

Trend Study 27R-9-98

Study site name: Five Mile Mountain Enclosure .

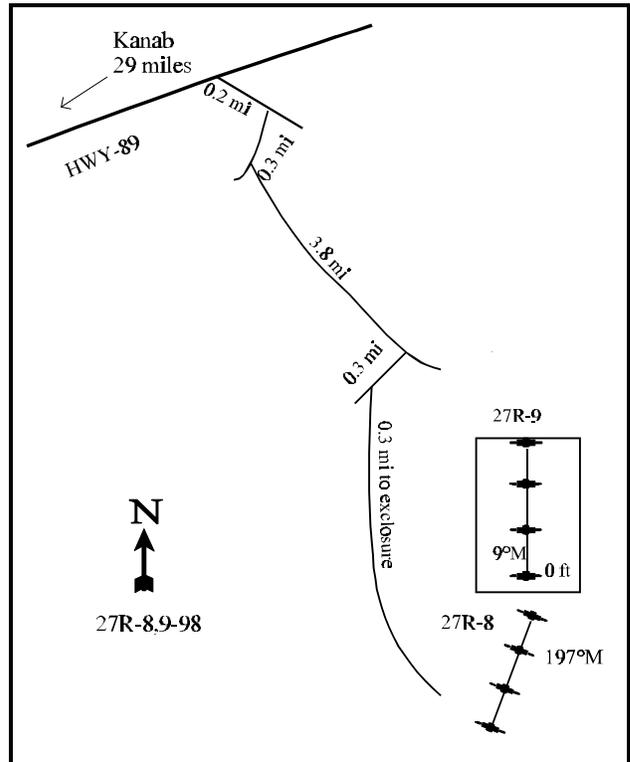
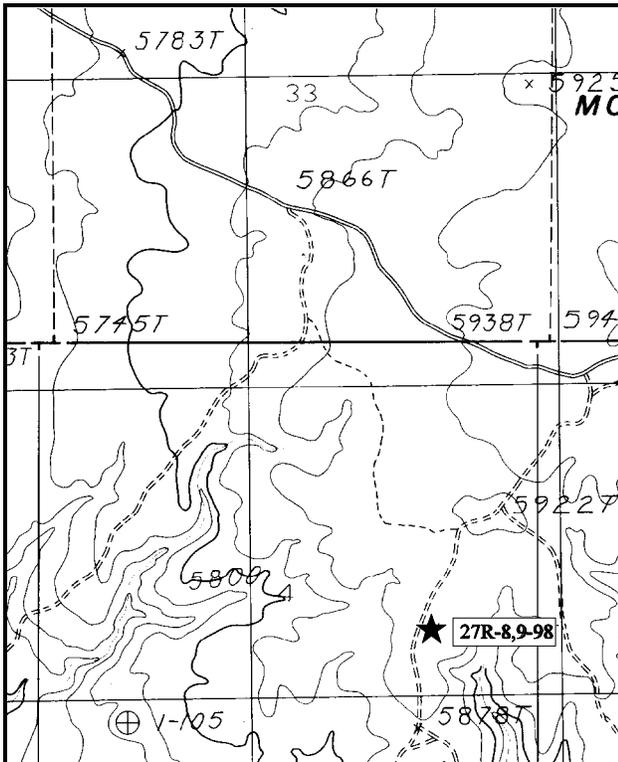
Range type: Burned Sagebrush/Annual Weed

Compass bearing: frequency baseline 9°M degrees.

Footmark (first frame placement) 5 feet. Frequency belt placement; line 1 (11ft & 95ft), line 2 (59ft), line 3 (34ft & 71ft).

LOCATION DESCRIPTION

From the 90° turn on HWY-89 in Kanab, travel 29 miles on south-89 (traveling east from Kanab) to the Five-mile Mountain turnoff. Turn right and go approximately 0.2 miles to a fork. Stay right at the fork and continue 0.3 miles to another fork. Go left for 3.8 miles to another fork. At the fork, go right for 0.3 miles to the next fork. From here, go right for 0.3 miles to the enclosure on the left. The 0 foot stake of the baseline is located within the enclosure on the south end and can be located by counting down 5 metal posts from the SW corner of the enclosure. Browse tag #107 is attached to the 0 foot stake.



Map Name: Pine Hollow Canyon

Diagrammatic Sketch

Township 43S , Range 2W , Section 4

UTM 4106243.659 N , 409583.615 E

## DISCUSSION

### Trend Study No. 27R-9

This is a new trend study located within the Five Mile Mountain livestock enclosure. It samples a black sagebrush range type with a few scattered Utah juniper trees. Most of the inside of the enclosure was burned a few years ago which eliminated most of the sagebrush. Slope is about 4% with a south aspect. Elevation is about 5,900 feet. Deer use this area mostly during severe winters. Pellet group data estimate 24 deer days use/acre within the enclosure. Rabbits also use the area in significant numbers with quadrat frequency of rabbit pellets nearly twice as high as deer.

Soil within the enclosure is quite different compared to outside with respect to soil texture. Effective rooting depth is similar at just under 8 inches compared to over 8 inches with a hardpan present at about 7-8 inches in depth. However, soil texture is a sand inside the enclosure, but classified as a loam outside. Both phosphorus and potassium appear to be limiting to plant development at just 7.4 ppm and 32 ppm respectively. Values below 10 ppm for phosphorus and 70 ppm for potassium are considered deficient. Rock and pavement are common on the surface and within the profile. Due to the abundance of sand and rock in the soil, average temperature of the soil is extremely high at 84.8°F at an average depth of just under 8 inches. This condition causes rapid drying of the soil and gives a competitive advantage to winter annuals like cheatgrass and storksbill. Erosion is not a problem on the site due to the levelness of the terrain.

The site once supported a dense stand of black sagebrush, although a fire which burned a few years ago, eliminated most of the sagebrush. There were some unburned areas sampled near the end of the baseline. Broom snakeweed is the most abundant shrub on the site. It provides 45% of the shrub cover and it is more dense in burned areas. Density is estimated at 4,980 plants/acre. The population appears to have declined since the fire due to the high number of dead plants at 3,420 plants/acre. An additional 990 decadent plants/acre were classified as dying. Reproduction is poor with no seedlings sampled and only 2% of the population consisting of young plants. There are also a few unburned juniper trees in the enclosure which provide 20% of the browse cover or a total cover value of 2%.

Surviving black sagebrush is estimated at 700 plants/acre, 77% of which are mature. Two thirds of the sagebrush are found in the unburned area along belt 4. Utilization of the sagebrush is light to moderate, vigor is generally good with abundant seed stalks, and percent decadence is low at 11%. There is also a few widely scattered cliffrose plants in the enclosure. None were found in the shrub density strips but one plant was measured for height/crown.

The herbaceous understory is poor and dominated by annuals, but to a lesser extent compared to the outside of the enclosure. The annual, cheatgrass, is abundant and accounts for 86% of the grass cover. However, Indian ricegrass and bottlebrush squirreltail were also encountered occasionally. Forbs are depleted with the most abundant species being the annual storksbill, which provides 87% of the forb cover. The only perennial species sampled is globemallow.

### 1998 APPARENT TREND ASSESSMENT

Soil conditions are poor due to a lack of protective ground cover. Erosion is not a problem, however this is primarily due to the lack of significant slope. The browse composition is also poor due to the fire which burned through most of the enclosure. Burned areas have a higher density of the increaser/invaser, broom snakeweed. Currently density is estimated at 4,980 plants/acre, 68% of which are mature. Its population appears to be in a state of decline however, with a large number of dead plants sampled, poor reproduction, poor vigor, and relatively high decadence (30%). Black sagebrush has a density of 700 plants/acre. It shows light to moderate utilization, and generally good vigor and low decadence. The sagebrush should increase over time within the burned areas. The herbaceous understory is poor with annuals dominating. Although,

annuals are at lower numbers and produce less cover in the enclosure when compared to outside, there are still more perennial grasses and forbs inside. Overall, the cheatgrass and storksbill are the dominant species inside as well as outside the enclosure. Cheatgrass provides 86% of the grass cover and storksbill accounts for 87% of the forb cover inside the enclosure. Cheatgrass produces nearly twice as much cover and storksbill accounts for 5 times more cover outside of the enclosure.

HERBACEOUS TRENDS --

Herd unit 27R, Study no: 9

Type	Species	Nested Frequency '98	Quadrat Frequency '98	Average Cover % '98
G	<i>Bromus tectorum</i> (a)	371	92	4.94
G	<i>Oryzopsis hymenoides</i>	11	6	.42
G	<i>Sitanion hystrix</i>	5	4	.33
G	<i>Vulpia octoflora</i> (a)	25	9	.04
Total for Annual Grasses		396	101	4.98
Total for Perennial Grasses		16	10	0.75
Total for Grasses		412	111	5.74
F	<i>Eriogonum cernuum</i> (a)	3	1	.00
F	<i>Erodium cicutarium</i> (a)	217	63	1.69
F	<i>Salsola iberica</i> (a)	1	1	.00
F	<i>Sphaeralcea parvifolia</i>	61	25	.25
Total for Annual Forbs		221	65	1.70
Total for Perennial Forbs		61	25	0.25
Total for Forbs		282	90	1.95

BROWSE TRENDS --

Herd unit 27R, Study no: 9

Type	Species	Strip Frequency '98	Average Cover % '98
B	<i>Artemisia nova</i>	21	2.33
B	<i>Cercocarpus ledifolius</i>	0	-
B	<i>Cowania mexicana stansburiana</i>	0	-
B	<i>Gutierrezia sarothrae</i>	67	3.30
B	<i>Juniperus osteosperma</i>	0	1.48
B	<i>Opuntia</i> spp.	1	.15
B	<i>Ribes</i> spp.	0	-
Total for Browse		89	7.26

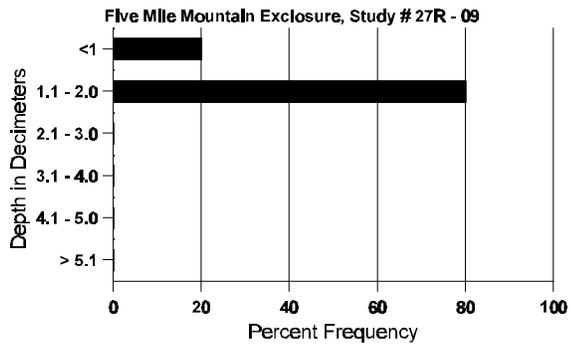
BASIC COVER --  
Herd unit 27R, Study no: 9

Cover Type	Nested Frequency '98	Average Cover % '98
Vegetation	406	15.70
Rock	276	7.30
Pavement	444	30.46
Litter	420	16.29
Cryptogams	151	2.13
Bare Ground	437	33.09

SOIL ANALYSIS DATA --  
Herd Unit 27R, Study # 09, Study Name: Five Mile Mountain Exclosure

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
7.6	84.8 (7.5)	7.2	92.2	2.0	5.8	1.6	7.4	32.0	.5

### Stoniness Index



PELLET GROUP FREQUENCY --  
Herd unit 27R, Study no: 9

Type	Quadrat Frequency '98
Rabbit	13
Deer	7

BROWSE CHARACTERISTICS --

Herd unit 27R, Study no: 9

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Artemisia nova</i>																		
Y	98	3	1	-	-	-	-	-	-	-	4	-	-	-	80		4	
M	98	23	4	-	-	-	-	-	-	-	27	-	-	-	540	19	31	27
D	98	2	2	-	-	-	-	-	-	-	-	-	-	4	80		4	
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	380		19	
% Plants Showing '98		<u>Moderate Use</u> 20%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 11%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'98	700	Dec:	11%	
<i>Cercocarpus ledifolius</i>																		
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing '98		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 00%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'98	0	Dec:	-	
<i>Cowania mexicana stansburiana</i>																		
M	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	54	50	0
% Plants Showing '98		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 00%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'98	0	Dec:	-	
<i>Gutierrezia sarothrae</i>																		
Y	98	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
M	98	170	-	-	-	-	-	-	-	-	170	-	-	-	3400	7	10	170
D	98	75	-	-	-	-	-	-	-	-	9	-	-	66	1500		75	
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	3420		171	
% Plants Showing '98		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 27%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'98	4980	Dec:	30%	
<i>Juniperus osteosperma</i>																		
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing '98		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 00%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'98	0	Dec:	-	
<i>Opuntia spp.</i>																		
M	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20	8	22	1
% Plants Showing '98		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 00%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'98	20	Dec:	-	

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Ribes spp.																	
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	240		12
% Plants Showing '98		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>				<u>%Change</u>					
		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)													'98	0	Dec:	-	