

Trend Study14-32-04

Study site name: Lower Deer Flat .

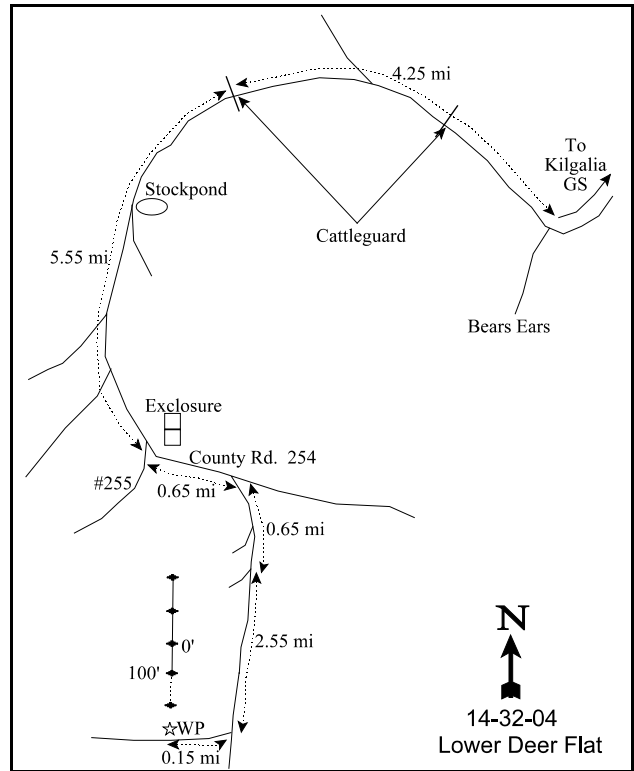
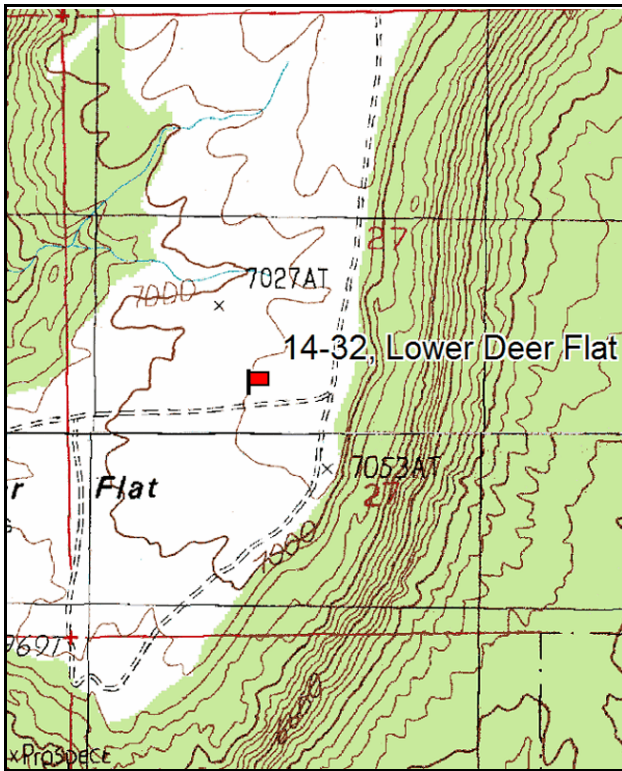
Vegetation type: Sagebrush-Grass .

Compass bearing: frequency baseline 356 degrees magnetic.

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

LOCATION DESCRIPTION

At the intersection 2.45 miles southwest of the turnoff to Kigalia Guard Station and almost 2 miles northeast of the Bears Ears, turn west and proceed 2.0 miles to a cattleguard near a corral. Continue straight on this road, ignoring the turnoffs near the corral, for 1.75 miles to a fork. Stay left and continue 1.5 miles to a cattleguard at the FS/BLM boundary. After 2.4 more miles stay to the right at a fork under a stock pond. Continue 0.65 miles to another fork. Stay left. Proceed 0.6 more miles and stay left at the fork. Go 1.90 miles to an enclosure on the east side of the road. From the fork where county roads 254 and 255 split, go left on Road 254 for 0.65 miles to a fork. Turn right and go 0.35 miles to another fork. Stay left for 0.3 miles to another fork. Stay left for 2.55 miles to another fork. Turn right on a two-track for 0.15 miles to a witness post. The 0-foot stake is 19 paces at 342°M from the witness post.



Map name: Woodenshoe Butte

Diagrammatic Sketch

Township 36S, Range 18E, Section 19

GPS: NAD 27, UTM 12S 4164541 N, 585402 E

## DISCUSSION

### Lower Deer Flat - Trend Study No. 14-32

The Lower Deer Flat trend study was established in 1994 to replace 14-17, Deer Flat. After the sagebrush at the original Deer Flat site was treated and seeded, deer no longer utilize the area in the winter in significant numbers. The Lower Deer Flat study site was established about 3 miles further south in an old chaining where deer winter in larger numbers. The study area has a 3% slope with a west aspect and an elevation of about 7,200 feet. Two pastures are used in a rotation system in which one pasture is grazed June 1 to Aug 15 one year then from Aug 16 to Oct 31 the next. The unit is allotted 400 cattle. Pellet group data from 1999 estimated 121 deer days use/acre (299 ddu/ha), 1 elk days use/acre (2 edu/ha), and 40 cow days use/acre (99 cdu/ha). Cattle were in the area when the site was monitored in 1999. Pellet group data from 2004 estimated 56 deer days use/acre, 9 elk, and 30 cow (139 ddu/ha, 23 edu/ha, and 73 cdu/ha).

The soil is a very compact loam with an effective rooting depth estimated at only a little over 12 inches. Soil depth measurements were limited by the compact soil, but there does not appear to be any rooting barriers in the soil profile. The soil has limited amounts of phosphorus and potassium at 4.5 and 51.2 ppm respectively. Values less than 10 ppm for phosphorus and 70 ppm for potassium may limit normal plant growth and development. Average soil temperature was very high in 1999 at 74.2°F at a depth of almost 13 inches. This condition gives winter annuals like cheatgrass a competitive advantage over cool season perennial grasses, forbs, and especially the establishment of sagebrush seedlings. Areas that were sprayed to kill sagebrush, about 1 mile east of the study site, are now dominated by cheatgrass. In 2004, soil temperature was lower, with an average temperature of 61.7°F at about 13 inches. There is quite a bit of bare ground exposed, but erosion is minimal due to the abundant herbaceous vegetation cover, chaining debris and lack of significant slope. Relative bare ground cover increased from 34% in 1999 to 44% in 2004.

The site supports a dense stand of Wyoming big sagebrush. In 1994, density was highest at 6,740 plants/acre and decadence was moderately low at 18%. Density then declined by 23% in 1999 to 5,160 plants/acre. Decadence was still low at 19% and 22% of the population was classified as young. In 2004, density declined by 5%, but decadence increased to 39% and only 7% of the population was classified as young. Sixteen percent of the population was considered to be dying in 2004. Cover has remained fairly constant since 1994 varying between 12 and 13%. Utilization was classified as mostly light in 1994, moderate to heavy in 1999, and moderate in 2004. Seed production was poor in 2004 and many plants were dropping leaves to conserve moisture. There are also a few heavily utilized fourwing saltbush scattered throughout the site.

Pinyon and juniper trees are found at a relatively low density considering the age of the chaining. Point quarter data from 1999 estimated 32 pinyon and 45 juniper trees/acre with an average diameter of 3.0 inches and 4.4 inches respectively. Twelve percent of the juniper trees sampled consisted of large knocked down trees (tipped over) that are still living. Tree density remained stable in 2004 with an estimated 32 pinyons and 48 junipers/acre. Average diameter was 3.4 inches for pinyon and 3.2 inches for juniper.

The herbaceous understory is dominated by crested wheatgrass which provided 73% of the grass cover in 1994 and 67% of the herbaceous cover. It increased significantly in nested frequency in 1999 and provided 88% of the grass cover and 83% of the herbaceous cover. It declined significantly in 2004 from 1999, but was still higher than values for 1994. In 2004, it provided 96% of the grass cover and 93% of the herbaceous cover. Other perennial grasses on this site include, Indian ricegrass, bottlebrush squirreltail, and needle-and-thread grass. Annual cheatgrass is also present, but not very abundant. It was a wetter year in 1999 and cheatgrass was more abundant than it was in 1994 and 2004. Forbs are rare and produce less than 1% cover. The only fairly common species include timber poisonvetch, longleaf phlox, and scarlet globemallow.

## 1994 APPARENT TREND ASSESSMENT

The soil trend appears to be stable due to abundant litter and herbaceous cover combined with the gentle terrain. The Wyoming big sagebrush population appears to be relatively stable. Percent decadence is low at 17% and recruitment is good. Vigor is poor on half of the population however, and about 7% of the population appear to be dying. Recruitment is good and there appears to be enough young plants to replace decadent and dying plants. The herbaceous understory appears to be in good condition with several moderately abundant grasses. Crested wheatgrass dominated the composition however, by providing 73% of the grass cover. Annual cheatgrass is also present but only in low abundance. Forbs are lacking. The Desirable Components Index (see methods) rating is good at 63 for a Wyoming big sagebrush community.

winter range condition (DC Index) - 63 (good) Wyoming big sagebrush type

## 1999 TREND ASSESSMENT

Trend for soil appears stable. Percent cover of bare ground has increased slightly but so has litter cover. There is little erosion occurring due to levelness of the terrain. Trend for Wyoming big sagebrush is down slightly. It is being heavily browsed and density has declined from 7,140 to 5,160 plants/acre. Vigor is improved however, with only 10% of the plants sampled displaying poor vigor, down from 50% in 1994. Percent decadence remains low at 19%. The heavy use with drought has caused low annual growth and poor seed production. No seedlings were found, but young plants are still abundant. Trend for the herbaceous understory is stable. Sum of nested frequency of grasses and forbs both declined slightly, although the dominant grass, crested wheatgrass, has increased significantly in nested frequency. It currently provides 88% of the grass cover and 83% of the total herbaceous cover. Cheatgrass is found on the site in low abundance but it also has increased significantly in nested frequency. There is still several moderately abundant native perennial grasses present, yet forbs are lacking. The DCI score is rated as good to excellent (66). The sagebrush is abundant and healthy, while perennial grasses are also very abundant.

### TREND ASSESSMENT

soil - stable (3)

browse - down slightly (2)

herbaceous understory - stable (3)

winter range condition (DC Index) - 66 (good to excellent) Wyoming big sagebrush type

## 2004 TREND ASSESSMENT

The soil trend is slightly down. Relative bare ground cover increased from 34% to 44%, while litter decreased from 40% to 29%. An erosion index assessment rated erosion as stable despite the moderately high amount of bare ground, due to the slight slope and lack of connectivity of bare areas. The browse trend is down. Wyoming big sagebrush density declined only 5% since 1999, but decadence increased from 19 to 39% and 16% of the population was classified as dying. Young plants only made up 7% of the population and seedlings were not very abundant. This is not enough plants to replace dying plants. Utilization did decline from moderate to heavy to just moderate. Cover has remained stable at this site since 1994 at about 12-13%. The herbaceous understory trend is slightly down. Nested frequency of perennial grasses decreased by about a fourth. Crested wheatgrass is the only abundant grass on the site and had nearly 16% cover in 2004. Cheatgrass did decline significantly since 1999, which is a positive thing, but will probably increase when precipitation is greater. Forbs are rare, but two of the most abundant forbs, timber poisonvetch and longleaf phlox declined significantly since 1999. The DCI score declined to good due to increased decadence and a lower proportion of young plants.

TREND ASSESSMENT

soil - slightly down (2)

browse - down (1)

herbaceous understory - slightly down (2)

winter range condition (DC Index) - 58 (good) Wyoming big sagebrush type

HERBACEOUS TRENDS --

Management unit 14 , Study no: 32

T y p e	Species	Nested Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
G	Agropyron cristatum	<sub>a</sub> 198	<sub>c</sub> 291	<sub>b</sub> 247	9.43	12.62	15.63
G	Agropyron intermedium	2	-	-	.00	-	-
G	Bouteloua gracilis	-	2	-	-	.01	-
G	Bromus tectorum (a)	<sub>a</sub> 35	<sub>b</sub> 103	<sub>a</sub> 61	.24	.81	.31
G	Oryzopsis hymenoides	<sub>b</sub> 58	<sub>a</sub> 23	<sub>a</sub> 1	.81	.19	.03
G	Poa fendleriana	<sub>b</sub> 12	<sub>a</sub> -	<sub>a</sub> -	.34	-	-
G	Sitanion hystrix	<sub>b</sub> 39	<sub>b</sub> 17	<sub>a</sub> 1	.71	.26	.03
G	Sporobolus cryptandrus	3	-	11	.00	-	.06
G	Stipa comata	<sub>b</sub> 94	<sub>a</sub> 41	<sub>a</sub> 16	1.44	.40	.14
Total for Annual Grasses		35	103	61	0.24	0.81	0.31
Total for Perennial Grasses		406	374	276	12.76	13.49	15.90
Total for Grasses		441	477	337	13.00	14.30	16.21
F	Astragalus convallarius	<sub>b</sub> 18	<sub>b</sub> 15	<sub>a</sub> 3	.67	.43	.18
F	Astragalus spp.	-	-	1	-	-	.00
F	Crepis acuminata	3	6	11	.00	.02	.07
F	Descurainia pinnata (a)	-	5	-	-	.00	-
F	Erigeron spp.	9	-	-	.01	-	-
F	Lappula occidentalis (a)	4	3	1	.01	.00	.03
F	Machaeranthera canescens	2	-	1	.00	-	.00
F	Microsteris gracilis (a)	-	1	-	-	.00	-
F	Orthocarpus spp. (a)	<sub>b</sub> 15	<sub>a</sub> -	<sub>a</sub> -	.04	-	-
F	Phlox longifolia	<sub>ab</sub> 91	<sub>b</sub> 105	<sub>a</sub> 75	.19	.32	.25
F	Sphaeralcea coccinea	29	18	20	.08	.08	.12
Total for Annual Forbs		19	9	1	0.05	0.01	0.03
Total for Perennial Forbs		152	144	111	0.97	0.86	0.64
Total for Forbs		171	153	112	1.03	0.87	0.67

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

BROWSE TRENDS --

Management unit 14 , Study no: 32

Type	Species	Strip Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
B	Artemisia tridentata wyomingensis	87	80	84	12.77	11.80	13.08
B	Atriplex canescens	0	1	0	-	.38	-
B	Chrysothamnus viscidiflorus	1	3	2	-	.15	.15
B	Juniperus osteosperma	0	3	3	1.01	1.23	.53
B	Opuntia spp.	1	0	0	.00	-	-
B	Pinus edulis	-	-	-	.15	-	-
Total for Browse		89	87	89	13.94	13.57	13.77

CANOPY COVER, LINE INTERCEPT --

Management unit 14 , Study no: 32

Species	Percent Cover	
	'99	'04
Artemisia tridentata wyomingensis	-	13.56
Chrysothamnus viscidiflorus	-	.06
Juniperus osteosperma	.20	1.66

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 14 , Study no: 32

Species	Average leader growth (in)
	'04
Artemisia tridentata wyomingensis	1.4

POINT-QUARTER TREE DATA --

Management unit 14 , Study no: 32

Species	Trees per Acre	
	'99	'04
Juniperus osteosperma	45	48
Pinus edulis	32	32

Average diameter (in)	
'99	'04
4.3	3.2
3.1	3.4

BASIC COVER --

Management unit 14 , Study no: 32

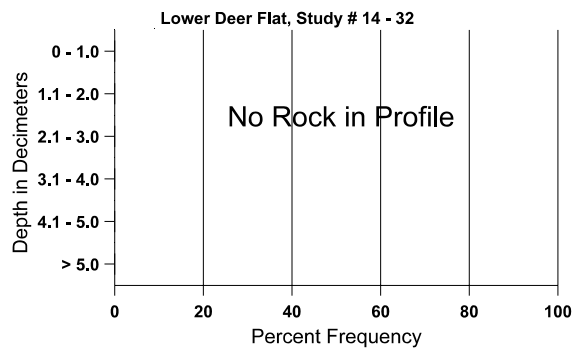
Cover Type	Average Cover %		
	'94	'99	'04
Vegetation	28.21	27.89	29.85
Rock	.15	0	0
Pavement	0	0	.01
Litter	41.73	43.37	32.42
Cryptogams	.22	.49	.69
Bare Ground	30.60	36.52	48.65

SOIL ANALYSIS DATA --

Management unit 14, Study no: 32, Study Name: Lower Deer Flat

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
12.4	61.7 (12.8)	7.1	46.0	29.4	24.6	1.4	4.5	51.2	0.6

Stoniness Index



PELLET GROUP DATA --

Management unit 14 , Study no: 32

Type	Quadrat Frequency		
	'94	'99	'04
Rabbit	30	50	24
Elk	1	1	5
Deer	59	61	45
Cattle	1	4	14

Days use per acre (ha)	
'99	'04
-	-
1 (2)	9 (23)
121 (299)	56 (139)
40 (99)	30 (73)

BROWSE CHARACTERISTICS --  
Management unit 14 , Study no: 32

		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>6740</b>	1060	560	4940	1240	40	4	.89	18	7	47	37/50
99	<b>5160</b>	-	1140	3060	960	120	41	42	19	2	10	20/28
04	<b>4920</b>	240	340	2640	1940	420	65	20	39	16	24	18/30
<i>Atriplex canescens</i>												
94	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
99	<b>20</b>	-	-	-	20	-	0	100	100	100	100	-/-
04	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
<i>Chrysothamnus nauseosus</i>												
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	142/9
99	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
04	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
<i>Chrysothamnus viscidiflorus</i>												
94	<b>40</b>	-	-	20	20	-	0	0	50	50	50	8/13
99	<b>60</b>	-	-	20	40	-	0	0	67	33	33	12/18
04	<b>40</b>	-	-	20	20	-	0	0	50	50	50	9/13
<i>Juniperus osteosperma</i>												
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
99	<b>60</b>	-	40	20	-	20	0	0	-	-	0	-/-
04	<b>60</b>	-	-	60	-	-	0	0	-	-	0	-/-
<i>Opuntia spp.</i>												
94	<b>20</b>	-	-	20	-	-	0	0	-	-	0	4/15
99	<b>0</b>	-	-	-	-	-	0	0	-	-	0	5/13
04	<b>0</b>	-	-	-	-	-	0	0	-	-	0	4/21