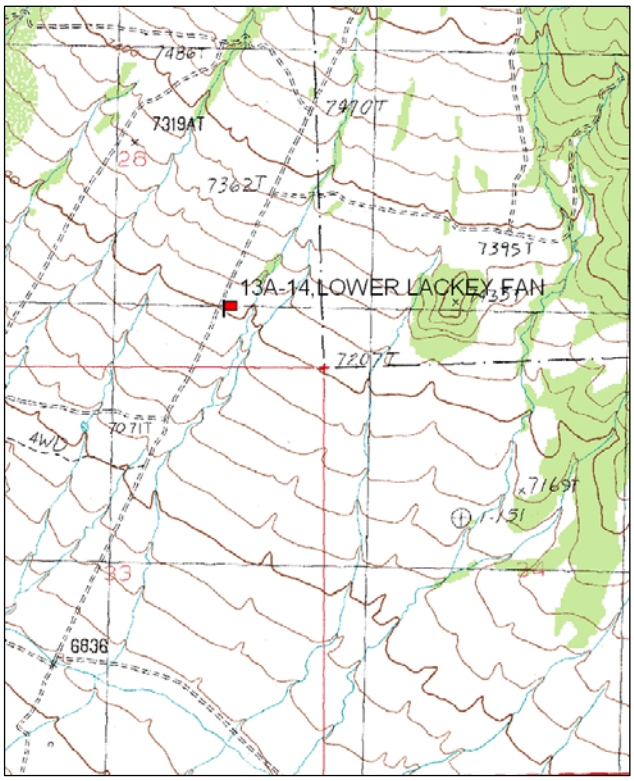
LOWER LACKEY FAN - STUDY NO. 13A-14-09

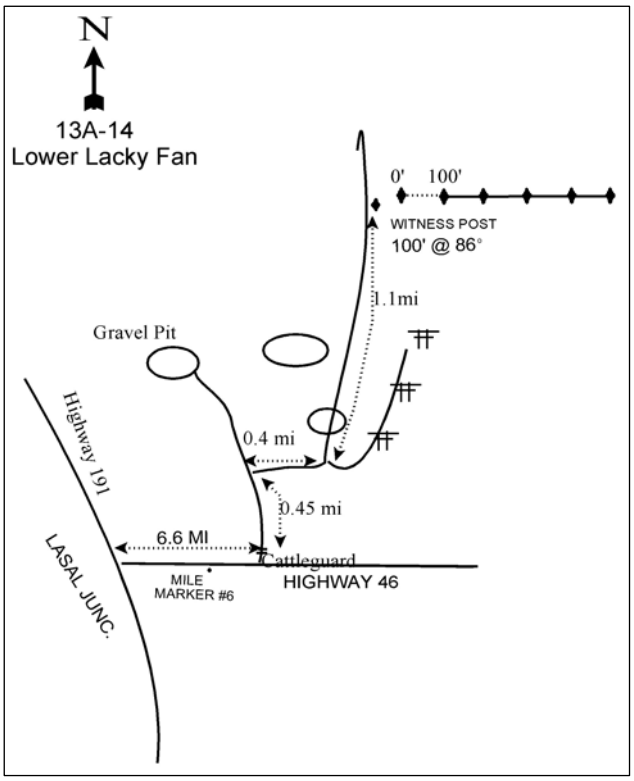
Vegetation Type: Wyoming Big Sagebrush
Range Type: Crucial Deer Winter, Crucial Elk Winter
NRCS Ecological Site Description: Upland Stony Loam (Wyoming Big Sagebrush), R035XY318UT
Land Ownership: BLM
Elevation: 7,200 ft (2,195 m)
Aspect: South
Slope: 2%-4%
Transect bearing: 86 degrees magnetic
Belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5(95 ft)

Directions:
From La Sal 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 83, UTM 12S 650375 E 4244165 N

LOWER LACKEY FAN - TREND STUDY NO. 13A-14

Site Information

Site Description: The study is located on the lower southwest slopes of the La Sal Mountains on a fairly flat ridge with scattered pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*). There is a moderately dense stand of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) on the site that in the past was sprayed and seeded with crested wheatgrass (*Agropyron cristatum*). This area is managed by the BLM and is part of the Hatch Point grazing allotment. Pellet group data has estimated elk use as fluctuating from heavy to light between sample years. Estimated deer use has increased from light use in 1999 to more moderate use in 2009. Estimated cattle use has been light since 1999 (Table - Pellet Group Data).

Browse: The key browse species on the site is Wyoming big sagebrush, which has provided an average of 10% cover since 1994 (Table - Browse Trends). Density of sagebrush has remained relatively similar over the study, but there has been a steady decline in the recruitment of young sagebrush plants since 1994. The sagebrush population was fairly healthy from 1994 to 2003, but decadence and plants displaying poor vigor both increased markedly in 2009. Utilization of sagebrush has been mostly moderate to heavy since 1999 (Table - Browse Characteristics).

The undesirable species, broom snakeweed (*Gutierrezia sarothrae*), is prevalent on the site. Snakeweed has had fluctuating cover and density on the site since 1994, and is found mostly in clumped patches. There is also a very small, heavily used population of antelope bitterbrush (*Purshia tridentata*) scattered throughout the community (Table - Browse Trends, Table - Browse Characteristics).

Herbaceous Understory: The herbaceous understory is dominated by the seeded perennial grass, crested wheatgrass. Cheatgrass (*Bromus tectorum*) is the only other grass species sampled with any notable frequency and it has declined in both frequency and cover since 1999. Perennial forbs are rare on the site and are not a major component of this community (Table - Herbaceous Trends).

Soil: The soil is a reddish-brown, sandy clay loam that has a moderately shallow rooting depth with a neutral pH (Table - Soil Analysis Data). There is abundant rock within the profile (Figure - Stoniness Index) and on the surface. Bare ground cover is not as high as some other sagebrush/grass sites with a scattered population of pinyon and juniper (Table - Basic Cover). The soil erosion condition was classified as slight in 2004 and 2009, due to pedestaling of plants, flow patterns, and gullies.

Trend Assessments

Browse:

- **1994 to 1999 - down (-2):** Sagebrush density decreased by 21% to 3,880 plants/acre, and cover decreased from 12% to 10%. Recruitment of young sagebrush plants decreased from 36% to 19% of the population.
- **1999 to 2004 - stable (0):** Sagebrush density and cover remained similar. Recruitment of young sagebrush plants decreased to 6%.
- **2004 to 2009 - stable (0):** Sagebrush density increased slightly and cover remained similar. Recruitment of young sagebrush plants decreased to 4% of the population. Sagebrush decadence and plants displaying poor vigor both increased.

Grass:

- **1994 to 1999 - up (+2):** There was a significant increase in nested frequency of the dominant grass, crested wheatgrass, and cover increased from 8% to 10%.
- **1999 to 2004 - slightly up (+1):** The nested frequency of crested wheatgrass decreased slightly, but cover increased to 16%. There was a significant decrease in the nested frequency of cheatgrass and cover decreased from 3% to 1%.

- **2004 to 2009 - stable (0):** There was little change in the nested frequency of crested wheatgrass, though cover decreased slightly.

Forb:

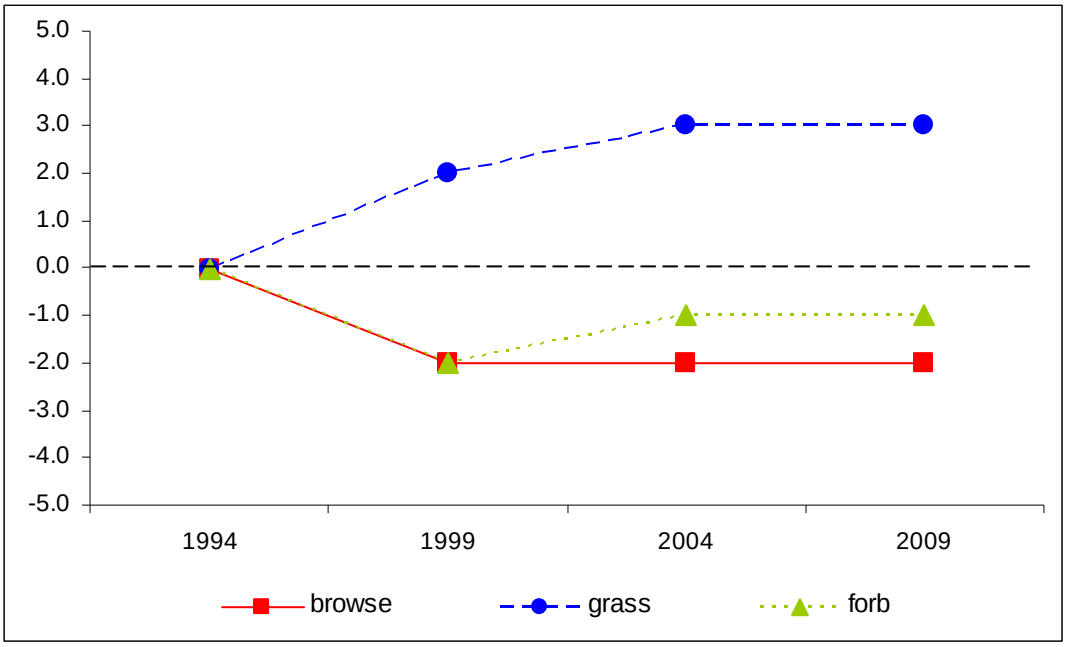
- **1994 to 1999 - down (-2):** The sum of nested frequency of perennial forbs decreased substantially, and the number of perennial forb species sampled decreased from 12 species to 3 species.
- **1999 to 2004 - slightly up (+1):** The sum of nested frequency and cover of perennial forbs increased slightly, but forbs remain rare on this site.
- **2004 to 2009 - stable (0):** There was little change in perennial forbs on this site.

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --
Management unit 13A, study no: 14

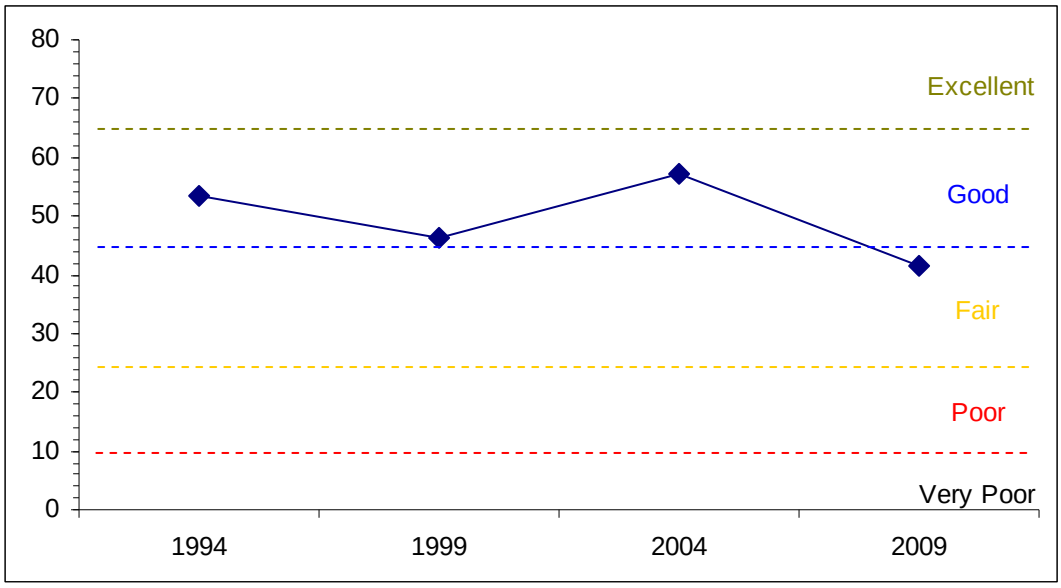
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	**Total Score**	Ranking
94	15.3	8.8	15.0	15.1	-2.4	1.7	0.0	**53.5**	Good
99	12.7	6.6	9.2	20.3	-2.6	0.1	0.0	**46.2**	Fair-Good
04	12.8	10.7	3.2	30.0	-0.9	1.3	0.0	**57.1**	Good
09	11.8	2.4	2.0	25.1	-0.3	0.4	0.0	**41.4**	Fair

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 13A, Study no: 14



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE
Management unit 13A, Study no: 14



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

Type	Species	Nested Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron cristatum	a225	b309	ab285	b302	7.54	10.15	16.17	12.55
G	Bromus tectorum (a)	b175	b206	a80	a77	3.18	3.51	1.23	.43
G	Vulpia octoflora (a)	-	8	5	-	-	.02	.01	-
Total for Annual Grasses		175	214	85	77	3.18	3.53	1.24	0.43
Total for Perennial Grasses		225	309	285	302	7.54	10.15	16.17	12.55
Total for Grasses		400	523	370	379	10.73	13.69	17.41	12.99
F	Astragalus convallarius	c29	a3	bc19	a3	.14	.01	.61	.02
F	Astragalus sp.	-	-	-	4	-	-	-	.03
F	Chenopodium sp. (a)	b11	a-	a-	a-	.02	-	-	-
F	Collinsia parviflora (a)	b26	a4	a-	a3	.09	.00	-	.00
F	Comandra pallida	b24	a-	a-	a-	.06	-	-	-
F	Cryptantha nevadensis	b39	a-	a-	a-	.06	-	-	-
F	Cryptantha sp.	b20	a-	a-	a6	.04	-	-	.04
F	Dalea searlsiae	2	-	-	-	.00	-	-	-
F	Descurainia pinnata (a)	14	-	4	-	.02	-	.15	-
F	Draba nemorosa (a)	b42	a-	a-	a-	.08	-	-	-
F	Erigeron pumilus	-	-	-	-	-	.00	-	-
F	Gayophytum ramosissimum(a)	b22	a-	a-	a-	.04	-	-	-
F	Gilia sp. (a)	b18	a-	a-	a-	.04	-	-	-
F	Heterotheca villosa	-	4	-	7	-	.03	-	.06
F	Ipomopsis aggregata	2	1	1	-	.00	.00	.00	-
F	Machaeranthera spp	1	-	-	-	.00	-	-	-
F	Microsteris gracilis (a)	b60	a6	a-	b80	.32	.01	-	.25
F	Oxybaphus linearis	2	-	-	-	.01	-	-	-

Type	Species	Nested Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
F	Phlox longifolia	3	-	5	4	.01	-	.01	.03
F	Ranunculus testiculatus (a)	$_{c}$158	$_{a}$-	$_{a}$-	$_{b}$45	.73	-	-	.14
F	Salsola iberica (a)	3	-	-	-	.01	-	-	-
F	Schoencrambe linifolia	$_{b}$27	$_{a}$-	$_{a}$-	$_{a}$-	.07	-	-	-
F	Sisymbrium altissimum (a)	-	-	-	-	.00	-	-	-
F	Sphaeralcea coccinea	5	-	-	3	.38	-	-	.00
F	Tragopogon dubius	5	-	-	-	.01	-	-	-
F	Trifolium sp.	3	-	2	5	.03	-	.03	.01
Total for Annual Forbs		354	10	4	128	1.37	0.01	0.15	0.40
Total for Perennial Forbs		162	8	27	32	0.84	0.05	0.65	0.20
Total for Forbs		516	18	31	160	2.22	0.07	0.81	0.60

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	'09	'94	'99	'04	'09
B	Artemisia tridentata wyomingensis	86	73	73	74	12.07	9.84	9.71	9.39
B	Chrysothamnus depressus	0	1	7	3	-	.00	.01	.01
B	Eriogonum microthecum	1	0	1	4	.00	-	.00	.03
B	Gutierrezia sarothrae	37	73	65	65	.82	8.06	2.04	2.36
B	Juniperus osteosperma	0	1	1	1	-	.00	.00	.15
B	Pediocactus simpsonii	0	0	1	2	-	-	.00	.01
B	Pinus edulis	0	1	1	2	-	3.75	5.94	2.01
B	Purshia tridentata	1	4	4	3	.15	.15	.15	.00
B	Quercus gambelii	0	0	0	0	-	.15	.38	-
B	Yucca sp.	6	7	9	12	1.60	1.31	1.80	1.97
Total for Browse		131	160	162	166	14.64	23.26	20.05	15.95

CANOPY COVER, LINE INTERCEPT--
Management unit 13A, Study no: 14

Species	Percent Cover		
	'99	'04	'09
Artemisia tridentata wyomingensis	-	10.71	11.14
Chrysothamnus depressus	-	.01	-
Gutierrezia sarothrae	-	2.48	1.73
Juniperus osteosperma	-	.05	.15
Pinus edulis	5.19	6.26	5.38
Purshia tridentata	-	.21	.08
Quercus gambelii	4.00	3.59	8.03
Yucca sp.	-	2.65	2.59

KEY BROWSE ANNUAL LEADER GROWTH--
Management unit 13A, Study no: 14

Species	Average leader growth (in)	
	'04	'09
Artemisia tridentata wyomingensis	1.9	1.0

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

Species	Trees per Acre			Average diameter (in)		
	'99	'04	'09	'99	'04	'09
Juniperus osteosperma	6	<18	<18	5.8	-	-
Pinus edulis	6	<18	<18	4.0	-	-

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

Cover Type	Average Cover %			
	'94	'99	'04	'09
Vegetation	27.73	34.18	36.42	30.71
Rock	12.83	15.93	16.14	12.76
Pavement	1.11	3.06	4.60	1.60
Litter	31.20	36.69	30.13	35.79
Cryptogams	.06	1.40	.37	.20
Bare Ground	28.67	23.90	30.02	26.80

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

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

PELLET GROUP DATA--
Management unit 13A, Study no: 14

Type	Quadrat Frequency				Days use per acre (ha)		
	'94	'99	'04	'09	'99	'04	'09
Rabbit	17	21	7	19	-	-	-
Elk	30	21	26	3	34 (84)	52 (129)	14 (35)
Deer	1	16	8	29	20 (49)	7 (18)	36 (89)
Cattle	-	8	1	2	12 (30)	7 (16)	15 (36)

BROWSE CHARACTERISTICS--
Management unit 13A, Study no: 14

		Age class distribution				Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Artemisia tridentata wyomingensis									
94	**4920**	36	43	21	4240	9	2	13	25/36
99	**3880**	19	52	29	560	52	13	6	20/28
04	**3860**	6	79	15	-	54	30	11	18/29
09	**4020**	4	54	42	20	24	45	30	18/25
Chrysothamnus depressus									
94	**0**	0	0	-	-	0	0	0	-/-
99	**20**	0	100	-	-	0	0	0	3/6
04	**240**	17	83	-	-	50	0	0	6/10
09	**60**	67	33	-	-	0	33	33	-/-
Ephedra viridis									
94	**0**	0	0	-	-	0	0	0	-/-
99	**0**	0	0	-	-	0	0	0	-/-
04	**0**	0	0	-	-	0	0	0	43/63
09	**0**	0	0	-	-	0	0	0	26/22
Eriogonum microthecum									
94	**40**	0	100	-	-	0	0	0	9/11
99	**0**	0	0	-	-	0	0	0	-/-
04	**20**	0	100	-	-	0	0	0	10/14
09	**100**	0	100	-	-	0	0	0	6/5
Gutierrezia sarothrae									
94	**1800**	29	68	3	1720	0	0	1	10/10
99	**20060**	29	70	2	880	.69	0	.59	11/11
04	**15100**	16	83	2	200	0	0	.92	7/7
09	**6800**	4	90	6	-	0	0	4	9/8
Juniperus osteosperma									
94	**0**	0	0	-	-	0	0	0	-/-
99	**20**	100	0	-	-	0	0	0	-/-
04	**20**	0	100	-	-	0	0	0	-/-
09	**20**	0	100	-	-	0	0	0	-/-
Leptodactylon pungens									
94	**0**	0	0	-	-	0	0	0	-/-
99	**0**	0	0	-	-	0	0	0	9/7
04	**0**	0	0	-	-	0	0	0	-/-
09	**0**	0	0	-	-	0	0	0	-/-
Opuntia sp.									
94	**0**	0	0	-	-	0	0	0	-/-
99	**0**	0	0	-	-	0	0	0	-/-
04	**0**	0	0	-	-	0	0	0	6/13
09	**0**	0	0	-	-	0	0	0	-/-

		Age class distribution				Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Pediocactus simpsonii									
94	**0**	0	0	-	-	0	0	0	-/-
99	**0**	0	0	-	-	0	0	0	-/-
04	**20**	0	100	-	-	0	0	0	1/3
09	**40**	50	50	-	-	0	0	0	2/5
Pinus edulis									
94	**0**	0	0	-	-	0	0	0	-/-
99	**20**	0	100	-	-	0	0	0	-/-
04	**20**	0	100	-	-	0	0	0	-/-
09	**40**	50	50	-	20	0	0	0	-/-
Purshia tridentata									
94	**20**	0	100	0	-	0	0	0	13/27
99	**80**	0	100	0	-	0	75	0	17/35
04	**80**	50	50	0	-	50	50	0	27/61
09	**80**	25	50	25	-	0	100	25	22/36
Yucca sp.									
94	**360**	0	100	0	-	0	0	0	24/38
99	**440**	9	91	0	-	0	0	0	18/29
04	**600**	30	67	3	-	0	0	3	22/30
09	**500**	0	92	8	-	0	8	20	22/27