

\*\*\*Suspended\*\*\*

Trend Study 2-8-96

Study site name: Millville Canyon.

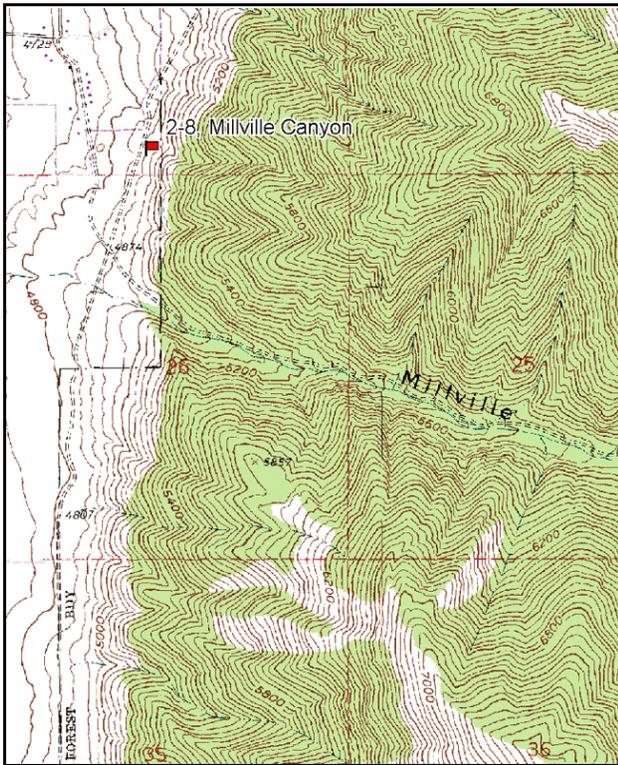
Vegetation type: Big Sagebrush.

Compass bearing: frequency baseline 165 degrees magnetic.

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

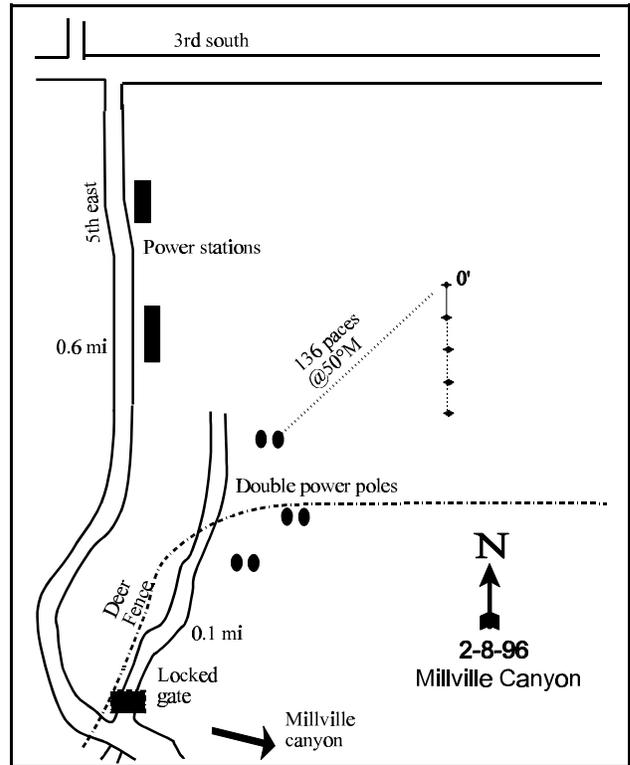
LOCATION DESCRIPTION

From 500 East and 300 South in Millville travel south 0.6 miles. At the intersection just beyond the deer fence turn left (north). Proceed 0.1 miles and stop just opposite the northernmost pair of power poles just east of the road. From the easternmost pole walk 136 paces at 50 degrees magnetic to 0-foot baseline stake, marked by browse tag #7986. Baseline runs at 165 degrees magnetic.



Map Name: Logan

Township 11N, Range 1E, Section 26



Diagrammatic Sketch

UTM 4613406 N, 433117 E

## DISCUSSION

### Trend Study No. 2-8

**\*\*\*SUSPENDED** - This site was suspended in 2001 and will be reevaluated in 2006. The site was suspended after inspection by the project leader. It is located in close proximity to 2 other trend study sites, Broad Hollow Flat (2-10) and Mouth of Blacksmith Fork Canyon (2-2). There was very little sign of any wildlife use on the site.

The Millville Canyon study site lies on the steep west-facing slope of the Cache "face" near Millville Canyon. The area contains an important stand of mountain big sagebrush without the general association of bitterbrush and a somewhat scattered population of Utah juniper. This site is immediately north of Millville Canyon at an elevation of 5,180 feet. It is quite steep (75%) with a rocky and eroded soil surface. Animal use was observed as extremely heavy in 1984. Additionally, eight deer and one elk carcass were found near the site as a result of the harsh winter of 1983-84. No elk and few deer pellet groups were found on the site in 1996. No pellet groups were found in 2001.

Soil is a "Richmond Very Stony Loam," similar to that described and reported in studies at Smithfield Dry Canyon (#5) and Green Canyon Exclosure (#6). Soil at the site is fairly deep (almost 17 inches), but rocky with poor structure and high erosion potential. It has a loam texture and a relatively low percent organic matter content (1.6%). Both phosphorus and potassium could be limiting at 5.6 and 3.2 ppm respectively. Values less than 10 ppm for phosphorus and 70 ppm for potassium can limit normal plant growth and development. Average soil temperature is also quite high at nearly 75° F, due mostly to the abundance of rock on the surface and in the profile. Steep slope and poor cover resulting from intense animal use and trampling effects have caused accelerated soil erosion in the past, but current conditions appear more stable.

Browse composition is dominated by one of the few remaining stands of mountain big sagebrush on this portion of the Cache Valley "face." Estimated density in 1984 was approximately 732 plants/acre, which constitutes a moderately sparse stand that appeared to be slowly declining. The population was dominated by heavily browsed decadent plants in poor vigor. Little reproduction was evident. During the 1990 reading, the sagebrush population was split into mountain big sagebrush and a hybrid form, a cross between black sagebrush and mountain big sagebrush. Estimated density of the hybrid sagebrush was about 400 plants/acre in 1990. The population was moderately hedged, mostly decadent (83%), yet it displayed good vigor. Mountain big sagebrush numbered only 132 plants/acre with light to moderate use. Percent decadency was 50%. Density of the big sagebrush/black sagebrush hybrid increased to 740 plants/acre by 1996. Decadency declined to 54% with moderate use. Mountain big sagebrush numbered 360 plants/acre with light use and good vigor. Because the community structure is basically discontinuous and clumped, the much larger sampling design used in 1996 greatly improves the accuracy for population estimates.

Herbaceous composition is poor. Unlike the Green Canyon site, annual grasses including cheatgrass, Japanese brome, and rattlesnake brome are abundant here. These three species alone accounted for 67% of the grass cover in 1996. Preferred perennials include bluebunch wheatgrass and Sandberg bluegrass. Also encountered in 1996 were winter rye and jointed goatgrass.

Forb composition consists chiefly of annual and perennial weeds. The only forbs of value are arrowleaf balsamroot, yellow salsify, gray Lomatium, and perhaps thistle. Dyers woad was found on the site in 1990 and it has since increased significantly in nested frequency.

### 1984 APPARENT TREND ASSESSMENT

This site is in perhaps the poorest condition of any that we observed on the herd unit in 1984. Soil and vegetative trend are definitely declining and in view of the steep slope, combined with the presence of the big game fence, there is probably little or no corrective action feasible.

### 1990 TREND ASSESSMENT

Sagebrush appears to continue to decline. New growth on the shrubs is very vigorous and there is good seed production, but no seedling or young plants were found. Sagebrush canopy cover was estimated at 5%. There was an increase in perennial grass nested and quadrat frequency values. This is largely due to increases in Sandberg bluegrass and bluebunch wheatgrass. Forb composition is poor. The soil remains loose and easily disturbed, with a high potential for erosion. However, the condition appears to have stabilized since 1984.

#### TREND ASSESSMENT

soil - stable (3)

browse - down (1)

herbaceous understory - up slightly (4)

### 1996 TREND ASSESSMENT

Soil trend is improved slightly due to an increase in litter cover and a decline in percent bare ground from 7% to 3%. Trend for browse is up for mountain big sagebrush due to increased density, lighter utilization, good vigor, declining percent decadency, and improved recruitment. Trend for the more preferred mountain big sagebrush/black sagebrush hybrid is stable. Due to the lack of young plants, the increased density would be mostly the result of the much larger sample size used in 1996. Percent decadency declined, but a majority are still decadent (54%) and use is slightly heavier. Overall, trend for browse is slightly up. The composition of the herbaceous understory is poor and dominated by annual grasses and weedy forbs. Sum of nested frequency for perennial grasses declined while frequency of perennial forbs increased. Sum of nested frequency for bluebunch wheatgrass and Sandberg bluegrass declined significantly since 1990. The increase in forb frequency is due primarily to a significant increase in dyers woad which changed from a quadrat frequency of 11% to 55%. It is currently the most numerous forb on the site. Trend is considered slightly down.

#### TREND ASSESSMENT

soil - slightly improved (4)

browse - up slightly (4)

herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --

Herd unit 02 , Study no: 8

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %
		'84	'90	'96	'84	'90	'96	'96
G	<i>Aegilops cylindrica</i> (a)	-	-	7	-	-	2	.03
G	<i>Agropyron spicatum</i>	<sub>a</sub> 49	<sub>b</sub> 88	<sub>ab</sub> 72	24	36	26	3.52
G	<i>Bromus brizaeformis</i> (a)	-	-	293	-	-	96	4.97
G	<i>Bromus japonicus</i> (a)	-	-	81	-	-	27	.96
G	<i>Bromus tectorum</i> (a)	-	-	305	-	-	87	10.07
G	<i>Poa bulbosa</i>	<sub>a</sub> -	<sub>b</sub> 15	<sub>c</sub> 40	-	6	13	1.07
G	<i>Poa secunda</i>	<sub>ab</sub> 170	<sub>b</sub> 202	<sub>a</sub> 136	67	78	52	2.47
G	<i>Secale cereale</i> (a)	-	-	75	-	-	29	.89
Total for Annual Grasses		0	0	761	0	0	241	16.95
Total for Perennial Grasses		219	305	248	91	120	91	7.07
Total for Grasses		219	305	1009	91	120	332	24.02
F	<i>Alyssum alyssoides</i> (a)	-	-	52	-	-	23	.11
F	<i>Artemisia ludoviciana</i>	3	7	6	1	3	3	.33
F	<i>Balsamorhiza sagittata</i>	-	2	1	-	1	1	.09
F	<i>Cirsium undulatum</i>	<sub>a</sub> -	<sub>ab</sub> 8	<sub>b</sub> 8	-	4	6	.87
F	<i>Comandra pallida</i>	1	4	1	1	2	1	.00
F	<i>Epilobium brachycarpum</i> (a)	-	-	17	-	-	9	.04
F	<i>Holosteum umbellatum</i> (a)	-	-	7	-	-	3	.01
F	<i>Ipomopsis aggregata</i>	3	7	14	1	6	6	.03
F	<i>Isatis tinctoria</i>	<sub>a</sub> -	<sub>b</sub> 23	<sub>c</sub> 119	-	11	55	1.80
F	<i>Lactuca serriola</i>	-	-	7	-	-	2	.01
F	<i>Lomatium grayi</i>	3	-	-	1	-	-	-
F	<i>Melilotus alba</i>	-	-	8	-	-	3	.33
F	<i>Phlox longifolia</i>	-	-	1	-	-	1	.00
F	<i>Ranunculus testiculatus</i> (a)	-	-	1	-	-	1	.00
F	<i>Tragopogon dubius</i>	<sub>a</sub> 34	<sub>a</sub> 23	<sub>b</sub> 94	18	12	45	1.72
Total for Annual Forbs		0	0	77	0	0	36	0.17
Total for Perennial Forbs		44	74	259	22	39	123	5.21
Total for Forbs		44	74	336	22	39	159	5.38

Values with different subscript letters are significantly different at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --  
Herd unit 02 , Study no: 8

Type	Species	Strip Frequency	Average Cover %
		'96	'96
B	Artemisia tridentata-nova hybrid	29	2.69
B	Artemisia tridentata vaseyana	16	2.25
B	Gutierrezia sarothrae	38	.56
B	Rhus glabra cismontana	10	.24
Total for Browse		93	5.74

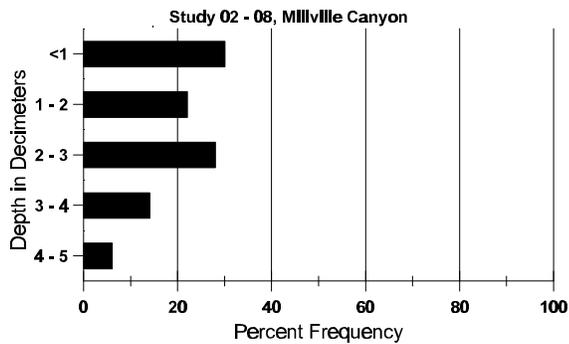
BASIC COVER --  
Herd unit 02 , Study no: 8

Cover Type	Nested Frequency	Average Cover %		
		'96	'84	'90
Vegetation	381	3.75	4.00	41.35
Rock	318	22.25	20.50	24.38
Pavement	234	17.50	35.25	5.16
Litter	394	39.00	32.00	38.56
Cryptogams	112	3.50	1.00	1.79
Bare Ground	110	14.00	7.25	2.76

SOIL ANALYSIS DATA --  
Herd Unit 02, Study no: 08, Millville Canyon

Effective rooting depth (in)	Temp °F (depth)	PH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
16.5	74.7 (17.4)	8.0	50.6	31.4	18.0	1.6	5.6	3.2	.6

### Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 02 , Study no: 8

Type	Quadrat Frequency '96
Rabbit	3
Deer	6

BROWSE CHARACTERISTICS --

Herd unit 02 , Study no: 8

A G R 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				
Artemisia tridentata-nova hybrid																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	11	6	-	-	-	-	-	-	-	17	-	-	-	340	20	39	17
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	6	12	1	1	-	-	-	-	-	19	-	1	-	400			20
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	440			22
3	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	2	4	-	-	-	-	-	-	-	6	-	-	400			6
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		00%			00%			00%										
'90		33%			67%			00%			+46%							
'96		49%			03%			03%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	0	Dec:	0%			
												'90	400		0%			
												'96	740		54%			

A G R 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 tridentata vaseyana</i>																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5	
M	84	-	-	1	-	-	-	-	-	-	1	-	-	-	66	14	17	1
	90	1	-	-	-	-	-	-	-	-	1	-	-	-	66	24	25	1
	96	10	2	-	-	-	-	-	-	-	12	-	-	-	240	31	45	12
D	84	-	-	10	-	-	-	-	-	-	3	-	5	2	666		10	
	90	-	1	-	-	-	-	-	-	-	1	-	-	-	66		1	
	96	-	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	280		14	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		00%			100%			64%			-82%							
'90		50%			00%			00%			+63%							
'96		17%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'84	732	Dec:	91%				
											'90	132		50%				
											'96	360		6%				
<i>Gutierrezia sarothrae</i>																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	1	-	-	-	-	-	-	-	-	1	-	-	-	40		2	
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	19	-	-	-	-	-	-	-	-	19	-	-	-	380		19	
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	4	-	-	-	-	-	-	-	-	4	-	-	-	266	12	18	4
	96	66	-	-	-	-	-	-	-	-	66	-	-	-	1320	12	15	66
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		00%			00%			00%										
'90		00%			00%			00%			+84%							
'96		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'84	0	Dec:	-				
											'90	266		-				
											'96	1700		-				

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			
Juniperus osteosperma																	
Y	84	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1
	90	1	1	-	-	-	-	-	-	-	2	-	-	-	133		2
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>				<u>%Change</u>					
	'84	00%			00%			00%				+50%					
	'90	50%			00%			00%									
	'96	00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'84	66	Dec:	-		
												'90	133		-		
												'96	0		-		
Rhus glabra cismontana																	
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	96	13	-	-	-	-	-	-	-	-	13	-	-	-	260		13
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-
	96	1	5	-	-	-	-	-	-	-	6	-	-	-	120	14	16
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>				<u>%Change</u>					
	'84	00%			00%			00%									
	'90	00%			00%			00%									
	'96	26%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'84	0	Dec:	-		
												'90	0		-		
												'96	380		-		