

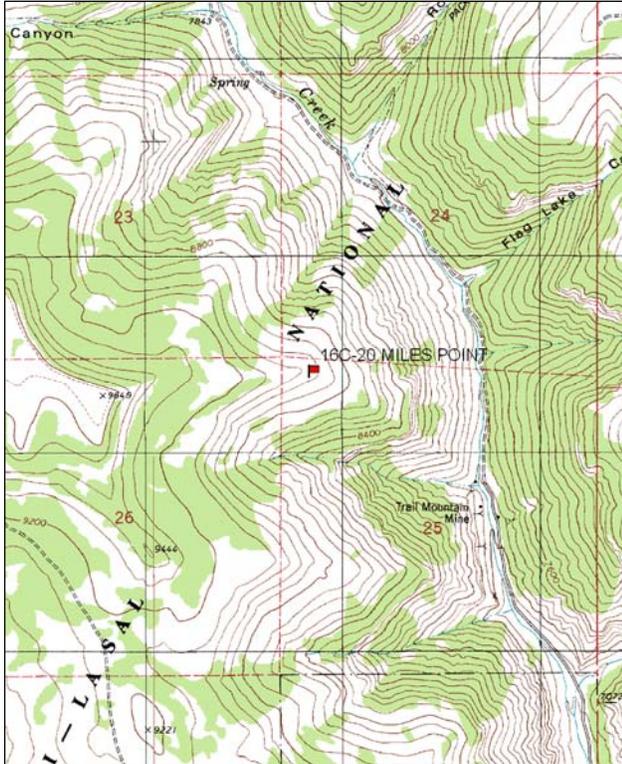
MILES POINT - TREND STUDY NO. 16C-20-09

Vegetation Type: Mountain Big Sagebrush  
Range Type: Crucial Deer Winter, Substantial Elk Winter  
NRCS Ecological Site Description: Not Available  
Land Ownership: USFS  
Elevation: 8,800 ft (2,682 m)  
Aspect: Southeast  
Slope: 30%-35%  
Transect bearing: 112 degrees magnetic.  
Belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft)

Directions:

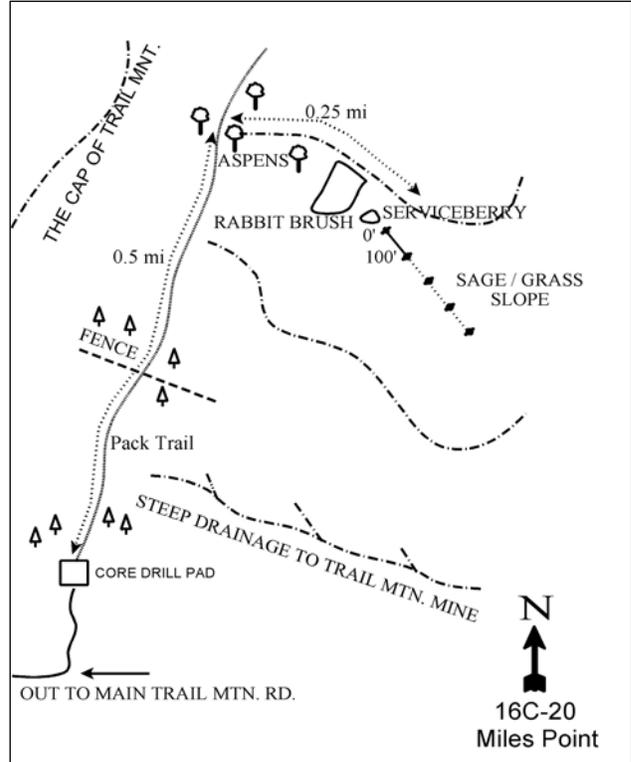
From the pass at the top of the Cottonwood Canyon Road (10.15 miles from Straight Canyon), take the Trail Mountain road southeast for approximately 9.5 miles to the south end of the Cap of Trail Mountain. The study site is to the NE, on the other side of this high cap. A new road takes off to the east from the main road just past the southern point of the cap. Follow this road for 0.65 miles and stop before you enter the thick timber. From here, a pack trail takes off to the north along the edge of Trail Mountain. Follow this trail for about 1/2 miles to an open ridge. Turn east and hike down this ridge to the SE for 1/4 mile. The study is located on a sage-grass slope on the SE side of the ridge. The 0-foot baseline stake, marked by browse tag #9030, is adjacent to a large clump of serviceberry. The area has a view of lower Cottonwood Canyon and the fields in Straight Canyon.

Map Name: Mahogany Point



Township: 17S, Range: 6E, Section: 25

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 482771 E 4352588 N

## MILES POINT - TREND STUDY NO. 16C-20

### Site Information

Site Description: This study is not actually situated on Miles Point, but on a similar sagebrush/grass point above the Trail Mountain mine in Cottonwood Canyon. The study samples a typical high elevation elk winter range, which mule deer use in the summer. The study is on a moderately steep slope (35%) with a southeast aspect. Nearby aspen (*Populus tremuloides*), curlleaf mountain mahogany (*Cercocarpus ledifolius*), and conifer stands show evidence of elk winter use. The study site is in the Trail Mountain summer cattle allotment, but actually receives little use by cattle. Pellet group data has indicated moderate to heavy use by elk and minimal use by deer since 1999. The estimated cattle use was light in 1999 and 2004, but was more moderate in 2009 (Table - Pellet Group Data).

Browse: The dominant browse on site is mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) which provides the majority of the browse cover (Table - Browse Trends). Sagebrush cover along the baseline is higher near the zero foot stake and decreases as you go downhill towards the 400 foot stake. The mountain big sagebrush population has shifted from predominantly young plants in 1988 to a more mature stand with moderate to high decadence in the other sample years. Decadence was very high at 57% in 2004 which is attributed severe drought conditions prior to the 2004 sample year. Utilization has been mostly moderate over the study. Other common shrubs include dwarf rabbitbrush (*Chrysothamnus depressus*), stickyleaf low rabbitbrush (*C. viscidiflorus* ssp. *viscidiflorus*), and snowberry (*Symphoricarpos oreophilus*). Dwarf rabbitbrush displayed consistent moderate to heavy use from 1988 to 2004, but was lighter in 2009. There are a few scattered Utah serviceberry (*Amelanchier utahensis*) plants that have shown heavy use, but good vigor, since 2004 (Table - Browse Characteristics).

Herbaceous Understory: Grasses are abundant, but not very diverse on the site. Bluebunch wheatgrass (*Agropyron spicatum*) and Salina wildrye (*Elymus salina*) provide nearly all of the herbaceous understory cover. Other grass species are rare. Forbs are rare and produce little cover. Timber poisonvetch (*Astragalus convallarius*) is the most common species (Table - Herbaceous Trends).

Soil: The soil texture is a clay loam with a slightly alkaline pH (Table - Soil Analysis Data). Soil parent material is limestone with rocks common within the profile. The slope of the site is high, but bare ground cover is low due to good herbaceous vegetation, litter, rock, and pavement cover (Table - Basic Cover). The soil erosion condition was classified as stable in 2004 and 2009.

### Trend Assessments

#### Browse:

- **1988 to 1994 - stable (0):** Differences in density may be related to the larger sample area used in 1994; therefore, trend was determined using other parameters. The mountain big sagebrush population appears to be maturing with a large increase in decadence and a decrease in the recruitment of young plants.
- **1994 to 1999 - slightly up (+1):** There was a 6% increase in the density of sagebrush from 3,600 plants/acre to 3,840 plants/acre and cover increased from 13% to 16%. Decadence of sagebrush decreased from 21% to 14% and recruitment of young sagebrush plants increased from 6% to 9%. The density of dwarf rabbitbrush increased 60% from 920 plants/acre to 1,480 plants/acre.
- **1999 to 2004 - down (-2):** Density of mountain big sagebrush decreased by 45% to 2,120 plants/acre and cover decreased to 9%. Decadence of sagebrush increased to 57% and poor vigor increased from 8% to 25%. Recruitment of young sagebrush plants decreased to 4%.
- **2004 to 2009 - up (+2):** The density of mountain big sagebrush increased 28% to 2,720 plants/acre and cover increased to 12%. Decadence and poor vigor of sagebrush decreased, but remained fairly high at 29% and 20%, respectively. Recruitment of young sagebrush increased to 6%.

Grass:

- **1988 to 1994 - up (+2):** The sum of nested frequency of perennial grasses increased by 26% with a significant increase in the nested frequency of Salina wildrye.
- **1994 to 1999 - stable (0):** There was no change in the sum of nested frequency of perennial grasses, but composition changed with a significant increase in the nested frequency of bluebunch wheatgrass and a significant decrease in Salina wildrye.
- **1999 to 2004 - slightly down (-1):** Perennial grass sum of nested frequency decreased by 12% and cover decreased from 24% to 19%. Bluebunch wheatgrass decreased significantly in nested frequency.
- **2004 to 2009 - stable (0):** There was a 9% increase in the sum of nested frequency of perennial grasses and cover increased to 24%. Salina wildrye increased significantly in nested frequency.

Forb:

- **1988 to 1994 - down (-2):** There was an 88% decrease in the sum of nested frequency of perennial forbs with a significant decrease in the nested frequency of looseflower milkvetch. Forbs are now very rare on the site.
- **1994 to 1999 - slightly up (+1):** The sum of nested frequency of perennial forbs doubled, but forbs remain rare. Cover of perennial forbs increased to over 1%.
- **1999 to 2004 - slightly down (-1):** Perennial forb sum of nested frequency decreased by 31% and cover decreased to less than 1%. Forbs remain very rare.
- **2004 to 2009 - stable (0):** There was little change in forb sum of nested frequency or cover.

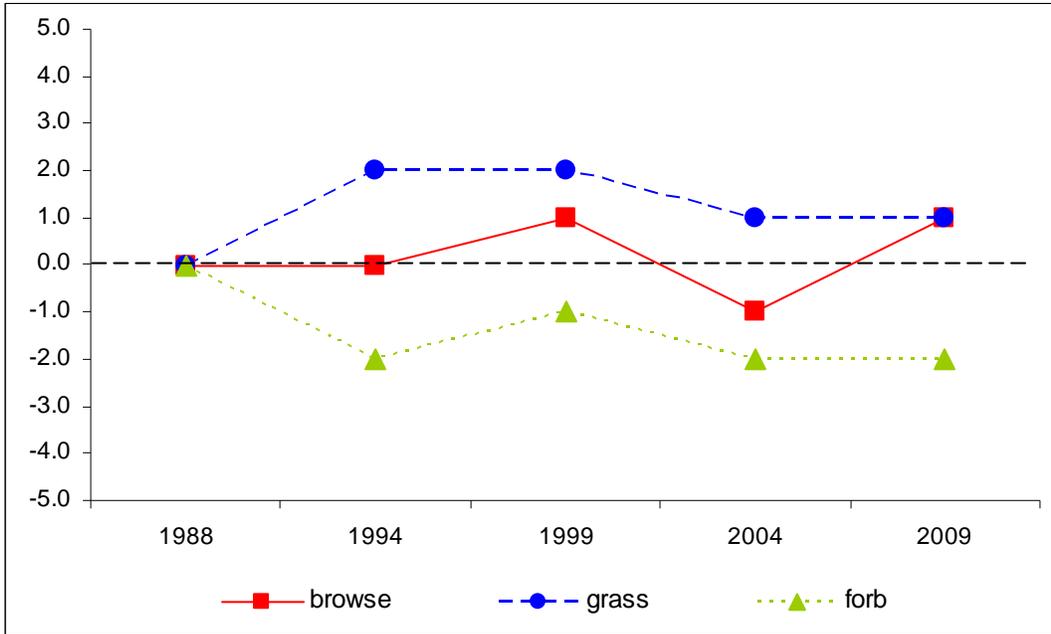
DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --

Management unit 16C, study no: 20

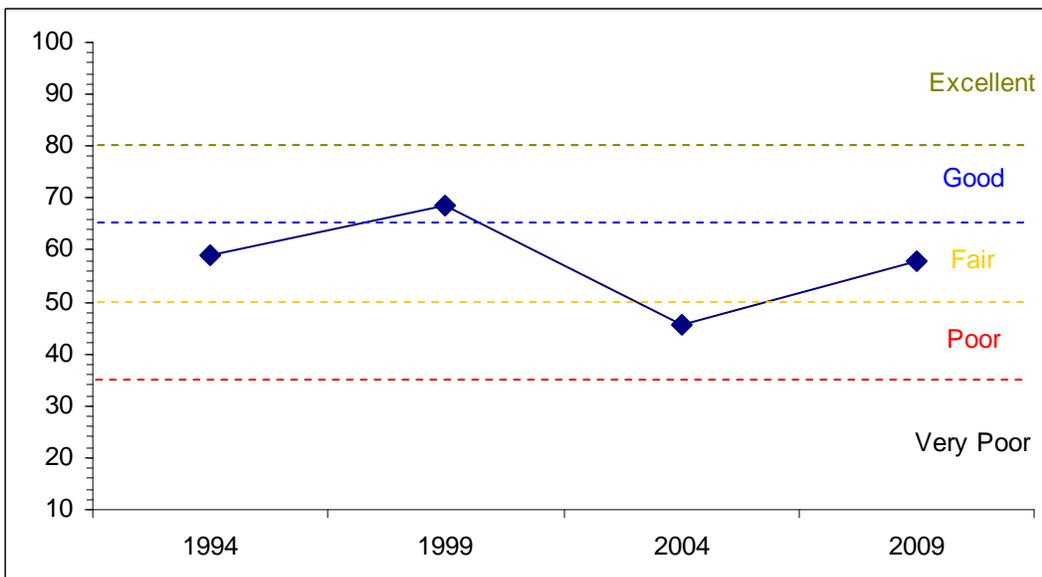
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
94	17.1	9.0	2.8	30.0	0.0	0.1	0.0	<b>59.0</b>	Fair
99	21.0	10.9	4.3	30.0	0.0	2.3	0.0	<b>68.5</b>	Good
04	12.8	-0.5	2.5	30.0	0.0	0.8	0.0	<b>45.6</b>	Poor
09	17.4	7.0	2.8	30.0	0.0	0.6	0.0	<b>57.7</b>	Fair

## Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--  
 Management unit 16C Study no: 20



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL  
 Management unit 16C, Study no: 20



HERBACEOUS TRENDS--  
Management unit 16C, Study no: 20

T y p e	Species	Nested Frequency					Average Cover %			
		'88	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron spicatum	<sub>a</sub> 212	<sub>ab</sub> 234	<sub>c</sub> 313	<sub>b</sub> 271	<sub>b</sub> 249	14.05	19.32	15.14	16.00
G	Elymus salina	<sub>ab</sub> 64	<sub>c</sub> 123	<sub>a</sub> 59	<sub>a</sub> 47	<sub>bc</sub> 107	8.85	3.98	3.20	7.50
G	Poa fendleriana	7	12	6	9	7	.03	.09	.04	.34
G	Stipa lettermani	21	15	6	13	7	.13	.18	.62	.07
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		304	384	384	340	370	23.06	23.57	19.01	23.91
Total for Grasses		304	384	384	340	370	23.06	23.57	19.01	23.91
F	Androsace septentrionalis (a)	-	-	3	-	-	-	.00	-	-
F	Aster sp.	2	2	-	2	3	.00	-	.01	.01
F	Astragalus convallarius	<sub>b</sub> 147	<sub>a</sub> 14	<sub>a</sub> 29	<sub>a</sub> 22	<sub>a</sub> 17	.04	.77	.33	.13
F	Astragalus sp.	-	-	3	-	-	-	.03	-	-
F	Calochortus nuttallii	1	2	1	-	-	.00	.01	-	-
F	Castilleja linariaefolia	<sub>b</sub> 13	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	-	-	-	-
F	Chaenactis douglasii	-	-	5	3	-	-	.03	.00	-
F	Cirsium neomexicanum	4	-	2	-	-	-	.03	-	-
F	Crepis acuminata	7	-	-	-	-	-	-	-	-
F	Cymopterus sp.	-	-	-	3	3	-	-	.00	.00
F	Hedysarum boreale	-	-	2	-	2	-	.15	-	.03
F	Hymenoxys richardsonii	-	-	-	-	2	.00	.00	-	.03
F	Machaeranthera canescens	<sub>b</sub> 9	<sub>a</sub> 2	<sub>ab</sub> 4	<sub>ab</sub> 5	<sub>ab</sub> 3	.00	.06	.04	.03
F	Penstemon caespitosus	-	-	5	1	3	-	.06	.00	.03
F	Penstemon sp.	-	-	-	-	1	-	-	-	.00
F	Phlox longifolia	3	-	1	-	-	-	.00	-	-
F	Polygonum douglasii (a)	-	-	-	2	-	-	-	.00	-
F	Schoenrambe linifolia	-	-	-	-	1	-	-	-	.00
F	Tragopogon dubius	4	-	-	-	-	-	-	-	-
F	Unknown forb-perennial	4	3	-	-	-	.00	-	-	-
Total for Annual Forbs		0	0	3	2	0	0	0.00	0.00	0
Total for Perennial Forbs		194	23	52	36	35	0.06	1.15	0.39	0.29
Total for Forbs		194	23	55	38	35	0.06	1.15	0.39	0.29

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

BROWSE TRENDS--

Management unit 16C, Study no: 20

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	Amelanchier utahensis	2	0	1	3	.00	-	.00	.03
B	Artemisia tridentata vaseyana	86	85	64	70	12.65	15.80	9.22	12.48
B	Ceratoides lanata	0	0	0	0	-	-	-	.63
B	Chrysothamnus depressus	12	20	20	22	.84	.79	.84	.70
B	Chrysothamnus nauseosus	0	0	1	3	-	-	.00	.00
B	Chrysothamnus viscidiflorus viscidiflorus	70	67	62	67	2.86	1.28	3.64	3.01
B	Sambucus cerulea	0	1	1	1	.15	.15	.15	.03
B	Symphoricarpos oreophilus	39	39	30	33	2.54	1.69	1.97	1.44
B	Tetradymia canescens	7	8	10	9	.00	.00	.24	.06
Total for Browse		216	220	189	208	19.06	19.73	16.08	18.40

CANOPY COVER, LINE INTERCEPT--

Management unit 16C, Study no: 20

Species	Percent Cover	
	'04	'09
Artemisia tridentata vaseyana	8.89	14.41
Chrysothamnus depressus	1.45	.83
Chrysothamnus viscidiflorus viscidiflorus	5.23	4.19
Symphoricarpos oreophilus	1.76	2.78
Tetradymia canescens	.50	.26

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 16C, Study no: 20

Species	Average leader growth (in)	
	'04	'09
Artemisia tridentata vaseyana	2.9	1.2

BASIC COVER--

Management unit 16C, Study no: 20

Cover Type	Average Cover %				
	'88	'94	'99	'04	'09
Vegetation	13.50	44.13	44.77	36.15	42.62
Rock	3.75	7.74	6.75	9.15	2.42
Pavement	3.50	1.18	6.38	5.17	7.67
Litter	58.75	42.52	43.77	33.15	30.37
Cryptogams	0	.03	.18	.96	.15
Bare Ground	20.50	18.95	16.36	34.59	23.18

SOIL ANALYSIS DATA --

Management unit 16C, Study no: 20, Study Name: Miles Point

Effective rooting depth (in)	pH	clay			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
16.9	7.5	24.7	29.4	45.8	3.1	6	128	0.5

PELLET GROUP DATA--

Management unit 16C, Study no: 20

Type	Quadrat Frequency			
	'94	'99	'04	'09
Rabbit	11	10	29	7
Moose	-	-	1	-
Elk	31	24	36	16
Deer	9	2	4	1
Cattle	-	2	1	4

Days use per acre (ha)		
'99	'04	'09
-	-	-
-	-	-
70 (173)	56 (139)	31 (76)
3 (7)	5 (13)	2 (5)
2 (5)	8 (20)	25 (61)

BROWSE CHARACTERISTICS--

Management unit 16C, Study no: 20

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<i>Amelanchier utahensis</i>									
88	0	0	0	-	-	0	0	0	-/-
94	40	0	100	-	-	0	0	0	33/40
99	0	0	0	-	-	0	0	0	36/20
04	20	0	100	-	-	0	100	0	31/36
09	80	50	50	-	-	25	50	0	29/36
<i>Artemisia tridentata vaseyana</i>									
88	2798	67	26	7	66	33	7	0	22/32
94	3600	6	73	21	-	19	.55	7	21/33
99	3840	9	77	14	100	32	1	8	22/32
04	2120	4	40	57	60	55	25	25	17/27
09	2720	6	65	29	60	35	12	20	17/29
<i>Chrysothamnus depressus</i>									
88	4731	6	80	14	-	42	17	3	3/7
94	920	0	91	9	20	20	22	0	4/8
99	1480	3	91	7	-	18	34	4	4/7
04	2000	0	96	4	-	34	43	0	4/10
09	1460	1	88	11	-	11	4	19	4/9
<i>Chrysothamnus nauseosus</i>									
88	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	-/-
99	0	0	0	-	-	0	0	0	-/-
04	20	0	100	-	-	0	0	0	19/19
09	60	0	100	-	-	0	0	0	20/25
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
88	5665	26	74	0	-	0	0	0	10/12
94	4780	1	97	2	-	.83	0	.83	10/16
99	4100	9	83	8	100	15	0	2	12/15
04	4040	0	98	2	-	7	5	1	9/14
09	4580	5	81	14	20	2	0	40	7/14

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Sambucus cerulea</b>										
88	<b>0</b>	0	0	-	-	0	0	0	-/-	
94	<b>0</b>	0	0	-	-	0	0	0	26/30	
99	<b>20</b>	0	100	-	-	0	0	0	22/24	
04	<b>20</b>	100	0	-	-	0	0	0	31/22	
09	<b>20</b>	0	100	-	-	0	0	0	22/15	
<b>Symphoricarpos oreophilus</b>										
88	<b>1798</b>	67	33	0	199	41	30	4	13/33	
94	<b>1600</b>	4	93	4	-	0	8	1	11/32	
99	<b>1720</b>	16	79	5	20	26	0	2	11/23	
04	<b>1320</b>	3	97	0	-	2	2	0	10/23	
09	<b>2160</b>	22	76	2	60	2	14	19	10/24	
<b>Tetradymia canescens</b>										
88	<b>332</b>	20	80	0	-	40	20	0	7/10	
94	<b>180</b>	0	89	11	-	0	0	0	9/9	
99	<b>320</b>	6	94	0	-	31	0	0	8/9	
04	<b>320</b>	0	94	6	-	63	0	0	9/13	
09	<b>380</b>	5	42	53	-	5	37	11	6/12	