

Trend Study 22R-4-08

Study site name: Above Fremont Wash .

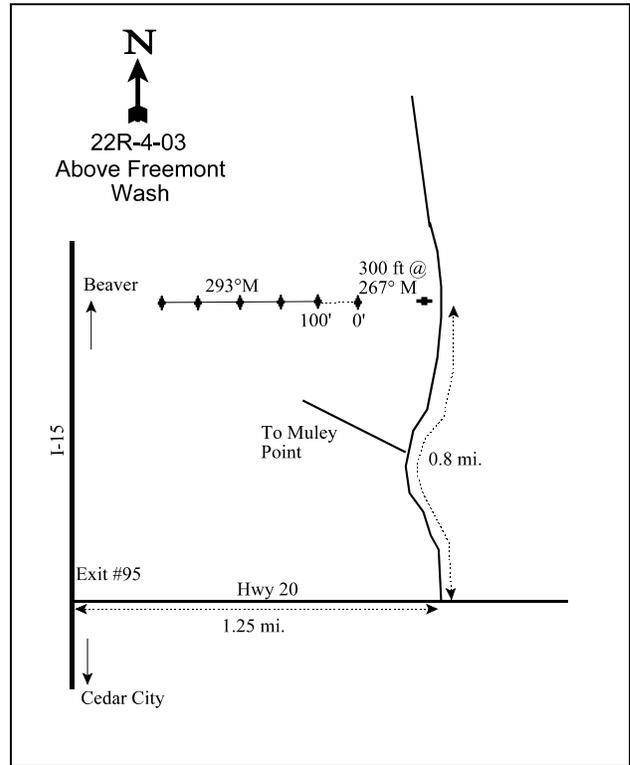
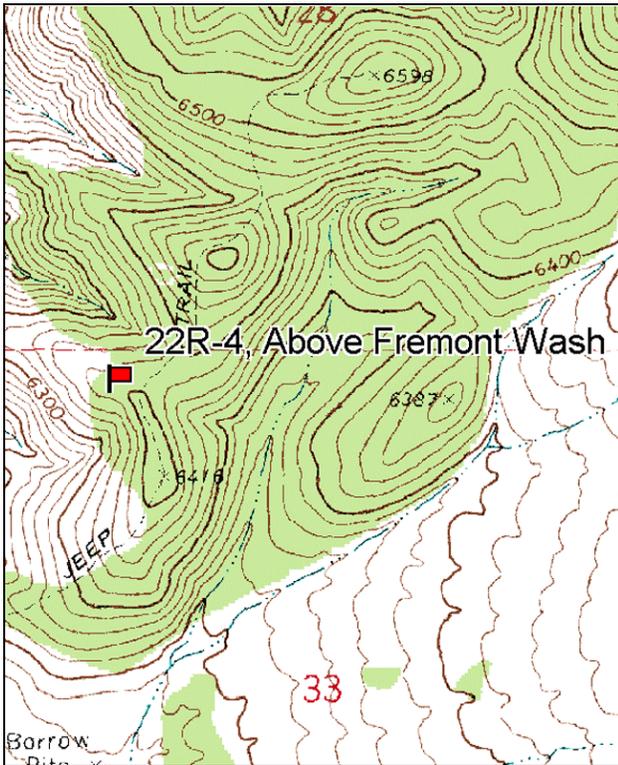
Vegetation type: Wyoming Big Sagebrush .

Compass bearing: frequency baseline 293 degrees magnetic.

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

LOCATION DESCRIPTION

South of Beaver on I-15 take exit # 95. Drive 1.25 miles east on Highway 20 to a road going north (left side of the road). Drive 0.8 miles to the witness post (the road to the Muley Point site will be past on the way). From the witness post, walk 300 feet at 267 degrees magnetic to the 0' stake. The 0' stake is marked by browse tag #406.



Map name: Buckhorn Flat

Diagrammatic Sketch

Township 31S, Range 7W, Section 33

GPS: NAD 83, UTM 12S 354328 E 4215100 N

## DISCUSSION

### Above Fremont Wash - Trend Study No. 22R-4

#### Study Information

This study was established in 1999 to monitor critical deer winter range east of Interstate 15 and north of Highway 20. This transect is just east of transect 22-8 (Muley Point), but is slightly higher in elevation [elevation: 6,400 feet (1,950 m), slope: 20-25%, aspect: southwest]. The vegetation type is Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) with scattered pinyon (*Pinus edulis*) and juniper (*Juniperus osteosperma*). Deer use on this site has been moderately high as evidenced by pellet group transect data collected. Deer use was estimated at 73 days use/acre (180 ddu/ha) in 1999 and 62 days use/acre (152 ddu/ha) in 2003. In 2008, deer use increased to 117 ddu/acre (289 ddu/ha) and cow use was at 4 cdu/acre (9 cdu/ha).

#### Soil

The site is classified within Muleypoint soil series (USDA-NRCS 2007). These soils consists of shallow to a carbonate cemented hardpan, well drained, moderately slowly permeable soils that formed in alluvium and colluvium from basic and intermediate igneous rocks. These soils are on foothills and highly dissected fan terraces. Soils are loam in texture and have a neutral pH (6.8). Rock and pavement are abundant on the surface and throughout the upper layers of the soil profile. Erosion has not been severe during either reading, but some sign of overland flow was apparent in 1999. The abundance of rock and pavement on the surface and relatively low amounts of bare ground hint that erosion was moderate in the past. An erosion condition class assessment completed on site in 2003 and 2008 rated soils as stable.

#### Browse

Wyoming big sagebrush is the key browse on the site. Density was estimated at 2,680 plants/acre in 1999 and 2,800 plants/acre in 2003, but declined 26% in 2008 to 2,060 plants/acre. This population consists almost entirely of mature and decadent plants with very low recruitment (percent young) in all surveys. The decadence was moderate in both 1999 and 2003 at 23% and 30%, respectively, but increased to 76% in 2008. Young plants have been rare. Sagebrush cover was about 4% in 2008. Point-center quarter data collected in 2003 and 2008 estimated 31 pinyon and 17 juniper trees/acre on the site with little change in density.

#### Herbaceous Understory

Cheatgrass (*Bromus tectorum*) dominants the herbaceous understory. Cheatgrass cover has been very high at every reading and was nearly sampled in every quadrat at each reading. This site has severe limitations with regard to both herbaceous and shrub species competing with cheatgrass and a fire hazard due to the abundance of fine fuels. A fire would eliminate browse and have a detrimental effect to the wintering deer herds in the area as the fire just down the ridge has eliminated much of the sagebrush on the Muley Point trend study. Perennial grasses have only fair abundance with the most abundant being blue grama (*Bouteloua gracilis*) and Indian ricegrass (*Oryzopsis hymenoides*). Forbs are scarce. Scarlet globemallow (*Sphaeralcea coccinea*) is the most common.

#### 1999 DESIRABLE COMPONENTS INDEX

Winter range condition (DCI) - very poor to poor (12) low potential scale.

#### 2003 TREND ASSESSMENT

Trend for browse is stable, however there are many negative parameters acting against this population with the expectation of lower population densities expected in the future. Wyoming big sagebrush slightly increased in density. Recruitment declined but was already very low in 1999 (3%) and now is at only 1%. A value of at least 10% is thought necessary to maintain a low elevation sagebrush population. Vigor improved somewhat in 2003, but decadence increased to 30%. Trend for the herbaceous understory is stable but remains dominated by cheatgrass. Cheatgrass declined in nested frequency, but nearly doubled in average cover and

poses a serious fire hazard for the site and surrounding area. Sum of nested frequency for perennial grasses and forbs remained stable between 1999 and 2003.

Winter Range Condition (DCI) - very poor to poor (10) low potential scale  
browse - stable (0)                      grass - stable (0)                      forb - stable (0)

2008 TREND ASSESSMENT

Trend for browse is down. Wyoming big sagebrush density has decreased by 26%. Recruitment is now at zero. Plants classified with poor vigor is now up to 43%. Decadence has increased upward to a high to 76%. Trend for the herbaceous understory is stable but remains dominated by cheatgrass. Cheatgrass declined in cover, but still has a quadrat frequency of 99%. The fine fuels still pose a serious fire hazard for the site and surrounding area.

Winter Range Condition (DCI) - very poor (7) low potential scale  
browse - down (-2)                      grass - stable (0)                      forb - stable (0)

HERBACEOUS TRENDS --  
Management unit 22R, Study no: 4

Type	Species	Nested Frequency			Average Cover %		
		'99	'03	'08	'99	'03	'08
G	Agropyron spicatum	-	-	-	-	.00	.00
G	Aristida purpurea	-	4	1	-	.06	.03
G	Bouteloua gracilis	46	70	48	1.49	2.13	1.17
G	Bromus tectorum (a)	<sub>b</sub> 453	<sub>a</sub> 410	<sub>a</sub> 417	13.05	23.11	11.58
G	Hilaria jamesii	<sub>a</sub> -	<sub>a</sub> 5	<sub>b</sub> 73	-	.06	1.67
G	Oryzopsis hymenoides	<sub>b</sub> 50	<sub>b</sub> 47	<sub>a</sub> 19	2.12	1.17	.81
G	Poa secunda	-	-	8	-	-	.03
G	Sitanion hystrix	<sub>a</sub> 1	<sub>b</sub> 34	<sub>b</sub> 34	.00	.42	.46
G	Sporobolus cryptandrus	<sub>c</sub> 99	<sub>b</sub> 38	<sub>a</sub> -	4.73	1.00	-
G	Stipa comata	6	3	11	.06	.04	.22
G	Vulpia octoflora (a)	<sub>a</sub> -	<sub>b</sub> 22	<sub>a</sub> 4	-	.06	.01
<b>Total for Annual Grasses</b>		<b>453</b>	<b>432</b>	<b>421</b>	<b>13.05</b>	<b>23.18</b>	<b>11.60</b>
<b>Total for Perennial Grasses</b>		<b>202</b>	<b>201</b>	<b>194</b>	<b>8.41</b>	<b>4.92</b>	<b>4.42</b>
<b>Total for Grasses</b>		<b>655</b>	<b>633</b>	<b>615</b>	<b>21.47</b>	<b>28.10</b>	<b>16.02</b>
F	Collinsia parviflora (a)	<sub>a</sub> -	<sub>b</sub> 11	<sub>b</sub> 12	-	.02	.02
F	Descurainia pinnata (a)	<sub>a</sub> -	<sub>b</sub> 8	<sub>ab</sub> 13	-	.02	.05
F	Draba sp. (a)	-	3	-	-	.00	-
F	Eriogonum cernuum (a)	2	1	3	.00	.00	.00
F	Erodium cicutarium (a)	-	-	4	-	-	.03
F	Erigeron eatonii	3	1	-	.00	.00	-
F	Gilia sp. (a)	<sub>a</sub> -	<sub>c</sub> 49	<sub>b</sub> 25	-	.23	.04
F	Lappula occidentalis (a)	-	1	2	-	.00	.00

T y p e	Species	Nested Frequency			Average Cover %		
		'99	'03	'08	'99	'03	'08
F	<i>Leucelene ericoides</i>	-	4	5	-	.03	.03
F	<i>Microsteris gracilis</i> (a)	<sub>a</sub> -	<sub>b</sub> 12	<sub>a</sub> -	-	.03	-
F	<i>Phlox austromontana</i>	-	5	2	-	.00	.00
F	<i>Ranunculus testiculatus</i> (a)	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 25	-	-	.05
F	<i>Sisymbrium altissimum</i> (a)	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 10	-	-	.07
F	<i>Sphaeralcea coccinea</i>	17	10	20	.10	.14	.40
Total for Annual Forbs		2	85	94	0.00	0.32	0.29
Total for Perennial Forbs		20	20	27	0.10	0.18	0.43
Total for Forbs		22	105	121	0.10	0.51	0.72

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

BROWSE TRENDS --

Management unit 22R, Study no: 4

T y p e	Species	Strip Frequency			Average Cover %		
		'99	'03	'08	'99	'03	'08
B	<i>Artemisia tridentata wyomingensis</i>	65	70	65	3.74	8.21	4.40
B	<i>Echinocereus</i> sp.	0	1	1	-	.00	.00
B	<i>Gutierrezia sarothrae</i>	0	1	1	-	.00	.00
B	<i>Juniperus osteosperma</i>	0	0	0	.15	.15	-
B	<i>Opuntia</i> sp.	0	0	2	-	-	.03
B	<i>Opuntia whipplei</i>	10	13	15	1.41	1.85	1.69
B	<i>Pinus edulis</i>	0	0	0	.03	-	-
Total for Browse		75	85	84	5.33	10.21	6.13

CANOPY COVER, LINE INTERCEPT --

Management unit 22R, Study no: 4

Species	Percent Cover		
	'99	'03	'08
Artemisia tridentata wyomingensis	-	8.19	4.71
Echinocereus sp.	-	.15	.18
Juniperus osteosperma	.80	.80	.83
Opuntia whipplei	-	1.50	1.71
Pinus edulis	-	-	.25

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 22R, Study no: 4

Species	Average leader growth (in)	
	'03	'08
Artemisia tridentata wyomingensis	1.5	1.1

POINT-QUARTER TREE DATA --

Management unit 22R, Study no: 4

Species	Trees per Acre		
	'99	'03	'08
Juniperus osteosperma	31	17	31
Pinus edulis	31	31	-

Average diameter (in)		
'99	'03	'08
10.0	10.4	11.2
3.0	4.0	-

BASIC COVER --

Management unit 22R, Study no: 4

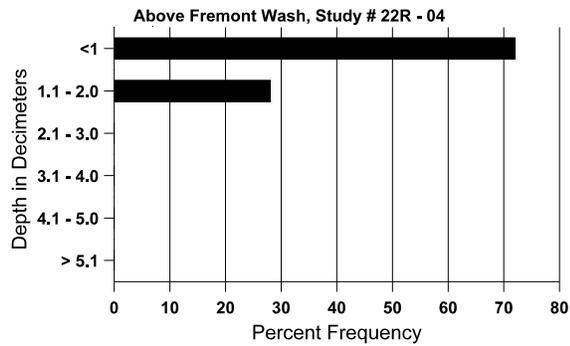
Cover Type	Average Cover %		
	'99	'03	'08
Vegetation	32.45	40.91	25.30
Rock	18.97	15.79	15.80
Pavement	13.86	19.65	13.94
Litter	30.85	24.50	46.99
Cryptogams	.48	.01	.11
Bare Ground	9.31	10.57	9.14

SOIL ANALYSIS DATA --

Management unit 22R, Study no: 4, Study Name: Above Fremont Wash

Effective rooting depth (in)	Temp °F (depth)	pH	loam			%OM	PPM P	PPM K	ds/m
			%sand	%silt	%clay				
11.6	67.4 (12.8)	6.8	42.0	34.7	23.3	1.7	7.1	147.2	0.5

### Stoniness Index



PELLET GROUP DATA --

Management unit 22R, Study no: 4

Type	Quadrat Frequency		
	'99	'03	'08
Rabbit	27	17	90
Elk	-	-	1
Deer	21	27	43
Cattle	-	1	1

Days use per acre (ha)		
'99	'03	'08
-	-	-
-	-	-
73 (180)	62 (152)	117 (289)
-	1 (3)	4 (9)

BROWSE CHARACTERISTICS --  
 Management unit 22R, Study no: 4

		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	<b>2680</b>	20	80	1980	620	820	31	53	23	19	19	17/26
03	<b>2800</b>	-	40	1920	840	620	41	58	30	6	6	18/26
08	<b>2060</b>	1920	-	500	1560	1000	21	13	76	42	43	19/26
<i>Echinocereus</i> sp.												
99	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
03	<b>20</b>	-	-	20	-	-	0	0	-	-	0	5/14
08	<b>20</b>	-	-	20	-	-	0	0	-	-	0	4/13
<i>Gutierrezia sarothrae</i>												
99	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
03	<b>40</b>	-	-	40	-	-	0	0	-	-	0	6/5
08	<b>20</b>	-	-	20	-	-	0	0	-	-	0	8/6
<i>Opuntia polyacantha</i>												
99	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
03	<b>0</b>	-	-	-	-	-	0	0	-	-	0	6/22
08	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
<i>Opuntia</i> sp.												
99	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
03	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
08	<b>40</b>	-	-	40	-	-	0	0	-	-	0	7/12
<i>Opuntia whipplei</i>												
99	<b>240</b>	-	-	240	-	-	0	0	0	-	0	15/33
03	<b>280</b>	-	20	260	-	-	0	0	0	-	0	16/36
08	<b>320</b>	-	40	220	60	20	0	0	19	-	13	14/34
<i>Pediocactus simpsonii</i>												
99	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
03	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
08	<b>0</b>	-	-	-	-	-	0	0	-	-	0	2/2