

Trend Study 16B-23-04

Study site name: Consumer Bench.

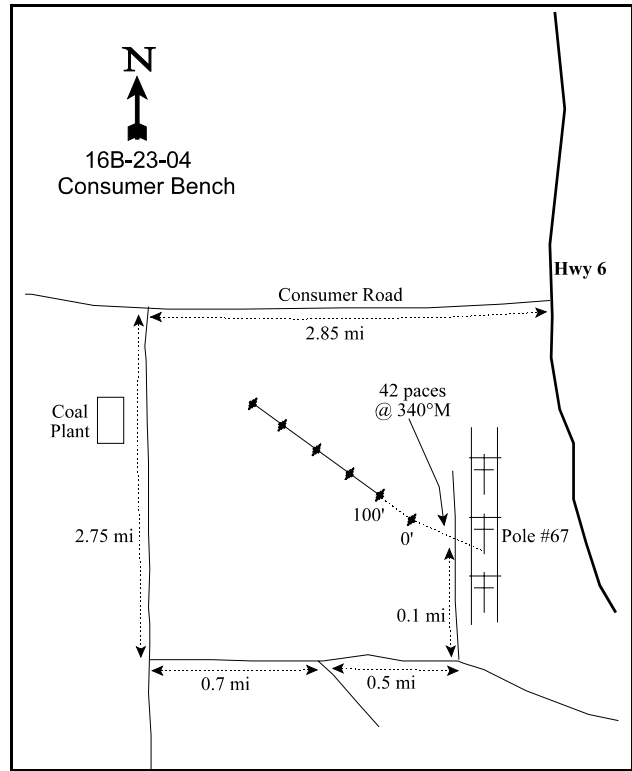
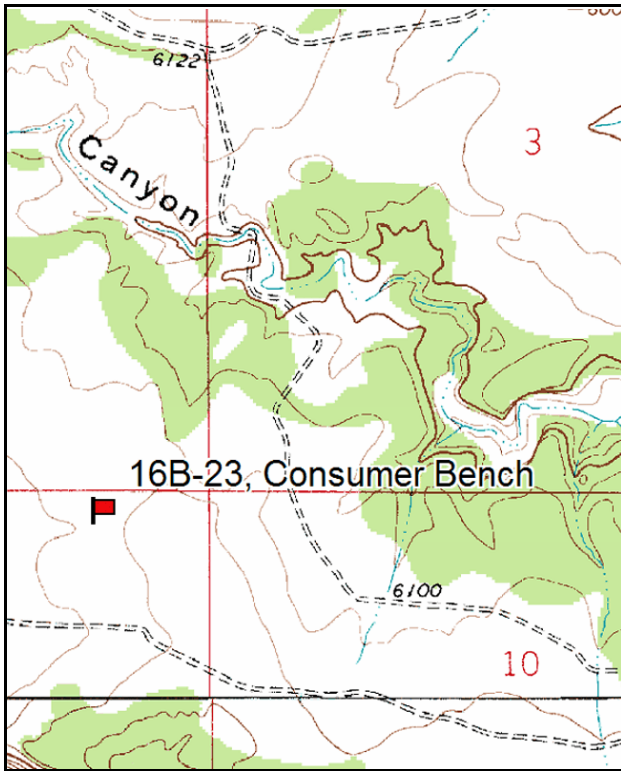
Vegetation type: Wyoming Big Sagebrush.

Compass bearing: frequency baseline 328 degrees magnetic.

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

LOCATION DESCRIPTION

On US 6 south of Helper, turn right (west) on Consumer Road and travel 2.85 miles. Turn left on a dirt road, and go 2.75 miles passing a coal plant. Turn left and travel 0.7 miles to a fork. Stay left for an additional 0.5 miles to another fork. Turn left and go 0.1 miles to a telephone pole (#67). The 0' stake is 42 paces away at 340°M from the telephone pole.



Map Name: Standardville

Diagrammatic Sketch

Township 14S, Range 9E, Section 4

GPS: NAD 27, UTM 12S 4386343 N, 507494 E

## DISCUSSION

### Consumer Bench - Trend Study No. 16B-23

The Consumer Bench trend study was established to monitor deer and elk winter range administered by the BLM. The site monitors a Wyoming big sagebrush/grass vegetation type with a few scattered junipers at an elevation of 6,100 feet. The aspect is southwest and the slope is gentle at approximately 5%. The site occurs within the Consumers Wash allotment, which is allotted for 54 sheep from October 1 to April 21, with an additional 821 sheep from April 21 until June 20. Because sheep use the area in the winter, the pellet-group counts will be combined for sheep and deer use. Days use/acre was moderately high in both 1999 and 2004. Pellet group transect data in 1999 estimated 90 sheep-deer days use/acre (223 s-ddu/ha) and 64 elk days use/acre (159 edu/ha). In 2004, sheep-deer use increased to 106 days use/acre (263 s-ddu/ha) and elk use declined to 25 days use/acre (63 edu).

The soil is a sandy loam with few rocks on the surface or within the profile. The estimated stoniness index is more a measure of a compacted layer about 12 inches below the surface than the presence of rock. The soil is moderately deep with an estimated effective rooting depth of over 16 inches. The soil has a slightly alkaline pH (7.8), and is low in both phosphorus (3.3 ppm) and potassium (41.6 ppm). Low values for these two basic elements effect plant growth and development. Relative percent bare ground cover was moderately high at 51% in 1994, decreasing to 35% in 1999, and then increasing to 46% in 2004. Ratio of bare ground to protective cover (vegetation, litter, and cryptogams) decreased from 1:3.0 in 1999 to 1:2.2 in 2004. Cryptogam cover decreased from 11% in 1999 to 3% in 2004. A couple of active gullies were noted on the site in 2004 and an erosion condition class rating in 2004 rated erosion on this site as slight. The slight slope has mitigated erosion problems.

The key browse species is Wyoming big sagebrush. The BLM has raised concerns in the past that sagebrush in the area was declining. This area has experienced drought conditions from 2001-2003 and annual precipitation has only been 48-60% of average during this time. Spring conditions (April-June) have been very dry and were only 13% of normal in 2002. The results of this drought were seen in 2004 as sagebrush density was four times lower than it was in 1999. Ninety-four percent of the population was classified as decadent and 90% showed signs of poor vigor. This was up from 27% decadency in 1999. Use was only slightly higher in 2004 with 38% showing moderate use and 54% heavy compared to 26 and 47% in 1999. Utilization was light in 1994. Cover declined from 9% in 1994, 10% in 1999, and down to 2% in 2004. Sagebrush density was stable from 1994 to 1999. Broom snakeweed density has fluctuated greatly with each reading and was down from 6,460 plants/acre in 1999 to 340 plants/acre in 2004. A few healthy winterfat were also present on this site.

In the past the herbaceous understory was relatively abundant for a Wyoming big sagebrush site. Grasses provided over half of the total vegetation cover in both 1994 and 1999. Six perennial species are present including: western wheatgrass, blue grama, Salina wildrye, Indian ricegrass, bottlebrush squirreltail, and needle-and-thread. All perennial grasses increased or remained stable in nested and quadrat frequency between 1994 and 1999. In 2004, four species had significantly lower nested frequencies. Cover declined from 16% in 1999 to 5% in 2004. Grasses made up only 22% of the total vegetation cover in 2004. Needle-and-thread and blue grama were the species found in the greatest abundance. Forbs are diverse. Scarlet globemallow is the dominant forb and was robust in 2004. It increased from 1% cover in 1999 to 9% in 2004, but was not significantly more abundant than it was in 1999. Annual forbs were higher in 2004 than they previously had been.

### 1994 APPARENT TREND ASSESSMENT

Relative cover of bare ground is high at 51%, but due to the gentle terrain and the abundance of herbaceous

vegetation, erosion does not seem to be a major problem. The apparent trend for soil is stable. The browse trend is also stable for the time being. The reproductive potential (number of young) is sufficient at 17% to replace dying shrubs on the site. It is apparent by the large number of dead shrubs counted that the population was once larger. Increaser shrubs, broom snakeweed and rabbitbrush are not abundant and do not have age classes characteristic of an expanding populations. The herbaceous understory is abundant. Perennial forbs are lacking somewhat, but typical for a Wyoming big sagebrush community. Currently, grasses and forbs account for 60% of the vegetation cover. Blue grama, a warm season grass, and needle-and-thread are the dominant grasses on the site. The Desirable Components Index (see methods) rating is good at 60. The sagebrush is abundant with low decadence and good recruitment. The herbaceous understory is diverse and abundant.

winter range condition (DC Index) - 60 (good) Wyoming big sagebrush type

### 1999 TREND ASSESSMENT

Trend for soil is slightly improved. Relative bare ground is still moderately high at 35%, but decreased from 51% in 1994. Vegetation and litter cover both increased in 1999, resulting in better protective ground cover to hold soils in place. The key browse species, Wyoming big sagebrush, shows a stable trend. Age class distribution of the population is nearly identical to the 1994 reading. The proportion of the population classified as decadent, and those showing poor vigor are about the same as 1994 levels. Recruitment is moderate at 17% . The only negative aspect with Wyoming big sagebrush is that the level of use has greatly increased. In 1999, 26% of the population displayed moderate use, with an additional 47% showing heavy use. Continued high use could reverse the stability of this species in the future, especially when accompanied with drought. Broom snakeweed is expanding with an 84% increase in its density in 1999. Half of the population is young plants which indicates possible expansion in the future. The overall trend for browse is stable. The herbaceous understory shows a mixed trend, overall it would be considered stable. Sum of nested frequency for perennial grasses was stable and perennial forbs showed an increase in 1999. However, perennial grasses are the most abundant group in cover (90% of herbaceous perennial cover) and frequency. The DCI index shows that this is an excellent Wyoming big sagebrush site. Both sagebrush and the herbaceous understory are abundant and healthy.

#### TREND ASSESSMENT

soil - up slightly (4)

browse - stable (3)

herbaceous understory - stable (3)

winter range condition (DC Index) - 65 (good to excellent) Wyoming big sagebrush type

### 2004 TREND ASSESSMENT

Soil trend is slightly down. Relative bare ground increased to 46%, but not as high as it was in 1994 at 51%. Both cryptogams and grass cover decreased with the drought. Ratio of bare ground to protective cover (vegetation, litter, and cryptogams) decreased to only 1:2.2 in 2004 (same ratio as 1994). Signs of erosion were seen in 2004 with active gullies and rills. Browse trend is down as the 1999 trend assessment predicted would happen with the combination of high use (sheep and deer) and severe drought. Wyoming big sagebrush density is four times lower than it was previously and the remaining plants are nearly all decadent with 90% of the plants left in the population classified as dying. Cover is down to less than 2%, which will not support very many deer. The herbaceous understory is also considered down. Sum of nested frequency for perennial grasses is only about one-half of what it was in 1999. Grass cover also is down to 5% from 16% in 1999. Perennial forb cover increased, but nested frequency actually was slightly lower. Annual forbs have also increased. Sagebrush die off and high decadency has reduced the DCI score to poor. Perennial grass cover also decreased.

TREND ASSESSMENT

soil - slightly down (2)

browse - down (1)

herbaceous understory - down (1)

winter range condition (DC Index) - 11 (poor) Wyoming big sagebrush type

HERBACEOUS TRENDS --

Management unit 16B, Study no: 23

Type	Species	Nested Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
G	Agropyron smithii	a <sup>-</sup>	a <sup>-</sup>	b <sup>18</sup>	-	-	.12
G	Bouteloua gracilis	b <sup>195</sup>	b <sup>193</sup>	a <sup>109</sup>	6.22	4.79	2.02
G	Elymus salina	b <sup>86</sup>	b <sup>105</sup>	a <sup>1</sup>	.95	2.59	.00
G	Oryzopsis hymenoides	ab <sup>114</sup>	b <sup>159</sup>	a <sup>68</sup>	2.06	3.80	.22
G	Sitanion hystrix	b <sup>24</sup>	b <sup>22</sup>	a <sup>1</sup>	.39	.56	.03
G	Sporobolus cryptandrus	1	-	1	.00	-	.00
G	Stipa comata	b <sup>181</sup>	ab <sup>142</sup>	a <sup>147</sup>	4.69	4.33	3.02
G	Vulpia octoflora (a)	a <sup>-</sup>	a <sup>6</sup>	b <sup>44</sup>	-	.01	.10
Total for Annual Grasses		0	6	44	0	0.01	0.10
Total for Perennial Grasses		601	621	345	14.33	16.10	5.44
Total for Grasses		601	627	389	14.33	16.11	5.53
F	Astragalus convallarius	a <sup>6</sup>	b <sup>39</sup>	b <sup>30</sup>	.01	.19	1.57
F	Astragalus spp.	7	-	-	.04	-	-
F	Castilleja linariaefolia	a <sup>-</sup>	b <sup>17</sup>	a <sup>3</sup>	-	.04	.00
F	Calochortus nuttallii	a <sup>-</sup>	b <sup>11</sup>	b <sup>16</sup>	-	.04	.05
F	Chenopodium fremontii (a)	-	-	3	-	-	.04
F	Chenopodium leptophyllum(a)	a <sup>-</sup>	a <sup>-</sup>	b <sup>162</sup>	-	-	1.55
F	Comandra pallida	a <sup>-</sup>	b <sup>10</sup>	b <sup>11</sup>	-	.02	.25
F	Collinsia parviflora (a)	17	15	16	.06	.25	.11
F	Cordylanthus spp. (a)	-	-	1	-	-	.00
F	Cryptantha spp.	a <sup>-</sup>	a <sup>-</sup>	b <sup>11</sup>	-	-	.27
F	Cymopterus spp.	-	3	1	-	.00	.00
F	Descurainia pinnata (a)	a <sup>3</sup>	a <sup>1</sup>	b <sup>16</sup>	.00	.01	.08
F	Eriogonum cernuum (a)	a <sup>4</sup>	a <sup>-</sup>	b <sup>22</sup>	.01	-	.12
F	Eriogonum ovalifolium	ab <sup>5</sup>	b <sup>16</sup>	a <sup>1</sup>	.04	.34	.03
F	Gayophytum ramosissimum(a)	a <sup>-</sup>	a <sup>-</sup>	b <sup>65</sup>	-	-	.73
F	Gilia spp. (a)	a <sup>-</sup>	a <sup>-</sup>	b <sup>114</sup>	-	-	.95
F	Lappula occidentalis (a)	a <sup>-</sup>	a <sup>-</sup>	b <sup>20</sup>	-	-	.06
F	Lepidium montanum	12	3	3	.21	.01	.07
F	Lygodesmia spp.	-	-	3	-	-	.06

T y p e	Species	Nested Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
		F	<i>Machaeranthera canescens</i>	1	3	2	.00
F	<i>Penstemon linarioides</i>	3	-	-	.00	-	-
F	<i>Penstemon</i> spp.	11	3	4	.02	.03	.03
F	<i>Phlox longifolia</i>	<sub>a</sub> 26	<sub>b</sub> 50	<sub>ab</sub> 30	.05	.15	.18
F	<i>Plantago patagonica</i> (a)	<sub>a</sub> 3	<sub>a</sub> 2	<sub>b</sub> 103	.00	.01	1.00
F	<i>Salsola iberica</i> (a)	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 38	-	-	.57
F	<i>Schoenocrambe linifolia</i>	<sub>a</sub> 7	<sub>b</sub> 17	<sub>a</sub> 5	.01	.07	.06
F	<i>Sphaeralcea coccinea</i>	<sub>a</sub> 128	<sub>ab</sub> 166	<sub>b</sub> 173	.93	1.04	8.54
F	<i>Taraxacum officinale</i>	-	-	1	-	-	.00
F	<i>Tragopogon dubius</i>	-	2	1	-	.00	.00
Total for Annual Forbs		27	18	560	0.08	0.26	5.25
Total for Perennial Forbs		206	340	295	1.33	2.00	11.18
Total for Forbs		233	358	855	1.41	2.27	16.43

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

#### BROWSE TRENDS --

Management unit 16B, Study no: 23

T y p e	Species	Strip Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
		B	<i>Artemisia tridentata wyomingensis</i>	77	74	35	9.19
B	<i>Ceratoides lanata</i>	2	1	2	-	.00	.01
B	<i>Chrysothamnus viscidiflorus</i>	1	2	2	-	.15	.01
B	<i>Gutierrezia sarothrae</i>	28	62	11	.78	.97	.25
B	<i>Opuntia polyacantha</i>	29	21	20	.51	.66	.64
B	<i>Pinus edulis</i>	0	1	1	-	-	.03
Total for Browse		137	161	71	10.49	12.11	2.74

CANOPY COVER, LINE INTERCEPT --  
 Management unit 16B, Study no: 23

Species	Percent Cover
	'04
Artemisia tridentata wyomingensis	1.23
Ceratoides lanata	.01
Chrysothamnus viscidiflorus	.01
Gutierrezia sarothrae	.20
Opuntia spp.	.35

KEY BROWSE ANNUAL LEADER GROWTH --  
 Management unit 16B, Study no: 23

Species	Average leader growth (in)
	'04
Artemisia tridentata wyomingensis	4.3
Ceratoides lanata	9.4

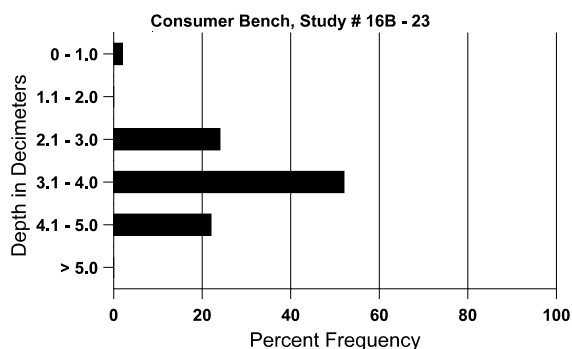
BASIC COVER --  
 Management unit 16B, Study no: 23

Cover Type	Average Cover %		
	'94	'99	'04
Vegetation	24.62	32.35	26.23
Rock	.05	.01	.00
Pavement	.44	.26	.60
Litter	17.95	24.32	30.77
Cryptogams	1.43	11.09	2.56
Bare Ground	45.88	36.49	51.98

SOIL ANALYSIS DATA --  
 Management unit 16B, Study no: 23, Study Name: Consumer Bench

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
16.4	58.9 (11.6)	7.8	54.7	27.4	17.8	1.7	3.3	41.6	0.6

## Stoniness Index



### PELLET GROUP DATA --

Management unit 16B, Study no: 23

Type	Quadrat Frequency		
	'94	'99	'04
Rabbit	6	66	36
Elk	20	17	16
Deer	55	58	62
Cattle	-	-	-

Days use per acre (ha)	
'99	'04
-	-
64 (159)	25 (63)
90 (223)	106 (263)
-	1 (2)

### BROWSE CHARACTERISTICS --

Management unit 16B, Study no: 23

		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 tridentata wyomingensis</b>												
94	<b>3820</b>	260	660	2080	1080	1660	15	0	28	10	10	16/26
99	<b>4480</b>	300	780	2480	1220	1200	26	47	27	8	11	17/30
04	<b>1040</b>	-	20	40	980	2880	38	54	94	90	90	16/19
<b>Ceratoides lanata</b>												
94	<b>60</b>	-	-	60	-	-	0	0	-	-	0	9/8
99	<b>20</b>	-	20	-	-	-	0	0	-	-	0	3/4
04	<b>40</b>	20	-	40	-	-	0	100	-	-	0	11/13
<b>Chrysothamnus viscidiflorus</b>												
94	<b>60</b>	-	-	60	-	-	0	0	-	-	0	7/18
99	<b>60</b>	-	60	-	-	-	0	0	-	-	0	4/10
04	<b>60</b>	140	-	60	-	-	0	0	-	-	0	9/13

		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>Gutierrezia sarothrae</i>												
94	<b>1020</b>	-	-	980	40	40	0	4	4	-	0	8/9
99	<b>6460</b>	2220	3240	3200	20	120	.30	.61	0	-	.30	4/4
04	<b>340</b>	-	20	320	-	-	6	0	0	-	0	6/8
<i>Opuntia polyacantha</i>												
94	<b>920</b>	-	40	840	40	-	0	0	4	-	0	3/10
99	<b>700</b>	40	100	500	100	-	0	0	14	6	6	3/9
04	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
<i>Opuntia spp.</i>												
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
99	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
04	<b>740</b>	40	140	600	-	-	0	0	-	-	0	4/12
<i>Pinus edulis</i>												
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
99	<b>20</b>	-	20	-	-	-	0	0	-	-	0	-/-
04	<b>20</b>	-	-	20	-	-	0	0	-	-	0	-/-