

Trend Study 25A-19-04

Study site name: Row of Pines - Cattle Exclosure .

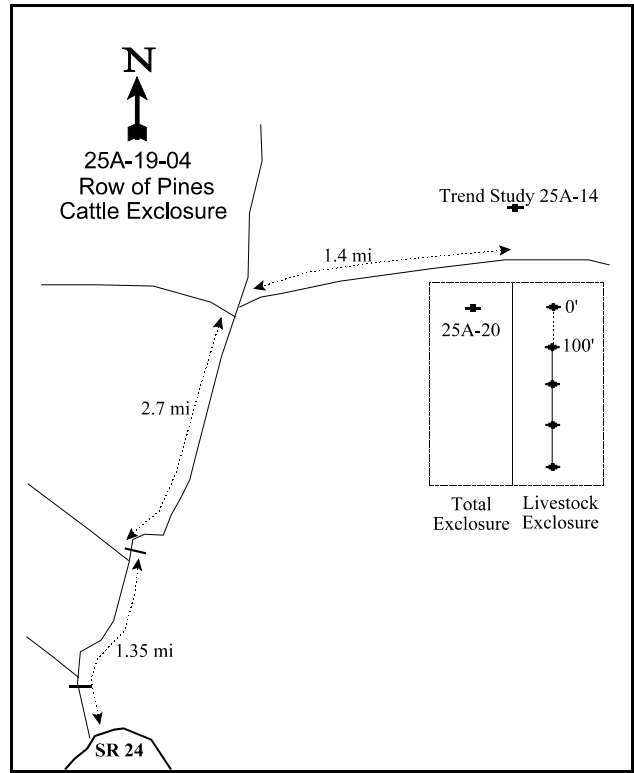
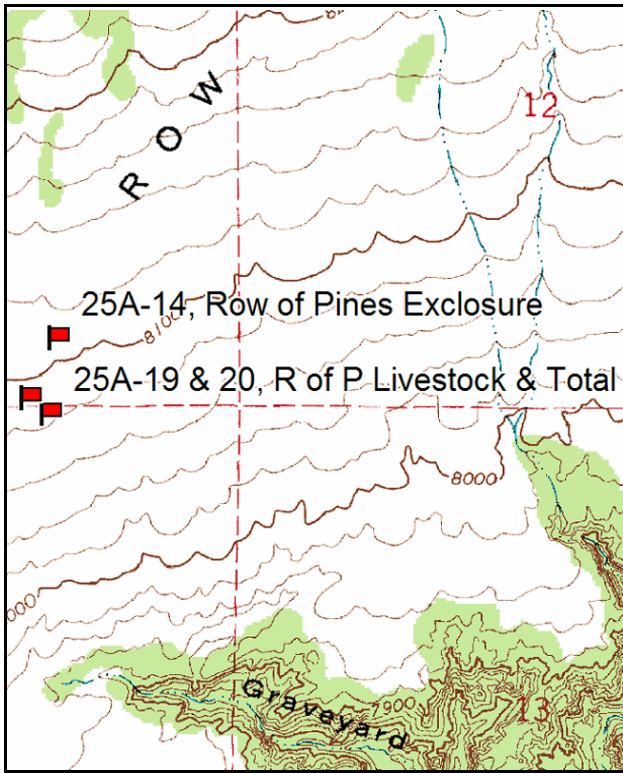
Vegetation type: Wyoming Big Sagebrush .

Compass bearing: frequency baseline 210 degrees magnetic.

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

LOCATION DESCRIPTION

From the Chappell Cheese Factory northwest of Loa on SR 24, go west 2.6 miles to a side road on the north where the highway makes a sharp turn (0.95 miles west of mile marker #49). Take this road 0.65 miles and turn right after crossing a cattleguard. After 0.7 more miles, turn right at the fork and cross another cattleguard. Go 2.7 miles to another fork where you will again turn right. After ~60', turn right (east) and go 1.4 miles to an exclosure. The baseline runs down through the middle of the livestock exclosure (east side), with the 0 ft stake having browse tag #409 attached.



Map name: Loa, Utah

Diagrammatic Sketch

Township 27S, Range 2E, Section 14 .

GPS: NAD 27, UTM 12S 4257846 N, 442709 E

DISCUSSION

Row of Pines Livestock Exclosure - Trend Study No. 25A-19

The Row of Pines Livestock Exclosure trend study was established in 1999 inside the livestock exclosure. The exclosure was built in the late 1980's after the area was chained and seeded. Trend study 25A-14 was established in 1991 about 200 feet to the north of the exclosure. In 1999 it was determined that data was needed within the livestock exclosure and the total exclosure. The area supports a sagebrush grass type which is nearly level (3-5% slope) and has a slight south aspect. Deer and elk use within the livestock exclosure was relatively heavy. Pellet group data from 1999 estimated 48 deer and 58 elk days use/acre (119 ddu/ha and 143 edu/ha), most of which was winter use. Data from 2004 showed an increase in deer use with an estimated 126 deer and 11 elk days use/acre (312 ddu/ha and 28 edu/ha).

Soil depth is moderately shallow with an estimated effective rooting depth of just over 11 inches. Texture is a sandy clay loam to a loam with a neutral pH (7.0). Soil parent material is basalt. Phosphorus is marginal at 8.5 ppm. Values less than 10 ppm may limit normal plant growth and development. The soil surface is mostly a combination of pavement and bare ground with some evidence of soil erosion. Due to the lack of slope, water erosion is not a major problem in this area.

The key browse species in this area is Wyoming big sagebrush, which had an estimated density of 5,820 plants/acre in 1999 in the livestock exclosure. Decadence was moderately high at 27% with 17% of the population classified as dying. In 2004, most of these plants must have died as density declined 16% 4,900 plants/acre. This trend worsened in 2004 as 69% of the population was decadent with percent dying doubling to 34%. Cover decreased from 8% in 1999 to 5% in 2004. Utilization has been moderate to heavy. Sixty percent of the plants showed signs of heavy use in 2004. Recruitment has been very poor with no seedlings and only 2-3% of the population consisting of young plants. This is not enough recruitment to replace the dying plants. The only other common shrubs found in the exclosure are increasers, thinleaf low rabbitbrush and broom snakeweed. Rabbitbrush density is stable at about 800 plants/acre. Broom snakeweed density declined 77% in 2004 to 540 plants/acre.

The herbaceous understory is dominated by grasses which are diverse for a Wyoming big sagebrush site. Common species include seeded species such as crested wheatgrass and Russian wildrye, and native blue grama and bottlebrush squirreltail. Crested wheatgrass and bottlebrush squirreltail declined significantly in nested frequency in 2004. Other seeded grasses, intermediate wheatgrass and smooth brome, occur occasionally. Forbs are rare and produce less than half of 1% cover.

Precipitation has been below normal 4 of 5 years prior to 2004, which would help explain some of the decline for sagebrush and herbaceous species.

1999 APPARENT TREND ASSESSMENT

The soil trend appears stable due to abundant protective ground cover. However, rock and pavement provide most of this cover. Erosion is minimal due to the armored nature of the soil surface combined with the gentle terrain. Trend for the key browse, Wyoming big sagebrush, appears to be declining due to low recruitment combined with a high number of decadent dying plants. Utilization is moderate to heavy with most plants not currently producing seed. The increasers, thinleaf low rabbitbrush and broom snakeweed, appear to have mature and stable populations. The herbaceous understory is dominated by a variety of seeded and native grasses. The livestock exclosure contains more seeded grasses than outside. The low abundance of cool season perennial grasses outside of the exclosure and higher numbers of cool season grasses inside of the livestock exclosure indicates higher grazing pressure outside of the exclosure in the spring by livestock. Forbs are lacking here as well as outside of the exclosure.

winter range condition (DC Index) - 42 (fair to good) Wyoming big sagebrush type

2004 TREND ASSESSMENT

The trend for soil is slightly down. Even with the slight decrease in relative percent bare ground cover from 25% to 20%, pavement increased from 25% to 37% indicating a possible loss of soil. Vegetation cover decreased due to drought conditions and litter increased with the death of sagebrush plants. The slight slope prevents erosion from being worse. The browse trend is down. Wyoming big sagebrush density declined 16%, while decadency increased to 69% which is very high. Percent dying also increased to 34% while there are very few young plants to replace those that are dying. The herbaceous understory trend is also down. Nested frequency for perennial grasses decreased 42% and perennial forbs decreased 59%. The Desirable Components Index (see methods) rating is poor due to the loss of preferred browse cover and the high percentage of decadent sagebrush.

TREND ASSESSMENT

soil - down slightly (2)

browse - down (1)

herbaceous understory - down (1)

winter range condition (DC Index) - 20 (poor) Wyoming big sagebrush type

HERBACEOUS TRENDS --

Management unit 25A, Study no: 19

Type	Species	Nested Frequency		Average Cover %	
		'99	'04	'99	'04
G	Agropyron cristatum	_b 130	_a 66	2.66	2.07
G	Agropyron intermedium	1	-	.00	-
G	Bouteloua gracilis	91	99	3.86	2.81
G	Bromus inermis	10	1	.09	.03
G	Elymus junceus	40	42	1.20	1.77
G	Oryzopsis hymenoides	10	7	.27	.24
G	Sitanion hystrix	_b 136	_a 25	2.01	.80
G	Stipa comata	1	2	.06	.03
G	Stipa pinetorum	2	2	.15	.15
Total for Annual Grasses		0	0	0	0
Total for Perennial Grasses		421	244	10.33	7.94
Total for Grasses		421	244	10.33	7.94
F	Androsace septentrionalis (a)	2	-	.01	-
F	Astragalus spp.	3	5	.00	.00
F	Chenopodium leptophyllum(a)	_a -	_b 15	-	.51
F	Cryptantha spp.	3	-	.03	-
F	Descurainia pinnata (a)	-	3	-	.00
F	Eriogonum ovalifolium	1	-	.03	-
F	Erigeron pumilus	_b 32	_a 3	.15	.00

T y p e	Species	Nested Frequency		Average Cover %	
		'99	'04	'99	'04
F	Salsola iberica (a)	-	1	-	.00
F	Sphaeralcea coccinea	10	14	.04	.25
F	Unknown forb-perennial	4	-	.03	-
Total for Annual Forbs		2	19	0.00	0.52
Total for Perennial Forbs		53	22	0.30	0.25
Total for Forbs		55	41	0.31	0.78

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

BROWSE TRENDS --

Management unit 25A, Study no: 19

T y p e	Species	Strip Frequency		Average Cover %	
		'99	'04	'99	'04
B	Artemisia tridentata wyomingensis	91	78	8.23	5.31
B	Chrysothamnus viscidiflorus stenophyllus	28	25	.11	.25
B	Gutierrezia sarothrae	67	23	1.06	.22
B	Opuntia fragilis	6	11	.18	.06
B	Pediocactus simpsonii	0	2	-	.00
Total for Browse		192	139	9.59	5.86

CANOPY COVER, LINE INTERCEPT --

Management unit 25A, Study no: 19

Species	Percent Cover
	'04
Artemisia tridentata wyomingensis	6.11
Chrysothamnus viscidiflorus stenophyllus	.18
Gutierrezia sarothrae	.26
Opuntia fragilis	.06

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 25A, Study no: 19

Species	Average leader growth (in)
	'04
Artemisia tridentata wyomingensis	1.1

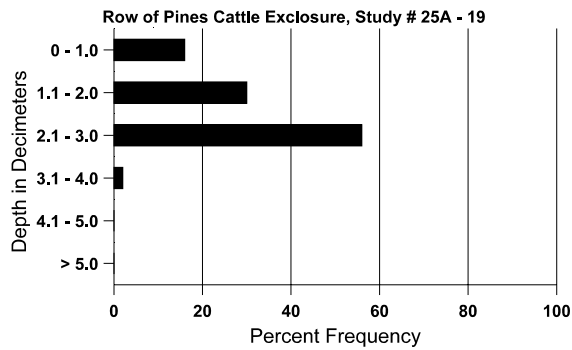
BASIC COVER --
Management unit 25A, Study no: 19

Cover Type	Average Cover %	
	'99	'04
Vegetation	21.47	13.96
Rock	12.68	15.14
Pavement	22.53	40.84
Litter	11.73	19.00
Cryptogams	.00	.03
Bare Ground	22.28	21.76

SOIL ANALYSIS DATA --
Management unit 25A, Study no: 19, Study Name: Row of Pines Cattle Exclosure

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
11.2	57.0 (11.6)	7.0	47.3	27.4	25.3	1.6	8.5	163.2	0.6

Stoniness Index



PELLET GROUP DATA --

Management unit 25A, Study no: 19

Type	Quadrat Frequency		Days use per acre (ha)	
	'99	'04	'99	'04
Rabbit	1	8	-	-
Elk	24	11	58 (143)	11 (28)
Deer	22	38	48 (119)	126 (312)
Cattle	-	1	-	-

BROWSE CHARACTERISTICS --

Management unit 25A, Study no: 19

		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 wyomingensis</i>												
99	5820	-	160	4100	1560	940	49	46	27	17	18	12/23
04	4900	-	100	1440	3360	2060	38	60	69	34	35	10/20
<i>Chrysothamnus viscidiflorus stenophyllus</i>												
99	880	-	20	820	40	-	18	5	5	5	5	5/8
04	800	20	40	700	60	20	0	0	8	5	5	5/11
<i>Gutierrezia sarothrae</i>												
99	2380	20	80	2300	-	80	0	0	-	-	0	7/8
04	540	-	40	500	-	-	0	0	-	-	0	5/7
<i>Opuntia fragilis</i>												
99	200	-	-	200	-	-	0	0	-	-	0	2/5
04	440	-	80	360	-	-	0	0	-	-	0	2/8
<i>Pediocactus simpsonii</i>												
99	0	-	-	-	-	-	0	0	-	-	0	-/-
04	40	-	-	40	-	-	0	0	-	-	0	1/2