G	Bromus sp.	a1	a2	-	-	.03	-	-
G	Dactylis glomerata	-	b116	a25	a3	3.59	.55	.06
G	Lolium perenne	26	-	-	-	-	-	-
G	Phleum pratense	b42	a8	a13	a11	.07	.59	.10
G	Poa pratensis	-	-	3	-	-	.03	-
G	Stipa lettermani	-	-	4	-	-	.18	-
Total for Annual Grasses		1	0	0	0	0	0	0
Total for Perennial Grasses		156	337	396	343	9.57	24.45	14.57
Total for Grasses		157	337	396	343	9.57	24.45	14.57
F	Achillea millefolium	a2	ab6	b12	ab7	.33	.86	.36
F	Agoseris glauca	-	a49	ab56	b94	.57	1.10	2.51
F	Arabis sp.	-	-	4	-	-	.06	-
F	Aster chilensis	-	a19	b40	b42	1.97	3.32	2.51
F	Chenopodium album (a)	-	a3	-	a8	.00	-	.16
F	Cirsium undulatum	a1	c124	b66	b57	2.29	.63	1.33
F	Claytonia lanceolata	-	b174	b206	a100	1.50	1.97	.66
F	Collomia linearis (a)	-	-	a82	b196	-	.40	2.80
F	Cynoglossum officinale	a10	c113	b72	bc83	2.35	1.28	1.62
F	Descurainia californica	14	-	-	-	-	-	-
F	Epilobium brachycarpum (a)	-	-	a138	b212	-	1.08	2.35
F	Epilobium sp.	2	-	-	-	-	-	-
F	Eriogonum brevicaule	-	-	-	3	-	-	.00
F	Eriogonum caespitosum	a4	a6	-	-	.16	-	-
F	Erigeron eatonii	-	a3	b22	ab14	.00	.56	.10
F	Eriogonum racemosum	-	-	4	-	-	.00	-
F	Galium aparine (a)	-	3	-	-	.00	-	-
F	Geranium sp.	-	a3	a1	a-	.00	.03	.38
F	Hedysarum boreale	6	-	-	-	-	-	-
F	Helenium hoopesii	-	-	-	2	-	-	.00

Type	Species	Nested Frequency				Average Cover %		
		'89	'97	'02	'07	'97	'02	'07
F	Lactuca serriola	$_{a}$8	-	-	$_{a}$4	-	-	.01
F	Linum lewisii	$_{a}$7	$_{a}$2	$_{a}$1	-	.16	.06	-
F	Machaeranthera canescens	-	-	-	3	-	-	.00
F	Machaeranthera spp	-	-	3	-	-	.03	-
F	Madia glomerata (a)	$_{a}$25	$_{c}$363	$_{b}$262	$_{b}$255	17.90	3.40	6.55
F	Machaeranthera grindelioides	-	-	-	13	-	-	.36
F	Mertensia ciliata	-	3	-	-	.00	-	-
F	Melilotus officinalis	8	-	-	-	-	-	-
F	Mertensia sp.	-	-	-	7	-	-	.04
F	Medicago sativa	-	1	-	-	.15	-	-
F	Oenethera flava	$_{b}$11	$_{a}$3	$_{ab}$10	-	.00	.28	-
F	Oenothera sp.	-	-	-	21	-	-	.19
F	Penstemon sp.	-	$_{a}$-	$_{a}$10	$_{a}$1	.00	.21	.03
F	Polygonum douglasii (a)	-	$_{b}$81	$_{a}$5	$_{c}$201	.27	.01	.78
F	Senecio multilobatus	1	-	-	-	-	-	-
F	Stellaria jamesiana	-	$_{a}$2	-	$_{a}$2	.01	-	.15
F	Taraxacum officinale	-	$_{a}$7	$_{a}$4	$_{a}$15	.21	.06	.16
F	Tragopogon dubius	$_{a}$1	$_{a}$9	$_{ab}$9	$_{b}$30	.07	.05	.45
F	Unknown forb-annual (a)	-	3	-	-	.15	-	-
F	Vicia americana	-	$_{a}$12	$_{a}$3	$_{a}$8	.02	.15	.18
F	Viguiera multiflora	-	$_{a}$23	$_{a}$23	$_{b}$89	.61	.71	1.87
F	Viola sp.	$_{a}$6	$_{b}$40	$_{a}$17	$_{ab}$31	.39	.12	.31
Total for Annual Forbs		25	453	487	872	18.34	4.89	12.65
Total for Perennial Forbs		81	599	563	626	10.85	11.52	13.31
Total for Forbs		106	1052	1050	1498	29.19	16.42	25.97

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

BROWSE TRENDS --
Management unit 16B, Study no: 14

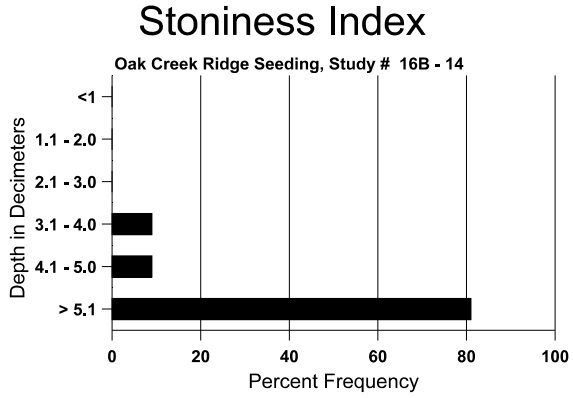
Type	Species	Strip Frequency			Average Cover %		
		'97	'02	'07	'97	'02	'07
B	Sambucus racemosa	0	0	0	-	-	.00
B	Symphoricarpos oreophilus	0	1	0	.00	-	-
Total for Browse		0	1	0	0.00	0	0.00

BASIC COVER --
Management unit 16B, Study no: 14

Cover Type	Average Cover %			
	'89	'97	'02	'07
Vegetation	13.25	39.88	41.42	51.20
Rock	1.50	.70	2.25	2.05
Pavement	0	.58	.58	.99
Litter	1.50	11.58	16.60	6.10
Cryptogams	0	0	0	0
Bare Ground	83.75	42.25	53.04	49.68

SOIL ANALYSIS DATA --
Herd Unit 16B, Study no: 14, Oak Creek Ridge Seeding

Effective rooting depth (in)	Temp °F (depth)	pH	Clay			%0M	ppm P	ppm K	dS/m
			%sand	%silt	%clay				
24.8	47.9 (17.7)	6.5	24.0	32.4	43.6	3.5	35.3	214.4	.4



PELLET GROUP DATA --
Management unit 16B, Study no: 14

Type	Quadrat Frequency		
	'97	'02	'07
Elk	12	1	1
Deer	1	2	-
Cattle	9	17	10

Days use per acre (ha)	
'02	'07
7 (17)	10 (25)
2 (5)	3 (7)
43 (106)	9 (23)

BROWSE CHARACTERISTICS --
Management unit 16B, Study no: 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)
Symphoricarpos oreophilus												
89	**0**	-	-	-	-	-	0	0	-	-	0	-/-
97	**0**	-	-	-	-	-	0	0	-	-	0	-/-
02	**20**	-	-	20	-	-	0	0	-	-	0	11/15
07	**0**	-	-	-	-	-	0	0	-	-	0	10/13