

Trend Study 2-6-01

Study site name: Green Canyon Exclosure.

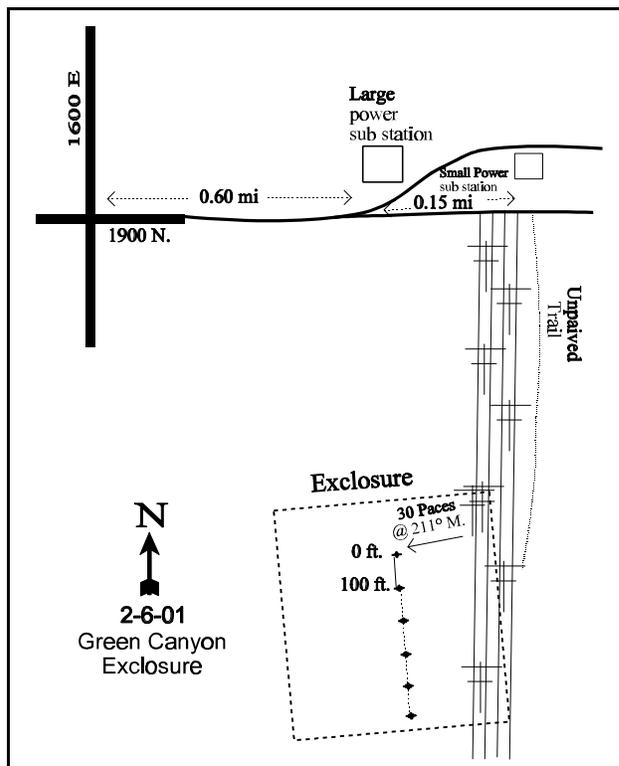
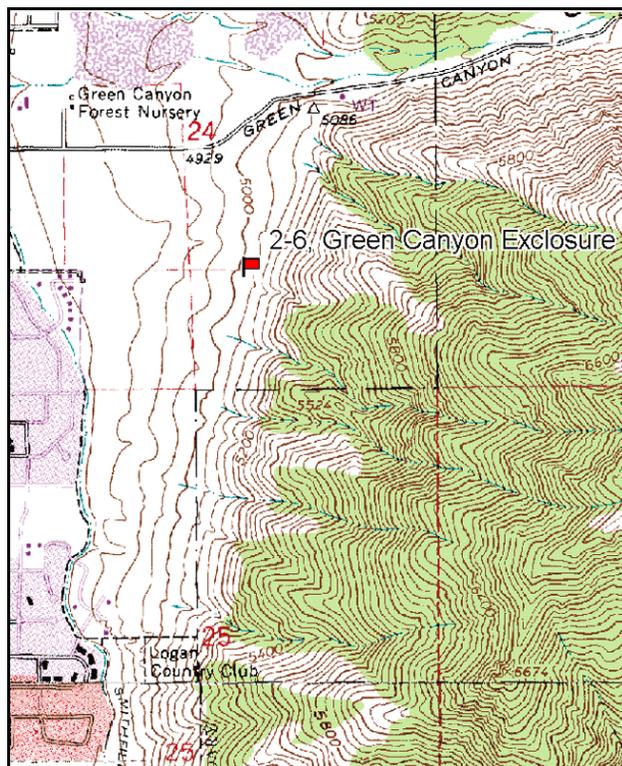
Vegetation type: Big Sagebrush.

Compass bearing: frequency baseline 182 degrees magnetic.

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

LOCATION DESCRIPTION

At the corner of 1600 East and 1900 North in Logan, travel east down 1900 North for 0.6 miles until a road veers off to the north. Stay right and proceed 0.15 miles to an unpaved trail on the right hand side of the road. Walk south down the trail until you hit the exclosure. From the power pole at the corner of the exclosure, walk 30 paces at 211 degrees magnetic to the 0-foot stake. The baseline runs parallel to the second set of power lines at 182 degrees magnetic.



Map Name: Smithfield

Diagrammatic Sketch

Township 12N, Range 1E, Section 24

UTM 4623432 N, 434977 E

DISCUSSION

Trend Study No. 2-6

The Green Canyon Exclosure trend study replaces the original Green Canyon site which was not read in 1996. It was dropped at the request of DWR biologist and a new Green Canyon site was established in an old 40-acre livestock exclosure just south of the canyon. Slope on the site varies from 20% to 25%. Aspect is to the west with an elevation of 5,180 feet. Deer and elk pellet groups were encountered in small numbers in 1996 along with a few cattle pats. The exclosure fence is no longer maintained. A pellet group transect read at the study site in 2001 estimated only 3 deer days use/acre (7 ddu/ha). The past few mild winters have allowed deer to winter at higher elevations. Humans also impact the site as there is a hiking and running trail transecting the site. There are also grain fields and a subdivision to the west.

Soil is a loam in texture and moderately deep with some rock on the surface and in the profile. Effective rooting depth (see methods) is estimated at about 14 inches. The soil reaction is moderately alkaline (7.8 pH). Phosphorous could be a limiting factor at only 6.6 ppm as values of less than 10 ppm can limit plant growth and development. Average soil temperature is lower (64° F at 18 inches) than other sites along the Cache Valley front. This is likely due to the lack of rock on the surface or in the surface profile. Protective ground cover from herbaceous vegetation and litter is abundant and well dispersed, effectively limiting erosion.

Browse on the site consist of aggregated clumps of mountain big sagebrush with a few scattered bitterbrush. Sagebrush had a density of 840 plants/acre in 1996 with 67% classified as young. Utilization was light, vigor good, and there were no decadent individuals. Age class analysis indicated an expanding population. During the 2001 reading, density was estimated at 1,640 plants/acre. Use remains mostly light, vigor good, and percent decadence low at 6%. Mature sagebrush are large and vigorous with annual leader growth averaging 3.3 inches. Bitterbrush occur infrequently. Utilization was moderate in 1996 and light in 2001.

The herbaceous understory is abundant with grasses and forbs combining to produce 52% cover in 1996 and 59% cover in 2001. Grass composition is poor with rye and bulbous bluegrass accounting for 95% and 90% of the grass cover in 1996 and 2001 respectively. Annual brome grasses which dominate the understory vegetation of many sites in this herd unit are not abundant. Forbs are abundant. However, they consist mostly of weedy species like thistle, morning glory, willowweed, curlycup gumweed, sunflower, prickly lettuce, yellow salsify, and mule's ear. Useful forbs including arrowleaf balsamroot, yellow sweetclover, and alfalfa accounted for 20% of the forb cover in 1996 and 50% in 2001.

1996 APPARENT TREND ASSESSMENT

Protective ground cover is abundant with little bare ground exposed (4%). Erosion is not a problem on this site. Browse is in short supply but the relatively small populations of mountain big sagebrush and bitterbrush appear vigorous and healthy. Mountain big sagebrush shows a high proportion of young plants (67%) and appears to have an expanding population. Utilization of sagebrush and bitterbrush is mostly light. The herbaceous understory composition is poor, but not dominated by annual brome grasses like many other winter range sites in this unit. Winter rye and bulbous bluegrass dominate the site by providing 74% of the understory cover. Native perennial grasses are represented by an occasional bluebunch wheatgrass. A few useful forb species are found on the site, yet the majority are weedy annuals and biennials.

2001 TREND ASSESSMENT

Trend for soil appears stable with similar ground cover characteristics compared to 1996. The ground surface is well protected by herbaceous vegetation and litter cover to help prevent accelerated erosion. Trend for the key browse species, mountain big sagebrush, is up. Density has increased 49%, use remains mostly light, vigor is normal, and percent decadence is low at only 6%. Recruitment is also good with 33% of the population consisting of young plants. Trend for the herbaceous understory is stable. Sum of nested frequency for perennial grasses increased. Nested frequency of bulbous bluegrass increased significantly while winter rye declined significantly. Japanese and rattlesnake brome, both annuals, increased significantly. Sum of nested frequency for perennial forbs declined since 1996. However, nested frequency of the more desirable forbs either remained stable or increased significantly. Overall the sum of nested frequency for perennial grasses and forbs remained similar to 1996 levels.

TREND ASSESSMENT

soil - stable (3)

browse - up (5)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --

Herd unit 02 , Study no: 6

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'96	'01	'96	'01	'96	'01
G	Agropyron cristatum	3	1	1	1	.03	.03
G	Agropyron spicatum	4	2	1	1	.21	.30
G	Agropyron trichoporum	-	2	-	2	-	.18
G	Bromus brizaeformis (a)	98	*134	32	53	.63	2.42
G	Bromus japonicus (a)	48	*79	16	25	.20	.67
G	Bromus tectorum (a)	65	47	17	15	.91	.89
G	Koeleria cristata	3	*12	2	4	.09	.51
G	Poa bulbosa	320	*416	78	93	13.11	25.28
G	Secale cereale (a)	375	*284	90	72	25.55	18.23
Total for Annual Grasses		586	544	155	165	27.30	22.22
Total for Perennial Grasses		330	433	82	101	13.44	26.30
Total for Grasses		916	977	237	266	40.75	48.52
F	Achillea millefolium	-	5	-	2	.03	.18
F	Agoseris glauca	-	1	-	1	-	.01
F	Alyssum alyssoides (a)	4	3	3	2	.04	.01
F	Aster spp.	4	4	1	3	.00	.06
F	Balsamorhiza sagittata	21	17	9	10	1.41	2.26
F	Cirsium undulatum	14	*-	7	-	.37	.03
F	Convolvulus arvensis	16	-	5	-	.75	-
F	Epilobium brachycarpum (a)	121	*29	47	14	2.46	.09

T y p e	Species	Nestled Frequency		Quadrat Frequency		Average Cover %	
		'96	'01	'96	'01	'96	'01
F	<i>Erodium cicutarium</i> (a)	-	*53	-	17	-	1.98
F	<i>Euphorbia</i> spp.	18	*-	8	-	.28	-
F	<i>Galium aparine</i> (a)	-	3	-	1	-	.03
F	<i>Gilia</i> spp. (a)	1	1	1	1	.00	.00
F	<i>Grindelia squarrosa</i>	131	*67	48	32	3.22	.99
F	<i>Helianthus annuus</i> (a)	13	*-	7	-	.11	-
F	<i>Helianthella uniflora</i>	1	-	1	-	.03	-
F	<i>Lactuca serriola</i>	2	*12	1	7	.00	.25
F	<i>Lithospermum ruderales</i>	6	7	2	2	.30	.44
F	<i>Melilotus officinalis</i>	8	3	4	1	.21	.00
F	<i>Medicago sativa</i>	12	*28	4	9	.68	3.12
F	<i>Microsteris gracilis</i> (a)	-	2	-	1	-	.00
F	<i>Phacelia</i> spp.	3	-	1	-	.00	-
F	<i>Physalis longifolia</i>	-	*14	-	5	-	.19
F	<i>Tragopogon dubius</i>	21	19	9	10	.40	.24
F	Unknown forb-perennial	13	-	4	-	.59	-
F	<i>Wyethia amplexicaulis</i>	9	16	3	8	.36	.92
Total for Annual Forbs		139	91	58	36	2.62	2.13
Total for Perennial Forbs		279	193	107	90	8.67	8.73
Total for Forbs		418	284	165	126	11.29	10.86

* Indicates significant difference at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --

Herd unit 02 , Study no: 6

T y p e	Species	Strip Frequency		Average Cover %	
		'96	'01	'96	'01
B	<i>Artemisia tridentata vaseyana</i>	22	36	1.83	7.34
B	<i>Gutierrezia sarothrae</i>	12	16	.33	2.34
B	<i>Purshia tridentata</i>	3	2	.21	1.41
B	<i>Rhus glabra cismontana</i>	-	-	.03	-
Total for Browse		37	54	2.41	11.10

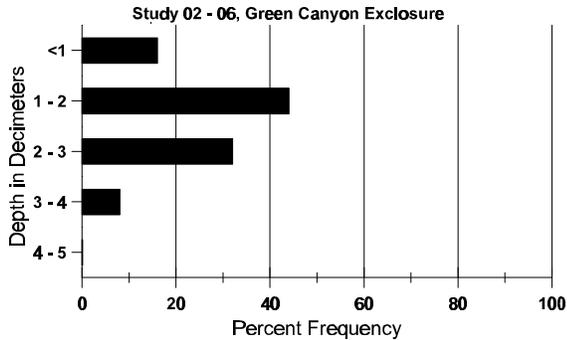
BASIC COVER --
Herd unit 02 , Study no: 6

Cover Type	Nested Frequency		Average Cover %	
	'96	'01	'96	'01
Vegetation	488	459	57.42	65.75
Rock	88	26	.52	.28
Pavement	167	221	2.07	3.59
Litter	498	472	69.95	52.29
Cryptogams	20	17	.25	.21
Bare Ground	135	158	4.41	5.68

SOIL ANALYSIS DATA --
Herd Unit 02, Study no: 06, Green Canyon Enclosure

Effective rooting depth (inches)	Temp °F (depth)	PH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
13.8	64.2 (17.5)	7.8	45.3	32.7	22.0	2.7	6.6	156.8	.6

Stoniness Index



PELLET GROUP FREQUENCY --
Herd unit 02 , Study no: 6

Type	Quadrat Frequency		Pellet Transect	
	'96	'01	Pellet Groups per Acre 01	Days Use per Acre (ha) 01
Horse	-	1	-	-
Elk	1	-	-	-
Deer	3	1	35	3 (7)
Cattle	2	-	-	-

BROWSE CHARACTERISTICS --

Herd unit 02 , Study no: 6

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	96	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
	01	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
Y	96	28	-	-	-	-	-	-	-	-	28	-	-	-	560		28	
	01	26	1	-	-	-	-	-	-	-	27	-	-	-	540		27	
M	96	13	1	-	-	-	-	-	-	-	13	-	-	1	280	29	46	
	01	40	10	-	-	-	-	-	-	-	49	1	-	-	1000	34	45	
D	96	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	01	4	1	-	-	-	-	-	-	-	4	-	-	1	100		5	
X	96	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	01	-	-	-	-	-	-	-	-	-	-	-	-	60		3		
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		02%			00%			02%			+49%							
'01		15%			00%			01%										
Total Plants/Acre (excluding Dead & Seedlings)											'96	840	Dec:	0%				
											'01	1640		6%				
<i>Gutierrezia sarothrae</i>																		
S	96	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	01	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	96	23	-	-	-	-	-	-	-	-	23	-	-	-	460		23	
	01	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7	
M	96	28	-	-	-	-	-	-	-	-	28	-	-	-	560	14	19	
	01	89	-	-	-	-	-	-	-	-	89	-	-	-	1780	15	20	
X	96	-	-	-	-	-	-	-	-	-	-	-	-	20		1		
	01	-	-	-	-	-	-	-	-	-	-	-	-	120		6		
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		00%			00%			00%			+47%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'96	1020	Dec:	-				
											'01	1920		-				
<i>Purshia tridentata</i>																		
M	96	2	2	-	-	-	-	-	-	-	4	-	-	-	80	39	90	
	01	2	-	-	-	-	-	-	-	-	2	-	-	-	40	28	58	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		50%			00%			00%			-50%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'96	80	Dec:	-				
											'01	40		-				