

Trend Study 19A-10-07

Study site name: Rocky Spring .

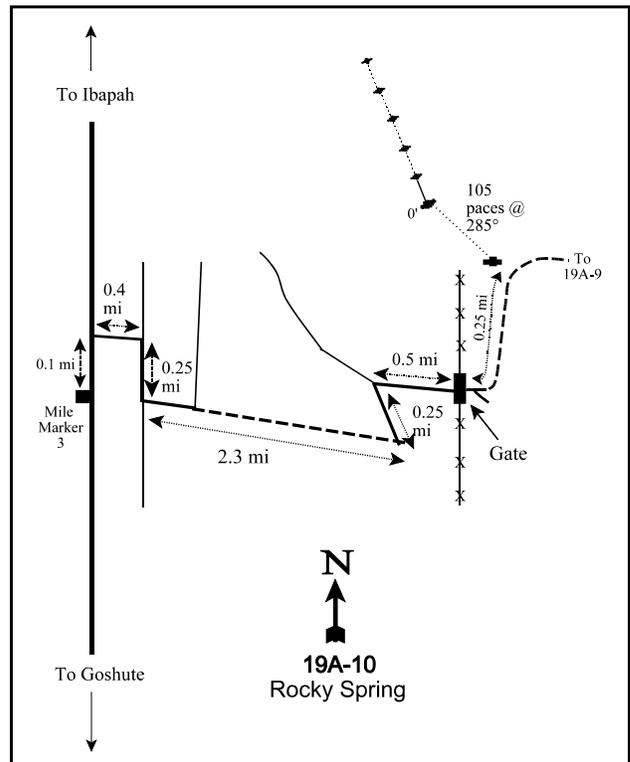
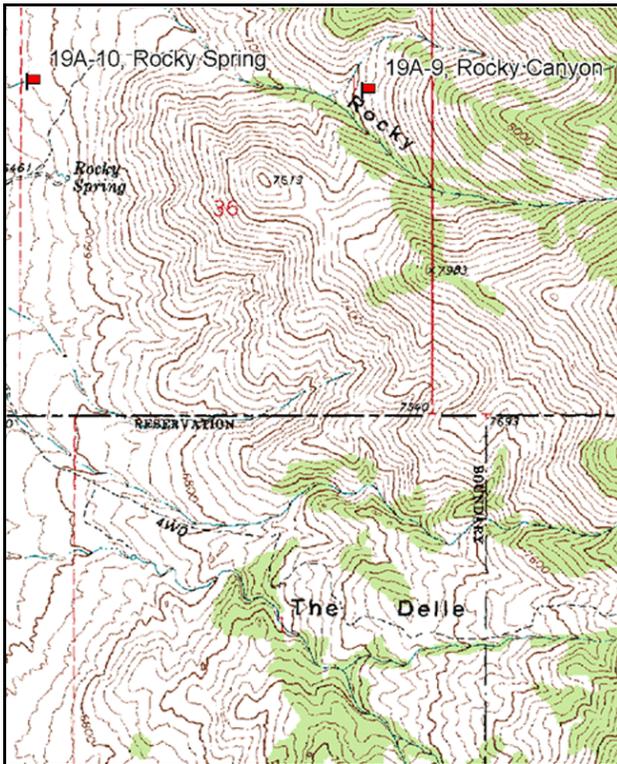
Vegetation type: Mountain Big Sagebrush .

Compass bearing: frequency baseline 326 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 Ibabah 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. From the witness post, walk 105 paces at 285 degrees magnetic to the 0-foot stake.



Map Name: Goshute

Diagrammatic Sketch

Township 10S, Range 19W, Section 36

GPS: NAD 83, UTM 12S 248241 E 4422727 N

## DISCUSSION

### Rocky Spring - Trend Study No. 19A-10

#### Study Information

This study was established in 2002 to monitor winter big game use, primarily by elk, on the west side of the Deep Creek Mountains. It lies on an alluvial fan at the mouth of Rocky Canyon [elevation: 6,500 feet (1,974 m), slope: 11%, aspect: southwest]. The study samples a mountain big sagebrush flat that receives moderate to heavy deer and elk use during the winter. From the pellet group transect, elk use was estimated at 33 elk days use/acre (83 edu/ha) in 2002 and 35 elk days use/acre (86 edu/ha) in 2007. Deer use was estimated at 67 deer days use/acre (165 ddu/ha) in 2002 and 58 deer days use/acre (144 ddu/ha) in 2007. Cattle use was estimated at 3 cattle days use/acre (9 cdu/ha) in 2002 and 2 cattle days use/acre (5 cdu/ha) in 2007. In both readings, most deer and elk pellet groups were from winter and spring use. Cattle were present in 2007 when the study was sampled.

#### Soil

The soil is in the Holmes series, which consists of very deep, well-drained, moderately permeable soils that formed in mixed alluvium (USDA-NRCS 2007). It is dark brown/gray in color and very rocky, both on the surface and throughout the profile. The soil has a loam texture and is slightly acidic in reactivity (pH of 6.5). Combined relative vegetation and litter cover has been high, averaging 74% in 2002 and 61% in 2007. Relative bare ground cover was 9% in 2002 and 16% in 2007. The erosion condition was classified as stable in 2002, and increased to slight in 2007 due to the formation of a small gully, and pedestalling.

#### Browse

The dominant browse is mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Sagebrush density was 2,840 plants/acre (7,015 plants/ha) in 2002 and 2,220 plants/acre (5,483 plants/ha) in 2007. It accounted for 97% of the browse cover and 55% of the total vegetation cover in 2002. In 2007, these values had decreased slightly to 95% and 44%. Young plants made up 2% of the population in 2002 and 13% in 2007. Decadent plants decreased from 42% of the population in 2002 to 36% in 2007. Plants classified as dying made up 19% of the population in 2002 and 2007. Plants with poor vigor increased from 19% of the population in 2002 to 27% in 2007. Utilization has been mostly light-moderate. Annual leaders averaged about 1.5 inches (3.8 cm) of growth in 2002 and about 2 inches (5 cm) in 2007.

Other browse sampled include broom snakeweed (*Gutierrezia sarothrae*), pricklypear cactus (*Opuntia* spp.), pediocactus (*Pediocactus simpsonii*), and wild rose (*Rosa woodsii*). Utah juniper (*Juniperus osteosperma*) and singleleaf pinyon (*Pinus monophylla*) are scattered throughout the area. A point-centered quarter estimate of tree density in 2007 estimated Utah juniper at 28 trees/acre (69 plants/ha) and singleleaf pinyon pine at 32 trees/acre (79 plants/ha). In 2007, the average trunk diameter for juniper was 6.9 inches (17.5 cm) and that for pinyon was 3.4 inches (8.6 cm).

#### Herbaceous Understory

The understory has poor diversity with few forage species. Eight species of grasses and 11 species of forbs have been sampled, but four species dominate the understory. Cheatgrass (*Bromus tectorum*) made up 44% of the total grass cover in 2002 and 24% in 2007. Bluebunch wheatgrass (*Agropyron spicatum*) and Sandberg bluegrass (*Poa secunda*) are the only abundant perennial grass species. Both species had a patchy distribution, but increased in cover from 2002 to 2007.

Silvery lupine (*Lupinus argenteus*) was the most abundant forb in 2002 and 2007. It provided 3% cover in 2002 and 4% cover in 2007. Other forbs sampled include aster (*Aster* spp.), milkweed (*Asclepias* spp.), bastard toadflax (*Comandra pallida*), and skeleton weed (*Lygodesmia* spp.). Forbs provided 5%-6% of the total ground cover both years.

2007 TREND ASSESSMENT

The browse trend is down. Mountain big sagebrush, the dominant key browse species, decreased in density by 22%. The population was comprised mostly of mature and decadent plants. Plants classified as dying did not change and fewer decadent plants were sampled. The recruitment of young increased from 2% of the population to 13%, and decadence decreased from 42% to 36%. Plants classified with poor vigor increased from 19% of the population to 27, and browse use remained mostly light. The grass trend was up. The sum of the nested frequency of perennial grasses with the exception of bulbous bluegrass increased 22%, and perennial grass cover increased from 6% to 10%. Cheatgrass nested frequency significantly decreased. The forb trend is stable with no significant change in the nested frequencies of individual species. Silvery lupine continued to be the dominate forb species. In 2002, the Desirable Components Index (DCI) score was poor-fair due to high browse cover, low annual grass cover, and good perennial grass and forb cover. In 2007, the DCI score increased to fair due to improved recruitment of young browse into the population, increased perennial grass cover, and decreased cheatgrass cover.

2002 winter range condition (DCI) - poor-fair (47) Mid-level potential scale

2007 winter range condition (DCI) - fair (59) Mid-level potential scale

browse - down (-2)

grass - up (+2)

forb - stable (0)

HERBACEOUS TRENDS --

Management unit 19A, Study no: 10

Type	Species	Nested Frequency		Average Cover %	
		'02	'07	'02	'07
G	Agropyron spicatum	<sub>a</sub> 83	<sub>a</sub> 90	3.09	3.94
G	Bromus tectorum (a)	<sub>b</sub> 250	<sub>a</sub> 173	5.00	3.75
G	Poa bulbosa	-	8	-	.18
G	Poa fendleriana	<sub>a</sub> 28	<sub>a</sub> 26	.34	.59
G	Poa pratensis	-	26	-	.96
G	Poa secunda	<sub>a</sub> 162	<sub>a</sub> 173	2.84	4.04
G	Sitanion hystrix	<sub>a</sub> 1	<sub>b</sub> 19	.15	.42
G	Vulpia octoflora (a)	<sub>a</sub> 3	<sub>b</sub> 20	.01	.04
Total for Annual Grasses		253	193	5.01	3.79
Total for Perennial Grasses		274	342	6.43	10.15
Total for Grasses		527	535	11.45	13.96
F	Agoseris glauca	-	2	-	.03
F	Asclepias sp.	<sub>a</sub> 8	<sub>a</sub> 4	.15	.15
F	Aster sp.	<sub>a</sub> 21	<sub>a</sub> 20	.54	.51
F	Comandra pallida	<sub>a</sub> 18	<sub>a</sub> 15	.29	.31
F	Cryptantha sp.	-	1	-	.00
F	Eriogonum brevicale	<sub>a</sub> 3	<sub>a</sub> 2	.00	.00
F	Gayophytum ramosissimum(a)	-	1	-	.00
F	Lupinus argenteus	<sub>a</sub> 59	<sub>a</sub> 68	2.92	3.87
F	Lygodesmia sp.	<sub>a</sub> 20	<sub>a</sub> 13	.72	.72

Type	Species	Nested Frequency		Average Cover %	
		'02	'07	'02	'07
F	Senecio multilobatus	-	5	-	.08
F	Zigadenus paniculatus	-	3	-	.06
Total for Annual Forbs		0	1	0	0.00
Total for Perennial Forbs		129	133	4.64	5.75
Total for Forbs		129	134	4.64	5.76

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

#### BROWSE TRENDS --

Management unit 19A, Study no: 10

Type	Species	Strip Frequency		Average Cover %	
		'02	'07	'02	'07
B	Artemisia nova	3	3	-	.06
B	Artemisia tridentata vaseyana	75	71	20.21	15.91
B	Cercocarpus montanus	1	0	-	-
B	Gutierrezia sarothrae	14	8	.51	.09
B	Juniperus osteosperma	1	1	-	-
B	Leptodactylon pungens	1	0	-	-
B	Opuntia sp.	12	9	.07	.09
B	Pediocactus simpsonii	2	3	.06	.03
B	Pinus monophylla	3	2	-	.03
B	Rosa woodsii	4	5	.06	.48
Total for Browse		116	102	20.92	16.71

#### CANOPY COVER, LINE INTERCEPT --

Management unit 19A, Study no: 10

Species	Percent Cover	
	'02	'07
Artemisia nova	1.00	.06
Artemisia tridentata vaseyana	18.60	18.83
Cercocarpus ledifolius	-	.80
Gutierrezia sarothrae	.25	.21
Opuntia sp.	-	.03
Pinus monophylla	.46	.85
Rosa woodsii	.20	.66

KEY BROWSE ANNUAL LEADER GROWTH --  
Management unit 19A, Study no: 10

Species	Average leader growth (in)	
	'02	'07
Artemisia tridentata vaseyana	1.6	1.9

POINT-QUARTER TREE DATA --  
Management unit 19A, Study no: 10

Species	Trees per Acre	
	'02	'07
Juniperus osteosperma	-	28
Pinus monophylla	-	32

Average diameter (in)	
'02	'07
-	6.9
-	3.4

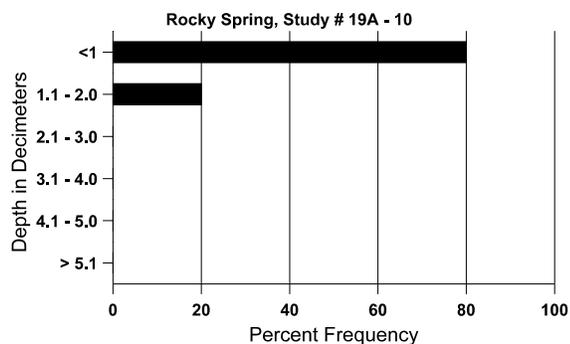
BASIC COVER --  
Management unit 19A, Study no: 10

Cover Type	Average Cover %	
	'02	'07
Vegetation	34.56	33.98
Rock	16.34	21.75
Pavement	2.91	4.01
Litter	52.09	35.54
Cryptogams	.35	.04
Bare Ground	10.96	18.00

SOIL ANALYSIS DATA --  
Herd Unit 19A, Study no: 10, Rocky Spring

Effective rooting depth (in)	Temp °F (depth)	pH	Loam			%OM	ppm P	ppm K	dS/m
			% sand	% silt	% clay				
7.0	69.0 (8.3)	6.5	45.3	36.7	18.0	4.6	20.4	233.6	.8

### Stoniness Index



PELLET GROUP DATA --

Management unit 19A, Study no: 10

Type	Quadrat Frequency		Days use per acre (ha)	
	'02	'07	'02	'07
Rabbit	6	26	-	-
Elk	26	19	33 (83)	35 (86)
Deer	15	13	67 (165)	58 (144)
Cattle	2	-	4 (9)	2 (5)

BROWSE CHARACTERISTICS --

Management unit 19A, Study no: 10

		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>120</b>	-	-	100	20	-	0	0	17	-	0	-/-
07	<b>80</b>	-	-	80	-	20	0	0	0	-	0	8/15
<i>Artemisia tridentata vaseyana</i>												
02	<b>2840</b>	20	60	1600	1180	1040	18	3	42	19	19	22/38
07	<b>2220</b>	1300	280	1140	800	640	33	3	36	19	27	23/45
<i>Ceratoides lanata</i>												
02	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
07	<b>0</b>	-	-	-	-	-	0	0	-	-	0	4/23
<i>Cercocarpus montanus</i>												
02	<b>20</b>	-	-	20	-	-	100	0	-	-	0	-/-
07	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
<i>Chrysothamnus viscidiflorus viscidiflorus</i>												
02	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
07	<b>0</b>	-	-	-	-	-	0	0	-	-	0	8/19
<i>Gutierrezia sarothrae</i>												
02	<b>640</b>	-	-	560	80	40	16	0	13	6	6	9/14
07	<b>200</b>	-	-	200	-	100	0	0	0	-	0	9/11
<i>Juniperus osteosperma</i>												
02	<b>20</b>	-	20	-	-	-	0	0	-	-	0	-/-
07	<b>20</b>	-	20	-	-	-	0	0	-	-	0	-/-
<i>Leptodactylon pungens</i>												
02	<b>120</b>	-	-	120	-	-	0	0	-	-	0	7/11
07	<b>0</b>	-	-	-	-	20	0	0	-	-	0	-/-

		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>Opuntia sp.</b>												
02	<b>260</b>	-	40	220	-	-	0	0	-	-	0	5/9
07	<b>220</b>	-	20	200	-	-	18	0	-	-	18	4/12
<b>Pediocactus simpsonii</b>												
02	<b>40</b>	-	-	40	-	-	0	0	-	-	0	2/4
07	<b>100</b>	-	-	100	-	-	0	0	-	-	0	2/7
<b>Pinus monophylla</b>												
02	<b>60</b>	-	60	-	-	-	0	0	-	-	0	-/-
07	<b>40</b>	-	20	20	-	-	0	0	-	-	0	-/-
<b>Rosa woodsii</b>												
02	<b>640</b>	-	-	640	-	-	0	0	0	-	0	10/12
07	<b>360</b>	-	40	300	20	-	0	0	6	-	0	12/17