

Trend Study 00-2-06

Study site name: Frery Homestead.

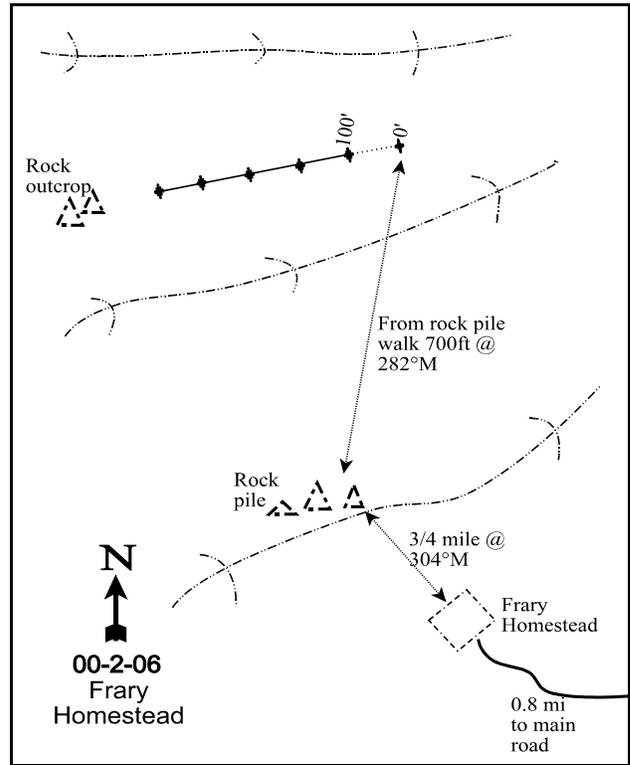
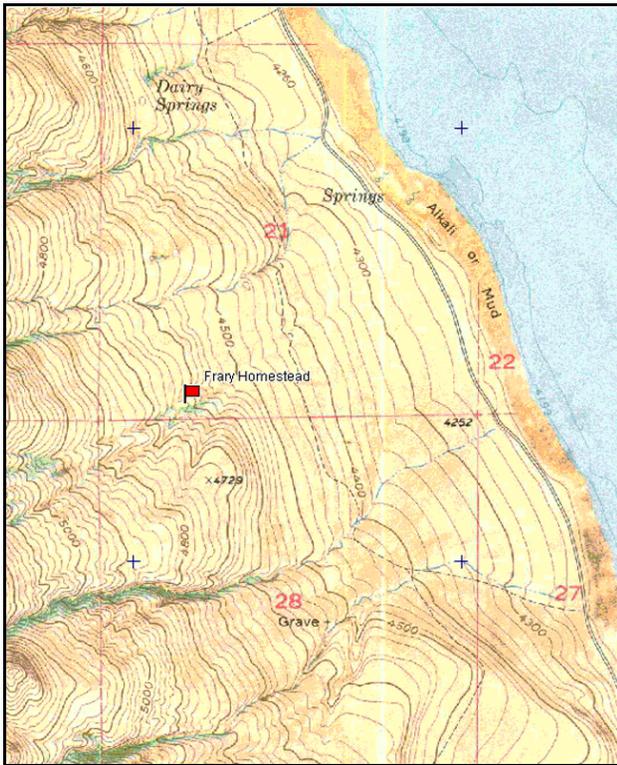
Vegetation type: Annual Grass.

Compass bearing: frequency baseline 208 degrees magnetic.

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

LOCATION DESCRIPTION

From the main gate on Antelope Island, travel south for approximately 6.9 miles. Turn west and travel 0.8 miles to the Frery homestead and gravesite. From the Frery gravesite, walk 3/4 mile at a bearing of 304 degrees magnetic to the left most rock on the end of the ridge. From the left most rock walk 15 paces at a bearing of 295 degrees magnetic to a rock pile. From the rock pile walk 700 feet at a bearing of 282 degrees magnetic to the 0-foot baseline stake. The baseline runs 208 degrees magnetic toward some rock outcrops.



Map Name: Antelope Island

Diagrammatic Sketch

Township 3N, Range 3W, Section 21

UTM NAD 27, UTM 12T 4536210 N 399242 E

DISCUSSION

Frary Homestead - Trend Study No. 00-2

Study Information

This study is located on the east side of Antelope Island north of the Frary Homestead grave site (elevation: 4,650 feet, slope: 8%, aspect: northeast). It is located on an alluvial fan with drainages on both sides (north and south) and has burned several times in the past, resulting in very little browse cover. Some surrounding ridges and drainages are still covered with sagebrush. Bison use of the area has been moderate. Numerous bedding sites and buffalo pats were noted in 1996. The pellet group transect in 2001 estimated 7 deer, 7 bighorn sheep, and 28 bison days use/acre (17 ddu/ha, 18 bhdu/ha, and 68 bdu/ha). In 2006, 23 bison days use/acre (57 bdu/ha) were estimated.

Soil

The soil is in the Ridd-Wasatch series complex, which consists of moderately to very deep, well to excessively drained, moderately permeable soils that formed in residuum and colluvium derived from gneiss, schist, quartzite, metamorphic, and igneous rocks; they are found on fan remnants, lake terraces, hillsides, and mountainsides (USDA-NRCS 2006). The soil texture is a sandy loam with a slightly acidic pH (6.1). The effective rooting depth is nearly 27 inches. Moisture was apparent in the profile while taking soil samples in 1996. Vegetation and litter cover are abundant and cover nearly all of the ground surface. The erosion condition class rating was stable in 2006.

Browse

Browse is scarce at this location due to recurring fire. Broom snakeweed and basin big sagebrush have been sampled, but at very low densities. The estimated density for broom snakeweed was 260 plants/acre in 1996 and 2001. The broom snakeweed population had increased to 880 plants/acre by 2006. The majority of plants have been mature and the population is stable. Wyoming big sagebrush density had an estimated density of 20 plants/acre in 1996 and 2001, but increased slightly to 160 plants/acre in 2006. No young or seedling sagebrush plants were sampled previous to 2006, but 80 young plants/acre and 20 seedlings/acre were sampled in 2006. The low recruitment is due to high competition with annual weeds in the understory. Rubber rabbitbrush was sampled for the first time in 2006 at 80 plants/acre. Most of these were young. No utilization was measured on any species previous to 2006, but there was some moderate browsing on sagebrush and rubber rabbitbrush in 2006.

Herbaceous Understory

The herbaceous understory is dominated by cheatgrass, which is thick and uniformly distributed. Cheatgrass was sampled in all quadrats in both 1996 and 2001, but only 80% in 2006. Cheatgrass nested frequency decreased significantly in 2001 and 2006. Other annual grass species include Japanese brome and rattail fescue, both of which have significantly increased in nested frequency since 1995. In 2001, rattail fescue significantly decreased in nested frequency. In 2006, Japanese brome nested frequency increased significantly. Six perennial grass species have been sampled; purple three-awn, bulbous bluegrass, and Sandberg bluegrass are the most abundant. Purple three-awn was the most abundant perennial grass until 2006, when bulbous bluegrass surpassed it in nested frequency and quadrat frequency. Bulbous bluegrass was sampled in 94% of quadrats and provided 13% cover in 2006, compared to 43% quadrat frequency and 3% cover in 2001. Sum of nested frequency of all perennial grasses combined increased by 25% in 2001 and 50% in 2006.

The forb composition is dominated by weedy annual species. Storksbill is the dominant forb; it has provided much of the forb cover since 1995. Yellow salsify, prickly lettuce, and annual agoseris (all of which are beneficial to wildlife) were both abundant in 1996, but significantly decreased in nested frequency in 2001 with the drier conditions. Salsify was not sampled in 2006 and annual agoseris had increased significantly. The nested frequency for all perennial forbs has continually decreased since 1996 and the nested frequency of

annual forbs has increased continually.

1996 TREND ASSESSMENT

The browse trend is stable with very few broom snakeweed plants encountered. Herbaceous weedy species, primarily annuals, will provide competition to browse species and prohibit the population from expanding. The grass trend is stable. The nested frequency of perennial grasses remained unchanged, but the nested frequency of annual grasses increased 24%. Cheatgrass nested frequency did not increase, but continues to dominate the herbaceous understory. Even if fire is suppressed, it will be extremely difficult to change the community composition. The forb trend is slightly up. The nested frequency of perennial forbs increased substantially and that of annual forbs decreased 69%. Yellow salsify, which is used by big game (Miller et al. 1981), increased significantly in nested frequency. Bur buttercup nested frequency decreased significantly and storksbill cover decreased. Unfortunately, composition is poor and the nested frequency of prickly lettuce, which is also utilized by big game (Miller et al. 1981), and annual agoseris decreased significantly. The nested frequency of the weedy moth mullein increased significantly. The 1995 Desirable Components Index score was very poor due to the lack of browse cover, high annual grass cover, and low perennial forb cover. The 1996 DCI score improved to very poor to poor due to increases in perennial grass and forb cover.

1995 winter range condition (DC Index) - very poor (-5) Lower potential scale

1996 winter range condition (DC Index) - very poor to poor (9) Lower potential scale

browse - stable (0)

grass - stable (0)

forb - slightly up (+1)

2001 TREND ASSESSMENT

Browse density is very low due to the recurrence of fire at short intervals. Broom snakeweed and sagebrush both remain at low, but identical, densities compared to 1996 estimates. There is still no sagebrush recruitment, which will likely continue in the future with the dominance of annuals. The grass trend is stable. The nested frequency of perennial grasses, excluding bulbous bluegrass, remained unchanged. The nested frequency of annual grasses changed little, despite a significant decrease in cheatgrass nested frequency. Bulbous bluegrass nested frequency increased significantly as well. The forb trend is down. The nested frequency of perennial forbs decreased 41% and that of annuals increased 22%. The nested frequencies of prickly lettuce, annual agoseris, and yellow salsify all decreased significantly. Then nested frequency of storksbill increased significantly. The DCI score increased to poor due to the increased in perennial grass cover.

winter range condition (DC Index) - poor (19) Lower potential scale

browse - stable (0)

grass - stable (0)

forb - down (-2)

2006 TREND ASSESSMENT

The browse trend is stable. The density of sagebrush increased slightly, but remained very low. Rubber rabbitbrush was sample for the first time in 2006 and had been moderately utilized. The grass trend is slightly up. The nested frequency of perennial grasses (excluding that of bulbous bluegrass) has increased 10% since 1995, the nested frequency of annual grasses decreased 12% since 1996, and cheatgrass nested frequency decreased significantly again in 2006. The forb trend is slightly down. The nested frequency of perennial forbs decreased 49%, the nested frequency of annual forbs increased 15%, and yellow salsify was not sampled (a significant decrease). Dalmation toadflax, a noxious weed in Wasatch County, was sampled for the first time. Weedy forbs continue to make up much of the community. Fortunately, the nested frequencies of storksbill and moth mullein decreased significantly. The DCI score remained poor.

winter range condition (DC Index) - poor (18) Lower potential scale

browse - stable (0)

grass - slightly up (+1)

forb - slightly down (-1)

HERBACEOUS TRENDS --
Management unit 00 , Study no: 2

Type	Species	Nested Frequency				Average Cover %			
		'95	'96	'01	'06	'95	'96	'01	'06
G	<i>Aristida purpurea</i>	_a 185	_b 220	_c 279	_c 280	5.05	9.79	19.31	22.85
G	<i>Bromus japonicus</i> (a)	_a 17	_{ab} 47	_b 71	_c 165	.03	.46	.89	3.82
G	<i>Bromus tectorum</i> (a)	_c 482	_c 480	_b 463	_a 315	43.42	34.31	28.07	12.61
G	<i>Elymus cinereus</i>	-	-	3	-	-	-	.15	-
G	<i>Festuca myuros</i> (a)	_a 29	_c 126	_b 68	_{bc} 95	.26	1.58	.41	2.50
G	<i>Poa bulbosa</i>	_a 6	_a 8	_b 115	_c 363	.01	.02	2.95	12.89
G	<i>Poa fendleriana</i>	_b 37	_c 84	_a 3	_{ab} 16	.28	.42	.00	.11
G	<i>Poa secunda</i>	_c 181	_a 54	_b 120	_b 140	1.16	.13	.88	6.48
G	<i>Sporobolus cryptandrus</i>	_a 24	_b 81	_a 39	_a 37	.08	.87	.78	.60
G	<i>Vulpia octoflora</i> (a)	-	-	-	4	-	-	-	.00
Total for Annual Grasses		528	653	602	579	43.72	36.36	29.38	18.95
Total for Perennial Grasses		433	447	559	836	6.59	11.24	24.09	42.93
Total for Grasses		961	1100	1161	1415	50.31	47.60	53.47	61.88
F	<i>Agoseris heterophylla</i> (a)	_d 137	_c 74	_a -	_b 10	.63	.18	-	.02
F	<i>Arabidopsis thaliana</i> (a)	-	-	-	5	-	-	-	.03
F	<i>Aster</i> sp.	-	10	-	-	-	.01	-	-
F	<i>Cirsium undulatum</i>	-	-	-	1	.00	.15	-	.01
F	<i>Delphinium nuttallianum</i>	1	-	-	-	.00	-	-	-
F	<i>Descurainia pinnata</i> (a)	_b 190	_a -	_a 8	_a -	.42	-	.01	-
F	<i>Draba nemorosa</i> (a)	_c 261	_a -	_b 56	_b 85	1.25	-	.22	.36
F	<i>Epilobium brachycarpum</i> (a)	_a -	_a -	_a -	_b 21	-	-	-	.06
F	<i>Erodium cicutarium</i> (a)	_{ab} 257	_a 246	_b 313	_a 225	5.39	2.84	8.91	2.46
F	<i>Erigeron divergens</i>	_a 2	_b 51	_b 42	_b 46	.00	.90	.59	1.36
F	<i>Helianthus annuus</i> (a)	_a -	_a -	_a -	_b 103	-	-	-	.45
F	<i>Heterotheca villosa</i>	-	-	-	-	-	-	.00	-
F	<i>Holosteum umbellatum</i> (a)	_b 21	_a -	_b 14	_b 17	.20	-	.08	.08
F	<i>Lactuca serriola</i>	_c 106	_b 70	_a 9	_a 1	.41	.32	.01	.00
F	<i>Linaria dalmatica</i>	-	-	-	2	-	-	-	.00
F	<i>Lychnis drummondii</i>	_a -	_a -	_b 27	_a 13	-	-	.07	.02
F	<i>Machaeranthera</i> spp	9	-	-	-	.01	-	-	-
F	<i>Polygonum douglasii</i> (a)	-	3	-	-	-	.00	-	-
F	<i>Ranunculus testiculatus</i> (a)	_b 184	_a 2	_a -	_a -	1.48	.00	-	-
F	<i>Sisymbrium altissimum</i> (a)	12	2	7	2	.02	.00	.19	.03
F	<i>Taraxacum officinale</i>	_{ab} 6	_{ab} 9	_b 11	_a -	.05	.07	.13	-
F	<i>Tragopogon dubius</i>	_b 12	_d 96	_c 37	_a -	.02	.51	.37	-

Type	Species	Nested Frequency				Average Cover %			
		'95	'96	'01	'06	'95	'96	'01	'06
F	<i>Verbascum blattaria</i>	_a -	_b 61	_b 48	_a 16	.01	.93	2.96	.22
Total for Annual Forbs		1062	327	398	468	9.41	3.04	9.42	3.51
Total for Perennial Forbs		136	297	174	79	0.53	2.91	4.15	1.62
Total for Forbs		1198	624	572	547	9.94	5.95	13.57	5.14

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

BROWSE TRENDS --

Management unit 00 , Study no: 2

Type	Species	Strip Frequency				Average Cover %			
		'95	'96	'01	'06	'95	'96	'01	'06
B	<i>Artemisia tridentata tridentata</i>	0	1	1	6	-	.03	.63	.36
B	<i>Chrysothamnus nauseosus</i>	0	0	0	3	-	-	-	.03
B	<i>Chrysothamnus nauseosus albicaulis</i>	0	0	0	0	-	-	-	.06
B	<i>Gutierrezia sarothrae</i>	6	7	10	17	.01	.19	.45	.98
Total for Browse		6	8	11	26	0.00	0.22	1.07	1.43

CANOPY COVER, LINE INTERCEPT --

Management unit 00 , Study no: 2

Species	Percent Cover
	'06
<i>Artemisia tridentata tridentata</i>	.21
<i>Chrysothamnus nauseosus</i>	.08
<i>Gutierrezia sarothrae</i>	1.85

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 00 , Study no: 2

Species	Average leader growth (in)
	'06
<i>Artemisia tridentata tridentata</i>	3.8

BASIC COVER --

Management unit 00 , Study no: 2

Cover Type	Average Cover %			
	'95	'96	'01	'06
Vegetation	70.77	62.96	65.87	73.74
Rock	.36	.03	.01	.03
Pavement	0	1.22	.11	1.98
Litter	76.29	76.46	60.50	27.75
Cryptogams	.02	1.03	.00	.08
Bare Ground	1.21	.78	.44	1.54

SOIL ANALYSIS DATA --

Herd Unit 00, Study no: 02, Frary Homestead

Effective rooting depth (in)	Temp °F (depth)	PH	Sandy loam			%OM	PPM P	PPM K	dS/m
			%sand	%silt	%clay				
26.9	58.4 (19.7)	6.1	69.7	15.0	15.3	1.7	21.2	179.2	0.3

PELLET GROUP DATA --

Management unit 00 , Study no: 2

Type	Quadrat Frequency			
	'95	'96	'01	'06
Big Horn	-	-	1	-
Deer	-	-	4	-
Buffalo	5	15	9	7

Days use per acre (ha)	
'01	'06
7 (18)	-
7 (17)	-
28 (68)	23 (57)

BROWSE CHARACTERISTICS --
Management unit 00 , Study no: 2

		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 tridentata tridentata</i>												
95	0	-	-	-	-	-	0	0	-	-	0	-/-
96	20	-	-	20	-	-	0	0	-	-	0	10/12
01	20	-	-	20	-	-	0	0	-	-	0	23/43
06	160	20	80	80	-	20	38	0	-	-	0	19/20
<i>Chrysothamnus nauseosus</i>												
95	0	-	-	-	-	-	0	0	0	-	0	-/-
96	0	-	-	-	-	-	0	0	0	-	0	-/-
01	0	-	-	-	-	-	0	0	0	-	0	-/-
06	80	-	60	-	20	-	50	0	25	-	0	-/-
<i>Chrysothamnus viscidiflorus</i>												
95	0	-	-	-	-	-	0	0	-	-	0	-/-
96	0	-	-	-	-	-	0	0	-	-	0	-/-
01	0	-	-	-	-	-	0	0	-	-	0	9/12
06	0	-	-	-	-	-	0	0	-	-	0	14/25
<i>Gutierrezia sarothrae</i>												
95	220	-	160	60	-	-	0	0	0	-	0	9/11
96	260	120	-	260	-	-	0	0	0	-	0	11/11
01	260	-	20	100	140	140	0	0	54	31	31	8/10
06	880	-	20	860	-	-	0	0	0	-	0	13/18