

WOODRUFF CREEK SOUTH - TREND STUDY NO. 4-15-11

Vegetation Type: Wyoming Big Sagebrush - PJ

Range Type: Crucial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: [Semidesert Stony Loam \(Black Sagebrush\), R047XB252UT](#)

Land Ownership: Private

Elevation: 6,800 ft (2,073 m)

Aspect: Southeast

Slope: 21%

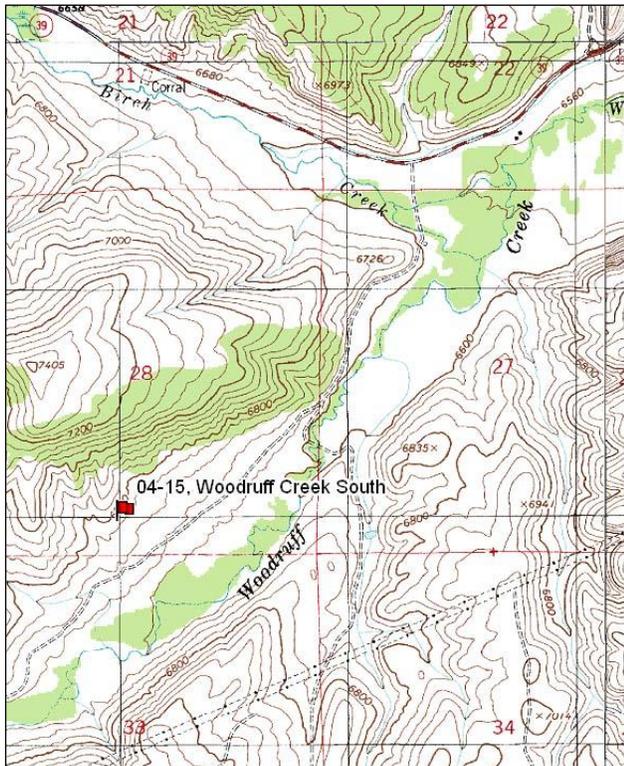
Transect bearing: 26° magnetic

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

Directions:

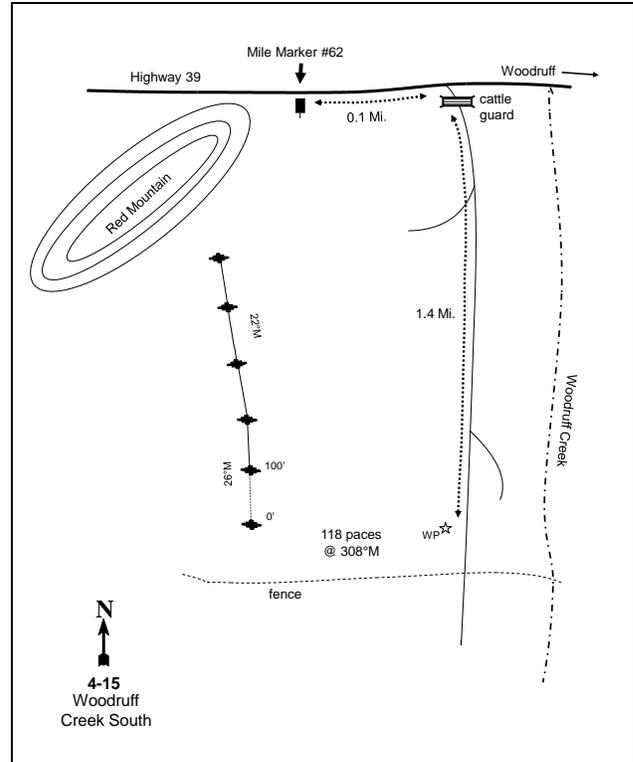
Travel east on highway 39 and turn right (south) 0.1 miles past mile marker #62. Travel west for 1.4 miles to a cattle guard. From the cattlegaurd, walk 118 paces at 205 degrees magnetic to the 0-foot baseline stake. The 0-foot baseline stake is marked with a browse tag #56. There is a fence 200 feet to the west from the 0-foot baseline stake. The baseline runs in a direction of 26 degrees magnetic. The baseline doglegs at the 300-foot baseline stake and runs in a direction of 22 degrees magnetic.

Map Name: Meachum Ridge



Township: 9N Range: 6E Section: 28

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 476924 E 4592189 N

WOODRUFF CREEK SOUTH - TREND STUDY NO. 4-15

Site Information

Site Description: The study is located on private land downstream from Woodruff Reservoir, about a third of a mile north of Woodruff Creek. The study samples a Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) community with a Utah juniper (*Juniperus osteosperma*) overstory. The Ruby Pipeline is just to the south of the study on the other side of the canyon. The area has been heavily used in winter by deer, with five winter-killed deer found in 1996. Several deer carcasses were near the site in 2011. Deer pellet groups have fluctuated in abundance with moderate abundance in 2001, low abundance in 2006, and very high abundance in 2011. Presence of other big game has been minimal. Sampled cattle sign has been high since 2001 (Table - Pellet Group Data).

Browse: Wyoming big sagebrush is the predominant browse species on the site, providing over half of the total browse cover (Table - Browse Trends). The sagebrush population is a moderately dense stand that has displayed mostly light to moderate use. Decadence of sagebrush was high at the outset of the study, but has steadily decreased to more moderate levels. Poor vigor has been moderately high in the population since 2006. Recruitment of young sagebrush plants has been very good over the course of the study. Other shrubs include stickleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*), prickly pear (*Opuntia* sp.), and gray horsebrush (*Tetradymia canescens*). A few snowberry (*Symphoricarpos oreophilus*), bitterbrush (*Purshia tridentata*), and winterfat (*Ceratoides lanata*) plants have been observed, but have not been sampled in the density belt (Table - Browse Characteristics). A moderately dense, but stable, stand of Utah juniper trees are scattered through the area (Table - Point-Quarter Tree Data), with most of the mature trees being highlined.

Herbaceous Understory: The herbaceous understory is dominated by thick patches of cheatgrass (*Bromus tectorum*). In areas where cheatgrass is not as abundant, Sandberg bluegrass (*Poa secunda*), western wheatgrass (*Agropyron smithii*), bluebunch wheatgrass (*A. spicatum*), bottlebrush squirreltail (*Sitanion hystrix*), and Indian ricegrass (*Oryzopsis hymenoides*) are common. Several other perennial grasses are found in small numbers. Forbs are very sparse, and perennial forbs have produced less than 1% cover since 1996 (Table - Herbaceous Trends).

Soil: The soil is in the Duckree gravelly loam series, which occurs on stream terraces and alluvial fans. Parent material consists of colluvium and/or slope alluvium derived from quartzite, sandstone, and chert. These soils are characterized as very deep, well drained, and moderately permeable (Soil Survey Staff 2011). The soil texture is a sandy clay loam with a neutral soil reaction (pH 6.8) (Table - Soil Analysis Data). At about 6 inches in depth, a layer of larger gravel can be detected. Bare ground is not abundant due to a high amount of vegetation and litter cover provided primarily by cheatgrass (Table - Basic Cover). Some erosion has occurred in the form of flow patterns, rills, pedestalling, and an active gully near the end of the baseline, but has not been excessive. The soil erosion condition was classified as slight in 2001 and 2006, but was stable in 2011.

Trend Assessments

Browse:

- **1996 to 2001 - up (+2):** The density of Wyoming big sagebrush increased 66% from 3,300 plants/acre to 5,480 plants/acre, though cover remained similar at 11%. Recruitment of young sagebrush plants increased from 18% to 29% of the population. Decadence decreased from 33% to 23%.
- **2001 to 2006 - stable (0):** The total density of sagebrush decreased 14% to 4,700 plants/acre due to a decrease in the recruitment of young plants to 19% of the population. Cover of sagebrush increased slightly to 12%. Decadence decreased to 19%, but poor vigor increased from 1% to 19%.

- **2006 to 2011 - up (+2):** Density of sagebrush increased 46% to 6,860 plants/acre, and cover increased to 13%. Recruitment of young sagebrush plants increased to 26% of the population. Decadence decreased slightly to 17%, and poor vigor decreased to 10%.

Grass:

- **1996 to 2001 - up (+2):** The sum of nested frequency of perennial grasses increased 19%, and cover increased from 9% to 11%. Cheatgrass decreased significantly in nested frequency, and cover decreased from 16% to 2%.
- **2001 to 2006 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 13%, and cover decreased to 9%. Nested frequency of cheatgrass remained similar, but cover increased to 8%.
- **2006 to 2011 - stable (0):** The sum of nested frequency of perennial grasses remained similar, but cover increased to 12%. Cheatgrass increased significantly in nested frequency, and cover increased to 12%.

Forb:

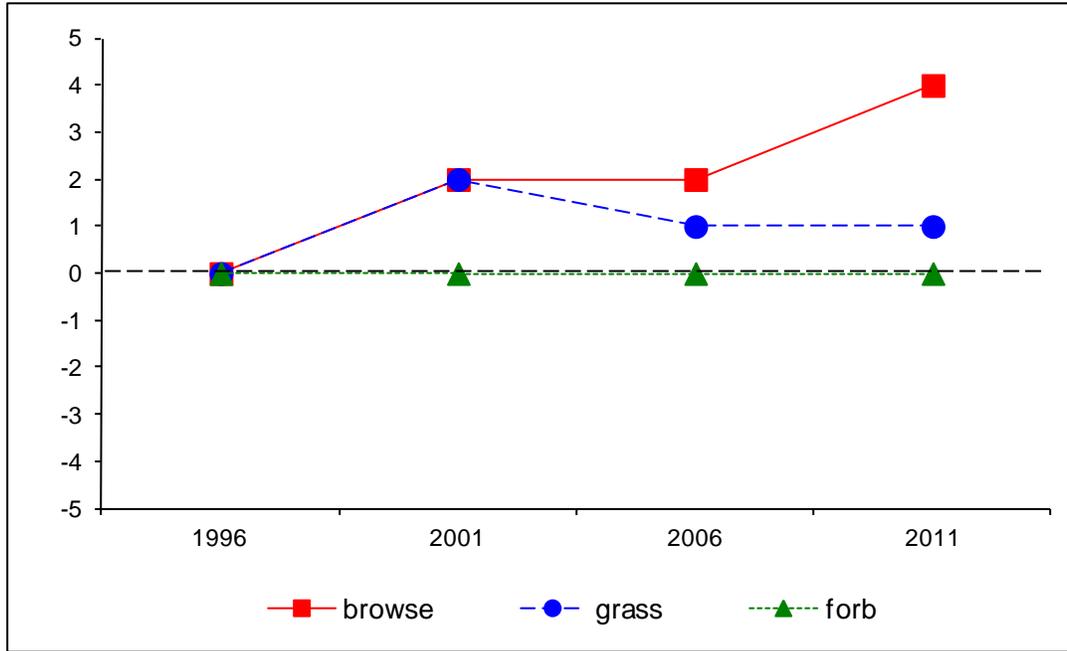
- **1996 to 2001 - stable (0):** Forbs are very rare on the site.
- **2001 to 2006 - stable (0):** Forbs are very rare on the site.
- **2006 to 2011 - stable (0):** Forbs are very rare on the site.

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --
Management unit 4, study no: 15

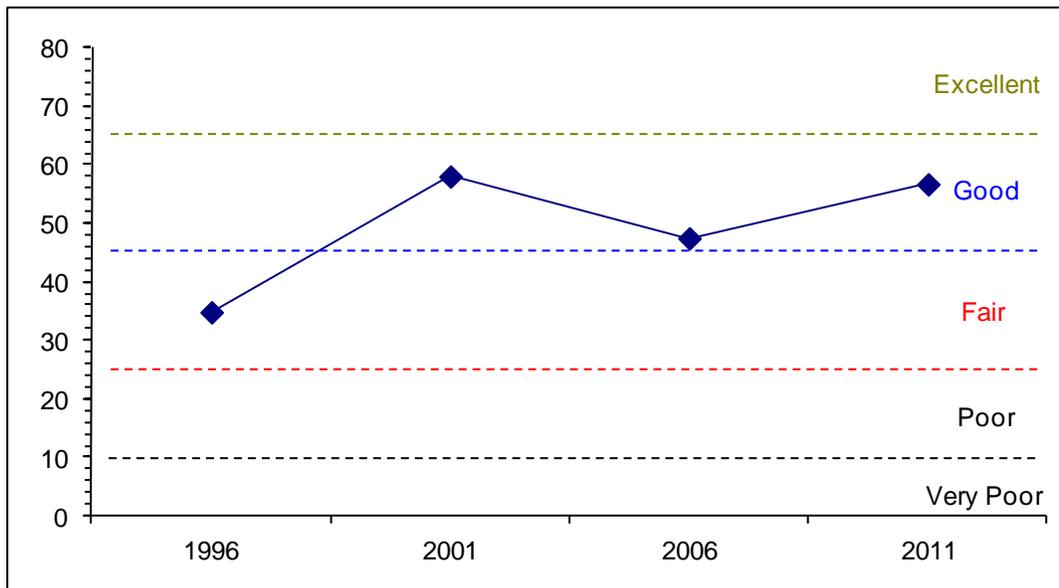
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
96	13.5	5.1	9.0	18.6	-11.8	0.4	0.0	34.8	Fair
01	13.8	8.1	14.5	22.2	-1.2	0.6	0.0	58.0	Good
06	15.2	9.3	9.5	17.7	-5.8	1.6	0.0	47.5	Good
11	16.7	9.9	13.0	24.4	-8.7	1.4	0.0	56.7	Good

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
 Management unit 4 Study no: 15



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--
 Management unit 4, Study no: 15



HERBACEOUS TRENDS--
Management unit 04, Study no: 15

Type	Species	Nested Frequency				Average Cover %			
		'96	'01	'06	'11	'96	'01	'06	'11
G	Agropyron cristatum	-	-	-	-	-	-	-	.03
G	Agropyron smithii	a37	c123	bc105	b80	.29	2.29	2.81	3.40
G	Agropyron spicatum	c52	a2	ab13	bc27	1.37	.01	.34	.93
G	Bromus tectorum (a)	b354	a232	a253	b327	15.76	1.60	7.67	11.57
G	Elymus cinereus	4	-	-	-	.06	-	-	-
G	Koeleria cristata	2	-	-	2	.00	-	-	.03
G	Oryzopsis hymenoides	b36	a22	ab21	ab24	.81	.49	.50	1.01
G	Poa fendleriana	9	-	-	16	.22	-	-	.25
G	Poa pratensis	1	-	2	4	.03	-	.03	.01
G	Poa secunda	bc257	c309	ab241	a186	6.25	7.15	4.35	4.29
G	Sitanion hystrix	a22	a13	a24	b61	.23	.04	.31	1.29
G	Stipa comata	a2	b31	b31	b31	.03	1.09	.50	.91
Total for Annual Grasses		354	232	253	327	15.76	1.60	7.67	11.57
Total for Perennial Grasses		422	500	437	431	9.30	11.10	8.85	12.18
Total for Grasses		776	732	690	758	25.07	12.71	16.53	23.76
F	Agoseris glauca	-	-	2	-	-	-	.00	-
F	Alyssum alyssoides (a)	a-	a-	a2	b12	-	-	.00	.03
F	Antennaria rosea	-	5	4	9	-	.01	.18	.01
F	Arabis drummondii	b12	a-	a-	ab5	.03	.03	-	.04
F	Astragalus beckwithii	2	-	3	4	.03	-	.03	.03
F	Astragalus convallarius	a2	b15	ab8	ab8	.01	.16	.10	.15
F	Astragalus utahensis	5	5	-	2	.03	.06	-	.00
F	Chaenactis douglasii	1	3	1	3	.00	.00	.03	.01
F	Chenopodium album (a)	-	-	7	-	-	-	.04	-
F	Cordylanthus sp. (a)	-	-	-	3	-	-	-	.03
F	Crepis acuminata	-	-	-	1	-	-	-	.06
F	Cryptantha sp.	a-	a-	a13	b21	.03	-	.22	.19
F	Descurainia pinnata (a)	6	2	6	17	.04	.00	.07	.08
F	Erigeron pumilus	-	1	4	-	-	.00	.03	-
F	Gayophytum ramosissimum(a)	a-	a-	a-	b49	-	-	-	.20
F	Gilia sp. (a)	a-	a-	b12	b13	-	-	.05	.10
F	Holosteum umbellatum (a)	-	-	1	-	-	-	.00	-
F	Lappula occidentalis (a)	a-	a7	a5	b34	-	.04	.03	.27
F	Orobancha sp.	5	-	-	7	.01	-	-	.04
F	Phlox hoodii	6	6	1	1	.04	.04	.03	.00
F	Phlox longifolia	a3	a4	ab17	b34	.00	.01	.14	.14
F	Ranunculus testiculatus (a)	a-	a-	b17	b26	-	-	.05	.05
F	Sisymbrium altissimum (a)	-	-	-	5	-	-	.00	.18
F	Tragopogon dubius (a)	-	3	-	2	-	.01	-	.01
Total for Annual Forbs		6	12	50	161	0.04	0.05	0.25	0.96
Total for Perennial Forbs		36	39	53	95	0.20	0.31	0.78	0.70
Total for Forbs		42	51	103	256	0.24	0.37	1.04	1.67

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

BROWSE TRENDS--

Management unit 04, Study no: 15

Type	Species	Strip Frequency				Average Cover %			
		'96	'01	'06	'11	'96	'01	'06	'11
B	Artemisia tridentata wyomingensis	83	86	85	94	10.83	11.01	12.12	13.35
B	Atriplex canescens	0	0	0	0	-	.03	-	-
B	Chrysothamnus viscidiflorus viscidiflorus	58	54	52	55	2.68	1.89	.91	1.36
B	Gutierrezia sarothrae	0	0	1	1	-	-	-	-
B	Juniperus osteosperma	7	8	8	9	6.98	8.26	10.63	8.86
B	Opuntia sp.	13	6	4	2	.16	.00	-	-
B	Tetradymia canescens	3	3	5	5	.01	-	-	-
Total for Browse		164	157	155	166	20.67	21.20	23.67	23.57

CANOPY COVER, LINE INTERCEPT--

Management unit 04, Study no: 15

Species	Percent Cover		
	'01	'06	'11
Artemisia tridentata wyomingensis	-	13.43	22.01
Chrysothamnus viscidiflorus viscidiflorus	-	2.38	4.00
Juniperus osteosperma	11.19	15.63	15.76
Opuntia sp.	-	.26	.20
Tetradymia canescens	-	-	.16

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 04, Study no: 15

Species	Average leader growth (in)		
	'01	'06	'11
Artemisia tridentata wyomingensis	1.2	1.3	1.6

POINT-QUARTER TREE DATA--

Management unit 04, Study no: 15

Species	Trees per Acre			Average diameter (in)		
	'01	'06	'11	'01	'06	'11
Juniperus osteosperma	93	117	94	7.4	5.3	6.3

BASIC COVER--

Management unit 04, Study no: 15

Cover Type	Average Cover %			
	'96	'01	'06	'11
Vegetation	44.31	37.37	41.52	48.75
Rock	3.07	1.93	2.13	2.34
Pavement	10.89	13.43	17.09	13.18
Litter	46.23	47.56	42.37	32.19
Cryptogams	2.21	4.95	4.09	4.11
Bare Ground	7.96	14.96	13.99	10.61

PELLET GROUP DATA--

Management unit 04, Study no: 15

Type	Quadrat Frequency				Days use per acre (ha)		
	'96	'01	'06	'11	'01	'06	'11
Rabbit	13	25	32	13	-	-	-
Horse	1	-	-	1	1 (3)	-	1 (2)
Elk	7	1	2	5	-	-	3 (8)
Deer	28	34	4	14	31 (76)	18 (45)	78 (192)
Cattle	6	12	18	8	34 (84)	36 (88)	43 (106)

BROWSE CHARACTERISTICS--

Management unit 04, Study no: 15

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<i>Artemisia tridentata wyomingensis</i>									
96	3300	18	48	33	1100	19	.60	5	18/36
01	5480	29	49	23	360	21	.72	.36	17/28
06	4700	19	63	19	7760	5	.42	19	18/27
11	6860	26	57	17	320	27	7	10	13/22
<i>Atriplex canescens</i>									
96	0	0	0	-	-	0	0	0	-/-
01	0	0	0	-	-	0	0	0	14/27
06	0	0	0	-	-	0	0	0	-/-
11	0	0	0	-	-	0	0	0	-/-
<i>Ceratoides lanata</i>									
96	0	0	0	-	-	0	0	0	-/-
01	0	0	0	-	-	0	0	0	-/-
06	0	0	0	-	-	0	0	0	9/16
11	0	0	0	-	-	0	0	0	-/-
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
96	2540	7	87	6	80	0	0	2	13/20
01	2340	3	86	11	-	0	0	3	10/15
06	2180	15	83	3	20	2	0	0	10/16
11	2260	4	96	1	-	0	0	.88	10/16

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Gutierrezia sarothrae</i>										
96	0	0	0	-	-	0	0	0	-/-	
01	0	0	0	-	-	0	0	0	5/8	
06	20	0	100	-	-	0	0	0	6/7	
11	20	0	100	-	-	0	0	0	8/14	
<i>Juniperus osteosperma</i>										
96	140	0	100	0	-	0	0	0	-/-	
01	180	11	89	0	-	0	0	0	-/-	
06	180	11	78	11	20	0	0	11	-/-	
11	200	10	80	10	-	0	0	0	-/-	
<i>Opuntia sp.</i>										
96	420	29	67	5	-	0	0	0	4/15	
01	300	47	33	20	-	0	0	20	3/10	
06	120	33	67	0	-	0	0	0	3/12	
11	100	0	100	0	20	0	0	0	4/12	
<i>Purshia tridentata</i>										
96	0	0	0	-	-	0	0	0	-/-	
01	0	0	0	-	-	0	0	0	-/-	
06	0	0	0	-	-	0	0	0	9/29	
11	0	0	0	-	-	0	0	0	-/-	
<i>Symphoricarpos oreophilus</i>										
96	0	0	0	-	-	0	0	0	-/-	
01	0	0	0	-	-	0	0	0	-/-	
06	0	0	0	-	-	0	0	0	19/18	
11	0	0	0	-	-	0	0	0	22/47	
<i>Tetradymia canescens</i>										
96	80	0	100	-	-	0	0	0	12/23	
01	80	0	100	-	-	0	0	0	8/20	
06	140	14	86	-	-	14	14	0	7/13	
11	140	0	100	-	-	0	0	0	8/13	