

Trend Study 1-2-06

Study site name: Rosette.

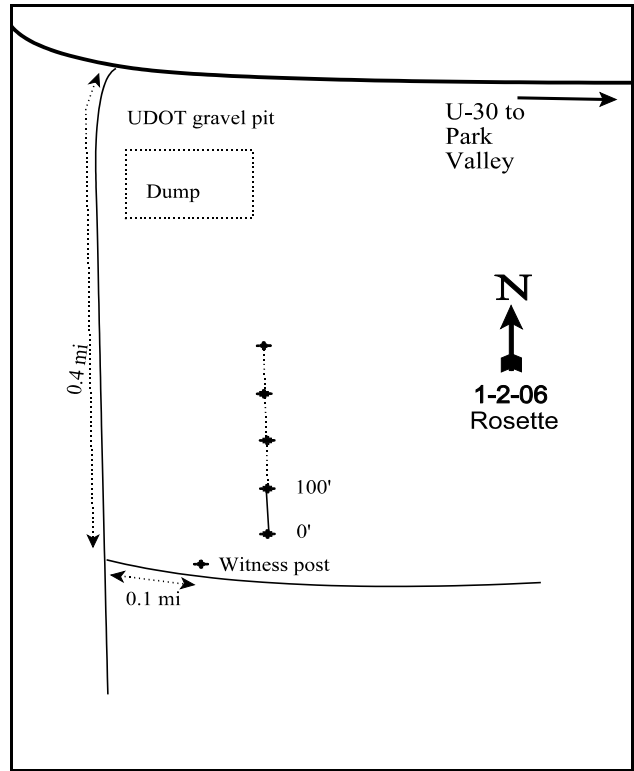
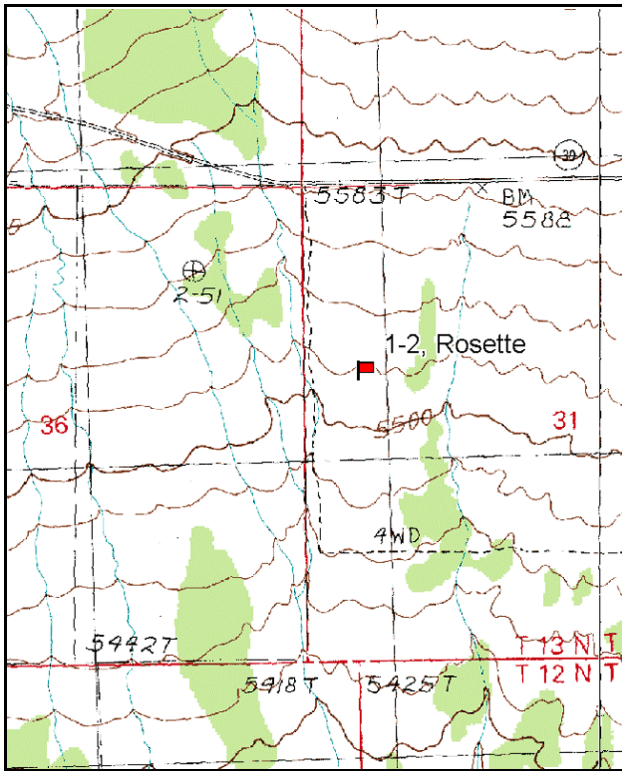
Vegetation type: Big Sagebrush.

Compass bearing: frequency baseline 0 degrees magnetic.

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

LOCATION DESCRIPTION

From Rosette, Utah and mile marker 51, proceed northeast on U-30 approximately 1.0 miles and turn right. Proceed through the Utah Department of Transportation gravel dump and find a dirt road on the west side of gravel pile area. Proceed south on this road for 0.4 miles (passing a left fork) to a left fork. Turn left (i.e., east) and proceed 0.1 miles to a witness post on the left side of the road and stop. From the witness post take a bearing of 9 degrees magnetic and walk 22 paces to the 0-foot stake of the frequency baseline. The 0-foot stake is wired with a red browse tag, number 7906.



Map Name: Rosette

Diagrammatic Sketch

Township 13N, Range 13W, Section 31

UTM NAD 27, UTM 12T 4631263 N, 301911E

DISCUSSION

Rosette - Trend Study No. 1-2

Study Information

This trend study is located approximately two miles east of Rosette on critical deer winter range (elevation: 5,500 feet, slope: nearly level, aspect: south). This area is a Wyoming big sagebrush type which also contains some scattered Utah juniper and a few pockets of black sagebrush. Judging from browse utilization and pellet group frequency, deer use through the years has ranged from moderate to heavy. Cattle also graze the area and were on the study area in 1984. This area is within the BLM Hirschi allotment which is assigned for 25 cattle with a season of use from October 16 through December 31. A pellet group transect read in 2001 estimated 26 deer days use/acre (65 ddu/ha). In 2006, animal use was estimated at 25 deer days use/acre (61 ddu/ha) and 1 cow day use/acre (2 cdu/ha).

Soil

This soil is part of the the Taylorsflat series, which consists of very deep, well drained, moderate or moderately slowly permeable soils. These soils formed in alluvium and lacustrine sediments from igneous and sedimentary rocks on fan remnants, lake terraces, fan skirts, alluvial flats, and lake plains (USDA-NRCS 2006). Soil texture is a clay loam with a neutral soil reaction (7.3 pH). Soil phosphorus is marginal at 7.2 ppm, which can limit plant growth and development (Tiedemann and Lopez 2004). Rocks are rare in the profile. Average effective rooting depth was just over 15 inches. The ratio of protective ground cover from vegetation and litter compared to percent bare ground is relatively poor. The erosion condition classification was determined to be moderate in 2001 and 2006. Pedestalling was high, while flow patterns and rills were found across the site.

Browse

The key browse species is Wyoming big sagebrush, which also shows characteristics of basin big sagebrush. Density estimates have varied since 1984, however the methods were slightly modified by increasing the sample size by more than three times in 1992. Since 1996, sagebrush density has declined from 6,160 plants/acre to 5,380 plants/acre in 2001, to 4,180 plants/acre in 2006. Young plants were extremely abundant in 1996 (49% of population), which may have inflated the density. Young recruitment was still good in 2001 at 23%, but dropped to only 7% in 2006. Decadence rose to 77% in 1990, then declined to 29% by 1996 and 18% in 2001. This increased to 35% in 2006. Sagebrush cover was 14% in 1996, 19% in 2001, and 16% in 2006. Utilization was determined to be heavy in 1984 with 52% of the population displaying heavy use. By 1990, only 11% of the sagebrush was classified as heavily hedged. Use was mostly light in the last three readings. The sagebrush type in the 1970 Range Inventory estimated air dry production of 2,010 pounds/acre.

Other shrubs found which produce additional forage consist of small numbers of black sagebrush and rubber rabbitbrush. Narrowleaf low rabbitbrush, a low growing increaser, has been decreasing in density since 1996. Rabbitbrush cover has decreased from 6% in 1996 to less than 2% in 2006. Monitoring of this species abundance will be an important trend parameter in the future. A different variety of low rabbitbrush was sampled in 2006. The leaves were wider, darker green, and heavily hedged. Utah juniper density was estimated using the point-center-quarter method. Density was 56 trees/acre in both 2001 and 2006. Juniper cover was about 7% in 2001 and 2006, using the line intercept method.

Herbaceous Understory

Sandberg bluegrass and western wheatgrass are the most abundant perennial grasses. Sum of nested frequency for western wheatgrass has increased since 1990. Sandberg bluegrass is the most abundant perennial grass. Unfortunately cheatgrass is also present and can out-compete young shrubs and other perennial plants. In 2006, cheatgrass significantly increased in nested frequency and cover and was sampled in 95% of the quadrats. Forbs are diverse, but sparse. Total forb cover has only been about 2%. Common perennial forb species include hooker balsamroot, hoods phlox, and cryptantha.

1990 TREND ASSESSMENT

Trend for browse is down. Wyoming big sagebrush had an estimated 25% canopy cover in 1990. However, density declined from 6,332 plants/acre in 1984 to 3,799 plants per acre in 1990. Decadence has also increased from 23% to 77%. Very few seedlings and no young sagebrush were sampled in 1990. Recent utilization of sagebrush has been light to moderate. In contrast, narrowleaf low rabbitbrush density increased by 17%. Trend for grasses is up. Sandberg bluegrass and squirreltail have increased in nested frequency and quadrat frequency values since 1984. Sum of nested frequency of perennial forbs has also increased slightly.

browse - down (-2)

grass - up (+2)

forb - slightly up (+1)

1996 TREND ASSESSMENT

The trend for the key browse species, Wyoming big sagebrush, has also improved since 1990. Density has increased from 3,799 to 6,160 plants/acre, some of these differences may be due to the expanded sampling size implemented in 1996. Percent decadence has declined from 77% to 29% and vigor is good. Age class composition indicates an expanding population with 2,620 seedlings/acre and 3,040 young plants/acre estimated. Cover was estimated at 14%. Trend for grasses is stable. Sum of nested frequency for perennial grasses changed very little. Cheatgrass is widely distributed across the site and abundant, but annuals were not previously sampled so trend determination cannot be done at this time. The trend for forbs is also stable with a very slight increase in forb frequency. The Desirable Components Index (see methods) rated this site as good.

winter range condition (DC Index) - good (56) Lower potential scale

browse - slightly up (+1)

grass - stable (0)

forb - stable (0)

2001 TREND ASSESSMENT

Trend for the key browse species, Wyoming big sagebrush, has remained fairly stable with only a slight decrease in density due to a lower number of young plants. There are more than enough young plants to maintain the current population. Decadence has declined from 77% in 1990 to 29% in 1996 and 18% in 2001. The number of young plants outnumbering the estimated number of dead plants indicates a slightly expanding population. Cover for Wyoming big sagebrush has increased from an estimated 14% to 19% in 2001. A further increase in sagebrush cover could negatively affect the herbaceous understory. Trend for grasses is stable. Sum of nested frequency for perennial grasses and cheatgrass was stable. The trend for forbs is down. The sum of nested frequency for perennial forbs declined 41% and annual forbs increased. The Desirable Components Index increased to excellent. Browse cover and perennial grass cover were higher.

winter range condition (DC Index) - excellent (68) Lower potential scale

browse - stable (0)

grass - stable (0)

forb - down (-2)

2006 TREND ASSESSMENT

The browse trend is slightly down. Wyoming big sagebrush density declined 22%, but the majority of this decline was a loss of young plants. Decadence increased from 18% to 35% in 2006. Young plants were abundant in 1996 and 2001, but declined to only 7% of the population in 2006. Sagebrush cover also declined from 19% to 16%. Narrowleaf low rabbitbrush also decreased in density, which is positive. Rabbitbrush has been declining since 1996. The grass trend is slightly down. Sandberg bluegrass declined to the lowest sum of nested frequency since this study was established. Cheatgrass sum of nested frequency increased significantly and was sampled in 95% of the quadrats. Cheatgrass cover was up to 5%, was nearly half of the total grass cover. If this continues to increase the site could be susceptible to fire. The forb trend is down. Perennial forb abundance continued to decline. Recent dry years may have lead to this decline. The DCI score declined to fair due to less perennial grass, sagebrush cover, increased decadence, reduced recruitment, and increased cheatgrass cover.

winter range condition (DC Index) - fair (41) Lower potential scale

browse - slightly down (-1)

grass - slightly down (-1)

forb - down (-2)

HERBACEOUS TRENDS --
Management unit 01 , Study no: 2

T y p e	Species	Nested Frequency					Average Cover %		
		'84	'90	'96	'01	'06	'96	'01	'06
G	<i>Agropyron smithii</i>	ab73	a51	ab67	ab83	b102	.57	1.12	1.36
G	<i>Agropyron spicatum</i>	a-	a1	b14	a-	a-	.05	-	-
G	<i>Bromus tectorum</i> (a)	-	-	a259	a227	b296	3.20	3.66	5.34
G	<i>Oryzopsis hymenoides</i>	1	2	-	1	6	-	.00	.19
G	<i>Poa secunda</i>	ab180	b231	ab189	ab212	a171	5.15	7.40	3.74
G	<i>Sitanion hystrix</i>	a21	b74	b70	a29	a22	.61	.68	.42
G	<i>Vulpia octoflora</i> (a)	-	-	3	-	6	.00	-	.01
Total for Annual Grasses		0	0	262	227	302	3.21	3.66	5.36
Total for Perennial Grasses		275	359	340	325	301	6.38	9.22	5.71
Total for Grasses		275	359	602	552	603	9.59	12.88	11.07
F	<i>Agoseris glauca</i>	-	-	3	-	-	.01	-	-
F	<i>Allium acuminatum</i>	c23	a-	a-	bc9	ab3	-	.04	.00
F	<i>Alyssum alyssoides</i> (a)	-	-	a4	a-	b18	.03	-	.06
F	<i>Antennaria rosea</i>	-	-	3	7	3	.03	.07	.03
F	<i>Arabis</i> sp.	-	-	6	3	2	.01	.03	.00
F	<i>Astragalus beckwithii</i>	-	-	2	-	1	.00	-	.03
F	<i>Astragalus</i> sp.	-	-	3	-	-	.00	-	-
F	<i>Astragalus utahensis</i>	-	2	6	7	4	.07	.04	.04
F	<i>Balsamorhiza hookeri</i>	-	-	2	7	-	.18	.33	-
F	<i>Calochortus nuttallii</i>	-	3	-	-	-	-	-	-
F	<i>Chaenactis douglasii</i>	a10	a4	b32	a5	a3	.08	.01	.00
F	<i>Collinsia parviflora</i> (a)	-	-	-	-	2	-	-	.00
F	<i>Cryptantha</i> sp.	a-	a5	b44	a-	a9	.19	-	.01
F	<i>Cymopterus longipes</i>	b53	b55	ab23	ab28	a9	.06	.22	.03
F	<i>Delphinium nuttallianum</i>	b17	a-	a-	a-	a-	-	-	-
F	<i>Descurainia pinnata</i> (a)	-	-	a3	b41	a5	.00	.15	.01
F	<i>Eriogonum caespitosum</i>	a2	b16	a3	a-	a2	.00	-	.03
F	<i>Eriogonum cernuum</i> (a)	-	-	b21	a6	a6	.06	.03	.01
F	<i>Erigeron pumilus</i>	-	-	-	1	-	-	.00	-
F	<i>Gayophytum ramosissimum</i> (a)	-	-	-	-	4	-	-	.01
F	<i>Gilia</i> sp. (a)	-	-	b13	ab5	a-	.05	.01	-
F	<i>Lappula occidentalis</i> (a)	-	-	17	11	12	.09	.03	.02
F	<i>Lactuca serriola</i>	-	-	-	-	2	-	-	.00
F	<i>Machaeranthera canescens</i>	a-	a-	b4	a-	a-	.07	-	.00
F	<i>Navarretia intertexta</i> (a)	-	-	4	-	-	.01	-	-

Type	Species	Nested Frequency					Average Cover %		
		'84	'90	'96	'01	'06	'96	'01	'06
F	Penstemon sp.	-	1	-	-	-	-	-	-
F	Phlox hoodii	_a 27	_b 51	_{ab} 36	_{ab} 30	_{ab} 48	.77	.97	.74
F	Phlox longifolia	_{bc} 48	_c 66	_{bc} 57	_b 33	_a 1	.18	.09	.00
F	Polygonum douglasii (a)	-	-	4	-	-	.01	-	-
F	Ranunculus testiculatus (a)	-	-	9	69	90	.01	.23	.24
F	Sisymbrium altissimum (a)	-	-	3	-	-	.03	-	-
F	Streptanthus cordatus	8	4	-	-	-	-	-	-
F	Zigadenus paniculatus	-	-	-	2	1	-	.01	.00
Total for Annual Forbs		0	0	78	132	137	0.31	0.45	0.37
Total for Perennial Forbs		188	207	224	132	88	1.68	1.84	0.95
Total for Forbs		188	207	302	264	225	2.00	2.30	1.32

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

BROWSE TRENDS --

Management unit 01 , Study no: 2

Type	Species	Strip Frequency			Average Cover %		
		'96	'01	'06	'96	'01	'06
B	Artemisia nova	0	0	2	-	-	.00
B	Artemisia tridentata wyomingensis	90	88	84	14.07	18.53	15.91
B	Chrysothamnus nauseosus consimilis	2	1	0	-	-	-
B	Chrysothamnus viscidiflorus	0	0	3	-	-	.06
B	Chrysothamnus viscidiflorus stenophyllus	81	64	64	5.62	3.02	1.52
B	Juniperus osteosperma	8	7	7	2.50	1.51	3.14
B	Leptodactylon pungens	31	32	40	2.04	2.83	1.22
B	Opuntia sp.	8	3	4	.21	.06	.06
Total for Browse		220	195	204	24.47	25.96	21.91

CANOPY COVER, LINE INTERCEPT --
Management unit 01 , Study no: 2

Species	Percent Cover
	'06
Artemisia tridentata wyomingensis	18.00
Chrysothamnus viscidiflorus	.11
Chrysothamnus viscidiflorus stenophyllus	3.13
Juniperus osteosperma	6.33
Leptodactylon pungens	1.86

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 01 , Study no: 2

Species	Average leader growth (in)	
	'01	'06
Artemisia tridentata wyomingensis	1.3	1.8

POINT-QUARTER TREE DATA --
Management unit 01 , Study no: 2

Species	Trees per Acre		Average diameter (in)	
	'01	'06	'01	'06
Juniperus osteosperma	56	56	7.8	5.5

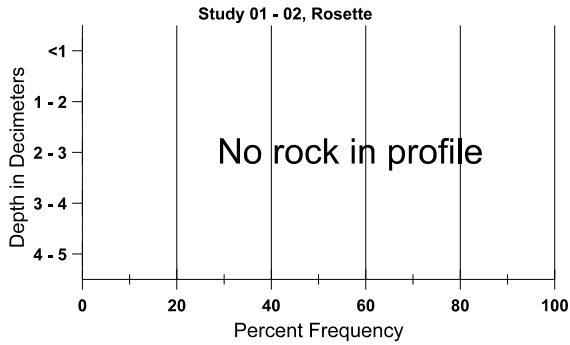
BASIC COVER --
Management unit 01 , Study no: 2

Cover Type	Average Cover %				
	'84	'90	'96	'01	'06
Vegetation	4.25	8.25	35.01	42.59	35.93
Rock	0	.50	1.20	.37	.32
Pavement	9.25	4.00	4.63	3.88	5.82
Litter	37.25	26.25	39.15	38.11	47.36
Cryptogams	7.25	11.50	4.57	2.85	5.06
Bare Ground	42.00	49.50	22.06	28.75	19.75

SOIL ANALYSIS DATA --
Herd Unit 01, Study no: 02, Rosette

Effective rooting depth (in)	Temp °F (depth)	PH	Sandy clay loam			%OM	PPM P	PPM K	dS/m
			% sand	% silt	% clay				
15.3	63.8 (13.6)	7.3	46.6	25.4	28.0	1.5	7.2	236.8	0.72

Stoniness Index



PELLET GROUP DATA --

Management unit 01 , Study no: 2

Type	Quadrat Frequency		
	'96	'01	'06
Rabbit	19	6	55
Moose	1	-	-
Deer	21	11	22
Cattle	-	-	-

Days use per acre (ha)	
'01	'06
-	-
-	-
26 (65)	25 (61)
-	1 (2)

BROWSE CHARACTERISTICS --

Management unit 01 , Study no: 2

		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)
Artemisia nova												
84	66	-	-	66	-	-	100	0	-	-	0	10/10
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	0	-	-	-	-	-	0	0	-	-	0	-/-
01	0	-	-	-	-	-	0	0	-	-	0	-/-
06	40	-	20	20	-	-	50	0	-	-	0	6/10
Artemisia tridentata wyomingensis												
84	6332	66	600	4266	1466	-	41	52	23	1	21	19/20
90	3799	66	-	866	2933	-	14	11	77	2	28	27/28
96	6160	2620	3040	1320	1800	1780	22	0	29	9	9	25/37
01	5380	20	1220	3200	960	1520	1	0	18	7	7	22/27
06	4180	2940	300	2420	1460	1720	21	2	35	16	16	23/30

		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)
Atriplex canescens												
84	0	-	-	-	-	-	0	0	-	-	0	-/-
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	0	-	-	-	-	-	0	0	-	-	0	-/-
01	0	-	-	-	-	-	0	0	-	-	0	13/11
06	0	-	-	-	-	-	0	0	-	-	0	-/-
Chrysothamnus nauseosus consimilis												
84	0	-	-	-	-	-	0	0	0	-	0	-/-
90	0	-	-	-	-	-	0	0	0	-	0	-/-
96	40	-	-	40	-	-	0	0	0	-	0	17/19
01	20	-	-	-	20	-	0	0	100	-	0	-/-
06	0	-	-	-	-	-	0	0	0	-	0	-/-
Chrysothamnus viscidiflorus												
84	0	-	-	-	-	-	0	0	0	-	0	-/-
90	0	-	-	-	-	-	0	0	0	-	0	-/-
96	0	-	-	-	-	-	0	0	0	-	0	-/-
01	0	-	-	-	-	-	0	0	0	-	0	-/-
06	640	20	100	480	60	-	25	69	9	-	0	-/-
Chrysothamnus viscidiflorus stenophyllus												
84	3466	400	533	2200	733	-	65	4	21	-	15	7/13
90	4198	466	1266	1466	1466	-	8	17	35	.95	8	9/8
96	5900	1660	1180	4600	120	-	2	0	2	.33	.33	11/18
01	3160	80	360	1980	820	540	0	0	26	.63	.63	10/14
06	2920	780	220	2240	460	-	6	1	16	2	2	10/13
Juniperus osteosperma												
84	0	-	-	-	-	-	0	0	-	-	0	-/-
90	0	66	-	-	-	-	0	0	-	-	0	-/-
96	160	-	60	100	-	-	0	0	-	-	0	-/-
01	140	20	60	80	-	-	0	0	-	-	0	-/-
06	140	20	40	100	-	-	0	0	-	-	0	-/-
Leptodactylon pungens												
84	0	-	-	-	-	-	0	0	0	-	0	-/-
90	465	133	333	66	66	-	0	0	14	-	0	5/5
96	2520	40	260	2240	20	-	0	0	1	.79	.79	12/15
01	2660	60	240	2280	140	-	0	0	5	.75	.75	7/8
06	2700	360	520	2080	100	40	0	0	4	-	0	6/9

		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>Opuntia</i> sp.												
84	66	-	-	66	-	-	0	0	0	-	0	6/4
90	66	-	-	66	-	-	0	0	0	-	0	6/10
96	160	-	20	120	20	-	0	0	13	-	0	4/12
01	140	-	-	140	-	20	0	0	0	-	0	-/-
06	80	-	-	60	20	-	0	0	25	25	25	5/9
<i>Pinus edulis</i>												
84	0	-	-	-	-	-	0	0	-	-	0	-/-
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	0	20	-	-	-	-	0	0	-	-	0	-/-
01	0	-	-	-	-	-	0	0	-	-	0	-/-
06	0	-	-	-	-	-	0	0	-	-	0	-/-