

Trend Study 13A-14-04

Study site name: Lower Lackey Fan .

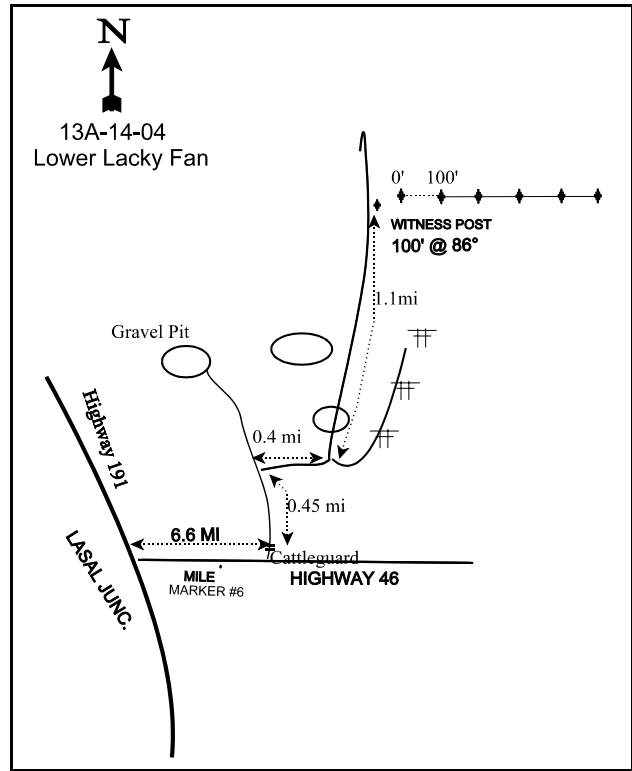
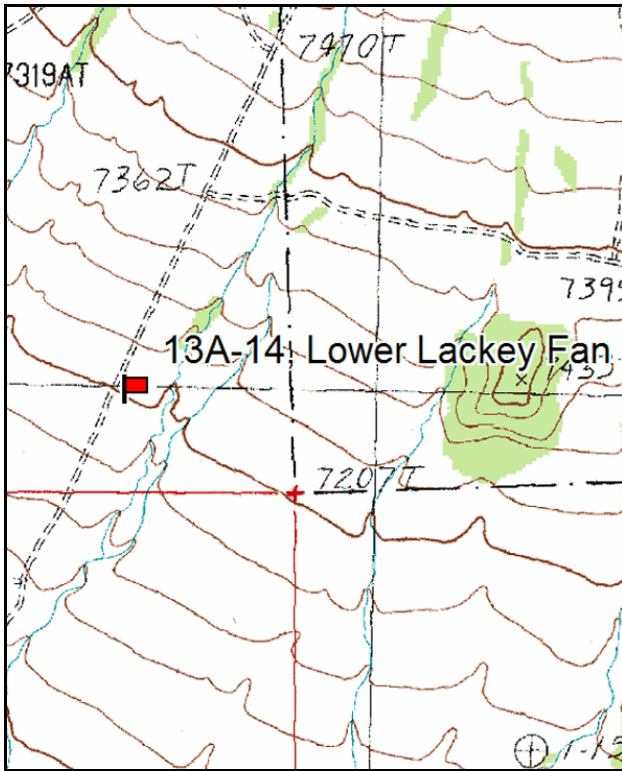
Vegetation type: Wyoming Big Sagebrush .

Compass bearing: frequency baseline 86 degrees magnetic.

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

LOCATION DESCRIPTION

From LaSal Junction travel east on Highway 46 to mile marker #6. Continue 0.60 miles from mile marker #6 and turn left (north) onto a dirt road. Go 0.45 miles to where the road forks and turn right. Go 0.4 miles to another fork. Turn left and go 1.1 miles to witness post. The 0-foot stake is found 100 feet away at a bearing of 86°M. Browse tag #200 marks the start of the baseline.



Map Name: LaSal West

Diagrammatic Sketch

Township 28S , Range 24E , Section 27

GPS: NAD 27, UTM 12S 4243961 N, 650438 E

## DISCUSSION

### Lower Lackey Fan - Trend Study No. 13A-14

The Lower Lackey Fan site was established in 1994 and is located on the lower southwest slopes of the LaSal Mountains at 7,200 feet in elevation. It is on a fairly flat ridge with scattered pinyon and juniper with a moderate density of Wyoming big sagebrush and fairly abundant crested wheatgrass. The sagebrush in the past has been sprayed and seeded to crested wheatgrass. This new area is thought to be particularly important to elk during the winter. The pellet group data from 1999 estimated 34 elk (84 edu/ha), 20 deer (49 ddu/ha), and 12 cow days use/acre (30 cdu/ha). Pellet group data from 2004 estimated 52 elk (129 edu/ha), 7 deer (18 ddu/ha), and 7 cow days use/acre (16cdu/ha). This area is managed by the BLM and is part of the Hatch Point grazing allotment.

The site has a moderately shallow (effective rooting depth of almost 11 inches), reddish-brown, sandy clay loam soil with abundant rock within the profile and on the surface. The soil reaction is neutral (7.2 pH). Phosphorous could be a limiting factor on the site at 8.1 ppm. Values below 10 ppm may limit normal plant growth and development. The soil has a combined rock and pavement cover of 21% with a relatively low litter cover of 30%. Percent bare ground is not as high as some other sagebrush/grass sites with a scattered population of pinyon and juniper. There is some evidence of soil movement, but this is mitigated by the lack of a steep slope. The erosion condition class was determined to be slight in 2004.

The key browse species is Wyoming big sagebrush with a moderate density of 4,920 plants/acre in 1994, 3,880 in 1999, and 3,860 in 2004. The population appears to be steady, although seedling production decreased from 86% in 1994, to 14% in 1999, to 0% in 2004. The young age class has had similar trends. Additionally, the proportion of the population that is classified as dead has gone up from 5% in 1994, 14% in 1999, to 19% in 2004, but percent decadence decreased from 29% in 1999 to 15% in 2004. With additional precipitation in 2004, perhaps the population will stabilize. Strip frequency also suggests a temporary stabilizing trend. Utilization is moderate to heavy, but vigor appears to be good.

The scattered pinyon and juniper provides some valuable cover for wintering animals during critical periods of winter. In 1999, point quarter estimated both pinyon and juniper trees to be 6 trees/acre with an average diameter of 4 inches and 5.8 inches. A very low density of heavily used bitterbrush are scattered throughout the community. The increaser, broom snakeweed has fluctuated in density, in 1994 it was estimated at 1,800 plants/acre. It increased substantially to 20,060 plants/acre in 1999, but decreased to 5,260 in 2004. This is its typical response to wet and dry cycles. It is found in thick clumped patches.

The herbaceous understory is primarily composed of grasses which make up, on average, 91% of the herbaceous cover. There are primarily only two grass species found on the site, crested wheatgrass and cheatgrass. Crested wheatgrass provided 42% of the cover in 2004, which just more than Wyoming big sagebrush at 25%. Cheatgrass decreased significantly in nested frequency in 2004, which has been fairly abundant in the past, but still has the potential to increase again. Forbs were diverse in 1994 at 23 species, although nearly half were small annual species. Only 6 species were sampled in 1999 and 4 in 2004. All together, forbs provided only 8% of the total cover in 1994, now they provide about 2% in 2004.

### 1994 APPARENT TREND ASSESSMENT

Because it is a new site there is no previous data to compare with. Inasmuch as the herbaceous species provide nearly 50% of the vegetative cover and percent bare ground is 29%, the soil on the site is considered stable, but only in fair condition. The apparent browse trend is considered up with excellent seedling and young production on Wyoming big sagebrush. Age class distribution is good with a moderately low percentage of decadent plants. The herbaceous understory is stable, but the percentage of annual grass should be watched

closely; any increase may indicate a downward trend for the site. The Desirable Components Index rated this site as good with a score of 57 due to good shrub cover, moderate annual grass cover, and few forbs.

winter range condition (DC Index) - 57 (good) Wyoming big sagebrush type

#### 1999 TREND ASSESSMENT

The trend for soil is slightly up, but still in poor condition. The decrease in bare soil is mostly because of increases in cheatgrass and broom snakeweed cover, both increasers. The browse trend has taken an unexpected turn downward as sagebrush has experienced decreases in cover, seedling production, and the percentage of young in the population. The population density has also decreased by 21% as shown by the decrease in strip frequency. Also, increases in decadency and the percent of the population classified as dead point to a downward trend. There has also been an unusually large increase in the broom snakeweed population. The herbaceous understory is somewhat mixed. There have been increases for crested wheatgrass, but increases for cheatgrass as well. The forbs only made up 17% of the herbaceous cover in 1994, but have since been reduced to less than 1% of the herbaceous cover. Overall, trend is up for the herbaceous species, however the annual grass component should be watched closely as further increases would probably mean losses of other herbaceous species and a reduction in the number of sagebrush seedlings becoming established. The Desirable Components Index rated this site as good with a score of 49 due to decreased shrub cover, moderate annual grass cover, and increase in percent decadence of shrubs.

#### TREND ASSESSMENT

soil - slightly up (4)

browse - down (1)

herbaceous understory - up (5)

winter range condition (DC Index) - 49 (good) Wyoming big sagebrush type

#### 2004 TREND ASSESSMENT

Trend for soil is down slightly. Percent bare ground increased as well as rock and pavement cover. Increases in rock and pavement suggest soil movement. The erosion condition class indicates some active soil movement and the presences of a few gullies. Trend for key browse Wyoming big sagebrush is stable. Density has remained similar to 1999 and percent decadence decreased from 29% in 1999 to 15% in 2004. Young and seedling production are low, but seedhead production was moderate and annual leader growth averaged almost 2 inches. Trend for herbaceous understory is considered stable with slight increases in nested values for perennial species, but not enough to change the trend. Cheatgrass decreased significantly in nested frequency, while crested wheatgrass increased in percent cover. The Desirable Components Index rated this site as good with a score of 59 due to increase in perennial grass cover, decreased annual grass cover, and decreased percent decadence of shrubs.

#### TREND ASSESSMENT

soil - slightly down (2)

browse - stable (3)

herbaceous understory - slightly up (3)

winter range condition (DC Index) - 59 (good) Wyoming big sagebrush type

HERBACEOUS TRENDS --  
Management unit 13A, Study no: 14

T y p e	Species	Nested Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
G	<i>Agropyron cristatum</i>	<sub>a</sub> 225	<sub>b</sub> 309	<sub>b</sub> 285	7.54	10.15	16.17
G	<i>Bromus tectorum</i> (a)	<sub>b</sub> 175	<sub>b</sub> 206	<sub>a</sub> 80	3.18	3.51	1.23
G	<i>Vulpia octoflora</i> (a)	-	8	5	-	.02	.01
Total for Annual Grasses		175	214	85	3.18	3.53	1.24
Total for Perennial Grasses		225	309	285	7.54	10.15	16.17
Total for Grasses		400	523	370	10.73	13.69	17.41
F	<i>Astragalus convallarius</i>	<sub>b</sub> 24	<sub>a</sub> 3	<sub>b</sub> 19	.14	.01	.61
F	<i>Chenopodium</i> spp. (a)	<sub>b</sub> 11	<sub>a</sub> -	<sub>a</sub> -	.02	-	-
F	<i>Comandra pallida</i>	<sub>b</sub> 24	<sub>a</sub> -	<sub>a</sub> -	.06	-	-
F	<i>Collinsia parviflora</i> (a)	<sub>b</sub> 26	<sub>a</sub> 4	<sub>a</sub> -	.09	.00	-
F	<i>Cryptantha nevadensis</i>	<sub>b</sub> 39	<sub>a</sub> -	<sub>a</sub> -	.06	-	-
F	<i>Cryptantha</i> spp.	<sub>b</sub> 20	<sub>a</sub> -	<sub>a</sub> -	.04	-	-
F	<i>Dalea searlsiae</i>	2	-	-	.00	-	-
F	<i>Descurainia pinnata</i> (a)	<sub>b</sub> 14	<sub>a</sub> -	<sub>ab</sub> 4	.02	-	.15
F	<i>Draba nemorosa</i> (a)	<sub>b</sub> 42	<sub>a</sub> -	<sub>a</sub> -	.08	-	-
F	<i>Erigeron pumilus</i>	-	-	-	-	.00	-
F	<i>Gayophytum ramosissimum</i> (a)	<sub>b</sub> 22	<sub>a</sub> -	<sub>a</sub> -	.04	-	-
F	<i>Gilia</i> spp. (a)	<sub>b</sub> 18	<sub>a</sub> -	<sub>a</sub> -	.04	-	-
F	<i>Heterotheca villosa</i>	-	4	-	-	.03	-
F	<i>Ipomopsis aggregata</i>	2	1	1	.00	.00	.00
F	<i>Machaeranthera</i> spp	1	-	-	.00	-	-
F	<i>Microsteris gracilis</i> (a)	<sub>b</sub> 60	<sub>a</sub> 6	<sub>a</sub> -	.32	.01	-
F	<i>Oxybaphus linearis</i>	2	-	-	.01	-	-
F	<i>Phlox longifolia</i>	3	-	5	.01	-	.01
F	<i>Ranunculus testiculatus</i> (a)	<sub>b</sub> 158	<sub>a</sub> -	<sub>a</sub> -	.73	-	-
F	<i>Salsola iberica</i> (a)	3	-	-	.01	-	-
F	<i>Schoenocrambe linifolia</i>	<sub>b</sub> 27	<sub>a</sub> -	<sub>a</sub> -	.07	-	-
F	<i>Sisymbrium altissimum</i> (a)	-	-	-	.00	-	-
F	<i>Sphaeralcea coccinea</i>	5	-	-	.38	-	-
F	<i>Tragopogon dubius</i>	5	-	-	.01	-	-
F	<i>Trifolium</i> spp.	3	-	2	.03	-	.03
Total for Annual Forbs		354	10	4	1.37	0.01	0.15
Total for Perennial Forbs		157	8	27	0.84	0.05	0.65
Total for Forbs		511	18	31	2.22	0.07	0.81

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

BROWSE TRENDS --

Management unit 13A, Study no: 14

Type	Species	Strip Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
B	Artemisia tridentata wyomingensis	86	73	73	12.07	9.84	9.71
B	Chrysothamnus depressus	0	1	7	-	-	.01
B	Eriogonum microthecum	1	0	1	-	-	-
B	Gutierrezia sarothrae	37	73	65	.82	8.06	2.04
B	Juniperus osteosperma	0	1	1	-	-	-
B	Pediocactus simpsonii	0	0	1	-	-	-
B	Pinus edulis	0	1	1	-	3.75	5.94
B	Purshia tridentata	1	4	4	.15	.15	.15
B	Quercus gambelii	-	-	-	-	.15	.38
B	Yucca spp.	6	7	9	1.60	1.31	1.80
Total for Browse		131	160	162	14.64	23.26	20.05

CANOPY COVER, LINE INTERCEPT --

Management unit 13A, Study no: 14

Species	Percent Cover	
	'99	'04
Artemisia tridentata wyomingensis	-	10.71
Chrysothamnus depressus	-	.01
Gutierrezia sarothrae	-	2.48
Juniperus osteosperma	-	.05
Pinus edulis	5.19	6.26
Purshia tridentata	-	.21
Quercus gambelii	4.00	3.59
Yucca spp.	-	2.65

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 13A, Study no: 14

Species	Average leader growth (in)
	'04
Artemisia tridentata wyomingensis	1.9

POINT-QUARTER TREE DATA --  
 Management unit 13A, Study no: 14

Species	Trees per Acre	
	'99	'04
Juniperus osteosperma	6	-
Pinus edulis	6	-

Average diameter (in)	
'99	'04
5.8	-
4.0	-

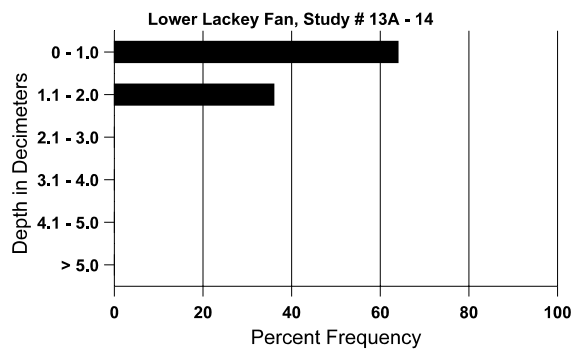
BASIC COVER --  
 Management unit 13A, Study no: 14

Cover Type	Average Cover %		
	'94	'99	'04
Vegetation	27.73	34.18	36.42
Rock	12.83	15.93	16.14
Pavement	1.11	3.06	4.60
Litter	31.20	36.69	30.13
Cryptogams	.06	1.40	.37
Bare Ground	28.67	23.90	30.02

SOIL ANALYSIS DATA --  
 Management unit 13A, Study no: 14, Study Name: Lower Lackey Fan

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	ds/m
10.7	69.7 (10.4)	7.2	52.9	25.8	21.3	2.1	8.1	76.8	0.5

### Stoniness Index



PELLET GROUP DATA --

Management unit 13A, Study no: 14

Type	Quadrat Frequency		
	'94	'99	'04
Rabbit	17	21	7
Elk	30	21	26
Deer	1	16	8
Cattle	-	8	1

Days use per acre (ha)	
'99	'04
-	-
34 (84)	52 (129)
20 (49)	7 (18)
12 (30)	7 (16)

BROWSE CHARACTERISTICS --

Management unit 13A, Study no: 14

		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>												
94	<b>4920</b>	4240	1760	2140	1020	260	9	2	21	11	13	25/36
99	<b>3880</b>	560	720	2020	1140	700	52	13	29	5	6	20/28
04	<b>3860</b>	-	240	3060	560	900	54	30	15	10	11	18/29
<i>Chrysothamnus depressus</i>												
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
99	<b>20</b>	-	-	20	-	-	0	0	-	-	0	3/6
04	<b>240</b>	-	40	200	-	-	50	0	-	-	0	6/10
<i>Ephedra viridis</i>												
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
99	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
04	<b>0</b>	-	-	-	-	-	0	0	-	-	0	43/63
<i>Eriogonum microthecum</i>												
94	<b>40</b>	-	-	40	-	-	0	0	-	-	0	9/11
99	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
04	<b>20</b>	-	-	20	-	20	0	0	-	-	0	10/14
<i>Gutierrezia sarothrae</i>												
94	<b>1800</b>	1720	520	1220	60	60	0	0	3	1	1	10/10
99	<b>20060</b>	880	5720	14020	320	100	.69	0	2	.59	.59	11/11
04	<b>5260</b>	200	1440	3580	240	900	0	0	5	2	3	7/7
<i>Juniperus osteosperma</i>												
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
99	<b>20</b>	-	20	-	-	-	0	0	-	-	0	-/-
04	<b>20</b>	-	-	20	-	-	0	0	-	-	0	-/-

		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)
<b>Leptodactylon pungens</b>												
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
99	<b>0</b>	-	-	-	-	-	0	0	-	-	0	9/7
04	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
<b>Opuntia spp.</b>												
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
99	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
04	<b>0</b>	-	-	-	-	-	0	0	-	-	0	6/13
<b>Pediocactus simpsonii</b>												
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
99	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
04	<b>20</b>	-	-	20	-	-	0	0	-	-	0	1/3
<b>Pinus edulis</b>												
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
99	<b>20</b>	-	-	20	-	-	0	0	-	-	0	-/-
04	<b>20</b>	-	-	20	-	-	0	0	-	-	0	-/-
<b>Purshia tridentata</b>												
94	<b>20</b>	-	-	20	-	-	0	0	-	-	0	13/27
99	<b>80</b>	-	-	80	-	-	0	75	-	-	0	17/35
04	<b>80</b>	-	40	40	-	-	50	50	-	-	0	27/61
<b>Yucca spp.</b>												
94	<b>360</b>	-	-	360	-	-	0	0	0	-	0	24/38
99	<b>440</b>	-	40	400	-	40	0	0	0	-	0	18/29
04	<b>600</b>	-	180	400	20	-	0	0	3	3	3	22/30