

Trend Study 18B-20-07

Study site name: Black Rock East.

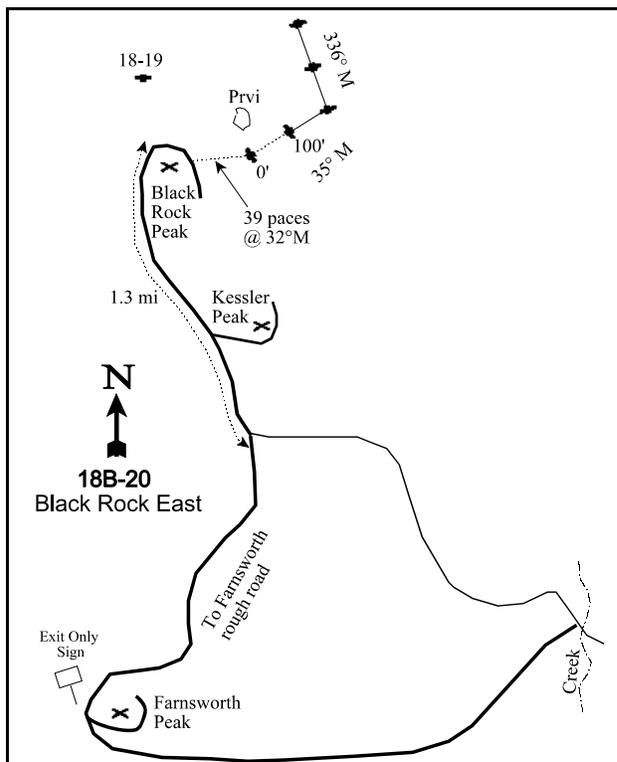
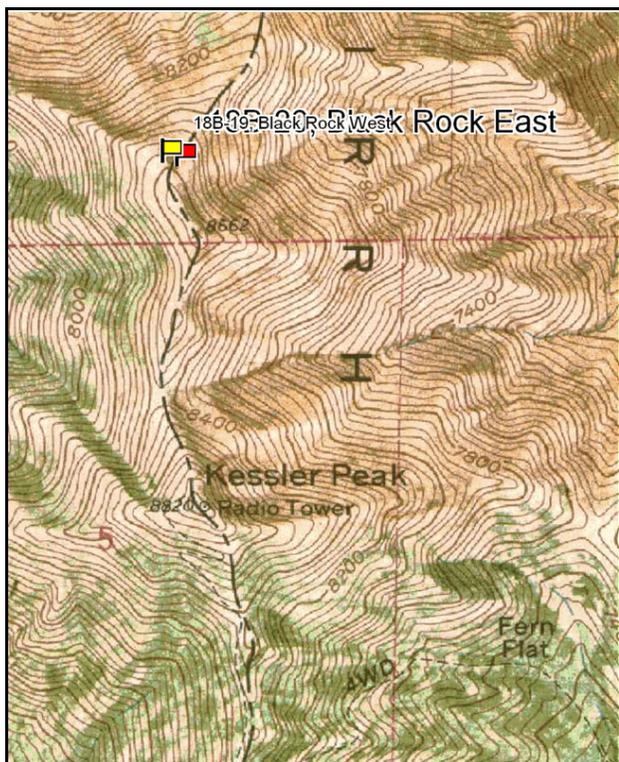
Vegetation type: Perennial Grass.

Compass bearing: frequency baseline 35 degrees magnetic (Line 3-4 @ 336°M).

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

LOCATION DESCRIPTION

Traveling north on Highway #111 turn left (West) (just before the Baccus west gate sign and overpass) on a dirt road which goes up Coon Canyon. Travel west for 0.2 miles to a gate. This gate (#39E) is controlled by Kennecott and you must get permission to have it opened. From the gate continue up Coon Canyon for 3.9 miles to a fork. Turn left at the fork and cross the bridge. Follow the road up the left fork of Coon Canyon to Farnsworth Peak. Just below the KSL radio tower at the peak, take a left at a road marked exit only (road is very steep and rocky). Drive this road for about 0.6 miles to a fork. Stay left and continue 1.3 miles up a steep road around the west side of Kessler Peak to last switchback west of Black Rock Peak. Park here and walk onto the knoll to the east. From the knoll, walk 39 paces north (bearing approximately 32 degrees magnetic) to the 0-foot baseline stake. The study is marked by short fenceposts. The 100-foot end of the baseline is marked by rebar.



Map Name: Farnsworth Peak

Diagrammatic Sketch

Township 1S, Range 3W, Section 32

GPS: NAD 83, UTM 12T 401552 E 4506870 N

DISCUSSION

Black Rock East - Trend Study No. 18B-20

Study Information

This study is located on the northern ridge of Kessler Peak in elk summer range on Kennecott land [elevation: 8,600 feet (2,621 m), slope: 35%, aspect: northeast]. In 1997, it was noted that the study had been poorly located; it was placed on the ecotone between a thick stand of spike fescue on the northern aspect and the noticeably drier eastern aspect dominated by needlegrass and slender wheatgrass. It was suggested that it should be moved further to the north where elk pellet groups indicated that elk preferred the spike fescue, not the drier eastern aspect, but the study was never moved. The northern aspect is similar in vegetation composition to the Black Rock West (18B-19) study. The elk pellet group transect data estimates were 48 days use/acre in 1997, 64 in 2002, and 44 in 2007 (119 edu/ha in 1997, 159 in 2002, and 107 in 2007). In 2007, 2/3 of elk pellet groups counted were on the northern aspect of the study. Deer pellet group estimates were 3 days use/acre in 2002 and 2007 (7 ddu/ha in 2002 and 2007). No deer pellets were sampled in 2007. Grasshoppers were common in 1997, 2002, and 2007.

Soil

The soil is moderately deep with an effective rooting depth of almost 16 inches (40.6 cm). The soil texture is a loam with a slightly acidic soil reaction (pH of 6.4). It has good protective herbaceous and litter cover, with little occurrence of erosion. The erosion condition class was determined as stable in 2002 and 2007.

Browse

Chokecherry (*Prunus virginiana*) is the most abundant browse species, but is only in a single clump and density measurements are dependent upon the number of young branches that emerge during the sample year. There are also a few stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) and snowberry (*Symphoricarpos oreophilus*) individuals on the slope. Total shrub cover was 4% in 1997, 6% in 2002, and 5% in 2007. Because the area is used by elk in spring and summer, utilization on the browse species is minimal.

Herbaceous Understory

The herbaceous understory is abundant and very diverse. Spike fescue (*Leucopoa kingii*) provided 17% cover in 1997, 21% in 2002, and 23% in 2007. Several other perennial grasses are present of which Letterman needlegrass (*Stipa lettermani*) and subalpine needlegrass (*Stipa columbiana*) are the most abundant. Annual grasses have not been sampled. Bulbous bluegrass (*Poa bulbosa*), an undesirable grass species, was sampled in one quadrat 1997 and 19 quadrats in 2007.

The forb composition is very diverse with 23-25 species sampled since 1997. The more common perennial species include western yarrow (*Achillea millefolium*), rose pussytoes (*Antennaria rosea*), aster (*Aster* sp.), silvery lupine (*Lupinus argenteus*), and showy goldeneye (*Viguiera multiflora*). The noxious weed dalmatian toadflax (*Linaria dalmatica*) was sampled in a single quadrat in 2002 and 2007.

1997 TREND ASSESSMENT

The browse trend is stable. Browse species are sparse and utilized very little in this summer range. The grass trend is stable. The sum of the nested frequency of perennial grasses changed little. With the change in sample area, the dominant species sampled changed. More spike fescue and less slender wheatgrass (*Agropyron trachycaulum*) and mountain brome (*Bromus carinatus*) were sampled. The forb trend is stable. The sum of the nested frequency of perennial forbs was unchanged.

winter range condition (DCI) - Not applicable, summer range

browse - stable (0)

grass - stable (0)

forb - stable (0)

2002 TREND ASSESSMENT

The browse trend remained stable for this summer range. The density of chokecherry increased, but all of the increase was in young rhizomatous stems. Chokecherry cover increased less than 2%. The grass trend is stable. The sum of the nested frequency of perennial grasses changed little. Perennial grass cover increased from 23% to 26% and diversity remained high. Spike fescue remains the dominant grass species. The forb trend is slightly down. The sum of the nested frequency of perennial forbs changed little, but dalmatian toadflax, a noxious weed, and cluster tarweed (*Madia glomerata*), an undesirable species, were sampled for the first time.

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

2007 TREND ASSESSMENT

The browse trend is stable for this summer range. The density of chokecherry decreased, but again the change in density is related to the number of rhizomatous stems that were sampled. Chokecherry cover did not change substantially. The grass trend is slightly up. The sum of the nested frequency of perennial grasses, excluding that of bulbous bluegrass, increased 11%. Bulbous bluegrass nested frequency increased significantly. The forb trend is up. The nested frequency of perennial forbs increased 33% and the nested frequencies of dalmatian toadflax and cluster tarweed remained unchanged.

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

HERBACEOUS TRENDS --
 Management unit 18B, Study no: 20

T y p e	Species	Nested Frequency				Average Cover %		
		'90	'97	'02	'07	'97	'02	'07
G	Agropyron spicatum	a3	a10	a4	-	.19	.03	-
G	Agropyron trachycaulum	c157	b91	a26	a43	.90	.24	1.04
G	Bromus carinatus	b102	a8	a22	a23	.22	.66	1.33
G	Leucopoa kingii	a21	b153	bc163	c178	17.10	20.87	22.97
G	Melica bulbosa	a4	a1	-	a5	.00	-	.06
G	Poa bulbosa	-	a1	-	b47	.00	-	.76
G	Poa fendleriana	-	a1	a11	a3	.03	.04	.03
G	Poa pratensis	a2	a5	a3	b17	.01	.03	.90
G	Poa secunda	-	a1	b15	ab12	.00	.13	.05
G	Stipa columbiana	a16	ab36	b43	ab36	1.09	.53	.48
G	Stipa lettermani	a121	a128	a111	a126	3.22	3.17	5.02
Total for Annual Grasses		0	0	0	0	0	0	0
Total for Perennial Grasses		426	435	398	490	22.79	25.74	32.67
Total for Grasses		426	435	398	490	22.79	25.74	32.67

Type	Species	Nested Frequency				Average Cover %		
		'90	'97	'02	'07	'97	'02	'07
F	<i>Achillea millefolium</i>	a ⁹⁷	a ¹⁰⁹	ab ¹³²	b ¹⁴⁹	2.79	1.88	4.18
F	<i>Agoseris glauca</i>	b ²⁶	ab ¹¹	a ⁵	ab ¹²	.02	.01	.10
F	<i>Agastache urticifolia</i>	-	a ⁷	b ²²	a ⁸	.04	.25	.44
F	<i>Antennaria rosea</i>	-	a ⁵¹	a ⁴⁵	a ⁵²	4.00	3.40	5.22
F	<i>Arabis</i> sp.	a ¹³	a ⁹	a ⁸	-	.02	.02	-
F	<i>Aster</i> sp.	-	a ¹⁸	b ⁴⁴	ab ²⁵	.43	.93	.86
F	<i>Chaenactis douglasii</i>	b ²¹	a ¹	-	-	.00	-	-
F	<i>Chenopodium fremontii</i> (a)	-	-	-	3	-	-	.15
F	<i>Cirsium</i> sp.	-	b ⁷	a ⁻	ab ³	.36	.00	.03
F	<i>Comandra pallida</i>	-	-	a ⁻	a ³	-	.00	.03
F	<i>Collinsia parviflora</i> (a)	-	-	b ¹⁰	a ³	-	.03	.00
F	<i>Crepis acuminata</i>	b ¹⁹	-	-	a ³	-	-	.03
F	<i>Delphinium nuttallianum</i>	a ⁵	a ³	a ¹	-	.06	.03	-
F	<i>Delphinium occidentale</i>	-	-	-	2	-	-	.30
F	<i>Epilobium brachycarpum</i> (a)	-	a ¹⁰	a ⁷	b ³³	.07	.01	.17
F	<i>Eriogonum umbellatum</i>	-	a ⁶	a ⁶	a ⁵	.15	.03	.04
F	<i>Erysimum</i> sp.	9	-	-	-	-	-	-
F	<i>Gayophytum ramosissimum</i> (a)	-	b ⁹⁵	a ¹	-	2.12	.01	-
F	<i>Helianthus annuus</i> (a)	1	-	-	-	-	-	-
F	<i>Helianthella uniflora</i>	16	-	-	-	-	-	-
F	<i>Lathyrus brachycalyx</i>	a ⁹	ab ¹⁷	a ¹⁴	b ³²	1.24	.60	1.81
F	<i>Lactuca serriola</i>	4	-	-	-	-	-	-
F	<i>Linaria dalmatica</i>	-	-	a ¹	a ²	-	.16	.00
F	<i>Lupinus argenteus</i>	b ⁶⁸	a ³¹	ab ⁴⁹	b ⁶⁰	2.46	3.95	3.83
F	<i>Lychnis drummondii</i>	-	-	-	14	-	-	.36
F	<i>Machaeranthera canescens</i>	a ¹	a ⁷	a ⁷	a ³	.07	.04	.03
F	<i>Madia glomerata</i> (a)	-	-	5	6	-	.04	.04
F	<i>Osmorhiza occidentalis</i>	a ¹²	-	-	a ¹	-	-	.06
F	<i>Penstemon</i> sp.	-	13	-	-	.11	-	-
F	<i>Polygonum douglasii</i> (a)	-	b ²⁰⁹	a ¹⁵⁹	a ¹⁷⁸	5.67	1.72	3.62
F	<i>Potentilla</i> sp.	-	a ⁴	-	a ²	.03	-	.00
F	<i>Stellaria jamesiana</i>	-	b ¹²¹	a ²⁵	c ¹⁸¹	1.61	.07	1.68
F	<i>Taraxacum officinale</i>	-	5	-	-	.15	-	-
F	<i>Thalictrum fendleri</i>	a ⁸	a ³	a ⁷	a ⁷	.15	.18	.59
F	<i>Tragopogon dubius</i>	b ¹³	a ¹	ab ²	-	.00	.01	-
F	Unknown forb-perennial	-	5	-	-	.09	-	-

Type	Species	Nested Frequency				Average Cover %		
		'90	'97	'02	'07	'97	'02	'07
F	Viguiera multiflora	_b 197	_a 80	_b 176	_b 158	1.33	5.66	6.34
F	Viola sp.	-	2	-	-	.03	-	-
Total for Annual Forbs		1	314	182	223	7.87	1.81	3.98
Total for Perennial Forbs		518	511	544	722	15.23	17.27	25.97
Total for Forbs		519	825	726	945	23.11	19.09	29.95

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

BROWSE TRENDS --

Management unit 18B, Study no: 20

Type	Species	Strip Frequency			Average Cover %		
		'97	'02	'07	'97	'02	'07
B	Chrysothamnus viscidiflorus viscidiflorus	0	2	1	-	.03	-
B	Prunus virginiana	12	13	12	4.06	5.65	5.28
B	Sambucus racemosa	0	0	1	-	-	.15
B	Symphoricarpos oreophilus	1	1	0	.15	-	-
Total for Browse		13	16	14	4.21	5.69	5.44

CANOPY COVER, LINE INTERCEPT --

Management unit 18B, Study no: 20

Species	Percent Cover	
	'02	'07
Chrysothamnus viscidiflorus viscidiflorus	-	.11
Prunus virginiana	5.80	6.71

BASIC COVER --

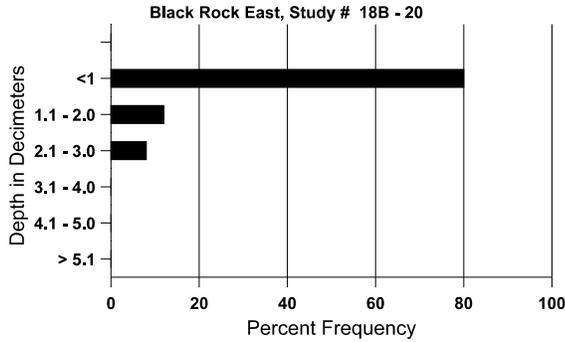
Management unit 18B, Study no: 20

Cover Type	Average Cover %			
	'90	'97	'02	'07
Vegetation	7.75	55.12	54.47	66.22
Rock	11.75	6.25	8.47	3.91
Pavement	16.00	14.37	8.39	10.07
Litter	51.50	42.15	36.38	18.06
Cryptogams	.25	0	.01	.15
Bare Ground	12.75	5.88	9.26	10.61

SOIL ANALYSIS DATA --
Herd Unit 18B, Study no: 20, Black Rock East

Effective rooting depth (in)	Temp °F (depth)	pH	Loam			%OM	ppm P	ppm K	dS/m
			%sand	%silt	%clay				
15.7	50.0 (17.4)	6.4	36.4	46.1	17.5	8.9	43.9	252.8	.4

Stoniness Index



PELLET GROUP DATA --
Management unit 18B, Study no: 20

Type	Quadrat Frequency			
	'90	'97	'02	'07
Elk	-	21	25	26
Deer	-	-	2	-

Days use per acre (ha)	
'02	'07
64 (159)	44 (107)
3 (7)	3 (7)

BROWSE CHARACTERISTICS --
Management unit 18B, Study no: 20

		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 viscidiflorus												
90	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
02	40	-	-	40	-	-	0	0	-	-	0	9/12
07	20	-	-	20	-	-	0	0	-	-	0	9/12
Prunus virginiana												
90	0	-	-	-	-	-	0	0	0	-	0	-/-
97	2120	-	1040	1060	20	140	3	0	1	.94	.94	30/14
02	9960	-	9240	480	240	160	.20	0	2	2	2	34/19
07	5680	-	1160	4480	40	100	6	.70	1	-	0	30/15

		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)
Sambucus racemosa												
90	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
02	0	-	-	-	-	-	0	0	-	-	0	-/-
07	40	-	-	40	-	-	0	0	-	-	0	-/-
Symphoricarpos oreophilus												
90	0	-	-	-	-	-	0	0	-	-	0	-/-
97	20	-	-	20	-	-	0	0	-	-	0	7/5
02	20	-	20	-	-	-	0	0	-	-	0	-/-
07	0	-	-	-	-	-	0	0	-	-	0	-/-