

Trend Study 1-11-06

Study site name: Kimber Ranch.

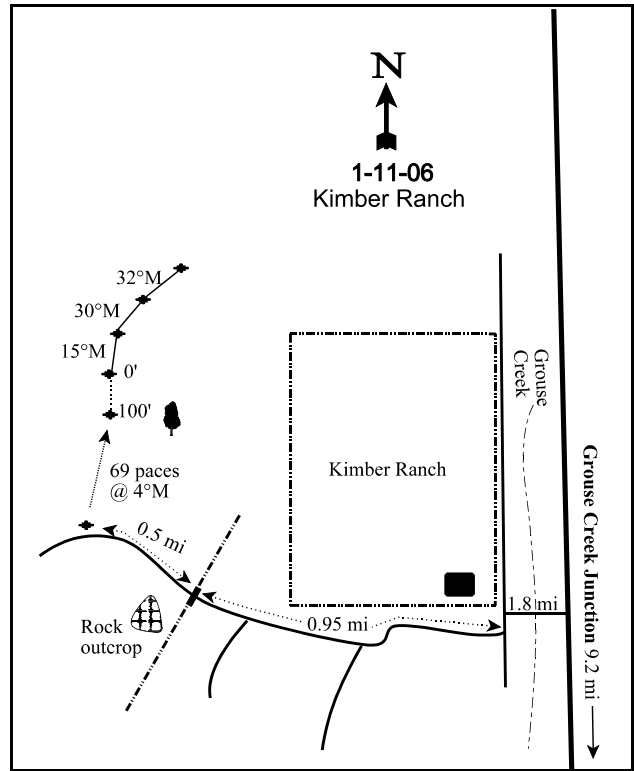
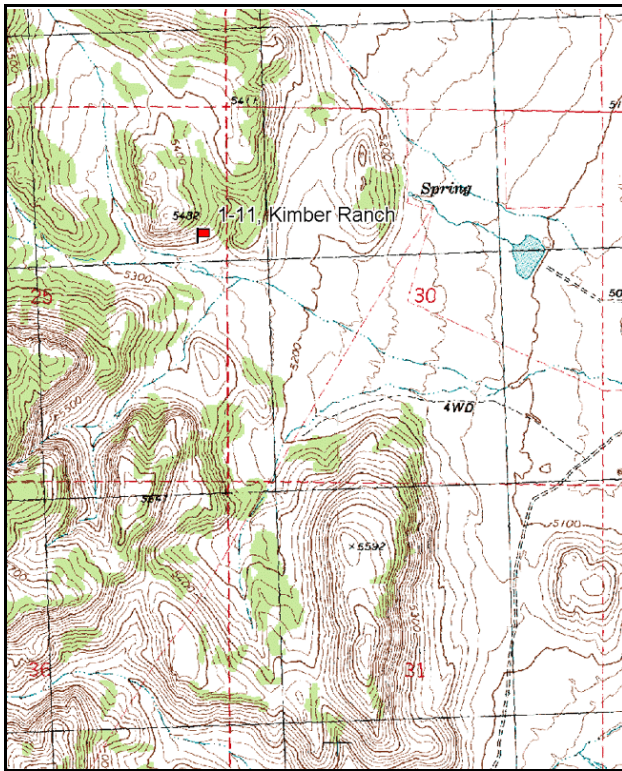
Vegetation type: Black Sagebrush.

Compass bearing: frequency baseline 165 degrees magnetic.

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

LOCATION DESCRIPTION

Proceed on U-30 to Grouse Creek junction, turn right and travel north 9.2 miles. Turn left at the ranch complex and proceed 1.8 miles to the Kimber Ranch. At the ranch house stay left for 0.05 miles. Stay left for another 0.25 miles, then turn right going west for 0.6 miles. Turn right for 0.1 miles to a gate. Continue up the road 0.5 miles to a witness post on the right side of the road. From the witness post walk 69 paces at 4 degrees magnetic to the 100-foot post. The 0-foot stake is 100 feet to the north and is marked by browse-tag #7912.



Map Name: Toms Cabin Spring

Diagrammatic Sketch

Township 10N, Range 19W, Section 25

UTM NAD 27, UTM 12T 4605076 N, 252701 E

## DISCUSSION

### Kimber Ranch - Trend Study No. 1-11

#### Study Information

The Kimber Ranch trend study (elevation: 5,300 feet, slope: 20-25%, aspect: south) samples a hillside dominated by black sagebrush southwest of Grouse Creek. The surrounding area is covered with patches of Utah juniper, which provide important thermal and hiding cover for wildlife. Winter use from deer on this black sagebrush type was very heavy in 1984. Additional use can come from cattle and horses. A pellet group transect in 2001 estimated 27 deer days use/acre (66 deer days use/ha) and 2 cow days use/acre (5 cow days use/ha). In 2006, 36 deer and 2 cow days use/acre (89 ddu/ha and 4 cdu/ha) were estimated.

#### Soil

This soil is part of the Plegomir series, which consists of very shallow soil over duripan, well drained, moderately permeable soils formed in alluvium from limestone, tuffaceous sandstone, or igneous rock. They are on dissected fan terraces and on sides of small hills (USDA-NRCS 2006). Soil texture is a clay loam that has a slightly alkaline soil reaction (7.8 pH). Protective ground cover (vegetation and litter cover) is poor and is comprised primarily of dead cheatgrass litter and shrub crowns with large amounts of rock and pavement. Apart from cheatgrass, herbaceous cover is insufficient. The soil condition class rating was slight in both 2001 and 2006. Relative percent bare ground increased in 2006 from 9% to 20% and pavement cover decreased.

#### Browse

Browse composition is dominated by a low-growing, evenly spaced stand of black sagebrush. The population was noted as heavily hedged in 1984. Use was moderate in 1996 and light in 2001 and 2006. Since 1996, black sagebrush density has continually declined, 10% in 2001 and 16% in 2006. Decadence increased from 17% of the population in 1996 to 33% in 2006. The percent of the population classified as dying increased to 16% in 2006. The proportion of young plants in the population has been good, but decreased to 8% of the population in 2006. Seedlings were very abundant in 2006, but may have a difficult time persisting with competition from cheatgrass. Young and Evans (1989) showed that sagebrush recruitment was completely stopped in a cheatgrass-dominated community in northwestern Nevada.

Other associated shrubs include Wyoming big sagebrush and shadscale, although together they provide less than 1% total cover. This is a marginal site for Wyoming big sagebrush, because of drought conditions and shallow rocky soils. Utah juniper density was 54 trees/acre in 2001 and increased to 60 trees/acre in 2006. Mean tree diameter was 5.0 inches in 2001 and 6.5 inches in 2006. Seventy five percent of the trees sampled in 2006 were less than eight feet tall.

#### Herbaceous Understory

The herbaceous understory is composed mainly of grasses. Cheatgrass is the most abundant species. It was sampled in at least 98% of the quadrats since it was first sampled in 1996. It was most abundant in 2001. Cheatgrass cover has averaged about 11% in both 2001 and 2006. Perennial grasses include: bluebunch wheatgrass, Thurber needlegrass, bottlebrush squirreltail, Indian ricegrass, and Sandberg bluegrass. Together these species provide on average only about 2% total cover. Indian ricegrass was significantly more abundant in 2006 than it previously had been. Perennial forbs are even more rare and together provide very little cover. Only seven forb species were sampled in 2006 and none had a higher quadrat frequency than 3%.

#### 1990 TREND ASSESSMENT

Trend for black sagebrush is slightly down. Density has declined slightly and decadent black sagebrush have increased from 34% to 69%. Vigor is poor on 29% of the population. The sagebrush showed light to moderate hedging but had low reproduction potential. Low production would be expected with the drought. The high density of cheatgrass also inhibits sagebrush reproduction and growth. The grass trend is stable. Grasses have been heavily grazed. Cheatgrass is still fairly dense (there are no quantitative measures for

annuals before 1996). The forb trend is down and forbs are very sparse.

browse - slightly down (-1)      grass - stable (0)      forb - down (-2)

1996 TREND ASSESSMENT

Browse trend is slightly up due to increased density, improved vigor and reduced decadence (69% to 17%). Trend for grasses is down. Sum of nested frequency of perennial grasses declined 22%. Cheatgrass is also a major component. Sum of nested frequency for bluebunch wheatgrass and Indian ricegrass increased, while frequency of squirreltail and Thurber needlegrass declined. The forb trend is up, but forbs only make up less than 1% total cover.

winter range condition (DC Index) - fair-good (44) Lower potential scale  
browse - slightly up (+1)      grass - down (-2)      forb - up (+2)

2001 TREND ASSESSMENT

Browse trend is slightly down due to a decrease in density. In addition, those plants classified with poor vigor increased and decadence increased (17% to 23%). Trend for grasses is down. Sum of nested frequency of perennial grasses declined 27% and cheatgrass increased significantly. Cheatgrass cover is high at 11%. The forb trend is also down as the few forbs found here were less abundant than in 1996. The DCI declined to fair with increased cheatgrass cover and higher decadence of black sagebrush.

winter range condition (DC Index) - fair (35) Lower potential scale  
browse - slightly down (-1)      grass - down (-2)      forb - down (-2)

2006 TREND ASSESSMENT

The browse trend is slightly down. Black sagebrush density declined from 7,200 plants/acre in 2001 to 6,040 plants/acre in 2006. Decadence also increased from 23% to 33%. Dry conditions and competition with cheatgrass may have caused this decline. The grass trend is stable. Perennial grass frequency remained stable. Cheatgrass frequency was significantly lower, but still very abundant and was sampled in 98% of the quadrats. Cheatgrass cover did not change. The forb trend is stable. Forbs are very rare. The DCI remained fair.

winter range condition (DC Index) - fair (31) Lower potential scale  
browse - slightly down (-1)      grass - stable (0)      forb - stable (0)

HERBACEOUS TRENDS --

Management unit 01 , Study no: 11

Type	Species	Nested Frequency					Average Cover %		
		'84	'90	'96	'01	'06	'96	'01	'06
G	Agropyron smithii	-	-	-	2	-	-	.00	-
G	Agropyron spicatum	<sub>a</sub> -	<sub>b</sub> 9	<sub>c</sub> 62	<sub>c</sub> 61	<sub>c</sub> 50	.73	.74	1.92
G	Bromus tectorum (a)	-	-	<sub>a</sub> 321	<sub>c</sub> 362	<sub>b</sub> 339	3.11	11.06	10.57
G	Oryzopsis hymenoides	<sub>a</sub> 4	<sub>ab</sub> 21	<sub>b</sub> 25	<sub>a</sub> 8	<sub>b</sub> 34	.34	.10	1.12
G	Poa secunda	6	8	-	10	-	.00	.07	-
G	Sitanion hystrix	<sub>c</sub> 79	<sub>bc</sub> 58	<sub>ab</sub> 43	<sub>a</sub> 21	<sub>ab</sub> 29	.41	.16	.65
G	Stipa thurberiana	<sub>b</sub> 99	<sub>b</sub> 106	<sub>a</sub> 28	<sub>a</sub> 13	<sub>a</sub> 6	.21	.16	.37
G	Vulpia octoflora (a)	-	-	<sub>b</sub> 22	<sub>b</sub> 21	<sub>a</sub> -	.04	.06	-

Type	Species	Nested Frequency					Average Cover %		
		'84	'90	'96	'01	'06	'96	'01	'06
	Total for Annual Grasses	0	0	343	383	339	3.15	11.13	10.57
	Total for Perennial Grasses	188	202	158	115	119	1.70	1.23	4.07
	Total for Grasses	188	202	501	498	458	4.86	12.37	14.65
F	<i>Antennaria rosea</i>	-	-	-	2	-	-	.03	-
F	<i>Astragalus beckwithii</i>	1	-	4	-	-	.01	-	-
F	<i>Astragalus utahensis</i>	<sub>ab</sub> 11	<sub>a</sub> 3	<sub>b</sub> 23	<sub>a</sub> 3	<sub>a</sub> 6	.14	.03	.06
F	<i>Balsamorhiza hookeri</i>	-	-	-	1	-	-	.03	.03
F	<i>Castilleja angustifolia</i>	<sub>b</sub> 28	<sub>a</sub> -	<sub>a</sub> 6	<sub>a</sub> -	<sub>a</sub> 1	.02	-	.00
F	<i>Chaenactis douglasii</i>	1	-	-	-	-	-	-	-
F	<i>Crepis acuminata</i>	-	-	-	1	1	-	.03	.00
F	<i>Cryptantha</i> sp.	-	-	3	-	2	.01	-	.00
F	<i>Descurainia pinnata</i> (a)	-	-	<sub>a</sub> 3	<sub>b</sub> 12	<sub>a</sub> -	.00	.06	-
F	<i>Erigeron aphanactis</i>	4	-	-	-	-	-	-	-
F	<i>Eriogonum caespitosum</i>	5	2	3	-	-	.00	-	-
F	<i>Eriogonum ovalifolium</i>	-	-	-	-	3	-	-	.03
F	<i>Erigeron pumilus</i>	-	-	-	1	-	-	.00	-
F	<i>Gilia</i> sp. (a)	-	-	<sub>a</sub> 2	<sub>b</sub> 114	<sub>a</sub> -	.00	.34	-
F	<i>Hymenopappus</i> sp.	-	-	8	-	-	.06	-	-
F	<i>Lappula occidentalis</i> (a)	-	-	<sub>a</sub> -	<sub>b</sub> 9	<sub>a</sub> -	-	.03	-
F	<i>Lygodesmia</i> sp.	-	-	3	-	-	.03	-	-
F	<i>Navarretia intertexta</i> (a)	-	-	2	-	-	.01	-	-
F	<i>Orobanche fasciculata</i>	-	1	6	2	-	.01	.00	-
F	<i>Phlox longifolia</i>	<sub>b</sub> 13	<sub>ab</sub> 9	<sub>ab</sub> 6	<sub>ab</sub> 14	<sub>a</sub> 3	.02	.03	.00
F	<i>Streptanthus cordatus</i>	-	1	-	-	-	-	-	-
F	Unknown forb-perennial	-	1	-	-	-	-	-	-
	Total for Annual Forbs	0	0	7	135	0	0.01	0.43	0
	Total for Perennial Forbs	63	17	62	24	16	0.31	0.16	0.15
	Total for Forbs	63	17	69	159	16	0.34	0.59	0.15

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

BROWSE TRENDS --

Management unit 01 , Study no: 11

Type	Species	Strip Frequency			Average Cover %		
		'96	'01	'06	'96	'01	'06
B	Artemisia nova	98	93	96	14.88	15.18	13.32
B	Artemisia tridentata wyomingensis	0	3	4	-	.53	.71
B	Atriplex confertifolia	15	10	7	1.27	.48	.21
B	Ceratoides lanata	0	0	0	-	-	.00
B	Chrysothamnus viscidiflorus stenophyllus	16	20	18	.42	.46	.64
B	Gutierrezia sarothrae	8	6	1	.00	-	-
B	Juniperus osteosperma	2	3	3	1.62	1.63	1.63
B	Kochia americana	9	9	6	.07	.07	.15
B	Opuntia sp.	0	1	0	.00	-	-
Total for Browse		148	145	135	18.29	18.36	16.68

CANOPY COVER, LINE INTERCEPT --

Management unit 01 , Study no: 11

Species	Percent Cover	
	'01	'06
Artemisia nova	-	14.61
Artemisia tridentata wyomingensis	-	.61
Atriplex confertifolia	-	.58
Chrysothamnus viscidiflorus stenophyllus	-	1.45
Juniperus osteosperma	2.20	1.66

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 01 , Study no: 11

Species	Average leader growth (in)	
	'01	'06
Artemisia nova	0.7	0.9
Artemisia tridentata wyomingensis	-	1.1

POINT-QUARTER TREE DATA --  
Management unit 01 , Study no: 11

Species	Trees per Acre		Average diameter (in)	
	'01	'06	'01	'06
Juniperus osteosperma	60	54	5.0	6.5

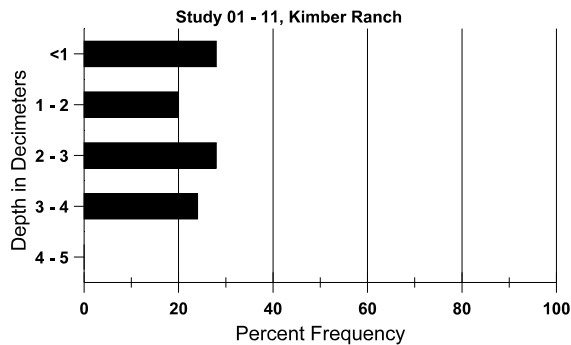
BASIC COVER --  
Management unit 01 , Study no: 11

Cover Type	Average Cover %				
	'84	'90	'96	'01	'06
Vegetation	1.75	9.00	25.21	31.16	31.70
Rock	19.50	26.50	17.69	19.26	17.98
Pavement	40.50	43.50	37.90	35.37	21.46
Litter	35.75	17.75	12.99	16.33	19.96
Cryptogams	0	0	.08	.01	.42
Bare Ground	2.50	3.25	6.77	10.06	22.68

SOIL ANALYSIS DATA --  
Herd Unit 01, Study no: 11, Kimber Ranch

Effective rooting depth (in)	Temp °F (depth)	PH	Clay loam			%OM	PPM P	PPM K	dS/m
			% sand	% silt	% clay				
11.9	73.0 (10.5)	7.8	42.9	29.1	28.0	1.9	7.0	134.4	0.5

### Stoniness Index



PELLET GROUP DATA --

Management unit 01 , Study no: 11

Type	Quadrat Frequency		
	'96	'01	'06
Rabbit	6	-	15
Horse	1	-	-
Elk	-	-	2
Deer	17	15	22
Cattle	-	7	1

Days use per acre (ha)	
'01	'06
-	-
-	-
-	-
27 (66)	36 (89)
4 (11)	2 (4)

BROWSE CHARACTERISTICS --

Management unit 01 , Study no: 11

		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>Artemisia nova</b>												
84	<b>5665</b>	-	866	2866	1933	-	8	88	34	-	15	7/17
90	<b>5133</b>	-	400	1200	3533	-	21	0	69	7	29	9/15
96	<b>7980</b>	340	900	5760	1320	620	56	2	17	3	3	12/24
01	<b>7200</b>	-	1120	4460	1620	440	3	2	23	8	8	9/20
06	<b>6040</b>	1760	500	3560	1980	700	10	4	33	16	16	10/23
<b>Artemisia tridentata wyomingensis</b>												
84	<b>1532</b>	-	800	466	266	-	22	52	17	-	9	17/21
90	<b>399</b>	-	66	133	200	-	0	0	50	-	17	11/14
96	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
01	<b>60</b>	-	-	40	20	-	0	0	33	33	33	24/23
06	<b>100</b>	-	-	100	-	-	40	0	0	-	0	18/29
<b>Atriplex confertifolia</b>												
84	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
90	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
96	<b>880</b>	120	500	380	-	20	16	0	0	-	0	9/17
01	<b>380</b>	-	120	140	120	20	0	0	32	21	21	14/26
06	<b>380</b>	-	40	320	20	-	0	0	5	5	5	14/23
<b>Chrysothamnus nauseosus hololeucus</b>												
84	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
90	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
96	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
01	<b>0</b>	-	-	-	-	-	0	0	-	-	0	26/51
06	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-

		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>Chrysothamnus viscidiflorus stenophyllus</i>												
84	<b>1465</b>	-	66	1066	333	-	36	0	23	-	5	11/15
90	<b>1000</b>	-	-	800	200	-	0	0	20	6	20	11/16
96	<b>420</b>	40	-	420	-	-	0	0	0	-	0	11/20
01	<b>520</b>	-	60	400	60	20	0	0	12	4	4	8/16
06	<b>480</b>	-	40	440	-	-	4	0	0	-	0	10/15
<i>Grayia spinosa</i>												
84	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
90	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
96	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
01	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
06	<b>0</b>	-	-	-	-	-	0	0	-	-	0	29/42
<i>Gutierrezia sarothrae</i>												
84	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
90	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
96	<b>360</b>	20	20	340	-	-	0	0	0	-	0	7/9
01	<b>160</b>	-	-	80	80	-	0	0	50	38	38	4/5
06	<b>20</b>	-	20	-	-	-	0	0	0	-	0	-/-
<i>Juniperus osteosperma</i>												
84	<b>66</b>	-	66	-	-	-	0	0	-	-	0	-/-
90	<b>66</b>	-	-	66	-	-	0	0	-	-	0	65/55
96	<b>40</b>	-	-	40	-	-	0	0	-	-	0	-/-
01	<b>60</b>	-	20	40	-	-	0	0	-	-	0	-/-
06	<b>60</b>	-	40	20	-	-	0	0	-	-	0	-/-
<i>Kochia americana</i>												
84	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
90	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
96	<b>460</b>	20	140	300	20	-	4	0	4	-	0	4/6
01	<b>340</b>	-	160	180	-	-	0	0	0	-	0	4/4
06	<b>140</b>	-	20	120	-	-	0	0	0	-	0	5/5
<i>Opuntia sp.</i>												
84	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
90	<b>66</b>	-	66	-	-	-	0	0	-	-	100	-/-
96	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
01	<b>20</b>	-	-	20	-	-	0	0	-	-	0	-/-
06	<b>0</b>	-	-	-	-	-	0	0	-	-	0	4/2