

Trend Study 24-3-08

Study site name: North Bull Rush .

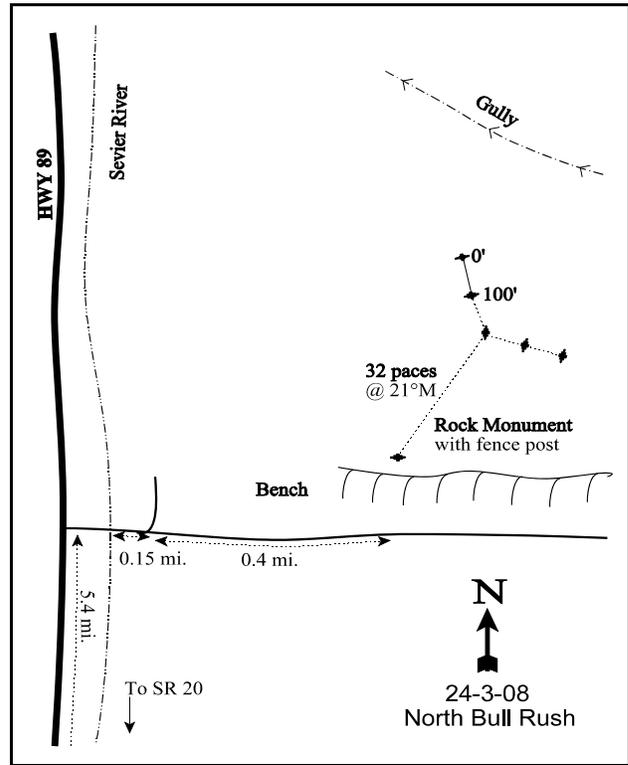
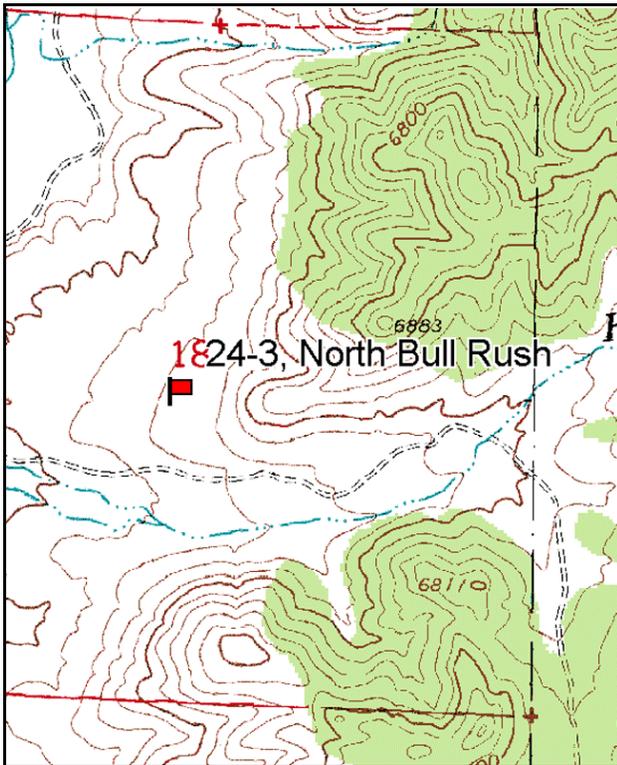
Vegetation type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 348 degrees magnetic. (Lines 3& 4 96° M)

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

LOCATION DESCRIPTION

From the Highway 89 and SR20 Junction, proceed north on 89 for 5.4 miles. Here at the beginning of Circleville Canyon, turn right off the highway onto a dirt road. Cross the Sevier River, and go 0.15 miles to a gate and intersection (bridge was washed out-may need to walk in). Go straight (east) for another 0.4 miles. Stop here. Walk 18 paces up on the edge of a low bench on the north side of the road at 356 degrees magnetic to a rock monument with a fencepost. Walk approximately 60 paces at 9 degree magnetic to the 100' baseline stake. The 0' stake is marked by browse tag #168.



Map Name: Bull Rush Peak

Diagrammatic Sketch

Township 32S , Range 4 1/2W , Section 18

GPS: NAD 83, UTM 12S 381624 E, 4209808 N

## DISCUSSION

### North Bull Rush - Trend Study 24-3

#### Study Information

This study is on key deer winter and spring habitat located on a bench one-quarter mile west of the Forest Service boundary on BLM land at the mouth of Horse Valley Creek [elevation: 6,500 feet (1,981 m), slope: 3%-5%, aspect: northwest]. Bull Rush Creek is located about one-half mile to the south and the Sevier River is one-half mile west of the site. Agricultural land is located in the valley bottom between the site and the river. The bench is relatively small, a half mile long and a half mile wide at the widest point, and is dissected by numerous small gullies. Deer pellet groups were abundant in 1991 and 1997, and an antler drop was also found on the site in 1991. Deer use was estimated to be moderate on the site in 2003 (27 ddu/acre:66 ddu/ha), and increased to moderately heavy use in 2008 (42 ddu/acre:104 ddu/ha). A few elk pellet groups were found in 1991 and 1997, but none were detected in 2003 or 2008. Some sheep use was also noted in 1991. No sign of cattle was encountered in 1991, but some cattle sign was found in 1997. Cattle use was estimated to be moderate in 2003 (25 cdu/acre:63 cdu/ha), and increased to moderately heavy use in 2008 (52 cdu/acre:127 cdu/ha). Most of the cattle pats encountered appeared to be from the previous grazing season to both sampling year 2003 and 2008. There was minimal horse use estimated in 2008 (1 hdu/acre:2 hdu/ha).

#### Soil

The soil has a sandy loam texture with a neutral reaction (pH 6.7). There is a considerable amount of pavement on the surface. Effective rooting depth was estimated at just over 13 inches. Soil at the site is characteristic of the alluvial deposits that form the low-lying foothills on the unit. Organic matter is low at 1.4%, and soil phosphorus is marginal at 7.1 ppm. Values less than 6 ppm may be limiting to plant growth and development (Tiedemann and Lopez 2004). The relative combined vegetation and litter cover was 48%, 42%, and 56% for 1997, 2003, and 2008, respectively. Relative combined rock and pavement cover was 33%, 40%, and 37% for 1997, 2003, and 2008, respectively. Relative bare ground cover was similar for sample years 1997 and 2003 at 16%-18%, but decreased to 7% in 2008. Some small gullies in the area are experiencing some down-cutting problems. The erosion condition rating class was determined to be slight in 2003, and stable in 2008.

#### Browse

Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) is both the dominant and key browse species. Wyoming big sagebrush had a density of 6,666 plants/acre in 1987 declining slightly to 5,440 plants/acre by 2003, and declining further to 3,540 plants/acre in 2008. Use was extremely heavy in 1987 and 1991, more moderate in 1997, light to moderate in 2003, and moderate to heavy in 2008. The number of decadent plants has increased from a low of 17% in 1987 to a high of 69% in 2008. Recruitment has steadily declined with the population of young sagebrush going from 14% in 1987 to 3% in 1997 and 0%-0.6% by 2003 and 2008.

#### Herbaceous Understory

Herbaceous species diversity is very limited on this site, as is the case with most Wyoming big sagebrush communities. The herbaceous understory is composed mostly of blue grama (*Bouteloua gracilis*), bottlebrush squirreltail (*Sitanion hystrix*), and needle-and-thread grass (*Stipa comata*). These three grasses produced 10% cover in 1997, 12% cover in 2003, and 19% cover in 2008. Forbs are almost nonexistent to nonexistent on the site.

#### 1991 TREND ASSESSMENT

Trend for the key browse species, Wyoming big sagebrush, is down. It's population has decreased by 19% with the rate of decadence going from 17% to 67%, and plants showing poor vigor going from 3% to 32%. The trend for grasses is slightly down. The most abundant grass, needle-and-thread, is stable with an 85% quadrat frequency. The nested frequency of blue grama and bottlebrush squirreltail have declined

significantly. The trend for forbs is slightly down. The forbs are almost nonexistent on this site, but with what few species are present, all have declining quadrat frequencies.

browse - down (-2)                      grass - slightly down (-1)                      forb - slightly down (-1)

#### 1997 TREND ASSESSMENT

Trend for browse is stable. Density differences of browse species may be related to the larger sample area used in 1997, therefore, trend for browse was determined using other parameters. Trend for Wyoming big sagebrush is stable due to a still moderately high decadency (48%) and a decline in the young age class. Trend for the grasses and forbs appears stable. Sum of nested frequency of grasses and forbs have remained similar to 1991 estimates. Nested frequency of the dominant grass, needle-and-thread, remains constant but the frequency of blue gramma increased while the nested frequency of bottlebrush squirreltail declined significantly. Forbs comprise less than 0.1% of the total average cover for the site.

winter range condition (DCI) - fair (40) Low potential scale  
browse - stable (0)                      grass - stable (0)                      forb - stable (0)

#### 2003 TREND ASSESSMENT

Trend for Wyoming big sagebrush is stable. Density of sagebrush has declined 6%, vigor is poor on 18% of the plants sampled, and the number of decadent plants has increased from 48% to 54%. No seedlings or young were encountered in 2003. Trend for both the grasses and forbs is stable. Sum of nested frequency of perennial grasses remained constant and no perennial forbs were encountered. The most abundant perennial grasses, blue grama and needle-and-thread, remained at similar nested frequencies. Average cover of perennial grasses rose in 2003 due to a more than 2-fold increase in blue grama cover (2% to 5%).

winter range condition (DCI) - fair (34) Low potential scale  
browse - stable (0)                      grass - stable (0)                      forb - slightly down (-1)

#### 2008 TREND ASSESSMENT

Trend for Wyoming big sagebrush is down. Density of sagebrush has decreased by 35% from 2003. Decadence increased to 69%, plants with poor vigor increased to 38%, and recruitment remained minimal with only 1% of the population consisting of young plants. Trend for the grasses was up. Sum of nested frequency increased for all perennial grasses, and significantly increased for the dominant grass, needle-and-thread. The trend for forbs was stable with forbs being almost nonexistent on the site.

winter range condition (DCI) - fair (34) Low potential scale  
browse - down (-2)                      grass - up (+2)                      forb -stable (0)

HERBACEOUS TRENDS --  
Management unit 24 , Study no: 3

Type	Species	Nested Frequency					Average Cover %		
		'87	'91	'97	'03	'08	'97	'03	'08
G	<i>Bouteloua gracilis</i>	c222	a96	ab114	ab129	b144	1.88	5.15	8.56
G	<i>Bromus tectorum</i> (a)	-	-	-	-	-	.00	-	-
G	<i>Sitanion hystrix</i>	c138	b76	a35	a4	a7	.70	.05	.13
G	<i>Sporobolus cryptandrus</i>	-	16	10	-	-	.10	-	-
G	<i>Stipa columbiana</i>	-	-	-	-	3	-	-	.00
G	<i>Stipa comata</i>	a220	a236	a243	b233	285	7.52	6.94	9.78
Total for Annual Grasses		0	0	0	0	0	0.00	0	0
Total for Perennial Grasses		580	424	402	366	439	10.21	12.14	18.48
Total for Grasses		580	424	402	366	439	10.21	12.14	18.48
F	<i>Astragalus</i> sp.	b16	ab4	ab6	a-	a1	.01	-	.00
F	<i>Chenopodium</i> sp. (a)	-	-	b11	a-	a-	.03	-	-
F	<i>Cryptantha fulvocanescens</i>	7	-	-	-	-	-	-	-
F	<i>Descurainia pinnata</i> (a)	-	-	a-	b8	a-	-	.10	-
F	<i>Draba</i> sp. (a)	-	-	-	1	-	-	.00	-
F	<i>Erigeron pumilus</i>	b19	ab3	b7	a-	a-	.03	-	-
F	<i>Gilia</i> sp. (a)	-	-	3	-	-	.00	-	-
Total for Annual Forbs		0	0	14	9	0	0.03	0.11	0
Total for Perennial Forbs		42	7	13	0	1	0.04	0	0.00
Total for Forbs		42	7	27	9	1	0.07	0.11	0.00

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

BROWSE TRENDS --  
Management unit 24 , Study no: 3

Type	Species	Strip Frequency			Average Cover %		
		'97	'03	'08	'97	'03	'08
B	<i>Artemisia tridentata</i> <i>wyomingensis</i>	91	89	82	13.67	9.01	7.76
B	<i>Ceratoides lanata</i>	1	1	0	0.0	0.0	-
B	<i>Chrysothamnus viscidiflorus</i> <i>stenophyllus</i>	4	3	1	.15	.15	0.0
B	<i>Opuntia</i> sp.	3	2	0	.18	.15	-
B	<i>Pediocactus simpsonii</i>	0	1	1	-	0.0	.00
Total for Browse		99	96	84	14.00	9.30	7.76

CANOPY COVER, LINE INTERCEPT --

Management unit 24 , Study no: 3

Species	Percent Cover	
	'03	'08
Artemisia tridentata wyomingensis	9.81	9.50
Chrysothamnus viscidiflorus stenophyllus	.16	.03

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 24 , Study no: 3

Species	Average leader growth (in)	
	'03	'08
Artemisia tridentata wyomingensis	1.4	0.7

BASIC COVER --

Management unit 24 , Study no: 3

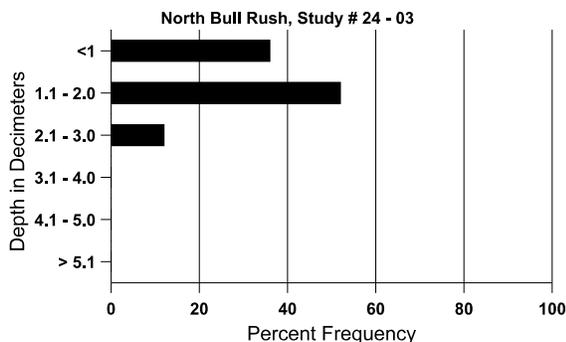
Cover Type	Average Cover %				
	'87	'91	'97	'03	'08
Vegetation	11.75	9.25	25.75	22.20	27.52
Rock	2.25	1.00	1.43	3.08	3.89
Pavement	30.75	36.25	35.46	39.82	35.77
Litter	39.50	30.75	28.81	22.23	33.69
Cryptogams	1.25	1.75	.72	.30	.20
Bare Ground	14.50	21.00	17.67	19.64	7.57

SOIL ANALYSIS DATA --

Management unit 24, Study no: 3, Study Name: North Bull Rush

Effective rooting depth (in)	Temp °F (depth)	pH	sandy loam			%OM	PPM P	PPM K	dS/m
			%sand	%silt	%clay				
13.4	75.0 (11.7)	6.7	60.4	20.1	19.6	1.4	7.1	208.0	0.6

Stoniness Index



PELLET GROUP DATA --

Management unit 24 , Study no: 3

Type	Quadrat Frequency		
	'97	'03	'08
Rabbit	8	53	96
Horse	-	-	-
Elk	4	2	-
Deer	41	16	9
Cattle	3	13	10

Days use per acre (ha)	
'03	'08
-	-
-	1 (1)
-	-
27 (66)	42 (104)
25 (63)	52 (127)

BROWSE CHARACTERISTICS --

Management unit 24 , Study no: 3

		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>												
87	<b>6665</b>	66	933	4599	1133	-	15	85	17	.90	3	14/18
91	<b>5397</b>	-	399	1399	3599	-	52	38	67	4	32	19/23
97	<b>5800</b>	200	180	2840	2780	2720	60	7	48	15	16	15/28
03	<b>5440</b>	-	-	2500	2940	1280	23	0	54	18	18	16/24
08	<b>3540</b>	60	20	1080	2440	540	37	25	69	34	38	18/30
<i>Ceratoides lanata</i>												
87	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
91	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
97	<b>20</b>	-	-	20	-	-	0	0	-	-	0	-/-
03	<b>20</b>	-	-	20	-	-	0	100	-	-	0	7/4
08	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
<i>Chrysothamnus viscidiflorus stenophyllus</i>												
87	<b>933</b>	-	-	933	-	-	93	7	0	-	0	6/7
91	<b>66</b>	-	-	66	-	-	0	100	0	-	100	2/3
97	<b>100</b>	-	-	100	-	-	0	0	0	-	0	8/11
03	<b>80</b>	-	-	60	20	-	0	0	25	25	25	9/9
08	<b>20</b>	-	-	-	20	-	0	0	100	100	100	-/-
<i>Opuntia sp.</i>												
87	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
91	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
97	<b>60</b>	-	-	60	-	-	0	0	-	-	0	6/13
03	<b>40</b>	-	-	40	-	-	0	0	-	-	50	4/15
08	<b>0</b>	-	-	-	-	-	0	0	-	-	0	4/12

		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>Pediocactus simpsonii</b>												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
03	20	-	-	20	-	-	0	0	-	-	0	1/3
08	20	-	20	-	-	-	0	0	-	-	0	-/-
<b>Pinus edulis</b>												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	66	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	-/-