

Trend Study 23R-2-03

Study site name: Greenwich Native.

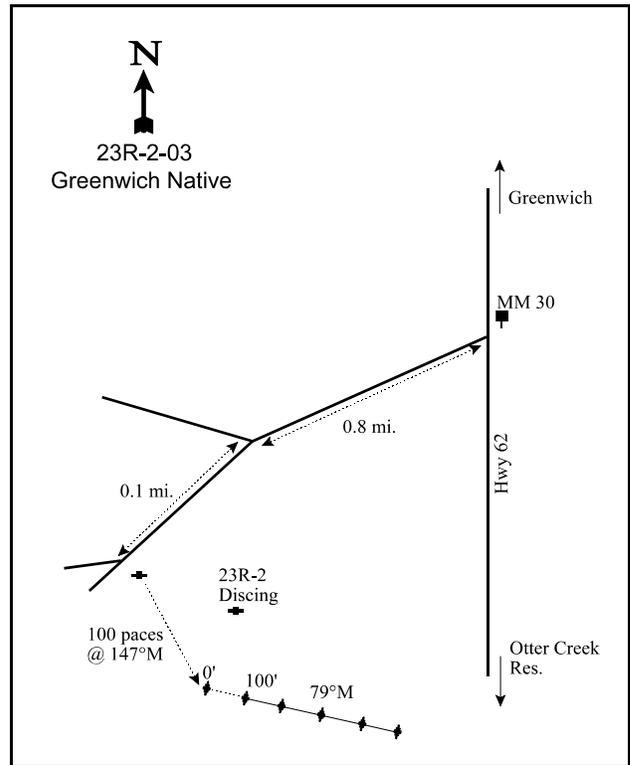
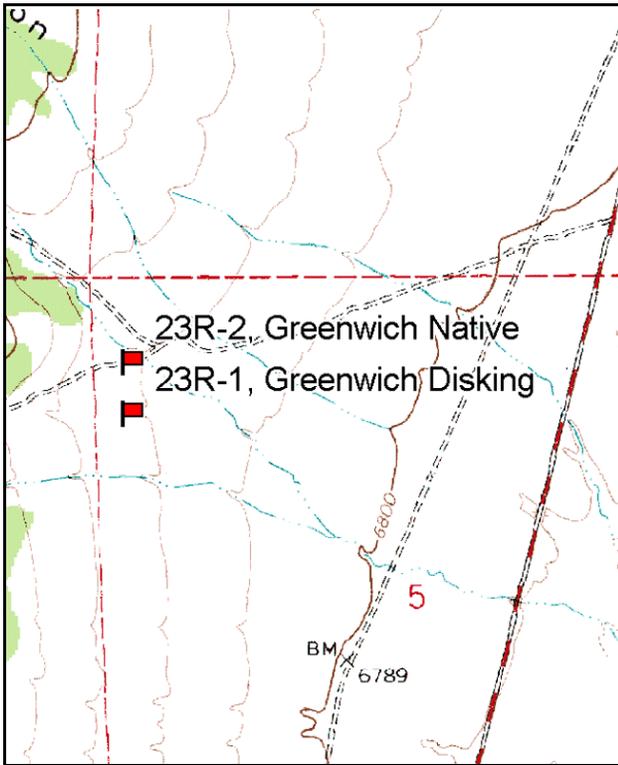
Vegetation type: Wyoming Big Sagebrush.

Compass bearing: frequency baseline 79 degrees magnetic.

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

LOCATION DESCRIPTION

Start on Highway 62 between Greenwich and Otter Creek Reservoir. At mile marker 30 there is a road going west. Take this road for 0.8 miles to a fork. Stay right and go 0.1 mile to a witness post on the left (south) side of the road. From the witness post walk 100 paces at 147 degrees magnetic to the 0-foot stake. The study is marked with green, steel fenceposts approximately 12-18 inches in height.



Map name: Greenwich

Diagrammatic Sketch

Township 28S, Range 1W, Section 5

GPS: NAD 27, UTM 12S 4251554 N, 417893 E

## DISCUSSION

### Greenwich Native - Trend Study No. 23R-2

This trend study samples an undisturbed sagebrush site adjacent to the disking and seeding treatment sampled by the previous trend study (23R-1). The area is considered big game winter range just south of the town of Greenwich and west of Highway 62. Elevation at the site is about 6,850 feet. The terrain is nearly level with a 3% to 5% slope and an eastern aspect. The area appears to be only lightly used by deer and elk. Pellet group transect data from 1997 estimated only 6 deer days use/acre (15 ddu/ha). Only one elk pellet group was encountered. During the 2003 reading, no deer pellet groups were encountered and elk use was estimated at only 1 day use/acre (3 edu/ha). Rabbit pellets were fairly common in 1997 and abundant in 2003 with a quadrat frequency of 64%.

Soils are moderately deep with an estimated effective rooting depth of 11 inches. Soil texture is a sandy loam which is slightly acidic (pH 6.3). Organic matter is low at 1%. Rock and pavement are abundant on the soil surface and moderate amounts of rock are found in the soil profile. Soil temperature is moderately high averaging 63°F at an depth of 11 inches. Sagebrush plants are pedestalled with cryptogamic plants concentrated under the shrub canopies. There is little erosion occurring due to the lack of significant slope. The erosion condition class was determined as slight in 2003.

The site is dominated by an over mature stand of Wyoming big sagebrush. It accounts for virtually all of the browse cover with line intercept canopy cover estimated at nearly 17%. Density was estimated at 4,200 plants/acre in 1997. Utilization was mostly light, vigor good, and only 17% of the population was classified as decadent. Seedling and young recruitment was good. During the 2003 reading, density estimates were stable at 4,220 plants/acre. Use was mostly light but the number of decadent plants increased to 82% of the population. In addition, half of those shrubs were classified as dying (>50% crown death). Average height/crown measurements also declined by 5 inches in height and 13 inches in crown diameter. No seedlings were sampled in 2003 but 4% of the population consists of young plants. Many of the sagebrush had good seed production in 2003 and annual leader growth averaged 2 inches. The only other shrubs on the site consist of a few broom snakeweed and prickly pear cactus.

The herbaceous understory is very poor, consisting of small numbers of blue grama and bottlebrush squirreltail. Forbs are rare with only one forb being sampled in one quadrat in 1997 and 2003. Total herbaceous cover was estimated at less than 1% in 1997 and only 0.12% in 2003.

### 1997 APPARENT TREND ASSESSMENT

Soil conditions are marginal. Rock and pavement cover are high while litter cover is low. Herbaceous vegetation cover is very low. Exposed bare ground is confined to the shrub interspaces with most litter and cryptogamic cover found under sagebrush canopies. There is little erosion occurring due to the gentle terrain. The sagebrush stand is abundant, lightly browsed, and vigorous. Most of the population is mature but age class distribution would indicate a stable population. The herbaceous understory is very poor. Perennial grasses are represented by low numbers of blue grama and bottlebrush squirreltail. Forbs are rare.

### 2003 TREND ASSESSMENT

Trend for soil is stable due to similar ground cover characteristics compared to 1997. Trend for browse is down. The Wyoming big sagebrush population has remained stable in density but it has shifted from a mostly mature population to a mostly decadent one. The number of decadent sagebrush has increased from 17% in 1997 to 82% in 2003. In addition, half of the decadent plants sampled were classified as dying which represents 1,680 plants/acre. Many of the sagebrush had good seed production in 2003 and annual leader

growth averaged 2 inches. Utilization remains light so drought conditions are the likely culprit for the downward trends in sagebrush. Data from the Koosharem weather station indicate that spring precipitation (April-June) has been well below average since 2000, averaging only 59% of normal (2000-2003). Total annual precipitation was 80% of normal in 2001 and 82% of normal in 2002. The sagebrush stand is fairly dense for a Wyoming big sagebrush type. Drought will likely cause a thinning of the stand but there are plenty of plants that will survive. Trend for the herbaceous understory is down and in very poor condition. Perennial grasses are uncommon and produce little forage. Forbs are even more rare with only one forb being found in one quadrat in 1997 and 2003. Since 1997, the only fairly common perennial grass, bottlebrush squirreltail, has declined significantly in nested frequency.

TREND ASSESSMENT

soil - stable (3)

browse - down (1)

herbaceous understory - down (1)

HERBACEOUS TRENDS --

Management unit 23R, Study no: 2

Type	Species	Nested Frequency		Average Cover %	
		'97	'03	'97	'03
G	Bouteloua gracilis	17	9	.27	.07
G	Sitanion hystrix	<sub>b</sub> 42	<sub>a</sub> 11	.49	.05
Total for Annual Grasses		0	0	0	0
Total for Perennial Grasses		59	20	0.76	0.12
Total for Grasses		59	20	0.76	0.12
F	Astragalus spp.	2	-	.03	-
F	Solanum triflorum (a)	-	1	-	.00
Total for Annual Forbs		0	1	0	0.00
Total for Perennial Forbs		2	0	0.03	0
Total for Forbs		2	1	0.03	0.00

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

BROWSE TRENDS --

Management unit 23R, Study no: 2

Type	Species	Strip Frequency		Average Cover %	
		'97	'03	'97	'03
B	Artemisia tridentata wyomingensis	88	86	22.94	21.12
B	Opuntia spp.	1	0	.06	-
Total for Browse		89	86	23.00	21.12

CANOPY COVER, LINE INTERCEPT --

Management unit 23R, Study no: 2

Species	Percent Cover	
	'97	'03
Artemisia tridentata wyomingensis	-	16.56

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 23R, Study no: 2

Species	Average leader growth (in)
	'03
Artemisia tridentata wyomingensis	2.0

BASIC COVER --

Management unit 23R, Study no: 2

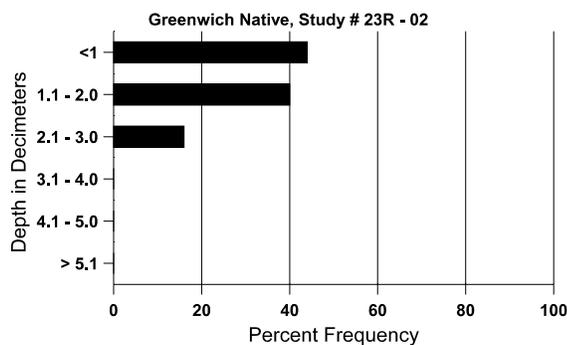
Cover Type	Average Cover %	
	'97	'03
Vegetation	24.26	21.27
Rock	22.26	19.95
Pavement	37.05	18.17
Litter	23.88	22.29
Cryptogams	12.39	7.34
Bare Ground	25.52	21.89

SOIL ANALYSIS DATA --

Management unit 23R, Study no: 2, Study Name: Greenwich Native

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
10.8	63.3 (11.4)	6.3	55.3	26.2	18.6	1.2	17.7	147.2	0.4

Stoniness Index



PELLET GROUP DATA --  
 Management unit 23R, Study no: 2

Type	Quadrat Frequency		Days use per acre (ha)	
	'97	'03	'97	'03
Rabbit	1	64	-	-
Elk	-	-	1 (2)	1 (3)
Deer	3	-	78 (193)	-

BROWSE CHARACTERISTICS --  
 Management unit 23R, Study no: 2

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
<i>Artemisia tridentata wyomingensis</i>											
97	<b>4200</b>	160	240	3240	720	1040	42	.47	17	7	27/41
03	<b>4220</b>	-	160	600	3460	1520	11	1	82	40	22/28
<i>Gutierrezia sarothrae</i>											
97	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
03	<b>0</b>	-	-	-	-	-	0	0	-	0	8/6
<i>Opuntia spp.</i>											
97	<b>40</b>	-	-	40	-	-	0	0	-	0	-/-
03	<b>0</b>	-	-	-	-	-	0	0	-	0	5/13