

WIREGRASS BENCH - TREND STUDY NO. 16B-24-09

Vegetation Type: Wyoming Big Sagebrush

Range Type: Crucial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: [Upland Loam \(Basin Big Sagebrush\), R047XA308UT](#)

Land Ownership: BLM

Elevation: 6,900 ft (2,103 m)

Aspect: Northwest

Slope: 5%-10%

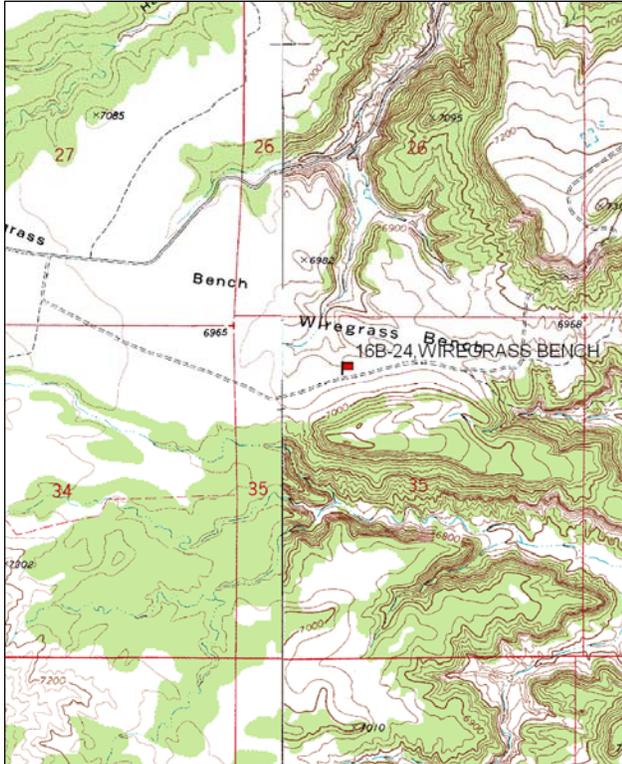
Transect bearing: 0 degrees magnetic

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

Directions:

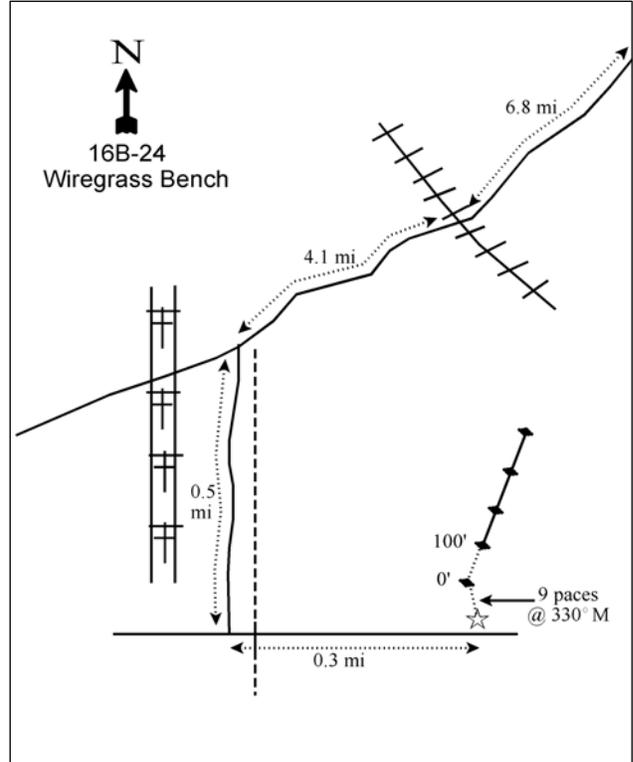
Take exit 240 on highway 6 in Price just past the hospital. Turn right at the stop sign, continue to another stop sign and turn right again. Stay on this road until you go over a canal, then turn right at the first road on the right. Proceed 6.8 miles to a railroad crossing. From the railroad tracks, travel 4.1 miles. Just before reaching the power lines turn left and travel 0.5 miles along the fence to a "T" in the road. Turn left through a gate and travel 0.3 miles to the witness post on the left. The 0' stake is 9 paces at 330° M. The baseline runs in the direction of 0°M.

Map Name: Pinnacle Peak



Township: 14S, Range: 8E, Section: 35

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 500228 E 4379946 N

WIREGRASS BENCH - TREND STUDY NO. 16B-24

Site Information

Site Description: The study is located on Wiregrass Bench, about 10 miles west of Price. This study was established to monitor possible sagebrush die-off on important deer winter range. The site is on the Haley allotment which is grazed from May 16 to October 31 by cattle and is managed by the BLM. Energy developments are prevalent in the area and there were expanded roads and a new oil/gas rig 500 feet to the west of the site in 2009. Pellet group data has indicated a steady increase in deer use since 1999 with deer use estimated to be very heavy in 2009. Estimated elk and cattle use has been mostly light to moderate since 1999 (Table - Pellet Group Data).

Browse: The key browse species on this site is Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*). The sagebrush population on this site is quite dynamic with large fluctuations in most of the measured parameters. Cover of sagebrush has fluctuated over the sample years from a high of 10% in 1999 to a low of 5% in 2004 (Table - Browse Trends). Density, decadence, vigor, and recruitment of young sagebrush have also fluctuated greatly over the sample years. Utilization of sagebrush has been mostly light to moderate on the site over the sample years except for 2004 when use of sagebrush was mostly heavy (Table - Browse Characteristics).

The most numerous browse species on the site is stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*), but this species does not contribute much cover. Broom snakeweed (*Gutierrezia sarothrae*) is present at the site in low cover (Table - Browse Trends). Utah serviceberry (*Amelanchier utahensis*) is also present in low numbers and has experienced increased use since 1999 (Table - Browse Characteristics).

Herbaceous Understory: The herbaceous understory is abundant and diverse on the site. Native perennial grasses provide the majority of the cover on the site and Salina wildrye (*Elymus salina*) and blue grama (*Bouteloua gracilis*) are the dominant species on the site. These two species provide the majority of the grass cover, but other native perennial grasses are common (Table - Herbaceous Trends). Forbs are diverse but not as abundant as grasses. A few important perennial species on the site include narrowleaf paintbrush (*Castilleja linariaefolia*), redroot eriogonum (*Eriogonum racemosum*), and scarlet globemallow (*Sphaeralcea coccinea*).

Soil: The soil is a loam with a slightly alkaline pH and a deep effective rooting depth (Table - Soil Analysis Data). Bare ground cover has been low to moderate for a Wyoming big sagebrush site over the sample years. Most of the protective ground cover is provided by vegetation and litter cover (Table - Basic Cover). The soil erosion condition was classified as slight in 2004 with signs of erosion from rills, gullies, and pedestaling, but was classified as stable in 2009.

Trend Assessments

Browse:

- **1994 to 1999 - up (+2):** The density of the primary browse species, Wyoming big sagebrush, increased by 26% from 1,880 plants/acre to 2,380 plants/acre, and cover increased from 6% to 10%. Recruitment of young sagebrush plants increased from 10% to 18%, and decadence and poor vigor both decreased.
- **1999 to 2004 - slightly down (-1):** Density of sagebrush decreased 18% to 1,940 plants/acre and cover decreased to 5%. There was a large decrease in the density of mature sagebrush plants and decadence increased to 63% of the population. Sagebrush plants displaying poor vigor increased to 44% and recruitment of young sagebrush plants decreased slightly to 13%.
- **2004 to 2009 - up (+2):** Density of sagebrush increased more than two-fold to 4,680 plants/acre primarily due to a large increase in the recruitment of young plants. The density of mature sagebrush

plants nearly doubled, and decadence decreased to 22%. Plants displaying poor vigor also decreased to 14%.

Grass:

- **1994 to 1999 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, though cover decreased slightly. There was a significant decrease in the nested frequency of bottlebrush squirreltail (*Sitanion hystrix*).
- **1999 to 2004 - slightly up (+1):** There was a 13% increase in the sum of nested frequency of perennial grasses and cover increased slightly. There was a significant increase in the nested frequency of needle-and-thread (*Stipa comata*), and western wheatgrass (*Agropyron smithii*) and Sandberg bluegrass (*Poa secunda*) were sampled for the first time in 2004.
- **2004 to 2009 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, but cover increased to 26%. There was a significant increase in nested frequency of Salina wildrye, Sandberg bluegrass, and Indian ricegrass (*Oryzopsis hymenoides*).

Forb:

- **1994 to 1999 - up (+2):** There was a substantial increase in the sum of nested frequency of perennial forbs and cover increased from 2% to 3%.
- **1999 to 2004 - down (-2):** There was a 33% decrease in the sum of nested frequency of perennial forbs, though cover increased slightly to near 4%.
- **2004 to 2009 - stable (0):** There was little change in the sum of nested frequency of perennial forbs, but cover decreased to near 3%.

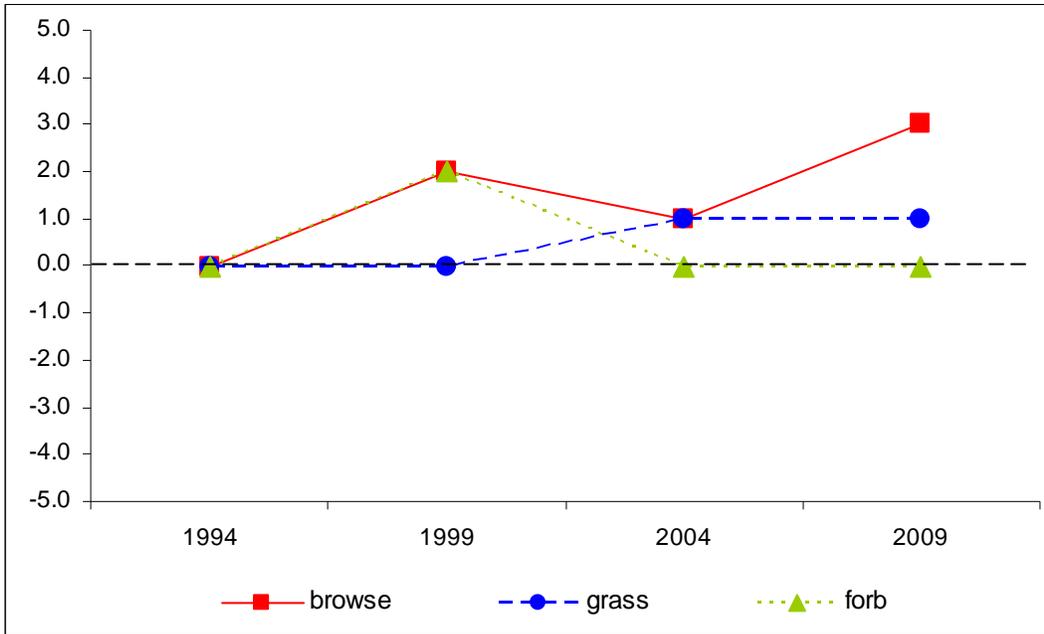
DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 16B, study no: 24

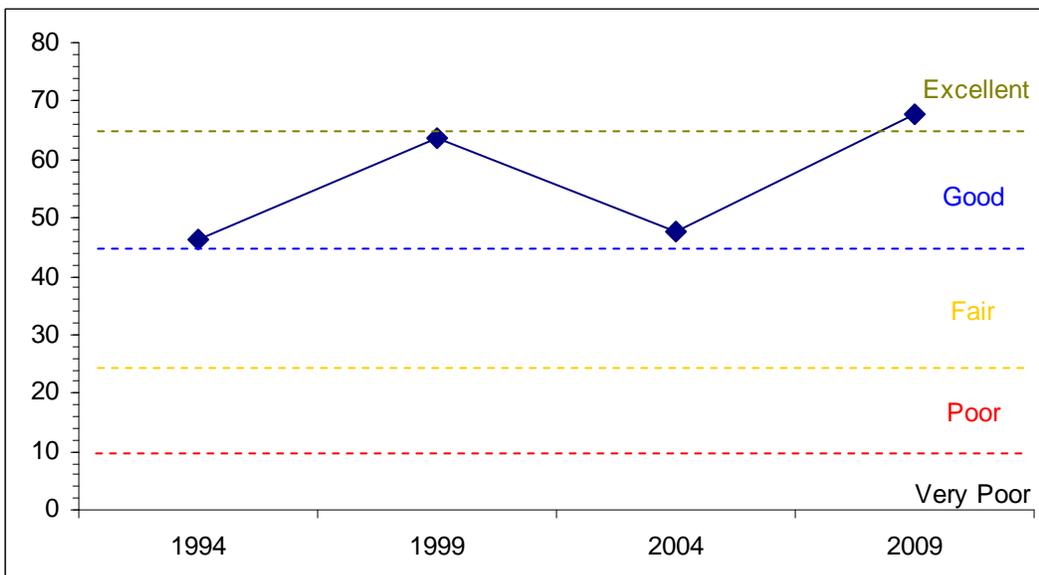
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
94	6.9	0.3	5.0	30.0	0.0	4.1	0.0	46.3	Fair-Good
99	12.2	6.3	9.0	30.0	-0.2	6.3	0.0	63.6	Good-Excellent
04	6.7	-2.5	6.0	30.0	0.0	7.5	0.0	47.7	Good
09	8.6	8.8	15.0	30.0	0.0	5.3	0.0	67.7	Excellent

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 16B, Study no: 24



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE
Management unit 16B, Study no: 24



HERBACEOUS TRENDS--
Management unit 16B, Study no: 24

Type	Species	Nested Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron smithii	a-	a-	b42	b31	-	-	.32	.16
G	Agropyron spicatum	10	2	12	9	.53	.01	.05	.16
G	Bouteloua gracilis	b274	a230	ab254	ab245	10.33	4.77	6.64	7.75
G	Bromus tectorum (a)	5	20	-	5	.01	.20	-	.03
G	Elymus salina	c263	b294	a265	b306	9.56	8.72	10.01	16.88
G	Oryzopsis hymenoides	c25	bc19	a-	b14	.38	.20	-	.27
G	Poa fendleriana	b44	b98	b71	a-	.51	1.27	.66	-
G	Poa secunda	a-	a-	b59	c160	-	-	.61	.86
G	Sitanion hystrix	c95	b53	a15	a15	1.06	1.19	.07	.20
G	Sporobolus cryptandrus	-	-	5	-	-	-	.00	-
G	Stipa comata	a17	a4	b70	a1	.32	.00	.93	.03
G	Vulpia octoflora (a)	-	-	2	-	-	-	.01	-
Total for Annual Grasses		5	20	2	5	0.00	0.20	0.00	0.03
Total for Perennial Grasses		728	700	793	781	22.71	16.18	19.34	26.34
Total for Grasses		733	720	795	786	22.72	16.38	19.35	26.37
F	Agoseris glauca	a-	b55	ab10	a6	-	.24	.05	.02
F	Arabis sp.	-	-	2	1	-	-	.00	.00
F	Astragalus convallarius	b42	b38	b57	a7	.41	.14	1.11	.06
F	Astragalus sp.	7	13	-	1	.30	.21	-	.00
F	Calochortus nuttallii	a3	b31	b37	a3	.00	.07	.14	.00
F	Castilleja linariaefolia	a14	b51	a13	b34	.05	.38	.08	.29
F	Chenopodium sp. (a)	-	-	2	-	-	-	.01	-
F	Collinsia parviflora (a)	b21	b27	a3	a4	.05	.06	.00	.01
F	Comandra pallida	b35	c69	c59	a5	.36	.19	.45	.01
F	Crepis acuminata	-	3	-	-	-	.03	-	-
F	Cryptantha sp.	2	-	-	-	.01	-	-	-
F	Cymopterus sp.	-	7	-	-	-	.04	-	-
F	Delphinium nuttallianum	-	5	-	1	-	.00	-	.00
F	Descurainia pinnata (a)	1	-	3	-	.00	-	.01	-
F	Epilobium brachycarpum (a)	a-	a-	a-	b63	-	-	-	.11
F	Erigeron eatonii	-	-	-	1	-	-	-	.00
F	Eriogonum alatum	a4	b33	a3	a-	.03	.16	.03	-
F	Eriogonum racemosum	44	45	31	32	.39	.32	.27	.74
F	Eriogonum umbellatum	3	1	3	4	.03	.00	.03	.06
F	Gayophytum ramosissimum(a)	a-	a-	b24	a3	-	-	.10	.00
F	Hedysarum boreale	-	-	5	7	-	-	.12	.10
F	Hymenoxys acaulis	a1	a-	a-	b6	.00	-	-	.16
F	Lappula occidentalis (a)	a-	a3	b25	a1	-	.00	.10	.00
F	Lepidium densiflorum (a)	b18	ab15	ab9	a-	.04	.02	.02	-
F	Lesquerella sp.	a1	a-	a1	b18	.00	-	.00	.09
F	Machaeranthera grindelioides	ab8	b11	a-	b13	.06	.10	-	.22
F	Penstemon caespitosus	5	20	8	7	.05	.09	.05	.01
F	Penstemon carnosus	-	-	3	5	-	-	.01	.05

Type	Species	Nested Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
F	Penstemon palmeri	3	-	-	2	.01	-	-	.00
F	Phlox longifolia	_a 43	_a 74	_a 80	_b 128	.08	.56	.35	.49
F	Plantago patagonica (a)	_b 42	_{ab} 37	_c 78	_a 8	.12	.08	.19	.01
F	Polygonum douglasii (a)	_a 21	_a 6	_b 146	_a 11	.04	.01	.31	.02
F	Ranunculus testiculatus (a)	_a -	_a -	_a 4	_b 29	-	-	.01	.09
F	Schoenocrambe linifolia	14	12	19	20	.03	.02	.27	.06
F	Sphaeralcea coccinea	_{ab} 52	_{ab} 48	_a 37	_b 55	.18	.48	.72	.22
F	Taraxacum officinale	7	12	2	-	.01	.02	.00	-
F	Zigadenus paniculatus	_a -	_b 24	_a -	_a 5	-	.06	.00	.01
Total for Annual Forbs		103	88	294	119	0.26	0.19	0.77	0.25
Total for Perennial Forbs		288	552	370	361	2.05	3.16	3.74	2.66
Total for Forbs		391	640	664	480	2.31	3.35	4.51	2.92

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

BROWSE TRENDS--

Management unit 16B, Study no: 24

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	Amelanchier utahensis	2	2	3	1	.00	.00	.38	.38
B	Artemisia tridentata wyomingensis	58	66	56	74	5.51	9.74	4.90	6.46
B	Chrysothamnus viscidiflorus viscidiflorus	72	76	86	67	2.94	2.96	2.96	1.96
B	Echinocereus sp.	0	4	0	0	-	.00	-	-
B	Gutierrezia sarothrae	63	34	13	34	.61	.18	.00	.76
B	Opuntia sp.	9	3	2	3	.01	.00	.00	.00
B	Pediocactus simpsonii	0	0	2	1	-	-	.00	.00
B	Pinus edulis	0	1	0	0	.38	.15	-	-
Total for Browse		204	186	162	180	9.46	13.05	8.25	9.57

CANOPY COVER, LINE INTERCEPT--

Management unit 16B, Study no: 24

Species	Percent Cover	
	'04	'09
Amelanchier utahensis	.16	.18
Artemisia tridentata wyomingensis	5.13	6.55
Chrysothamnus viscidiflorus viscidiflorus	2.71	1.76
Gutierrezia sarothrae	.25	3.59
Opuntia sp.	.23	.38

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 16B, Study no: 24

Species	Average leader growth (in)	
	'04	'09
Amelanchier utahensis	2.6	1.3
Artemisia tridentata wyomingensis	2.5	1.7

BASIC COVER--

Management unit 16B, Study no: 24

Cover Type	Average Cover %			
	'94	'99	'04	'09
Vegetation	34.32	32.04	34.01	36.34
Rock	1.33	.57	.25	.11
Pavement	.41	.33	3.89	.97
Litter	23.33	24.23	26.12	35.93
Cryptogams	3.75	13.03	1.58	1.09
Bare Ground	31.76	32.17	47.34	41.59

SOIL ANALYSIS DATA --

Management unit 16B, Study no: 24, Study Name: Wiregrass Bench

Effective rooting depth (in)	pH	loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
20.2	7.6	34.7	41.4	23.8	1.7	6.8	121.6	0.6

PELLET GROUP DATA--

Management unit 16B, Study no: 24

Type	Quadrat Frequency				Days use per acre (ha)		
	'94	'99	'04	'09	'99	'04	'09
Rabbit	33	56	25	69	-	-	-
Elk	12	5	6	-	23 (56)	13 (31)	8 (17)
Deer	36	53	50	49	38 (93)	69 (170)	125 (309)
Cattle	6	7	4	9	15 (38)	12 (30)	15 (38)

BROWSE CHARACTERISTICS--

Management unit 16B, Study no: 24

		Age class distribution					Utilization		
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Amelanchier utahensis									
94	40	0	100	-	-	50	0	0	17/20
99	60	67	33	-	-	33	0	0	37/42
04	60	0	100	-	-	0	100	0	24/22
09	20	0	100	-	-	0	100	0	33/30
Artemisia tridentata wyomingensis									
94	1880	10	41	49	20	16	1	14	22/33
99	2380	18	54	29	260	50	10	4	23/34
04	1940	13	24	63	30460	40	45	44	23/33
09	4680	59	19	22	4880	21	17	14	20/27

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
94	4400	1	99	0	-	0	0	0	21/25
99	7480	17	83	0	200	4	.26	0	4/8
04	6360	13	84	3	480	17	3	3	5/9
09	5100	22	76	2	300	10	.39	0	4/10
<i>Echinocereus sp.</i>									
94	0	0	0	-	-	0	0	0	-/-
99	80	0	100	-	-	0	0	0	1/2
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
<i>Gutierrezia sarothrae</i>									
94	3260	1	98	1	-	0	0	.61	31/6
99	3480	16	84	1	-	0	0	0	3/4
04	460	13	87	0	-	0	0	0	4/5
09	2480	19	81	1	480	.80	0	.80	4/6
<i>Opuntia sp.</i>									
94	260	0	100	-	-	0	0	0	3/7
99	80	0	100	-	-	0	0	0	2/5
04	40	0	100	-	-	0	0	0	3/16
09	140	29	71	-	-	29	0	0	4/13
<i>Pediocactus simpsonii</i>									
94	0	0	0	-	-	0	0	0	-/-
99	0	0	0	-	-	0	0	0	-/-
04	60	33	67	-	-	0	0	0	1/2
09	20	0	100	-	-	0	0	0	-/-
<i>Pinus edulis</i>									
94	0	0	0	-	-	0	0	0	-/-
99	20	100	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-