

HUNTINGTON CANYON - TREND STUDY NO. 16B-21-09

Vegetation Type: Perennial Grass

Range Type: Crucial Deer Spring/Fall, Crucial Elk Winter

NRCS Ecological Site Description: Not Available

Land Ownership: DWR

Elevation: 8,880 ft (2,707 m)

Aspect: Southwest

Slope: 35% -> 50%

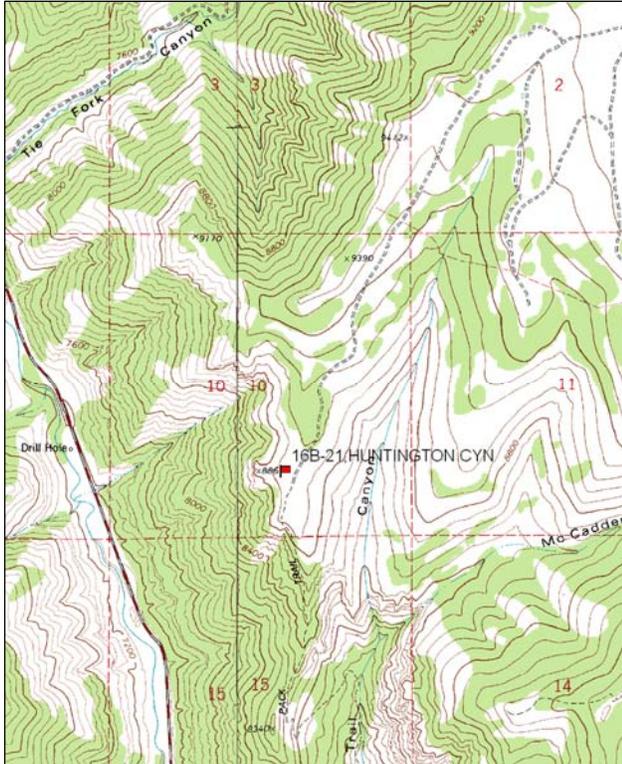
Transect bearing: Line 1 235°M, Lines 2-4 248°M

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

Directions:

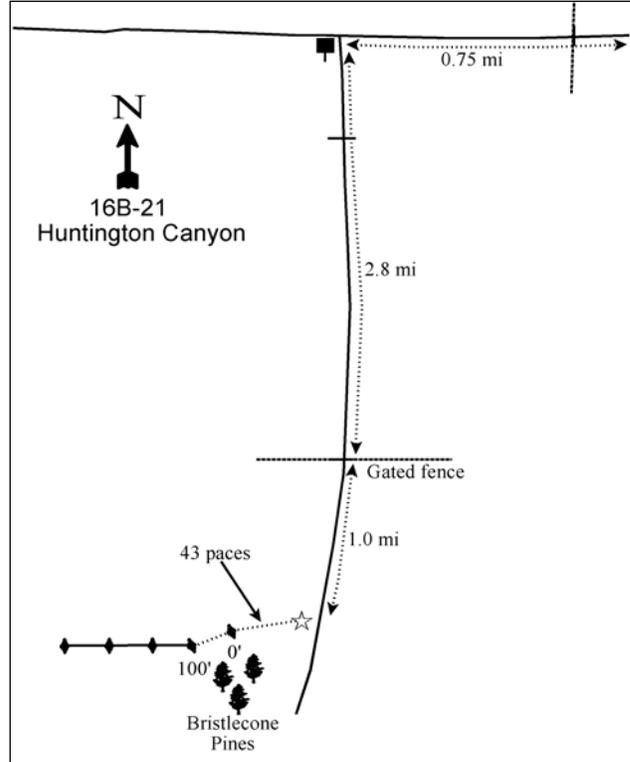
From the ghost town of Mohrland, proceed past the coal loadout and up Cedar Creek. Go 4.5 miles to the top of Gentry Mountain and a three-way junction. Take the middle road (#252) and go 0.1 mile to a fence and cattleguard at the Forest Boundary. Continue 0.65 miles to a fork with a sign, and turn right toward McCadden Hollow. Go 0.7 miles to a cattleguard. Continue 2.1 miles on the main road, passing a few minor forks, to a gated fence. Continue down the road for one mile. There is a witness post on the right. Walk west from the road 43 paces to the edge by a patch of bristlecone pine. The 0' stake is just north of these trees.

Map Name: Hiawatha



Township: 16S, Range: 7E, Section: 10

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 489415 E 4365800 N

HUNTINGTON CANYON - TREND STUDY NO. 16B-21

Site Information

Site Description: The study samples a very steep slope on the east side of Huntington Canyon dominated by Salina wildrye (*Elymus salina*). The windswept ridge tops and steep side hills are important winter range for the elk on Gentry Mountain. Adjacent stands of curlleaf mountain mahogany (*Cercocarpus ledifolius*) have shown signs of heavy elk use in the past. Although mahogany provides good thermal cover, much of the forage is unavailable because the mature trees are highlined. Pellet group transect indicated heavy elk use in 1999 and 2004, but use decreased slightly to moderate use in 2009. Estimated cattle use has been light since 2004 and deer use has been minimal since 1999, with no deer sign sampled in 2009 (Table - Pellet Group Data).

Browse: There is little browse directly on the study transect. There is a patch of curlleaf mahogany next to the study that has shown evidence of heavy browsing in the past. Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) is also found on the site in low cover (Table - Browse Trends) and density. The mountain big sagebrush population is mostly mature with a high amount of decadence and poor vigor. Utilization of mountain big sagebrush has been mostly light with some years of moderate use. The most numerous shrubs on the site are broom snakeweed (*Gutierrezia sarothrae*) and fringed sagebrush (*Artemisia frigida*) (Table - Browse Characteristics).

Herbaceous Understory: Salina wildrye dominates the community with an average cover of nearly 13% since 1994. Wildrye is also the only grass species of note on the site. Perennial forbs are somewhat diverse, but are not abundant. The perennial forb cover has increased and decreased markedly since 1994, and provided less than 2% cover in 2009 (Table - Herbaceous Trends).

Soil: The soil is very rocky on the surface with rock and pavement fragments loose and easily dislodged downslope. Soil texture is a clay loam with a slightly alkaline pH and has a moderately deep effective rooting depth. Both potassium and phosphorus are limiting to plant growth and development (Table - Soil Analysis Data). Bare ground cover has been low to moderate with high amounts of rock and pavement cover over the sample years (Table - Basic Cover). The soil erosion condition was classified as slight in 2004 and 2009 due to soil and surface litter movement, and flow patterns.

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 no change in decadence or vigor of mountain big sagebrush. Recruitment of young mountain big sagebrush plants decreased with no young plants sampled.
- **1994 to 1999 - slightly up (+1):** Density of the key browse species, mountain big sagebrush, increased slightly from 560 plants/acre to 820 plants/acre, and cover increased from just over 2% to 5%. Decadence of mountain big sagebrush increased from 7% to 20% and recruitment of young plants remained low. Fringed sagebrush also increased in density and cover.
- **1999 to 2004 - slightly down (-1):** The density of mountain big sagebrush decreased 17% to 620 plants/acre. Decadence of mountain big sagebrush increased to 44% and plants displaying poor vigor increased from 2% to 32%. There was a large increase in the density of fringed sagebrush, but a decrease in cover.
- **2004 to 2009 - stable (0):** There was little to no change in the mountain big sagebrush population. Fringed sagebrush density and cover decreased slightly.

Grass:

- **1988 to 1994 - slightly up (+1):** The sum of nested frequency of perennial grasses increased by 17%.
- **1994 to 1999 - stable (0):** There was little change in cover or the sum of nested frequency of perennial grasses.
- **1999 to 2004 - stable (0):** There was little change in cover or the sum of nested frequency of perennial grasses.
- **2004 to 2009 - stable (0):** There was little change in cover or the sum of nested frequency of perennial grasses.

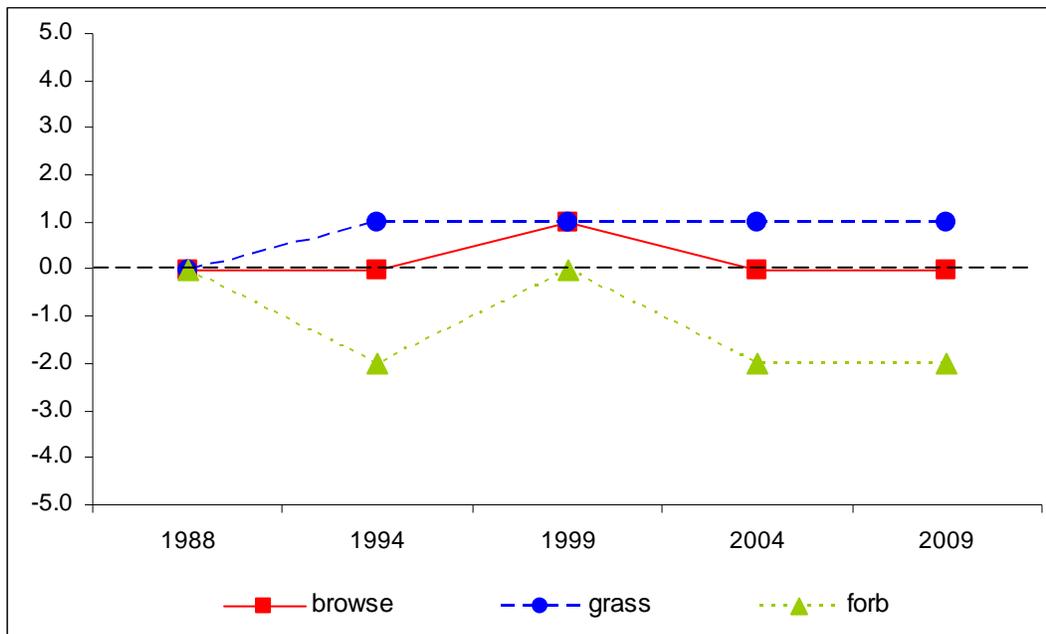
Forb:

- **1988 to 1994 - down (-2):** There was a 33% decrease in the sum of nested frequency of perennial forbs.
- **1994 to 1999 - up (+2):** The sum of nested frequency of perennial forbs increased to 1988 levels and cover increased from 3% to 9%.
- **1999 to 2004 - down (-2):** The sum of nested frequency of perennial forbs decreased by 45% and cover decreased to less than 2%.
- **2004 to 2009 - stable (0):** There was little change in cover of the sum of nested frequency of perennial forbs.

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--

Management unit 16B, Study no: 21



HERBACEOUS TRENDS--

Management unit 16B, Study no: 21

Type	Species	Nested Frequency					Average Cover %			
		'88	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron intermedium	-	3	-	-	-	.00	-	-	-
G	Agropyron spicatum	-	-	-	3	-	-	-	.00	-
G	Elymus salina	222	252	237	236	254	12.20	12.80	12.23	12.78
G	Poa fendleriana	a-	ab12	b17	a2	ab7	.24	.11	.00	.04
G	Poa secunda	-	1	3	1	3	.00	.03	.00	.03
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		222	268	257	242	264	12.45	12.93	12.25	12.86
Total for Grasses		222	268	257	242	264	12.45	12.93	12.25	12.86
F	Agoseris sp.	7	-	-	-	-	-	-	-	-
F	Antennaria microphylla	4	-	-	-	-	-	-	-	-
F	Arenaria fendleri	8	6	-	-	-	.01	-	-	-
F	Astragalus coltoni	b82	a-	a-	a-	a-	-	-	-	-
F	Astragalus convallarius	a-	b9	c97	b19	b24	.12	4.75	.23	.21
F	Astragalus tenellus	ab12	b27	ab9	a2	a3	1.16	.69	.03	.01
F	Chaenactis douglasii	11	2	12	-	-	.00	.06	-	-
F	Cryptantha sp.	-	-	-	2	-	-	-	.00	-
F	Holosteum umbellatum (a)	-	-	-	3	-	-	-	.00	-
F	Hymenopappus filifolius	a-	a-	a-	b15	ab9	-	-	.14	.04
F	Hymenoxys acaulis	c65	ab19	ab17	b28	a5	.05	.16	.14	.01
F	Hymenoxys richardsonii	bc63	d97	cd91	a34	ab48	1.93	1.85	.21	.45
F	Lesquerella sp.	-	-	1	-	-	-	.00	-	-
F	Lupinus sp.	-	-	-	-	3	.00	.06	-	.03
F	Machaeranthera canescens	-	-	-	2	-	-	-	.00	.03
F	Machaeranthera grindelioides	14	19	30	22	29	.17	.98	.34	.42
F	Penstemon sp.	-	1	1	-	2	.01	.00	-	.03
F	Phlox austromontana	a-	a-	ab4	b17	b15	-	.15	.35	.52
F	Phlox longifolia	-	-	-	-	9	-	-	-	.05
F	Streptanthus cordatus	-	-	-	4	-	-	-	.01	-
F	Unknown forb-perennial	1	-	-	-	-	-	-	-	-
Total for Annual Forbs		0	0	0	3	0	0	0	0.00	0
Total for Perennial Forbs		267	180	262	145	147	3.48	8.75	1.47	1.82
Total for Forbs		267	180	262	148	147	3.48	8.75	1.47	1.82

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

BROWSE TRENDS--

Management unit 16B, Study no: 21

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	Artemisia frigida	41	44	53	52	.56	.94	.63	.37
B	Artemisia tridentata vaseyana	17	23	23	23	2.44	5.01	3.20	3.47
B	Cercocarpus ledifolius	6	2	4	7	.01	.15	.00	.03
B	Chrysothamnus nauseosus glabratus	34	20	23	32	.76	.77	1.21	.82
B	Chrysothamnus viscidiflorus viscidiflorus	0	4	7	1	-	.15	.24	.00
B	Eriogonum corymbosum	1	1	1	2	.00	.00	.00	.03
B	Gutierrezia sarothrae	57	38	53	43	1.14	.42	1.04	.78
B	Juniperus osteosperma	0	0	0	0	.15	-	-	-
B	Juniperus scopulorum	0	0	1	2	-	.85	.85	.38
B	Pinus edulis	0	1	0	0	-	.00	-	-
B	Pinus flexilis	0	0	0	0	.53	1.38	2.07	2.74
B	Pseudotsuga menziesii	0	0	0	0	.15	-	.38	-
B	Symphoricarpos oreophilus	3	2	3	3	.15	.45	.45	.66
Total for Browse		159	135	168	165	5.91	10.15	10.10	9.29

CANOPY COVER, LINE INTERCEPT--

Management unit 16B, Study no: 21

Species	Percent Cover		
	'99	'04	'09
Artemisia frigida	-	.88	.35
Artemisia tridentata vaseyana	-	3.93	4.83
Cercocarpus ledifolius	5.19	1.89	3.00
Chrysothamnus nauseosus glabratus	-	1.13	2.08
Chrysothamnus viscidiflorus viscidiflorus	-	-	.08
Eriogonum corymbosum	-	-	.05
Gutierrezia sarothrae	-	1.56	.45
Juniperus scopulorum	-	1.00	1.18
Pinus flexilis	2.20	5.06	4.48
Pseudotsuga menziesii	.60	1.00	-
Symphoricarpos oreophilus	-	1.10	1.13

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 16B, Study no: 21

Species	Average leader growth (in)	
	'04	'09
Artemisia tridentata vaseyana	2.2	1.3
Cercocarpus ledifolius	4.3	1.9

BASIC COVER--

Management unit 16B, Study no: 21

Cover Type	Average Cover %				
	'88	'94	'99	'04	'09
Vegetation	13.25	20.46	34.86	24.12	24.79
Rock	21.75	30.95	18.72	21.60	17.51
Pavement	16.50	6.52	14.21	14.98	8.47
Litter	23.50	22.46	20.60	19.57	27.02
Cryptogams	0	.08	.04	.33	.08
Bare Ground	25.00	33.02	17.42	30.67	29.37

SOIL ANALYSIS DATA --

Management unit 16B, Study no: 21, Study Name: Huntington Canyon

Effective rooting depth (in)	pH	clay loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
16	7.5	36	25.4	38.6	1.6	2.8	64	0.6

PELLET GROUP DATA--

Management unit 16B, Study no: 21

Type	Quadrat Frequency				Days use per acre (ha)		
	'94	'99	'04	'09	'99	'04	'09
Rabbit	7	7	5	5	-	-	-
Elk	29	24	43	36	53 (131)	55 (136)	34 (84)
Deer	4	3	2	4	3 (7)	1 (2)	-
Cattle	-	-	-	2	-	9 (23)	12 (29)

BROWSE CHARACTERISTICS--

Management unit 16B, Study no: 21

		Age class distribution					Utilization		
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Artemisia frigida									
88	1165	57	43	0	166	6	0	0	4/6
94	1720	1	98	1	-	13	0	14	6/7
99	2300	24	76	0	420	20	0	0	8/7
04	4200	4	92	4	-	25	10	1	4/5
09	2660	17	74	8	-	12	14	11	5/5
Artemisia tridentata vaseyana									
88	465	36	57	7	66	0	0	0	19/28
94	560	0	93	7	-	0	0	0	10/22
99	820	5	76	20	-	41	5	2	18/28
04	680	0	56	44	-	65	6	32	14/30
09	700	9	49	43	-	20	11	31	17/36

		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>Cercocarpus ledifolius</i>										
88	433	100	0	-	66	31	62	0	-/-	
94	160	50	50	-	-	0	0	0	33/24	
99	80	75	25	-	20	0	75	0	149/121	
04	120	83	17	-	20	0	83	0	90/93	
09	140	57	43	-	-	14	14	0	24/22	
<i>Chrysothamnus nauseosus glabratus</i>										
88	1164	9	74	17	-	17	0	0	11/13	
94	1180	0	100	0	-	0	0	0	41/34	
99	580	7	86	7	-	0	0	0	17/20	
04	580	3	72	24	20	14	10	14	15/20	
09	780	3	51	46	-	3	0	23	15/20	
<i>Chrysothamnus viscidiflorus viscidiflorus</i>										
88	0	0	0	0	-	0	0	0	-/-	
94	0	0	0	0	-	0	0	0	6/16	
99	160	25	75	0	-	25	0	0	14/18	
04	240	0	75	25	-	8	25	8	9/11	
09	60	0	0	100	-	0	100	100	7/15	
<i>Eriogonum corymbosum</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	20	0	100	-	-	100	0	0	3/14	
99	40	50	50	-	-	0	0	0	6/15	
04	20	0	100	-	-	0	100	0	6/14	
09	40	0	100	-	40	0	0	0	9/19	
<i>Gutierrezia sarothrae</i>										
88	3865	60	36	3	699	4	.86	.86	8/7	
94	3140	10	83	7	-	0	0	4	6/7	
99	1960	8	88	4	100	7	0	1	8/8	
04	3860	1	98	2	-	2	0	2	6/7	
09	1940	1	86	13	-	0	0	5	6/7	
<i>Juniperus osteosperma</i>										
88	33	100	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	-/-	
<i>Juniperus scopulorum</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	-/-	
09	40	50	50	-	-	0	0	0	-/-	

		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>Pinus edulis</i>									
88	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	-/-
99	20	100	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
<i>Pinus longaeva</i>									
88	0	0	0	-	33	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	-/-
<i>Symphoricarpos oreophilus</i>									
88	0	0	0	0	-	0	0	0	-/-
94	80	25	75	0	-	0	0	0	16/48
99	40	0	100	0	40	50	0	0	19/54
04	80	0	100	0	-	0	25	0	15/41
09	180	0	11	89	-	0	100	0	13/43