

Trend Study 24-1-08

Study site name: N. Pole Canyon.

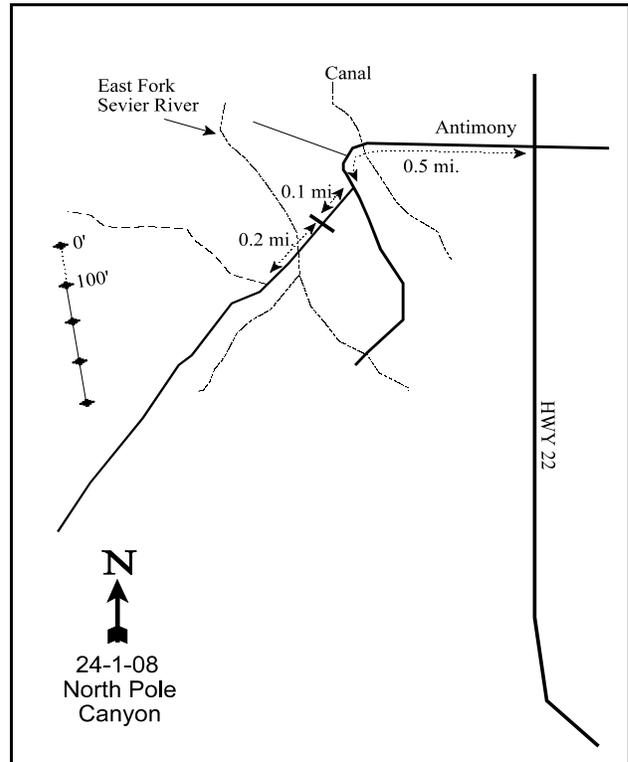
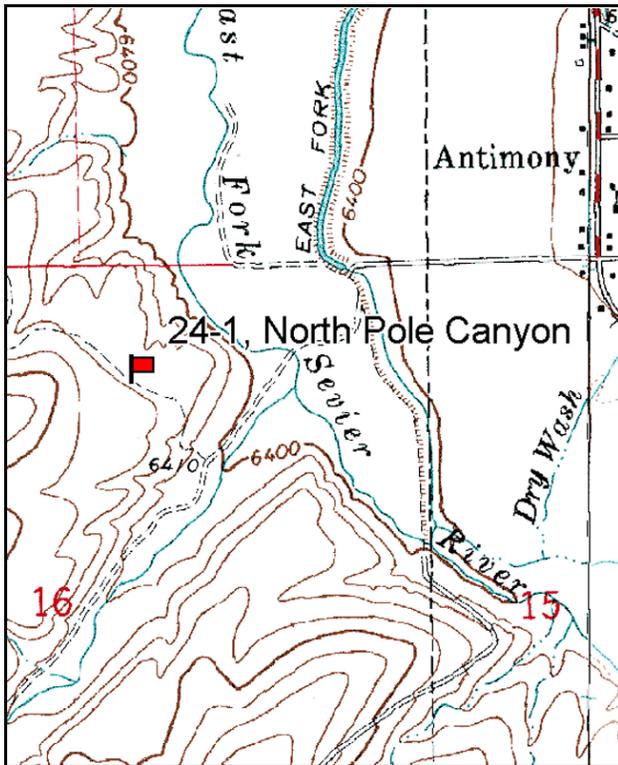
Vegetation type: Wyoming Big Sagebrush.

Compass bearing: frequency baseline 165 degrees magnetic.

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

LOCATION DESCRIPTION

From the town of Antimony, drive west on the Mt. Dutton road for approximately 0.5 mile to a canal and bridge. Just past the canal bridge, turn right, go through a gate and bear left down towards the Sevier River. Go 0.1 mile to another gate. Go through the gate and continue 0.2 miles across a field to the river. The old road is washed out, so cross the river on foot and hike up the hill to the southwest along an old jeep trail. The transect is on top of the hill and starts 20 feet south of the old road. The study is marked by short, green fence posts. There is a browse tag on the 0' stake.



Map Name: Deep Creek

Diagrammatic Sketch

Township 31S, Range 2W, Section 16

GPS: NAD 83, UTM 12S 411216 E 4218943 N

DISCUSSION

North Pole Canyon - Trend Study 24-1

Study Information

This study monitors key mule deer winter range located on a bench one-third mile above the East Fork of the Sevier River and about one-half mile from the town of Antimony [elevation: 6,520 feet (1,987 m), slope: 2%-4%, aspect: east]. Deer concentrate on the bench and utilize forage from adjacent agricultural lands in the valley during the spring and fall. Cattle typically use the area in the spring. This site does not receive much pressure from people since the jeep trail across the East Fork of the Sevier River has been washed out. The only other activities on this bench, outside of wildlife use, are those associated with livestock grazing. Deer use was moderate in 2003 (42 ddu/acre:104 ddu/ha), and light to moderate (21 ddu/acre:51 ddu/ha) in 2008. Pellet group data did not report any use by elk in 2003, but elk use was light in 2008 (5 edu/acre:13 edu/ha). Cattle grazing was estimated to be light to moderate in 2003 and 2008 (20 cdu/acre:48 cdu/ha and 38 cdu/acre:95 cdu/ha, respectively). Deer pellet groups appeared to be from winter use while cattle pats were from the previous grazing years.

Soil

The soil is a sandy clay loam which is neutral in reaction (pH 6.8). Organic matter is limited at 1.3%, the lowest level of all the sites on the unit. Soil on the site is relatively shallow with an effective rooting depth estimated at 12 inches. The soil profile is very rocky with a relative combined rock and pavement covers of 29% in 1997, 30% in 2003, and 21% in 2008. Relative combined vegetation and litter cover was 40% to 54% from 1997 to 2008. The relative bare ground cover remained fairly constant with an average of 29% from 1997 to 2008. The erosion condition rating was classified as stable in 2003 and 2008.

Browse

The key species is Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), which accounts for virtually 100% of the shrub cover. Sagebrush cover has remained steady at 6%-7% from 1997 to 2008. The stand was fairly dense in 1987 with an estimated 5,998 plants/acre. Many of the interspaces were occupied by seedlings (3,433/acre) in 1987. Young plants were also common at that time accounting for 48% of the population. However, sagebrush density dropped by 27% by 1991 to 4,399 plants/acre and the number of decadent plants increased from 9% to 51%. During the 1997 reading, the population remained relatively stable at 4,420 plants/acre. Decadence declined to 12% and recruitment was good with 39% of the population consisting of young plants. Vigor was normal on most plants. Drought conditions in 2003 contributed to a 32% decline in population density to 3,020 plants/acre. Vigor was considered poor on nearly half of the plants sampled (45%), and 80% of the population was classified as decadent. Young plants accounted for only 8% of the population and no new seedlings were encountered. In 2008, the population increased again by 11% to 3,380 plants/acre. However, recruitment was low with young plants still constituting only 8% of the sagebrush population.

Herbaceous Understory

Herbaceous species are lacking in the area. Blue grama (*Bouteloua gracilis*) is the only abundant grass. Blue grama cover has increased steadily from 7% in 1997 to 28% in 2008. It is a warm season species which provides limited forage due to its low growth form. Perennial forbs were nearly absent, but weedy annual forbs consisting of goosefoot (*Chenopodium fremontii*), nodding eriogonum (*Eriogonum cernuum*), and stickseed (*Lappula occidentalis*) were abundant in 1997. Cover of forbs decreased to trace amounts in 2003, and there was no notable cover for any forb species in 2008.

1991 TREND ASSESSMENT

Trend for browse is down. The dominant overstory is Wyoming big sagebrush. Density of sagebrush decreased by 27% to 4,399 plants/acre. Decadence of sagebrush increased from 9% in 2003 to 51%, and

plants displaying poor vigor increased from 11% to 37%. Trend for both grasses and forbs is stable. Grasses sum of nested frequency decreased slightly, but overall were stable on the site. The increase in weedy annual forbs and no desirable forb species is a cause for concern.

browse - down (-2)

grass - stable (0)

forb - stable (0)

1997 TREND ASSESSMENT

Trend for Wyoming big sagebrush is slightly up. Sagebrush density has remained relatively similar to 1991 estimates, however, vigor improved and decadence has decreased to 12%. Trend for the grasses is stable. Sum of nested frequency of perennial grasses has remained similar to 1991. The trend for forbs is slightly down. The sum of nested frequency of forbs increased, however, five of the six forbs encountered in 1997 are weedy annuals consisting of goosefoot, nodding eriogonum, and stickseed. These weedy species accounted for more than 99% of the forb cover. The only perennial forb encountered on the site was Utah milkvetch (*Astragalus utahensis*) which occurred in only 2 of the 100 quadrats.

winter range condition (DCI) - good (49) Low potential scale

browse - slightly up (+1)

grass - stable (0)

forb - slightly down (-1)

2003 TREND ASSESSMENT

Trend for Wyoming big sagebrush is down. Sagebrush density declined 32% from 4,420 plants/acre to 3,020 plants/acre. Nearly half (45%) of the sagebrush sampled displayed poor vigor and 80% of the population was classified as decadent. No seedlings were encountered and young plants accounted for only 8% of the population. These trends appear to be caused primarily by drought conditions which have effected this area for the past few years. Spring precipitation (April - June) has been extremely low between 2000 and 2003, averaging only 40% of normal at the Angle, Utah weather station (Utah climate summaries 2008). The trend for the grasses is up. There was an increase in the warm season perennial grass, blue grama. Blue grama increased in nested frequency and more than doubled in average cover from 7% in 1997 to 18% in 2003. Other grasses are rare in their occurrence. Trend for forbs is slightly up. Forbs remain rare, as well, but the frequency of annual weedy species has also decreased.

winter range condition (DCI) - fair (33) Low potential scale

browse - down (-2)

grass - up (+2)

forb - slightly up (+1)

2008 TREND ASSESSMENT

Trend for Wyoming big sagebrush is slightly up. Sagebrush density has increased 11% to 3,380 plants/acre. Sagebrush plants displaying poor vigor have declined to 15% of the sagebrush population. While still high at 49%, decadence has declined from the high of 80% in 2003. Recruitment has remained low with young plants comprising only 8% of the sagebrush population. The grass trend was stable with blue grama still comprising nearly all of the grass cover and 79% of the vegetative cover. Forb trend was stable, but no forbs detected on the site in 2008.

winter range condition (DCI) - fair (43) Low potential scale

browse - slightly up (+1)

grass - stable (0)

forb - stable (0)

HERBACEOUS TRENDS --
 Management unit 24 , Study no: 1

T y p e	Species	Nested Frequency					Average Cover %		
		'87	'91	'97	'03	'08	'97	'03	'08
G	<i>Bouteloua gracilis</i>	_{ab} 240	_a 210	_a 203	_{ab} 244	_b 275	7.00	18.33	28.21
G	<i>Bromus tectorum</i> (a)	1	-	-	-	-	-	-	-
G	<i>Oryzopsis hymenoides</i>	3	1	-	-	-	.00	-	.01
G	<i>Sitanion hystrix</i>	2	-	-	-	-	-	-	-
G	<i>Sporobolus cryptandrus</i>	_b 15	_{ab} 9	_a 1	_{ab} 12	_{ab} 19	.01	.38	.46
G	<i>Stipa comata</i>	4	-	1	-	9	.00	-	.14
Total for Annual Grasses		1	0	0	0	0	0	0	0
Total for Perennial Grasses		264	220	205	256	303	7.02	18.71	28.83
Total for Grasses		265	220	205	256	303	7.02	18.71	28.83
F	<i>Astragalus utahensis</i>	-	-	2	-	-	.01	-	-
F	<i>Chenopodium fremontii</i> (a)	_a 10	_b 75	_c 194	_a -	_a -	6.01	-	-
F	<i>Chenopodium leptophyllum</i> (a)	-	-	_b 108	_a 1	_a -	1.19	.03	-
F	<i>Eriogonum cernuum</i> (a)	-	3	_b 83	_a 2	_a -	1.09	.03	-
F	<i>Lappula occidentalis</i> (a)	-	-	_b 24	_{ab} 10	_a -	.05	.04	-
F	<i>Salsola iberica</i> (a)	3	-	-	-	-	-	-	-
F	<i>Sphaeralcea grossulariifolia</i>	-	-	-	2	-	-	.03	-
Total for Annual Forbs		13	78	409	13	0	8.35	0.11	0
Total for Perennial Forbs		0	0	2	2	0	0.01	0.03	0
Total for Forbs		13	78	411	15	0	8.36	0.14	0

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

BROWSE TRENDS --

Management unit 24 , Study no: 1

Type	Species	Strip Frequency			Average Cover %		
		'97	'03	'08	'97	'03	'08
B	Artemisia tridentata wyomingensis	75	74	72	6.47	6.05	6.76
B	Ceratoides lanata	0	2	2	-	0.0	0.0
B	Chrysothamnus nauseosus	1	0	0	0.0	-	-
B	Chrysothamnus viscidiflorus	0	1	0	-	.03	-
B	Chrysothamnus viscidiflorus stenophyllus	0	0	1	-	-	.00
B	Sclerocactus sp.	2	0	0	0.0	-	-
Total for Browse		78	77	75	6.47	6.08	6.77

CANOPY COVER, LINE INTERCEPT --

Management unit 24 , Study no: 1

Species	Percent Cover	
	'03	'08
Artemisia tridentata wyomingensis	3.73	10.73
Chrysothamnus depressus	1.28	-

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 24 , Study no: 1

Species	Average leader growth (in)	
	'03	'08
Artemisia tridentata wyomingensis	2.2	0.8

BASIC COVER --

Management unit 24 , Study no: 1

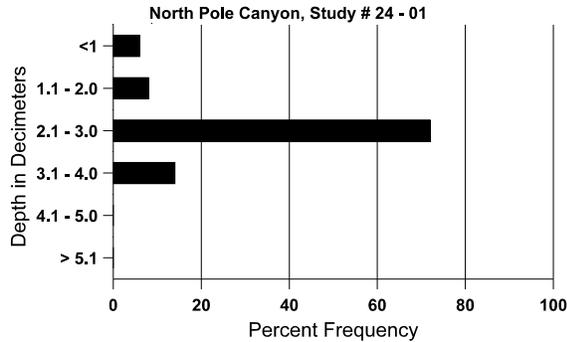
Cover Type	Average Cover %				
	'87	'91	'97	'03	'08
Vegetation	14.50	6.75	21.54	25.59	37.65
Rock	6.75	4.75	7.22	9.19	7.33
Pavement	15.00	16.25	20.33	21.87	15.70
Litter	29.00	38.00	16.26	17.27	21.90
Cryptogams	0	0	.18	.22	.08
Bare Ground	34.75	34.25	29.45	31.46	26.86

SOIL ANALYSIS DATA --

Management unit 24, Study no: 1, Study Name: North Pole Canyon

Effective rooting depth (in)	Temp °F (depth)	pH	sandy clay loam			%OM	PPM P	PPM K	dS/m
			%sand	%silt	%clay				
12.1	67.0 (15.0)	6.8	52.7	22.7	24.6	1.3	12.3	188.8	1.2

Stoniness Index



PELLET GROUP DATA --

Management unit 24 , Study no: 1

Type	Quadrat Frequency			Days use per acre (ha)	
	'97	'03	'08	'03	'08
Rabbit	7	19	57	-	-
Elk	1	-	-	-	5 (13)
Deer	20	15	36	42 (104)	21 (51)
Cattle	5	5	10	20 (48)	38 (95)

BROWSE CHARACTERISTICS --

Management unit 24 , Study no: 1

		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)
Artemisia tridentata wyomingensis												
87	5998	3433	2866	2566	566	-	41	43	9	1	11	13/18
91	4398	133	999	1166	2233	-	17	14	51	22	37	12/19
97	4420	360	1720	2180	520	840	8	.45	12	7	8	18/26
03	3020	-	240	360	2420	1320	28	5	80	43	45	15/20
08	3380	60	260	1460	1660	1080	52	6	49	12	15	15/23

		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)
<i>Ceratoides lanata</i>												
87	132	33	33	99	-	-	50	25	0	-	0	12/2
91	133	-	-	133	-	-	0	50	0	-	0	7/7
97	0	-	-	-	-	-	0	0	0	-	0	-/-
03	40	-	-	20	20	-	0	100	50	-	0	12/10
08	40	-	-	20	20	-	0	100	50	-	0	7/8
<i>Chrysothamnus nauseosus</i>												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
97	80	-	-	80	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Chrysothamnus viscidiflorus</i>												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
03	20	-	-	20	-	-	0	0	-	-	0	6/4
08	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Chrysothamnus viscidiflorus stenophyllus</i>												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	20	-	-	20	-	-	0	0	-	-	0	6/7
<i>Opuntia sp.</i>												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	5/10
<i>Sclerocactus sp.</i>												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
97	60	-	40	20	-	-	0	0	-	-	0	11/11
03	0	-	-	-	-	-	0	0	-	-	0	1/2
08	0	-	-	-	-	-	0	0	-	-	0	-/-