

EAGLE BENCH - TREND STUDY NO. 15-1-09

Vegetation Type: Chained, Seeded P-J

Range Type: Crucial Deer Winter, Crucial Bison Year-Long

NRCS Ecological Site Description: [Upland Loam \(Pinyon-Utah Juniper\), R035XY321UT](#)

Land Ownership: BLM

Elevation: 6,640 ft (2,024 m)

Aspect: northeast

Slope: 5%

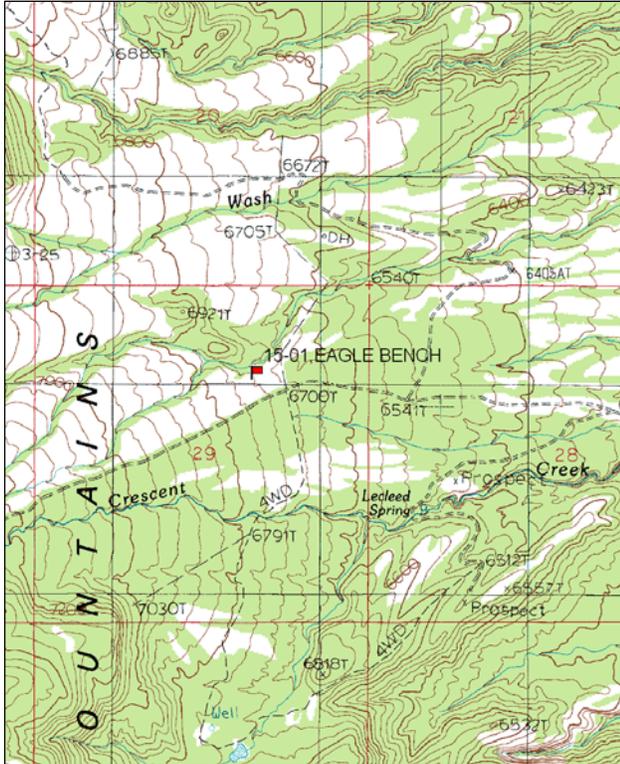
Transect bearing: 95 degrees magnetic.

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

Directions:

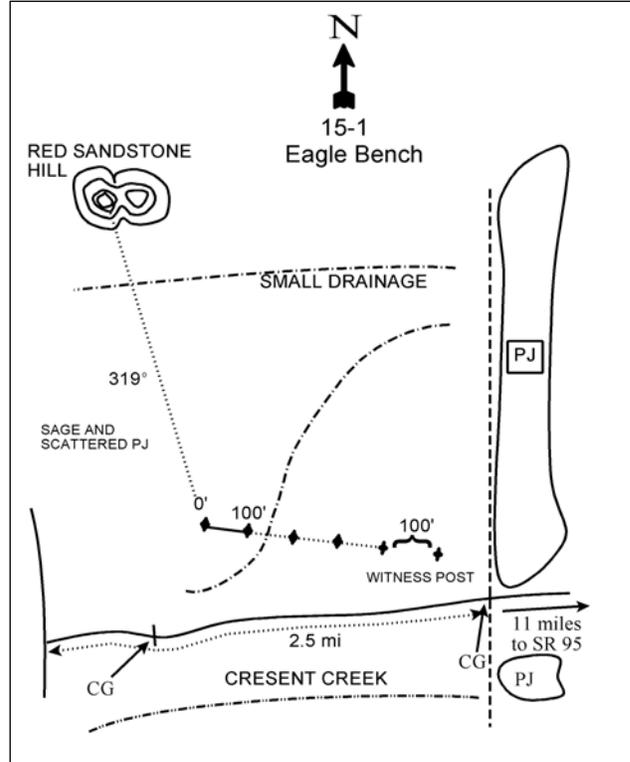
This transect is located in the Crescent Creek chaining on the east side of the Henry Mountains. It can be reached from SR 95 (approximately 11 miles through Little Egypt then west up Crescent Creek) or from the west via Copper Ridge of Granite Ridges and down Crescent Creek. From the intersection in the north part of Section 36 (T 31S, R 10E), go 0.6 miles down Crescent Creek to a cattleguard. Continue 1.95 miles to another cattleguard on the east edge of a large chaining (near section marker T 31S, R 11E, Sec. 29). On the north side of the road (NW of the cattleguard) there is a witness post out in the chaining. The transect starts with the 0-foot end of the baseline stake 500 feet to the west-northwest (275°M) at a short fence post tagged #7138.

Map Name: Raggy Canyon



Township: 31S, Range: 11E, Section: 29

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 524611 E 4215234 N

Site Information

Site Description: The study is located in a pinyon-juniper chaining and seeding that was done in 1968. The site is located in the Crescent Creek Allotment which is managed by the BLM. Scattered pinyon and juniper were becoming reestablished within the chaining, but a lop-and-scatter treatment occurred between the 1999 and 2004 sample years removing all of the mature trees. Water for livestock and wildlife is available in Crescent Creek which is about one mile south of the study area. Pellet group data estimated light deer use in 1999 and 2004, but was moderately heavy in 2009. Estimated cattle use has been light since 1999 (Table - Pellet Group Data).

Browse: Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) is the most abundant browse species in the area with an average cover of about 19% since 1994 (Table - Browse Trends). The majority of the sagebrush population consists of mature plants, with a decline in the recruitment of young sagebrush plants since 1999. Decadence and vigor of sagebrush has been good since the outset of the study. Sagebrush use was mostly light from 1994 to 2004, but increased to mostly heavy use in 2009 (Table - Browse Characteristics).

Other browse species on the site include broom snakeweed (*Gutierrezia sarothrae*) in relatively high density, but low cover (Table - Browse Characteristics, Table - Browse Trends). Prior to the lop-and-scatter treatment, point-center quarter data estimated 64 juniper trees/acre and 67 pinyon trees/acre, both with an average basal diameter of 3 inches in 1999. When sampled in 2004, all the pinyon and juniper within the chaining appeared to have been cut down within the past year.

Herbaceous Understory: The warm season perennial grass blue grama (*Bouteloua gracilis*) is the dominant understory grass on the site. Blue grama has maintained a fairly constant quadrat frequency for the last 15 years, around 42%. Crested wheatgrass decreased steadily from 1987 to 2004 and is now rare on the site. Bottlebrush squirreltail (*Sitanion hystrix*) is also fairly common on the site. Forbs are rare on this site and do not contribute substantially to the total herbaceous cover (Table - Herbaceous Trends).

Soil: The soil is a reddish-brown loam with a neutral pH and a fairly shallow estimated effective rooting depth. Organic matter is low and appears to be limited to the area directly beneath sagebrush plants (Table - Soil Analysis Data). There is a considerable amount of rock on the soil surface and throughout the soil profile. Bare ground cover is low with much of the protective cover being provided by rock and pavement (Table - Basic Cover). The soil erosion condition was classified as slight in 2004 and moderate in 2009 due to pedestaling of plants, surface litter and soil movement, flow patterns, and active gullies.

Trend Assessments

Browse:

- **1987 to 1994 - stable (0):** Differences in density may be related to the larger sample area used in 1994; therefore, trend was determined using other parameters. There was little change in vigor or decadence of sagebrush and both remained good. Recruitment of young sagebrush decreased, but remained good.
- **1994 to 1999 - stable (0):** There was little change in the density of sagebrush, though cover increased from 16% to 21%.
- **1999 to 2004 - slightly down (-1):** Density of sagebrush decreased by 17% to 5,280 plants/acre, and cover decreased to 19%. Decadence of sagebrush increased to 27% of the population and recruitment of young plants decreased to almost 0%.
- **2004 to 2009 - stable (0):** There was little change in the density and cover of sagebrush. Decadence and vigor of sagebrush improved slightly.

Grass:

- **1987 to 1994 - down (-2):** Sum of nested frequency of perennial grasses decreased by 38%. There was a significant decrease in the nested frequency of blue grama and bottlebrush squirreltail.
- **1994 to 1999 - slightly up (+1):** The sum of nested frequency of perennial grasses increased by 11%, though cover decreased slightly. There was a significant increase in the nested frequency of bottlebrush squirreltail.
- **1999 to 2004 - down (-2):** The sum of nested frequency of perennial grasses decreased by 33% and cover decreased slightly. There was a significant decrease in nested frequency of crested wheatgrass, Indian ricegrass (*Oryzopsis hymenoides*), and bottlebrush squirreltail.
- **2004 to 2009 - up (+2):** There was a 21% increase in the sum of nested frequency of perennial grasses, though cover decreased slightly. There was a significant increase in the nested frequency of bottlebrush squirreltail.

Forb:

- **1987 to 1994 - up (+2):** The sum of nested frequency of perennial forbs increased markedly. Forbs are not abundant on this site.
- **1994 to 1999 - slightly up (+1):** Sum of nested frequency of perennial forbs increased by 45%, but cover decreased slightly. Forbs are not abundant on this site.
- **1999 to 2004 - slightly down (-1):** The sum of nested frequency of perennial forbs decreased to 1994 levels, and cover decreased slightly.
- **2004 to 2009 - slightly up (+1):** The sum of nested frequency of perennial forbs and cover increased to 1999 levels.

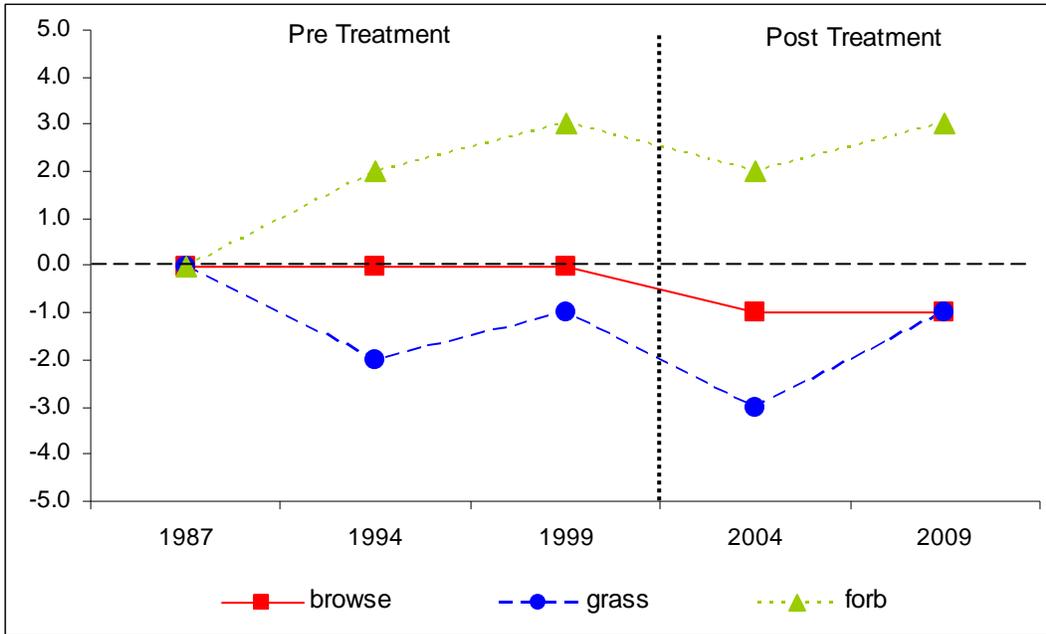
DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 15, study no: 1

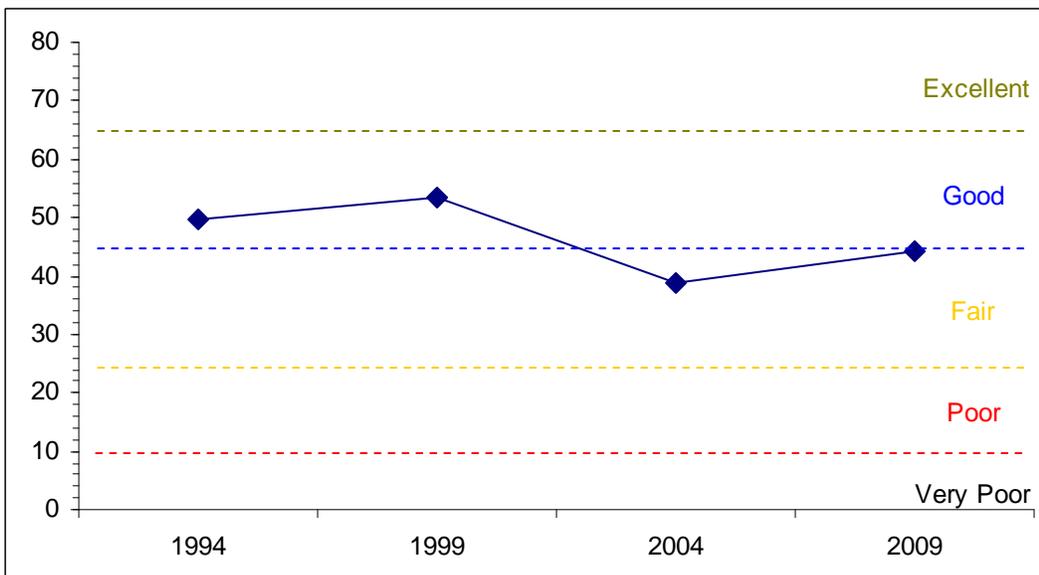
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
94	20.1	14.1	3.6	8.8	0.0	3.2	0.0	49.8	Good
99	26.9	12.3	4.0	8.4	0.0	1.9	0.0	53.5	Good
04	23.2	6.9	0.0	7.7	0.0	0.9	0.0	38.7	Fair
09	24.8	10.2	0.5	6.6	0.0	2.1	0.0	44.2	Fair-Good

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 15 Study no: 1



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE
Management unit 15, Study no: 1



HERBACEOUS TRENDS--
Management unit 15, Study no: 1

Type	Species	Nested Frequency					Average Cover %			
		'87	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron cristatum	c39	bc34	c31	a3	ab7	2.40	.68	.00	.04
G	Bouteloua gracilis	b196	a122	a113	a109	a104	1.53	1.87	3.15	2.65
G	Bromus tectorum (a)	-	a3	b15	a1	a-	.00	.05	.00	-
G	Hilaria jamesii	-	5	-	4	-	.01	-	.06	-
G	Oryzopsis hymenoides	ab19	b27	b24	a5	a3	.11	.31	.01	.00
G	Sitanion hystrix	b109	a36	b84	a49	b91	.34	1.34	.60	.60
G	Stipa lettermani	-	3	-	-	-	.00	-	-	-
Total for Annual Grasses		0	3	15	1	0	0.00	0.05	0.00	0
Total for Perennial Grasses		363	227	252	170	205	4.40	4.21	3.83	3.30
Total for Grasses		363	230	267	171	205	4.41	4.26	3.84	3.30
F	Arabis sp.	a-	a1	b9	a-	a-	.00	.05	-	-
F	Aster sp.	a-	b26	a-	a-	a-	.05	-	-	-
F	Astragalus sp.	a-	a-	b14	b13	b11	-	.05	.02	.03
F	Calochortus nuttallii	-	5	-	-	-	.01	-	-	-
F	Castilleja linariaefolia	-	-	-	1	-	-	-	.03	-
F	Chaenactis douglasii	-	3	-	-	-	.00	-	-	-
F	Chenopodium fremontii (a)	-	-	-	2	-	-	-	.00	-
F	Chenopodium leptophyllum(a)	-	-	-	1	-	-	-	.00	-
F	Collinsia parviflora (a)	-	a-	a-	b14	a-	-	-	.03	-
F	Cryptantha sp.	-	-	-	-	7	-	-	-	.02
F	Descurainia pinnata (a)	-	-	6	3	-	-	.01	.00	-
F	Erigeron sp.	-	6	-	-	-	.01	-	-	-
F	Eriogonum sp.	-	-	1	2	-	-	.00	.00	-
F	Gayophytum ramosissimum(a)	-	-	-	2	-	-	-	.00	-
F	Gilia sp. (a)	-	b22	ab16	a6	a-	.05	.04	.01	-
F	Hymenoxys acaulis	2	-	-	-	2	-	-	-	.00
F	Lappula occidentalis (a)	-	-	-	1	-	-	-	.00	-
F	Lesquerella kingii	a-	a8	b41	a5	a2	.01	.22	.04	.00
F	Lupinus sp.	-	-	-	8	-	-	-	.02	-
F	Phlox austromontana	-	-	3	-	-	-	.18	-	-
F	Phlox longifolia	a6	b56	b59	b51	a25	1.33	.18	.11	.05
F	Polygonum douglasii (a)	-	4	10	-	-	.00	.01	-	-
F	Ranunculus testiculatus (a)	-	-	1	-	-	-	.00	-	-
F	Senecio multilobatus	ab16	a7	ab31	b33	c104	.02	.24	.18	.91
F	Townsendia incana	a-	ab6	b13	ab4	b14	.16	.03	.01	.04
F	Unknown forb-perennial	6	-	-	-	-	-	-	-	-
Total for Annual Forbs		0	26	33	29	0	0.05	0.07	0.07	0
Total for Perennial Forbs		30	118	171	117	165	1.61	0.95	0.43	1.06
Total for Forbs		30	144	204	146	165	1.67	1.03	0.50	1.06

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

BROWSE TRENDS--

Management unit 15, Study no: 1

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	Amelanchier utahensis	0	1	0	0	-	-	-	-
B	Artemisia tridentata wyomingensis	89	88	85	89	16.02	21.45	18.59	19.83
B	Chrysothamnus depressus	0	0	0	0	-	-	-	-
B	Echinocactus sp.	0	0	0	1	-	-	-	-
B	Ephedra viridis	0	1	1	1	-	-	-	-
B	Eriogonum microthecum	10	7	1	3	.06	.04	.00	-
B	Gutierrezia sarothrae	41	36	37	63	1.09	.28	1.24	.66
B	Juniperus osteosperma	0	3	0	0	1.25	.63	-	-
B	Mahonia fremontii	0	0	0	0	-	-	-	-
B	Opuntia sp.	1	0	0	0	.00	-	-	-
B	Pinus edulis	0	5	0	0	1.87	2.24	-	-
Total for Browse		141	141	124	157	20.32	24.65	19.83	20.49

CANOPY COVER, LINE INTERCEPT--

Management unit 15, Study no: 1

Species	Percent Cover		
	'99	'04	'09
Amelanchier utahensis	-	.01	.10
Artemisia tridentata wyomingensis	-	25.36	20.48
Gutierrezia sarothrae	-	1.00	.78
Juniperus osteosperma	1.20	-	-
Pinus edulis	.40	-	-

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 15, Study no: 1

Species	Average leader growth (in)	
	'04	'09
Artemisia tridentata wyomingensis	1.2	0.9

BASIC COVER--

Management unit 15, Study no: 1

Cover Type	Average Cover %				
	'87	'94	'99	'04	'09
Vegetation	4.25	23.65	29.71	24.62	26.66
Rock	23.25	22.56	23.79	26.83	26.60
Pavement	16.25	4.56	13.64	16.85	14.56
Litter	37.50	22.97	24.80	25.20	28.94
Cryptogams	0	.03	.07	.09	.05
Bare Ground	18.75	20.02	21.97	15.07	15.67

SOIL ANALYSIS DATA --

Management unit 15, Study no: 1, Study Name: Eagle Bench

Effective rooting depth (in)	pH	loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
9.4	6.6	51.3	28.2	20.6	2.4	14.5	96	0.6

PELLET GROUP DATA--

Management unit 15, Study no: 1

Type	Quadrat Frequency				Days use per acre (ha)		
	'94	'99	'04	'09	'99	'04	'09
Rabbit	10	12	8	30	-	-	-
Deer	-	1	3	28	1 (2)	8 (20)	41 (101)
Bison/Cattle	-	2	-	1	9 (22)	2 (5)	2 (5)

BROWSE CHARACTERISTICS--

Management unit 15, Study no: 1

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
Amelanchier utahensis									
87	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	-/-
99	20	0	100	-	-	100	0	0	46/61
04	0	0	0	-	-	0	0	0	50/57
09	0	0	0	-	-	0	0	0	46/52
Artemisia tridentata wyomingensis									
87	6864	17	79	4	133	87	5	0	18/27
94	6400	7	90	3	240	0	0	4	17/26
99	6340	8	84	9	220	39	5	2	17/30
04	5280	0	73	27	400	4	0	14	16/29
09	5540	1	83	16	300	25	67	6	16/30
Chrysothamnus depressus									
87	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	-/-
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	11/21
Echinocactus sp.									
87	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	-/-
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	20	0	100	-	-	0	0	0	2/2

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Ephedra viridis</i>										
87	0	0	0	0	-	0	0	0	-/-	
94	0	0	0	0	-	0	0	0	10/8	
99	20	0	100	0	-	0	0	0	6/10	
04	20	0	0	100	-	0	0	100	10/8	
09	20	100	0	0	-	0	0	0	5/11	
<i>Eriogonum microthecum</i>										
87	265	75	25	-	-	25	0	0	3/3	
94	360	50	50	-	-	11	17	0	3/3	
99	320	13	88	-	80	31	13	0	3/4	
04	20	0	100	-	-	100	0	0	4/5	
09	140	0	100	-	-	0	0	0	2/3	
<i>Gutierrezia sarothrae</i>										
87	2465	8	92	0	66	0	0	0	6/4	
94	1960	8	89	3	80	0	0	0	5/6	
99	2080	36	63	1	380	0	0	.96	3/3	
04	2620	36	59	5	-	0	0	5	7/10	
09	9100	44	55	1	3560	.43	0	.43	3/4	
<i>Juniperus osteosperma</i>										
87	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	60	100	0	-	20	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
<i>Mahonia fremontii</i>										
87	0	0	0	-	66	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
<i>Opuntia sp.</i>										
87	0	0	0	-	-	0	0	0	-/-	
94	20	0	100	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	4/10	
09	0	0	0	-	-	0	0	0	-/-	
<i>Pinus edulis</i>										
87	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	100	40	60	-	60	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	