

Trend Study 23R-1-03

Study site name: Greenwich Disking.

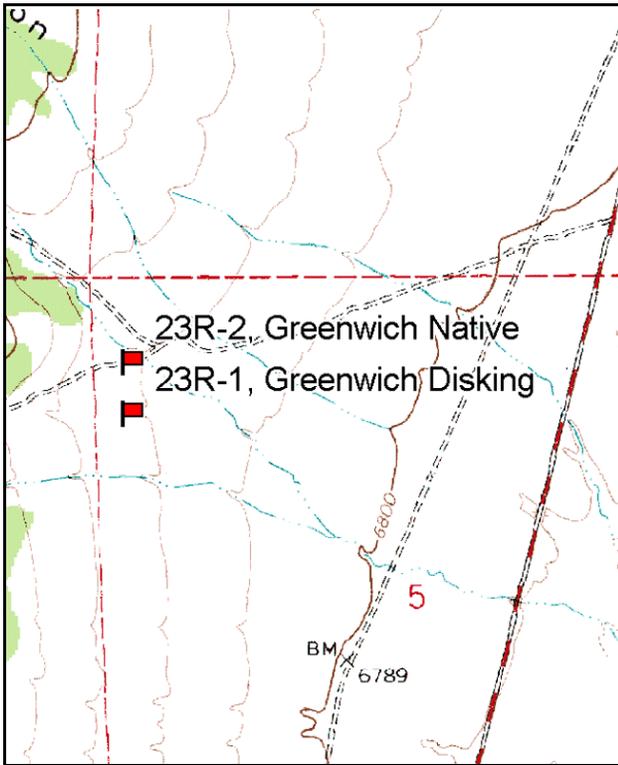
Vegetation type: Wyoming Big Sagebrush.

Compass bearing: frequency baseline 86 degrees magnetic.

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

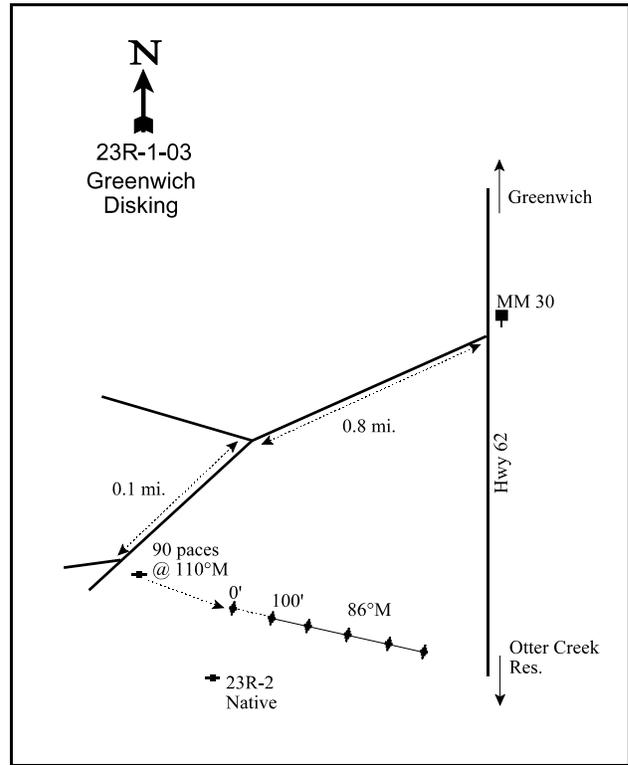
LOCATION DESCRIPTION

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. Walk 90 paces at 110 degrees magnetic into the disking to the 0-foot stake. The study is marked with green, steel fenceposts approximately 12-18 inches in height.



Map name: Greenwich

Township 28S, Range 1W, Section 5



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4251601 N, 417966 E

## DISCUSSION

### Greenwich Disking - Trend Study No. 23R-1

This trend study samples a sagebrush disking and seeding treatment on 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 was treated during the fall of 1996 to enhance herbaceous vegetation. Long narrow areas were disked (200 ft to 300 ft in width) and seeded leaving large areas of undisturbed sagebrush. The native sagebrush, sampled with trend study 23R-2, is overly mature with little understory vegetation. A pellet group transect read during the first reading of this site in 1997 indicated little big game use, estimated at only 3 deer days use/acre (7 ddu/ha). Only one elk pellet group was encountered but rabbit pellets were abundant. Pellet group transect data from 2003 found no deer pellet groups and only one elk pellet group. Rabbit pellets were even more abundant than in 1997, with a quadrat frequency of 91% in 2003.

Soil is moderately deep with an estimated effective rooting depth of nearly 15 inches. Soil texture is a sandy loam which is slightly acidic (pH 6.4). Organic matter is low at <1%. There are moderate amounts of rock and pavement on the surface and in the profile. Soil temperature was estimated at 61°F in 1997 and 63°F in 2003 at an average depth of 14 inches. Protective ground cover is poor leaving abundant bare ground subject to erosion. There is little erosion occurring due to the lack of significant slope. The erosion condition class was determined as slight in 2003.

The site was dominated by thick stand of Wyoming big sagebrush with a poor understory prior to treatment. After the disking, little sagebrush remained in the treatment strips. Density was estimated at 740 plants/acre in 1997. These shrubs were not utilized and in good vigor. Seeded fourwing saltbush established well with a density of 720 young plants/acre estimated. During the 2003 reading, no sagebrush was encountered within the shrub density strips but a few surviving sagebrush were measured for height/crown and leader growth measurements. These shrubs were vigorous and producing abundant seed. Annual leader growth averaged 2.6 inches. No fourwing saltbush was found during the 2003 survey.

Seeded grasses and forbs established well during the first growing season in 1997. Crested and intermediate wheatgrass had quadrat frequencies of 79% and 36% respectively. Cover was estimated at 3.5% for crested wheat and 1% for intermediate wheatgrass. Annual cheatgrass was encountered in only 1 quadrat. Seeded alfalfa and small burnet also established well. Alfalfa had a quadrat frequency value of 79% and produced 6% cover. Annual kochia was abundant in 1997, but the only other weedy forb found was some willowweed. During the 2003 reading, no seeded grasses were found and the only forb encountered was cutleaf nightshade (*Solanum triflorum*).

### 1997 APPARENT TREND ASSESSMENT

The treatment has effectively eliminated much of the sagebrush cover and established a good stand of seeded grasses and forbs. Soil conditions are poor with abundant bare ground exposed but this should improve as the herbaceous plants increase. There is little erosion occurring due to the gentle terrain. Seeded fourwing saltbush has established well and should increase as well as the surviving sagebrush.

### 2003 TREND ASSESSMENT

Trend for soil is down. Percent cover of bare ground is unchanged but there is less protective vegetation cover than was estimated in 1997. There are no perennial grasses and only cutleaf nightshade is left on the site. The soil erosion condition class was determined to be slight but erosion is limited by the gentle terrain. Trend for browse is down. There was no sagebrush or fourwing saltbush sampled within the shrub density

strips in 2003. Trend for the herbaceous understory is down. No seeded grasses or forbs were found in 2003. The only herbaceous plant sampled was cutleaf nightshade, a weedy annual forb. It appears, that due to the lack of wildlife and livestock use, rabbit use combined with drought conditions have caused these trends. Data from the Koosharem weather station indicates 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. Pellet group data indicates abundant rabbit use of these treated areas with quadrat frequency of rabbit pellets increasing from 11% in 1997 to 91% in 2003. Quadrat frequency of rabbit pellets was also high in 2003 on the adjacent native site increasing from only 1% in 1997 to 64% in 2003. Treatments like this, especially if small in scope, often concentrate use by wildlife.

**TREND ASSESSMENT**

soil - down (1)

browse - down (1)

herbaceous understory - down (1)

**HERBACEOUS TRENDS --**

Management unit 23R, Study no: 1

Type	Species	Nested Frequency		Average Cover %	
		'97	'03	'97	'03
G	Agropyron cristatum	<sub>b</sub> 209	<sub>a</sub> -	3.49	-
G	Agropyron intermedium	<sub>b</sub> 83	<sub>a</sub> -	1.22	-
G	Bromus tectorum (a)	2	-	.00	-
Total for Annual Grasses		2	0	0.00	0
Total for Perennial Grasses		292	0	4.71	0
Total for Grasses		294	0	4.71	0
F	Astragalus spp.	2	-	.03	-
F	Epilobium brachycarpum (a)	7	-	.07	-
F	Kochia scoparia (a)	<sub>b</sub> 156	<sub>a</sub> -	5.71	-
F	Medicago sativa	<sub>b</sub> 226	<sub>a</sub> -	6.09	-
F	Sanguisorba minor	<sub>b</sub> 33	<sub>a</sub> -	.22	-
F	Solanum triflorum (a)	-	5	-	4.94
Total for Annual Forbs		163	5	5.78	4.94
Total for Perennial Forbs		261	0	6.36	0
Total for Forbs		424	5	12.14	4.94

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

BROWSE TRENDS --

Management unit 23R, Study no: 1

Type	Species	Strip Frequency		Average Cover %	
		'97	'03	'97	'03
B	Artemisia tridentata wyomingensis	24	0	.58	-
B	Atriplex canescens	21	0	.02	-
B	Atriplex confertifolia	0	0	.11	-
B	Opuntia spp.	1	0	.15	-
Total for Browse		46	0	0.86	0

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 23R, Study no: 1

Species	Average leader growth (in)
	'03
Artemisia tridentata wyomingensis	2.6

BASIC COVER --

Management unit 23R, Study no: 1

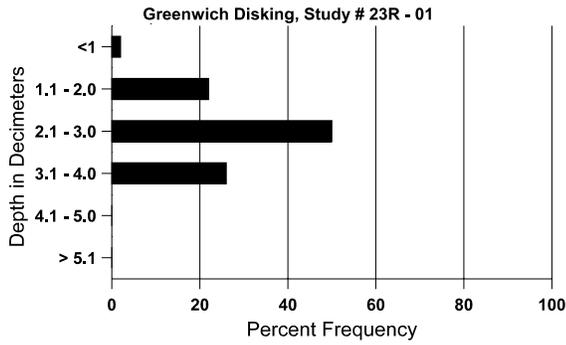
Cover Type	Average Cover %	
	'97	'03
Vegetation	15.51	5.21
Rock	4.41	9.32
Pavement	4.51	3.75
Litter	20.42	36.52
Cryptogams	.18	.11
Bare Ground	51.62	49.48

SOIL ANALYSIS DATA --

Management unit 23R, Study no: 1, Study Name: Greenwich Disking

Effective rooting depth (in)	Temp °F (depth)	pH	% sand	% silt	% clay	% OM	PPM P	PPM K	ds/m
14.8	62.7 (13.0)	6.4	57.6	25.1	17.3	1.0	22.7	288.0	0.5

# Stoniness Index



## PELLET GROUP DATA --

Management unit 23R, Study no: 1

Type	Quadrat Frequency		Days use per acre (ha)
	'97	'03	
Rabbit	11	91	-
Elk	-	4	1 (2)
Deer	6	-	-
Cattle	-	1	-

## BROWSE CHARACTERISTICS --

Management unit 23R, Study no: 1

		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)
<b>Artemisia tridentata wyomingensis</b>											
97	<b>740</b>	20	480	220	40	2500	0	0	5	0	14/23
03	<b>0</b>	-	-	-	-	-	0	0	0	0	21/31
<b>Atriplex canescens</b>											
97	<b>720</b>	20	720	-	-	-	0	0	-	0	11/9
03	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
<b>Opuntia spp.</b>											
97	<b>20</b>	-	-	20	-	-	0	0	-	0	6/11
03	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-