

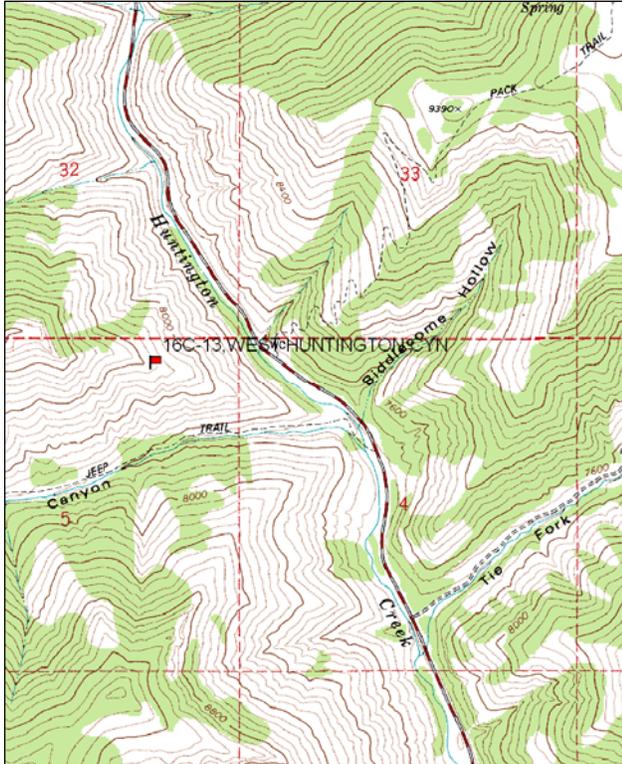
WEST HUNTINGTON CANYON - TREND STUDY NO. 16C-13-09

Vegetation Type: Curleaf Mountain Mahogany
Range Type: Crucial Deer Winter, Crucial Elk Summer
NRCS Ecological Site Description: Not Available
Land Ownership: USFS
Elevation: 7,600 ft (2,316 m)
Aspect: Southeast
Slope: 45%
Transect bearing: 117 degrees magnetic.
Belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft)

Directions:

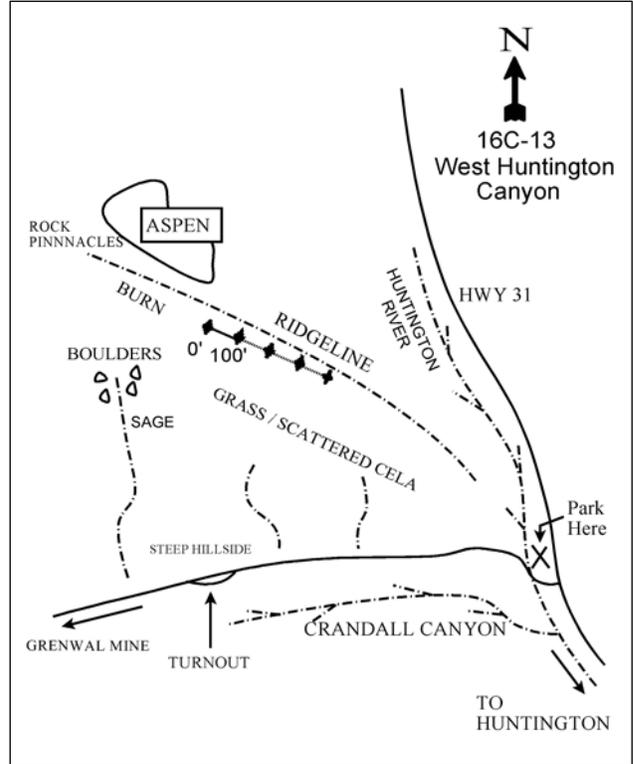
From Highway 31, the Huntington Canyon road, turn onto the Crandall Canyon road. From the turnout, look up the ridge to the north. The study site is on the top of the ridge on the eastern edge of an old burn; now sagebrush/grass and scattered mahogany. The site can be reached by a 1/4 mile hike up the steep rocky face, or a 3/4 mile hike up the ridge starting by the Huntington River. Once the top of the ridge below the rock pinnacles is reached, the study stakes are not difficult to locate. The 0-foot baseline stake is marked by browse tag #902S.

Map Name: Rilda Canyon



Township: 16S, Range: 7E, Section: 5

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 486488 E 4368520 N

WEST HUNTINGTON CANYON - TREND STUDY NO. 16C-13

Site Information

Site Description: The study is located on the west side of Huntington Canyon, along the top of the ridge north of Crandall Canyon. The south-facing slopes and ridge tops in this area are used by elk in the winter. Clumps of aspen (*Populus tremuloides*) higher up the ridge also provide summering habitat for deer. The study is within a curlleaf mountain mahogany (*Cercocarpus ledifolius*) community that burned many years ago. This area does not appear to be used by livestock, probably due to its inaccessibility and lack of water. Pellet group data has indicated light use by deer and very heavy use by elk since 1999, though estimated elk use was considerably lighter in 2009 (Table - Pellet Group Data).

Browse: The dominant overstory on the site consists of a few scattered mature curlleaf mountain mahogany, most of which are large, tree like, and mostly unavailable due to height and highlining. Smaller, more available mahogany sampled on the site are heavily browsed. Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), the key browse species on the site, has provided more than half of the browse coversince 1994. The density of sagebrush has fluctuated slightly, but averaged about 1,500 plants/acre since 1994. The sagebrush population is mostly mature, but healthy with low decadence and good vigor. Recruitment of young sagebrush plants was good from 1988 to 1999, but has been poor since 2004. Sagebrush has been mostly light to moderately browsed over all sampling periods (Table - Browse Characteristics).

Herbaceous Understory: Salina wildrye (*Elymus salina*) is the most abundant grass followed by bluebunch wheatgrass (*Agropyron spicatum*). Combined, the two grasses provide nearly all of the grass cover on the site. Other grasses are extremely rare on the site. It appears that there was an identification problem between bluebunch wheatgrass and Salina wildrye in 1994. Forbs are not abundant and no species are common. There was a large decrease in forb nested frequency from 1999 to 2004.

Soil: The soil is a clay with a slightly alkaline pH. Phosphorus has limited availability for plant growth and development at only 5.5 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Bare ground cover has been fairly low in most sample years except for 2004 when it increased substantially. Protective ground cover is provided primarily by the large bluebunch wheatgrass and Salina wildrye populations, which play a major role in holding the soil in place. For the most part, the soil is moderately protected (Table - Basic Cover). Erosion is inevitable due to the steepness of the slope, but it does not appear to be excessive. The soil erosion condition was classified as moderate in 2004 and 2009 due to severe pedestalling, and soil and litter movement down slope.

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. There was a slight increase in the decadence and poor vigor of the primary browse species, mountain big sagebrush, but both are still good.
- **1994 to 1999 - stable (0):** The density of mountain big sagebrush increased by 15% from 1,520 plants/acre to 1,760 plants/acre, but the density of the preferred browse species, curlleaf mountain mahogany, decreased by nearly half from 260 plants/acre to 140 plants/acre. Cover of sagebrush increased from 4% to 9%, but no there was no measurable cover from mahogany. The recruitment of young sagebrush plants increased from 8% to 13% of the population.
- **1999 to 2004 - down (-2):** The density of sagebrush decreased by 28% from to 1,260 plants/acre, and mahogany continued to decrease in density. Cover of sagebrush decreased to 5% and recruitment of young sagebrush plants was poor at only 3%.

- **2004 to 2009 - up (+2):** The density of sagebrush increased 34% to 1,700 plants/acre, though cover remained similar. Recruitment of young sagebrush plants decreased to only 1%.

Grass:

- **1988 to 1994 - slightly down (-1):** There was a 17% decrease in the sum of nested frequency of perennial grasses. It appears there were identification problems between Salina wildrye and bluebunch wheatgrass.
- **1994 to 1999 - stable (0):** There was a slight increase in the sum of nested frequency of perennial grasses and cover increased from 14% to 22%.
- **1999 to 2004 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 18%, though cover remained similar. There was a significant decrease in the nested frequency of Salina wildrye.
- **2004 to 2009 - slightly up (+1):** The sum of nested frequency of perennial grasses increased by 15% and cover increased from 23% to 29%.

Forb:

- **1988 to 1994 - up (+2):** There was more than a two-fold increase in the sum of nested frequency of perennial forbs due primarily to a significant increase in the nested frequency of aster (*Aster sp.*).
- **1994 to 1999 - stable (0):** There was a 9% increase in the sum of nested frequency of perennial forbs and cover increased from 2% to 4%.
- **1999 to 2004 - down (-2):** The sum of nested frequency of perennial forbs decreased by 44% and cover decreased to less than 1%.
- **2004 to 2009 - stable (0):** There was little change in the sum of nested frequency of perennial forbs, though cover increased to over 1%.

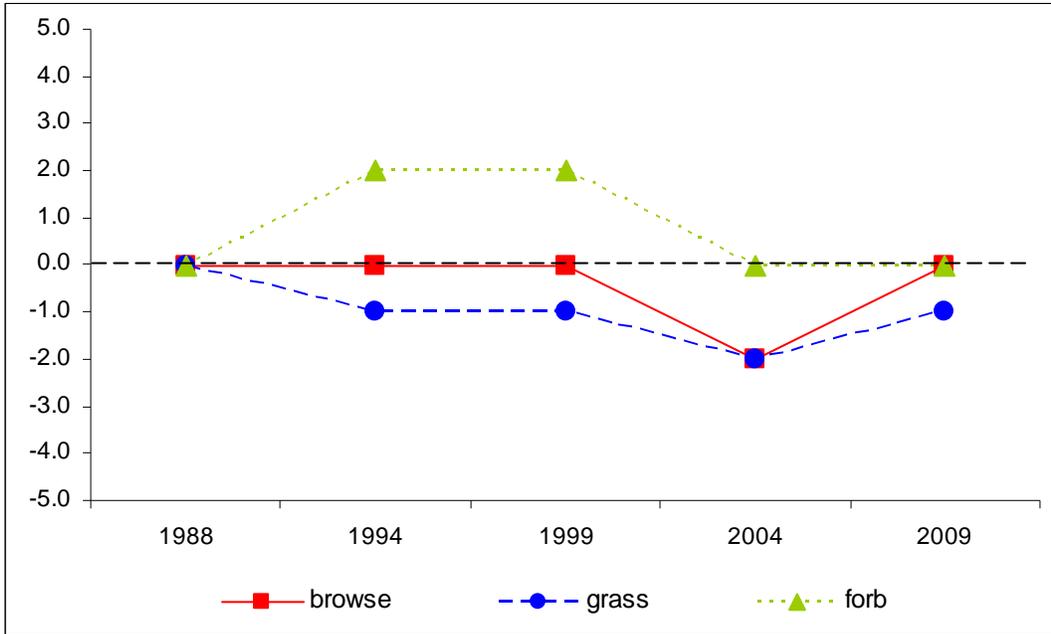
DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --

Management unit 16C, study no: 13

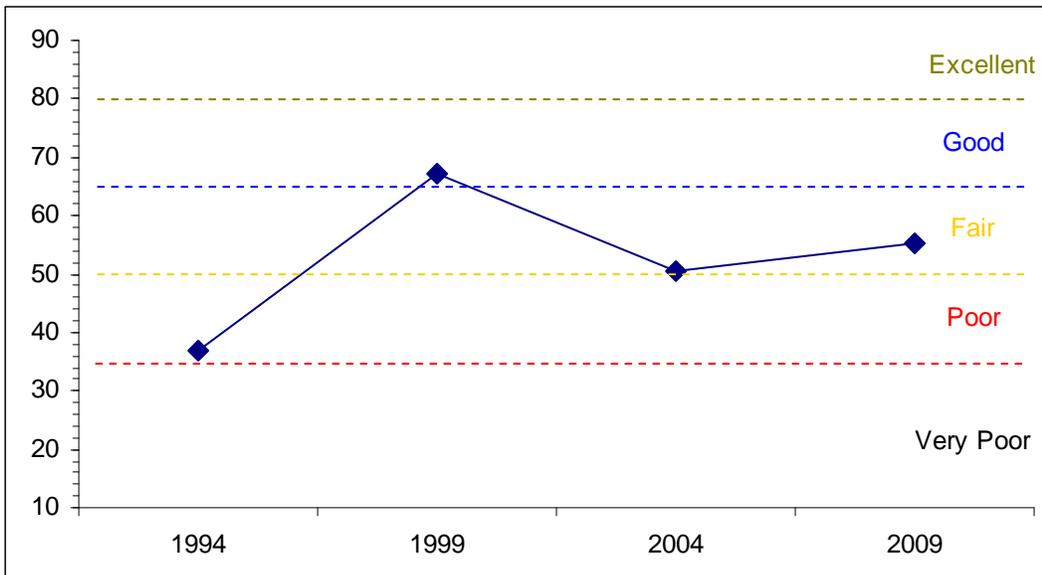
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
94	5.5	0.0	0.0	28.0	0.0	3.5	0.0	37.0	Poor
99	10.7	12.3	6.5	30.0	0.0	7.7	0.0	67.2	Good
04	6.6	10.3	1.8	30.0	0.0	1.7	0.0	50.4	Poor-Fair
09	7.7	10.7	4.0	30.0	0.0	3.0	0.0	55.3	Fair

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
 Management unit 16C Study no: 13



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL
 Management unit 16C, Study no: 13



HERBACEOUS TRENDS--

Management unit 16C, Study no: 13

Type	Species	Nested Frequency					Average Cover %			
		'88	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron spicatum	ab40	c194	b68	a15	ab49	10.87	2.84	.34	2.87
G	Bromus tectorum (a)	-	-	-	3	-	-	-	.00	-
G	Carex sp.	b15	a5	a5	a4	ab14	.03	.06	.03	.13
G	Elymus salina	c279	a80	b229	bc232	b225	3.08	19.46	22.56	25.56
G	Koeleria cristata	-	-	2	-	-	-	.00	-	-
G	Poa pratensis	-	-	1	-	1	-	.06	-	.03
Total for Annual Grasses		0	0	0	3	0	0	0	0.00	0
Total for Perennial Grasses		334	279	305	251	289	13.98	22.43	22.93	28.60
Total for Grasses		334	279	305	254	289	13.98	22.43	22.93	28.60
F	Achillea millefolium	a-	a2	b9	a2	ab3	.03	.23	.03	.03
F	Alyssum alyssoides (a)	-	-	-	2	-	-	-	.00	-
F	Antennaria microphylla	-	3	-	-	-	.03	-	-	-
F	Artemisia ludoviciana	-	3	6	3	5	.15	.07	.04	.06
F	Aster sp.	ab39	c76	c73	a45	ab12	1.02	2.49	.68	.22
F	Astragalus convallarius	a2	ab12	b19	a2	ab8	.07	.88	.03	.21
F	Astragalus sp.	-	4	-	-	-	.18	-	-	-
F	Chaenactis douglasii	-	4	-	-	-	.01	-	-	-
F	Chenopodium album (a)	-	2	-	9	-	.00	-	.05	-
F	Cirsium sp.	-	1	-	-	-	.03	.00	-	-
F	Comandra pallida	a-	a-	a-	a-	b31	-	-	-	.77
F	Descurainia pinnata (a)	-	a-	a-	b59	a2	-	-	.15	.00
F	Hymenoxys richardsonii	1	-	-	-	2	-	-	-	.15
F	Ipomopsis aggregata	-	-	1	-	-	-	.00	-	-
F	Lappula occidentalis (a)	-	a-	a-	b30	a-	-	-	.17	-
F	Machaeranthera canescens	4	5	11	1	3	.22	.13	.01	.03
F	Phlox longifolia	a-	ab6	b11	b15	a-	.01	.02	.05	-
F	Sanguisorba minor	-	-	-	-	-	-	.00	-	-
F	Schoenocrambe linifolia	-	3	-	5	4	.00	-	.01	.01
F	Taraxacum officinale	1	-	-	-	-	-	-	-	-
Total for Annual Forbs		0	2	0	100	2	0.00	0	0.38	0.00
Total for Perennial Forbs		47	119	130	73	68	1.77	3.86	0.87	1.48
Total for Forbs		47	121	130	173	70	1.78	3.86	1.25	1.49

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

BROWSE TRENDS--

Management unit 16C, Study no: 13

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	Artemisia tridentata vaseyana	44	49	39	40	4.25	8.53	5.19	5.34
B	Cercocarpus ledifolius	7	5	4	3	.15	.00	.06	.03
B	Chrysothamnus nauseosus	0	0	1	0	-	-	.03	-
B	Chrysothamnus viscidiflorus viscidiflorus	1	4	2	6	.00	.30	.15	.18
B	Gutierrezia sarothrae	0	2	2	3	-	.03	.03	.00
B	Juniperus osteosperma	0	0	1	1	.63	-	.41	.38
B	Mahonia repens	65	60	69	70	2.47	3.85	1.87	3.01
B	Pachistima myrsinites	1	2	2	4	.00	.09	.03	.03
B	Rosa woodsii	0	0	0	1	-	-	-	.00
B	Sambucus cerulea	0	2	1	2	-	.00	.00	.63
B	Symphoricarpos oreophilus	6	5	3	6	.06	.53	.18	.53
Total for Browse		124	129	124	136	7.58	13.34	7.98	10.14

CANOPY COVER, LINE INTERCEPT--

Management unit 16C, Study no: 13

Species	Percent Cover	
	'04	'09
Artemisia tridentata vaseyana	7.36	7.76
Gutierrezia sarothrae	.03	-
Juniperus osteosperma	.15	-
Mahonia repens	1.96	3.45
Sambucus cerulea	.16	.61

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 16C, Study no: 13

Species	Average leader growth (in)	
	'04	'09
Artemisia tridentata vaseyana	2.2	1.2
Cercocarpus ledifolius	5.4	2.6

BASIC COVER--

Management unit 16C, Study no: 13

Cover Type	Average Cover %				
	'88	'94	'99	'04	'09
Vegetation	10.25	24.57	40.22	32.04	42.73
Rock	10.00	9.04	10.68	10.93	7.03
Pavement	1.25	1.21	5.88	6.56	5.14
Litter	53.00	32.40	33.01	25.82	31.55
Cryptogams	0	.04	.00	.00	.00
Bare Ground	25.50	30.77	25.76	40.09	25.17

SOIL ANALYSIS DATA --

Management unit 16C, Study no: 13, Study Name: West Huntington Canyon

Effective rooting depth (in)	pH	clay			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
16.3	7.4	23.3	32.2	44.6	3.2	5.5	99.2	0.7

PELLET GROUP DATA--

Management unit 16C, Study no: 13

Type	Quadrat Frequency				Days use per acre (ha)		
	'94	'99	'04	'09	'99	'04	'09
Rabbit	13	7	-	4	-	-	-
Elk	47	54	39	31	96 (237)	131 (322)	40 (98)
Deer	4	6	3	7	10 (25)	27 (66)	3 (7)

BROWSE CHARACTERISTICS--

Management unit 16C, Study no: 13

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia tridentata vaseyana</i>										
88	3464	58	37	6	1599	2	0	4	13/21	
94	1520	8	79	13	-	18	1	9	20/32	
99	1760	13	78	9	40	39	8	1	16/24	
04	1260	3	81	16	300	30	13	10	12/22	
09	1700	1	82	16	-	12	13	9	14/30	
<i>Ceratoides lanata</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	15/17	
<i>Cercocarpus ledifolius</i>										
88	66	100	0	-	-	100	0	0	-/-	
94	260	69	31	-	-	0	0	0	27/18	
99	140	43	57	-	-	43	43	0	15/14	
04	100	60	40	-	-	20	80	0	17/17	
09	80	0	100	-	-	100	0	0	13/15	
<i>Chrysothamnus nauseosus</i>										
88	0	0	0	0	-	0	0	0	-/-	
94	0	0	0	0	-	0	0	0	11/15	
99	0	0	0	0	-	0	0	0	29/53	
04	20	0	0	100	-	0	0	0	19/53	
09	0	0	0	0	-	0	0	0	27/27	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Chrysothamnus viscidiflorus viscidiflorus</i>										
88	132	50	50	0	-	0	0	0	10/10	
94	20	0	100	0	-	0	0	0	10/15	
99	120	0	100	0	-	0	0	0	9/14	
04	40	0	100	0	-	0	0	0	7/18	
09	200	0	60	40	-	0	0	50	11/16	
<i>Gutierrezia sarothrae</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	80	0	100	-	-	0	0	0	8/12	
04	60	0	100	-	-	0	0	0	7/8	
09	80	0	100	-	-	0	0	0	10/12	
<i>Juniperus osteosperma</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	20	100	0	-	-	0	0	0	-/-	
09	20	100	0	-	-	0	0	0	-/-	
<i>Mahonia repens</i>										
88	43466	22	78	-	12666	0	0	0	5/4	
94	16740	7	93	-	-	0	0	0	9/12	
99	19420	31	69	-	260	.20	0	0	4/5	
04	20400	1	99	-	-	0	0	0	3/5	
09	29960	6	94	-	-	0	0	.06	3/5	
<i>Pachistima myrsinites</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	20	0	100	-	-	0	0	0	3/2	
99	60	100	0	-	-	0	0	0	9/9	
04	40	0	100	-	20	0	0	0	6/7	
09	120	0	100	-	-	0	0	0	3/6	
<i>Rosa woodsii</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	20	0	100	-	-	0	0	0	5/7	
<i>Sambucus cerulea</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	40/52	
99	240	67	33	-	-	0	0	0	57/68	
04	20	0	100	-	-	0	100	0	47/45	
09	60	67	33	-	-	0	0	0	13/33	

		Age class distribution						Utilization	
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Symphoricarpos oreophilus									
88	199	100	0	0	-	0	0	0	-/-
94	160	0	100	0	-	0	0	0	11/26
99	100	0	100	0	-	0	0	0	14/26
04	80	0	75	25	-	0	0	25	11/26
09	160	25	75	0	-	0	0	0	10/20