

DISCUSSION

Kilgore Basin - Trend Study No. 1-10

Study Information

The Kilgore Basin study (elevation: 5,330 feet, slope: 5%, aspect: southwest) is located southwest of Grouse Creek. It samples critical deer winter range. The study lies within a large basin surrounded by low hills that are nearly barren of tree cover. The area is dominated by a uniform, low-growing, evenly spaced stand of black sagebrush. Shrub interspecies are essentially barren of other vegetation. Within the basin, plant diversity is low. The only variation is in small swales where the deeper rooted Wyoming and basin big sagebrush predominates along with a few patches of Utah juniper trees. This area is within the Kilgore allotment (11/01 to 04/30). Deer pellet groups were moderately high with a quadrat frequency of 17% in 1996. A pellet group transect in 2001 estimated 21 deer days use/acre (51 deer days use/ha) and 5 cow days use/acre (13 cow days use/ha). Some sagegrouse droppings were also noted. In 2006, 11 deer and 14 cow days (26 ddu/ha and 34 cdu/ha) were estimated.

Soil

The Plegomir soil series consists of very shallow and shallow 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). The soil texture is a sandy clay loam with a moderately alkaline soil reaction (8.1 pH). Phosphorus is low (6.3 ppm) and may limit plant growth and development (Tiedemann and Lopez 2004). Effective rooting depth is moderately shallow with an average of about 12 inches. The bulk of the ground surface is occupied by rock and erosion pavement. Apart from shrub crowns there is very little herbaceous cover. Erosion continues at a slow but steady rate in spite of the gentle terrain. Plant pedestalling, exposed plant roots and exposed lichen lines on rocks are all common. The soil erosion condition was determined as stable in 2001 and slight in 2006.

Browse

Black sagebrush dominates the site with scattered narrowleaf low rabbitbrush, shadscale saltbush, winterfat, and spiny hopsage. The population of black sagebrush appears relatively stable, but showed a predominance of decadent plants in 1984 and 1990, but percent decadence has been lower since 1984 and 1990. Density of black sagebrush has averaged about 15,000 plants/acre over the five readings. Density was down slightly in 2006 with a decline in the number of young plants and an increase in the percent of plants classified as dying. Seedlings were very abundant in 2006. Black sagebrush has averaged about 23% cover from 1996-2006. Utilization was heavy in 1984, but has been mostly light to moderate since.

Herbaceous Understory

The herbaceous understory is sparse and has poor species diversity. Most are low-growing xeric species with low palatability. Total herbaceous cover equaled less than 4% cover in 1996 and only 2% total cover in 2001. In 2006, herbaceous cover was up to 8%, but over half of that was from cheatgrass. Perennial grasses include bottlebrush squirreltail, Sandberg bluegrass, and Indian ricegrass. Cheatgrass abundance was low in 1996 and 2001 with average quadrat frequency of 23%, but increased significantly and had 87% quadrat frequency in 2006. Cheatgrass cover increased from less than 1% to nearly 5%, which was 78% of the total grass cover. Forbs include longleaf phlox, milkvetch, and carpet phlox.

1990 TREND ASSESSMENT

Black sagebrush is stable. The high percentage of decadence is normal for high density stands like this one. Decadence has increased from 47% to 66%. This may be caused by drought and intraspecific competition for common but limited resources. Sagebrush canopy cover averages about 21%. These shrubs were severely hedged in the past, but recently there has been lighter utilization and improved growth form. The majority of the mature plants have normal vigor. The grass trend is down. Nested frequency of bottlebrush squirreltail declined and the other two grasses were not sampled. The forb trend is stable.

browse - stable (0)

grass - down (-2)

forb - stable (0)

1996 TREND ASSESSMENT

Trend for black sagebrush is slightly up. Sagebrush density has declined a little, but the number of mature plants has doubled, while the percentage of decadent plants has decreased substantially. The difference in density is likely due to the increased sampling size. Utilization is more moderate and vigor good on all but a few of the decadent plants. The grass and forb trends are up as the sum of nested frequency for perennial grasses and forbs has increased.

winter range condition (DC Index) - good (50) Lower potential scale

browse - slightly up (+1)

grass - up (+2)

forb - up (+2)

2001 TREND ASSESSMENT

Trend for black sagebrush is stable. Total density has increased slightly, percent dead within the population has remained the same, and percent decadence has decreased. Utilization is mostly light at this time. The grass trend is stable. The sum of nested frequency for perennial grasses and cheatgrass has remained unchanged. The forb trend is down as the frequency of perennial forbs has decreased substantially. The DCI score declined due to less perennial grass and forb cover and fewer young shrubs.

winter range condition (DC Index) - fair-good (46) Lower potential scale

browse - stable (0)

grass - stable (0)

forb - down (-2)

2006 TREND ASSESSMENT

The browse trend is slightly down. Black sagebrush density declined by 20%, but is still very high. Percent cover remained unchanged. Decadence did increase from 22% in 2001 to 31% in 2006 and the percent of plants classified as dying increased from 6% to 20%. The grass trend is slightly down. Perennial grass frequency did not change, but cheatgrass nested frequency increased significantly. Cheatgrass cover also increased from less than 1% to nearly 5%, which is by far higher than any other herbaceous species. The forb trend is slightly up. Perennial forbs were more abundant, but not nearly as abundant as they were in 1996. The DCI score declined to fair because percent decadence of black sagebrush increased and cheatgrass increased.

winter range condition (DC Index) - fair-good (46) Lower potential scale

browse - slightly down (-1)

grass - slightly down (-1)

forb - slightly up (+1)

HERBACEOUS TRENDS --
Management unit 01 , Study no: 10

Type	Species	Nested Frequency					Average Cover %		
		'84	'90	'96	'01	'06	'96	'01	'06
G	Bromus tectorum (a)	-	-	a53	a53	b256	.20	.52	4.60
G	Oryzopsis hymenoides	a2	a-	a5	a-	b23	.31	-	.16
G	Poa secunda	b10	a-	b22	b22	b19	.30	.11	.12
G	Sitanion hystrix	ab73	a50	b89	b97	ab80	1.02	.86	.98
G	Vulpia octoflora (a)	-	-	-	4	9	-	.01	.01
Total for Annual Grasses		0	0	53	57	265	0.20	0.53	4.62
Total for Perennial Grasses		85	50	116	119	122	1.63	0.97	1.26
Total for Grasses		85	50	169	176	387	1.83	1.50	5.89
F	Allium sp.	8	-	-	-	-	-	-	-
F	Arabis drummondii	b12	a-	a-	a1	a-	-	.01	-
F	Astragalus beckwithii	ab7	ab1	c29	a-	b12	.42	-	.12
F	Astragalus utahensis	-	-	-	-	5	-	-	.04
F	Cruciferae	a-	a-	b11	a-	a-	.03	-	-
F	Cryptantha sp.	a-	a-	b20	a-	ab8	.05	-	.02
F	Descurainia pinnata (a)	-	-	a-	a-	b14	-	-	.03
F	Eriogonum ovalifolium	-	-	-	-	2	-	-	.00
F	Gilia sp. (a)	-	-	b9	a-	ab7	.03	-	.02
F	Lappula occidentalis (a)	-	-	ab11	a-	b11	.04	-	.03
F	Navarretia intertexta (a)	-	-	b19	a-	b23	.04	-	.06
F	Phlox hoodii	a51	b87	ab61	a46	a48	.65	.38	1.06
F	Phlox longifolia	bc80	ab57	c94	abc51	a43	.58	.25	.30
F	Townsendia sp.	-	-	3	-	-	.03	-	-
Total for Annual Forbs		0	0	39	0	55	0.11	0	0.15
Total for Perennial Forbs		158	145	218	98	118	1.77	0.64	1.56
Total for Forbs		158	145	257	98	173	1.88	0.64	1.71

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

BROWSE TRENDS --

Management unit 01 , Study no: 10

Type	Species	Strip Frequency			Average Cover %		
		'96	'01	'06	'96	'01	'06
B	Artemisia nova	100	100	100	24.95	21.25	21.95
B	Artemisia tridentata wyomingensis	3	1	0	.03	-	-
B	Atriplex confertifolia	18	10	16	1.43	.22	1.51
B	Ceratoides lanata	0	4	0	-	-	-
B	Chrysothamnus viscidiflorus stenophyllus	76	79	84	5.37	3.79	5.50
B	Ephedra nevadensis	2	1	1	.03	-	.03
B	Grayia spinosa	3	3	2	.30	-	.15
B	Juniperus osteosperma	1	1	1	.15	.03	.15
B	Kochia americana	2	1	4	-	-	.00
B	Opuntia sp.	7	2	2	.00	-	.03
Total for Browse		212	202	210	32.27	25.30	29.33

CANOPY COVER, LINE INTERCEPT --

Management unit 01 , Study no: 10

Species	Percent Cover
	'06
Artemisia nova	25.88
Atriplex confertifolia	.70
Chrysothamnus viscidiflorus stenophyllus	4.83
Grayia spinosa	.28
Kochia americana	.15

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 01 , Study no: 10

Species	Average leader growth (in)	
	'01	'06
Artemisia nova	0.8	1.0
Atriplex confertifolia	-	2.8

BASIC COVER --

Management unit 01 , Study no: 10

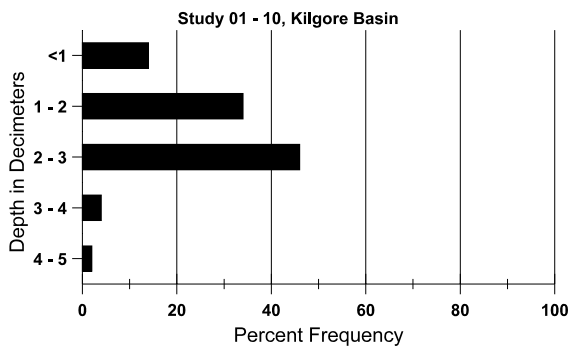
Cover Type	Average Cover %				
	'84	'90	'96	'01	'06
Vegetation	0	5.50	36.16	30.06	33.62
Rock	11.00	6.75	11.82	4.40	5.07
Pavement	40.00	55.25	28.72	36.97	38.77
Litter	21.50	13.75	19.58	11.14	19.35
Cryptogams	1.50	1.50	1.84	.89	.98
Bare Ground	26.00	17.25	9.20	22.91	15.21

SOIL ANALYSIS DATA --

Herd Unit 01, Study no: 10, Kilgore Basin

Effective rooting depth (in)	Temp °F (depth)	PH	Sandy clay loam			%OM	PPM P	PPM K	dS/m
			%sand	%silt	%clay				
12.4	65.0 (10.8)	8.1	48.9	27.1	24.0	1.2	6.3	444.8	0.6

Stoniness Index



PELLET GROUP DATA --

Management unit 01 , Study no: 10

Type	Quadrat Frequency		
	'96	'01	'06
Rabbit	2	1	12
Elk	1	2	-
Deer	17	13	13
Cattle	1	2	6

Days use per acre (ha)	
'01	'06
-	-
-	-
21 (51)	11 (26)
5 (13)	14 (34)

BROWSE CHARACTERISTICS --
Management unit 01 , Study no: 10

		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	15932	1800	1000	7466	7466	-	0	93	47	-	32	12/21
90	16199	933	1533	3933	10733	-	30	36	66	4	28	9/17
96	13600	560	1660	8340	3600	880	54	12	26	1	1	8/20
01	15960	40	1620	10800	3540	1040	22	.25	22	6	7	9/20
06	12700	117660	640	8140	3920	1560	6	.15	31	20	21	8/18
Artemisia tridentata wyomingensis												
84	0	-	-	-	-	-	0	0	0	-	0	-/-
90	0	-	-	-	-	-	0	0	0	-	0	-/-
96	80	-	-	20	60	20	0	75	75	-	0	19/23
01	20	-	-	20	-	-	0	0	0	-	0	26/45
06	0	-	-	-	-	20	0	0	0	-	0	18/43
Atriplex confertifolia												
84	1399	-	66	333	1000	-	67	14	71	-	19	12/12
90	1399	-	133	400	866	-	0	10	62	6	24	7/10
96	740	40	140	580	20	40	43	8	3	-	0	10/14
01	360	40	120	220	20	220	0	6	6	6	6	8/11
06	560	20	40	520	-	20	4	0	0	-	0	9/14
Ceratoides lanata												
84	0	-	-	-	-	-	0	0	-	-	0	-/-
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	0	-	-	-	-	-	0	0	-	-	0	-/-
01	120	20	40	80	-	-	0	0	-	-	0	3/3
06	0	-	-	-	-	-	0	0	-	-	0	6/8
Chrysothamnus viscidiflorus stenophyllus												
84	3199	-	66	1600	1533	-	58	10	48	-	15	6/7
90	3399	-	666	2600	133	-	20	0	4	-	0	7/11
96	4620	500	80	4500	40	20	3	0	1	-	0	9/15
01	4060	20	160	3400	500	60	0	0	12	2	2	9/14
06	4140	18020	60	3840	240	-	0	0	6	.48	.96	10/16

		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)
Ephedra nevadensis												
84	0	-	-	-	-	-	0	0	0	-	0	-/-
90	0	-	-	-	-	-	0	0	0	-	0	-/-
96	60	-	-	40	20	-	33	67	33	-	0	9/13
01	20	-	-	20	-	-	0	0	0	-	0	7/15
06	60	-	60	-	-	-	0	100	0	-	0	12/16
Grayia spinosa												
84	66	-	-	66	-	-	0	100	0	-	100	16/4
90	0	-	-	-	-	-	0	0	0	-	0	-/-
96	100	-	-	40	60	-	100	0	60	60	60	15/33
01	80	-	-	60	20	20	0	0	25	-	0	11/10
06	60	-	-	60	-	-	0	0	0	-	0	14/26
Juniperus osteosperma												
84	0	-	-	-	-	-	0	0	-	-	0	-/-
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	20	-	20	-	-	-	0	0	-	-	0	-/-
01	20	-	-	20	-	-	0	0	-	-	0	-/-
06	20	-	20	-	-	-	0	0	-	-	0	-/-
Kochia americana												
84	0	-	-	-	-	-	0	0	-	-	0	-/-
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	40	-	-	40	-	-	0	0	-	-	0	2/4
01	40	-	-	40	-	-	0	0	-	-	0	2/7
06	140	-	20	120	-	-	29	71	-	-	0	5/6
Opuntia sp.												
84	66	-	-	66	-	-	0	0	0	-	0	4/4
90	132	-	66	66	-	-	0	0	0	-	0	3/4
96	140	-	40	80	20	-	0	0	14	-	0	4/8
01	40	-	40	-	-	-	0	0	0	-	0	-/-
06	40	-	20	20	-	-	0	0	0	-	0	5/7
Sarcobatus vermiculatus												
84	0	-	-	-	-	-	0	0	-	-	0	-/-
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	0	-	-	-	-	-	0	0	-	-	0	-/-
01	0	-	-	-	-	-	0	0	-	-	0	21/38
06	0	-	-	-	-	-	0	0	-	-	0	39/54