

Trend Study 19A-9-07

Study site name: Rocky Canyon

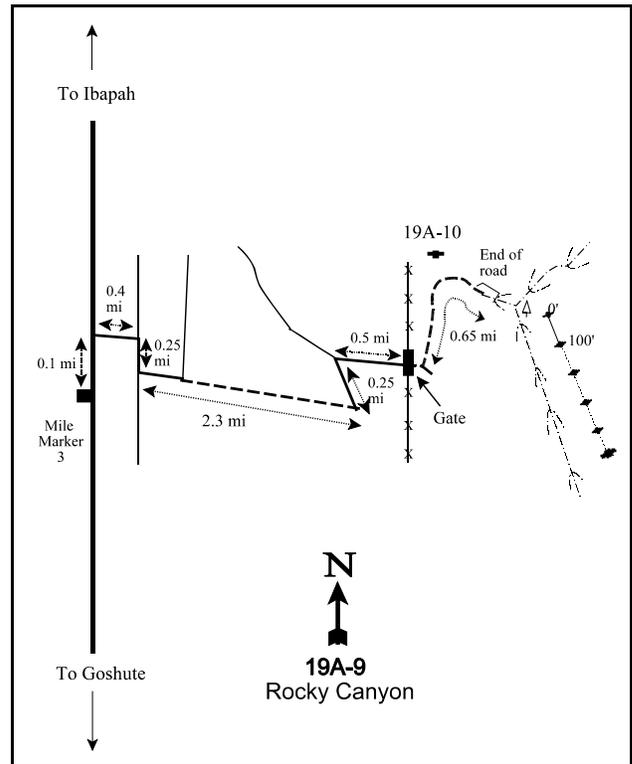
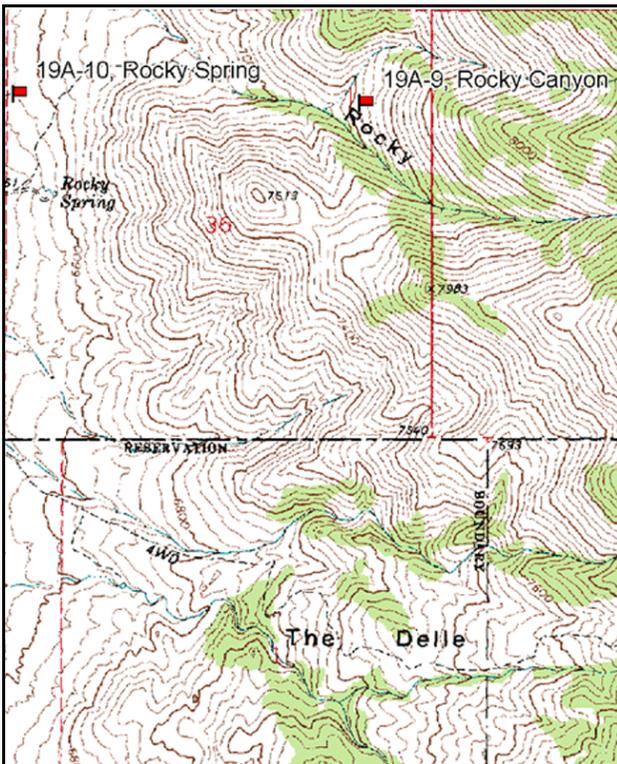
Vegetation type: Mountain Big Sagebrush

Compass bearing: frequency baseline 110 degrees magnetic.

Frequency belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), and line 5 (95ft). Rebar: belt 3 on 1ft.

LOCATION DESCRIPTION

From the main road between Ibapah and Goshute, turn east onto a road that is 0.1 mile north of mile marker 3. Go for 0.4 mile to an intersection. Turn right and go 0.25 mile to another intersection. Turn left and go 2.3 miles on a 4WD road that is faint in places to another intersection. Turn right and go 0.25 miles to another intersection. Turn right and go 0.50 to a gate. Drive through the gate and follow the road to the left for 0.65 miles, passing a witness post on your way on the left side of the road. This witness post is for 19A-10. At 0.65 mile (0.4 miles after the witness post) the road comes to an end. Park here and walk easterly in the drainage. The drainage will split, from here walk 200 feet eastward out of the drainage toward a lone juniper. The 0-foot stake is 20ft east of the juniper. The 0-foot stake is marked by browse tag #413.



Map Name: Goshute

Diagrammatic Sketch

Township 10S, Range 19W, Section 36

GPS: NAD 83, UTM 12S 249542 E 4422646 N

## DISCUSSION

### Rocky Canyon - Trend Study No. 19A-9

#### Study Information

This study was established in 2002 to monitor elk use on the west side of the Deep Creek Mountains. It is located within a natural travel corridor for elk that move down onto the lower flats during winter months, and monitors a mountain big sagebrush-grass community [elevation: 7,200 feet (2,187 m), slope: 34%, aspect: southwest]. From the pellet group transect, elk use was estimated at 25 days use/acre (63 edu/ha) in 2002 and 2007. Deer use was estimated at 16 days use/acre (40 ddu/ha) in 2002 and 21 days use/acre (51 ddu/ha) in 2007. Cattle use was estimated at 4 days use/acre (9 cdu/ha) in 2002 and 1 day use/acre (2 cdu/ha) in 2007. Cattle were grazing the area heavily in 2002, especially within the canyon bottom leading up to the site. Most of the deer and elk pellets were from winter and spring. An elk carcass was noted in 2007.

#### Soil

The soil is in the Podmor series, which consists of moderately deep, well-drained, moderately permeable soils that formed in colluvium and residuum, and are derived dominantly from quartzite (USDA-NRCS 2007). The soil is dark brown/gray in color, loam in texture, and slightly acidic in reactivity (pH 6.4). It is very rocky both on the surface and throughout the profile. The abundant vegetation, litter, and rock cover aid in minimizing erosion on this steep slope. Relative bare ground cover was low at 8% in 2002 and 10% in 2007. The erosion condition was classified as stable in 2002. In 2007, the erosion condition was classified as slight due to pedestalling around vegetation, flow patterns, and slight transportation of surface rock fragments.

#### Browse

The browse component is dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Mountain big sagebrush had an estimated density of 5,340 plants/acre (13,190 plants/ha) in 2002 and 3,100 plants/acre (7,657 plants/ha) in 2007. Recruitment has been low, ranging from 6%-8%. Percent decadence was 21% in 2002, and 35% in 2007. Plants classified as having poor vigor has ranged from 13%-28% of the population. In 2007, the sagebrush defoliator moth (*Aroga websteri*) was sampled on 11% of the population. Utilization has been light-moderate. Annual leader growth averaged just under 2 inches (5 cm) in 2002 and just over 1 inch (3 cm) in 2007.

Black sagebrush (*Artemisia nova*) had an estimated density of 440 plants/acre (1,087 plants/ha) in 2002 and 1,260 plant/acre (3,112 plants/ha) in 2007. Decadence was moderate at 18% of the population in 2002 and 27% in 2007. Plants classified with poor vigor made up 5% of the population in 2002 and 17% in 2007. With the fluctuation in sagebrush densities from 2002 to 2007 it may be possible that there was some hybridization between the two species or miss identification.

Other browse sampled include Myrtle pachistima (*Pachistima myrsinites*), gray rabbitbrush (*Chrysothamnus nauseosus* ssp. *hololeucus*), slenderbush eriogonum (*Eriogonum microthecum*), broom snakeweed (*Gutierrezia sarothrae*), Oregon grape (*Mahonia repens*), and pediocactus (*Pediocactus simpsonii*).

#### Herbaceous Understory

The herbaceous understory has fair diversity. Bluebunch wheatgrass (*Agropyrom spicatum*), Sandberg bluegrass (*Poa secunda*), and mutton bluegrass (*Poa fendleriana*) are the dominant perennial grasses. Bluebunch wheatgrass is the dominant grass species. It provided approximately 7% cover in 2002 and 2007. Sandberg bluegrass increased from 5% cover in 2002 to 7% in 2007. Bulbous bluegrass was also sampled at less than 1% cover in both 2002 and 2007. Cheatgrass (*Bromus tectorum*) was sampled in 33% of the quadrats in 2002 and only 5% in 2007. It provided 1% cover in 2002 and nearly no cover in 2007.

Silvery lupine (*Lupinus argenteus*) dominates the forb component. It contributed 77% of the forb cover in 2002 and 70% in 2007. In both years much of the sampled lupine was desiccated. Utilization of the lupine by crickets was noted in 2002.

2007 TREND ASSESSMENT

The browse trend is down. The density of mountain big sagebrush decreased 42%. Percent decadence increased from to 35% of the population. The recruitment of young increased from 6% of the population to 8%, and decadence increased from 21% to 35%. Plants classified as having poor vigor increased from 13% of the population to 28%, and browse use remained mostly light. Black sagebrush density increased nearly three-fold. However, the increase in black sagebrush density was not enough to replace the loss of mountain big sagebrush. The recruitment of young remained stable at 5% of the population, but decadence increased from 18% to 27%. Plants classified as showing poor vigor increased from 5% of the population to 17%, and browse use remained light. With the fluctuation in sagebrush densities from 2002 to 2007 it may be possible that there was some hybridization between the two species or miss identification. However, overall the density of sagebrush species decreased. The grass trend is up. The sum of the nested frequency of perennial grasses increased 20% and the nested frequency of Sandberg bluegrass increased significantly. Cheatgrass decreased significantly in nested frequency, and its cover also decreased. The forb trend is up. Nested frequencies of both annual and perennial forbs increased substantially. Silvery lupine, longleaf phlox (*Phlox longifolia*), false dandelion (*Agoseris glauca*) and bastard toadflax (*Comandra pallida*) nested frequencies increased significantly. In 2002, the Desirable Components Index (DCI) score was good-excellent due to the very good browse cover, excellent perennial grass and forb cover, and minimal annual grass cover. In 2007 the DCI score decreased to good due to a large decrease in preferred browse cover.

2002 winter range condition (DCI) - good-excellent (76) Mid-level potential scale

2007 winter range condition (DCI) - good (67) Mid-level potential scale

browse - down (-2)

grass - up (+2)

forb - up (+2)

HERBACEOUS TRENDS --

Management unit 19A, Study no: 9

Type	Species	Nested Frequency		Average Cover %	
		'02	'07	'02	'07
G	Agropyron spicatum	<sub>a</sub> 108	<sub>a</sub> 124	6.46	7.21
G	Bromus tectorum (a)	<sub>b</sub> 84	<sub>a</sub> 10	1.27	.06
G	Poa bulbosa	<sub>a</sub> 9	<sub>a</sub> 17	.17	.42
G	Poa fendleriana	<sub>a</sub> 99	<sub>a</sub> 115	2.75	2.75
G	Poa secunda	<sub>a</sub> 214	<sub>b</sub> 261	4.73	7.22
Total for Annual Grasses		84	10	1.27	0.06
Total for Perennial Grasses		430	517	14.11	17.62
Total for Grasses		514	527	15.39	17.68
F	Agoseris glauca	<sub>a</sub> 3	<sub>b</sub> 20	.00	.08
F	Balsamorhiza hookeri	-	-	.00	-
F	Calochortus nuttallii	-	3	-	.01
F	Chaenactis douglasii	<sub>a</sub> 3	<sub>a</sub> 1	.03	.00
F	Comandra pallida	<sub>a</sub> 12	<sub>b</sub> 34	.07	.57

Type	Species	Nested Frequency		Average Cover %	
		'02	'07	'02	'07
		F	Collinsia parviflora (a)	<sub>a</sub> 91	<sub>b</sub> 166
F	Cystopteris fragilis	-	16	-	.18
F	Epilobium brachycarpum (a)	<sub>a</sub> 4	<sub>a</sub> 9	.01	.04
F	Eriogonum brevicaule	2	-	.01	-
F	Hackelia patens	<sub>a</sub> 7	<sub>a</sub> 2	.05	.03
F	Heterotheca villosa	-	2	-	.00
F	Holosteum umbellatum (a)	-	13	-	.02
F	Ipomopsis aggregata	-	4	-	.03
F	Lappula occidentalis (a)	-	5	-	.06
F	Lupinus argenteus	<sub>a</sub> 94	<sub>b</sub> 137	4.01	4.74
F	Machaeranthera canescens	<sub>a</sub> 3	<sub>a</sub> 9	.06	.04
F	Microsteris gracilis (a)	<sub>a</sub> 2	<sub>a</sub> 3	.00	.01
F	Petradoria pumila	<sub>a</sub> 3	<sub>a</sub> 5	.38	.15
F	Phlox longifolia	<sub>a</sub> 15	<sub>b</sub> 29	.06	.24
F	Senecio multilobatus	-	8	-	.17
F	Unknown forb-perennial	15	-	.14	-
Total for Annual Forbs		97	196	0.38	0.53
Total for Perennial Forbs		157	270	4.83	6.28
Total for Forbs		254	466	5.22	6.82

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

BROWSE TRENDS --

Management unit 19A, Study no: 9

Type	Species	Strip Frequency		Average Cover %	
		'02	'07	'02	'07
B	Artemisia nova	5	19	.74	1.58
B	Artemisia tridentata vaseyana	90	80	20.95	12.99
B	Chrysothamnus nauseosus hololeucus	1	1	.03	.00
B	Eriogonum microthecum	4	3	.00	.06
B	Gutierrezia sarothrae	15	18	.63	.30
B	Juniperus osteosperma	2	1	-	.18
B	Mahonia repens	39	37	.87	1.12
B	Pachistima myrsinites	8	9	1.36	.63
B	Pediocactus simpsonii	1	0	.03	.03
B	Pinus monophylla	1	1	-	.03
Total for Browse		166	169	24.62	16.94

CANOPY COVER, LINE INTERCEPT --

Management unit 19A, Study no: 9

Species	Percent Cover	
	'02	'07
Artemisia nova	2.70	1.86
Artemisia tridentata vaseyana	24.56	16.88
Chrysothamnus nauseosus hololeucus	-	.05
Eriogonum microthecum	-	.33
Gutierrezia sarothrae	1.04	.63
Juniperus osteosperma	-	1.16
Mahonia repens	.73	1.56
Pachistima myrsinites	1.66	.66

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 19A, Study no: 9

Species	Average leader growth (in)	
	'02	'07
Artemisia tridentata vaseyana	1.9	1.3

BASIC COVER --

Management unit 19A, Study no: 9

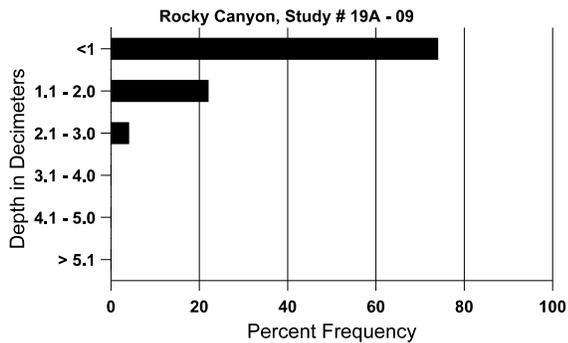
Cover Type	Average Cover %	
	'02	'07
Vegetation	42.00	37.12
Rock	27.06	33.02
Pavement	4.01	4.00
Litter	33.46	24.81
Cryptogams	.33	.20
Bare Ground	9.78	11.03

SOIL ANALYSIS DATA --

Herd Unit 19A, Study no: 9, Rocky Canyon

Effective rooting depth (in)	Temp °F (depth)	pH	Loam			%OM	ppm P	ppm K	dS/m
			%sand	%silt	%clay				
9.7	63.6 (11.5)	6.4	41.3	34.7	24.0	4.7	19.0	361.6	.7

Stoniness Index



PELLET GROUP DATA --

Management unit 19A, Study no: 9

Type	Quadrat Frequency		Days use per acre (ha)	
	'02	'07	'02	'07
Rabbit	3	3	-	-
Elk	15	12	25 (63)	25 (63)
Deer	6	4	16 (40)	21 (51)
Cattle	-	2	4 (9)	1 (2)

BROWSE CHARACTERISTICS --  
Management unit 19A, Study no: 9

		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>Artemisia nova</i>												
02	<b>440</b>	-	20	340	80	-	0	0	18	5	5	8/18
07	<b>1260</b>	220	60	860	340	80	0	0	27	17	17	9/24
<i>Artemisia tridentata vaseyana</i>												
02	<b>5340</b>	-	340	3860	1140	700	8	3	21	12	13	21/31
07	<b>3100</b>	940	240	1780	1080	280	34	9	35	19	19	23/38
<i>Cercocarpus montanus</i>												
02	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
07	<b>0</b>	-	-	-	-	-	0	0	-	-	0	32/51
<i>Chrysothamnus nauseosus hololeucus</i>												
02	<b>20</b>	-	-	20	-	-	0	0	-	-	0	17/4
07	<b>20</b>	-	-	20	-	-	0	0	-	-	100	28/30
<i>Chrysothamnus viscidiflorus viscidiflorus</i>												
02	<b>0</b>	-	-	-	-	-	0	0	-	-	0	16/16
07	<b>0</b>	-	-	-	-	-	0	0	-	-	0	14/18
<i>Eriogonum microthecum</i>												
02	<b>120</b>	-	20	100	-	-	0	0	-	-	0	7/13
07	<b>80</b>	-	-	80	-	-	0	0	-	-	0	9/14
<i>Gutierrezia sarothrae</i>												
02	<b>640</b>	-	-	600	40	-	0	0	6	3	6	8/12
07	<b>600</b>	20	20	560	20	-	0	0	3	-	0	7/10
<i>Juniperus osteosperma</i>												
02	<b>40</b>	-	20	20	-	-	0	0	-	-	0	-/-
07	<b>20</b>	-	20	-	-	-	0	0	-	-	0	-/-
<i>Mahonia repens</i>												
02	<b>6000</b>	-	180	5380	440	140	0	0	7	7	19	3/4
07	<b>6300</b>	-	60	6140	100	20	0	0	2	-	2	3/4
<i>Pachistima myrsinites</i>												
02	<b>2400</b>	20	40	2300	60	-	0	0	3	2	2	3/8
07	<b>1440</b>	-	-	1440	-	-	0	0	0	-	0	6/9
<i>Pediocactus simpsonii</i>												
02	<b>20</b>	-	-	20	-	-	0	0	-	-	0	2/2
07	<b>0</b>	-	-	-	-	-	0	0	-	-	0	2/3

		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)
<b>Pinus monophylla</b>												
02	<b>20</b>	40	20	-	-	-	0	0	-	-	0	-/-
07	<b>40</b>	-	40	-	-	-	0	0	-	-	0	-/-
<b>Purshia tridentata</b>												
02	<b>0</b>	-	-	-	-	-	0	0	-	-	0	29/90
07	<b>0</b>	-	-	-	-	-	0	0	-	-	0	29/78
<b>Rosa woodsii</b>												
02	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
07	<b>0</b>	-	-	-	-	-	0	0	-	-	0	14/23
<b>Sambucus racemosa</b>												
02	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
07	<b>0</b>	-	-	-	-	-	0	0	-	-	0	52/61