

SOUTH CREEK CHAINING - TREND STUDY NO. 15-4-09

Vegetation Type: Chained, Seeded P-J

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

NRCS Ecological Site Description: Upland Stony Loam (Wyoming Big Sagebrush), R035XY318UT

Land Ownership: BLM

Elevation: 7,900 ft (2,408 m)

Aspect: north

Slope: 5%

Transect bearing: 285 degrees magnetic.

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

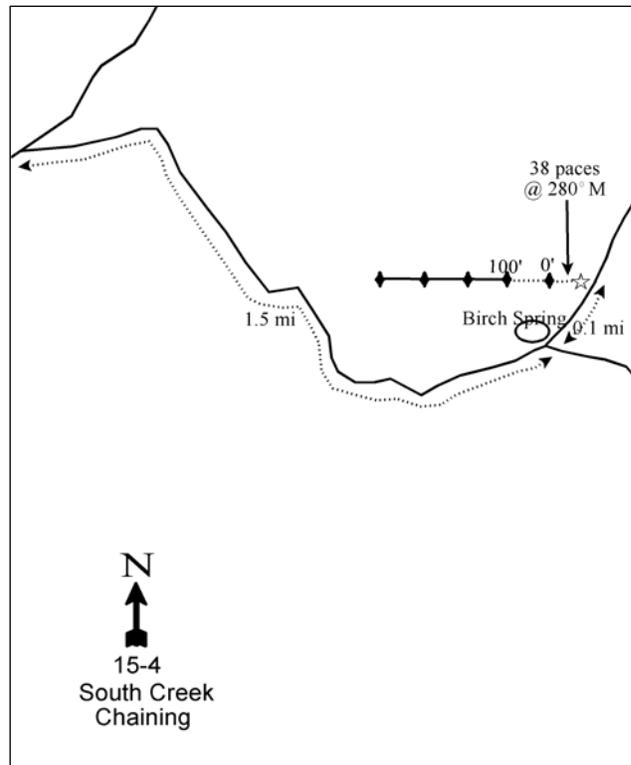
Directions:

From the intersection of the Willow Creek and South Creek Roads, (T32S, R9F, Sec.1) travel 1.5 miles west-southwest to a fork by Birch Spring. Turn left and go 0.1 miles past the fenced spring, and down a faint road. A witness post (tall green fence post) is located in the P-J just west of the road. The transect starts 38 paces away at a bearing of 280°M from the witness post. Browse tag# 7127.

Map Name: Mount Ellen



Diagrammatic Sketch:



Township: 32S, Range: 10E, Section: 6

GPS: NAD 83, UTM 12S 513018 E 4211338 N

SOUTH CREEK CHAINING - TREND STUDY NO. 15-4

Site Information

Site Description: The study is located in the pinyon-juniper foothills on the west slope of the Henry Mountains. It samples a portion of the South Creek pinyon-juniper project that was completed in the mid-1960's. Water is available for livestock and wildlife at Birch Spring a few hundred yards to the south. The site is within the Nasty Flat Cattle Allotment. A lop and scatter treatment of pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) was done on the site between the 1999 and 2004 samplings. Pellet group data estimated light deer use in 1999 and 2004, with a large increase in 2009. Due to difficulties distinguishing between species, bison and cattle pats were combined. Bison/cattle use was moderate to high in 1999 and 2004, but decreased in 2009 (Table - Pellet Group Data).

Browse: Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) is the dominant browse on this site. Mountain big sagebrush cover has steadily increased since 1994 (Table - Browse Trends). The density of sagebrush has also increased markedly over the sample years. Vigor and decadence of sagebrush have been excellent over the span of the study. Recruitment of young sagebrush plants has been high on the site with young plants comprising the majority of the sagebrush population in 2009 (Table - Browse Characteristics).

After pinyon and juniper trees became more abundant the chaining was retreated with a lop and scatter treatment in 2003. Photo transects show a decline in pinyon and juniper density in 2004, after the lop and scatter treatment. The site is bordered by pinyon and juniper, but very few trees are found within the sample area.

Herbaceous Understory: The grass understory is abundant, but not very diverse. Crested wheatgrass (*Agropyron cristatum*) is the predominant grass species, accounting for more than 93% of grass cover in all samples. Crested wheatgrass cover has varied from 11-22%. Perennial forbs are quite diverse on the site, but outside of the most abundant forb, alfalfa (*Medicago sativa*), provide limited cover (Table - Herbaceous Trends).

Soil: The soil on the site is a dark brown loam of granitic origin, with a neutral pH (6.9) with an effective rooting depth of just over 12 inches (Table - Soil Analysis Data). The soil surface is rocky as is the profile. The amount of bare ground cover has been low over the sample years with high cover of rock and pavement (Table - Basic Cover). The soil erosion condition classification was rated as stable in 2004 and 2009.

Trend Assessments

Browse:

- **1987 to 1994 - stable (0):** Differences in density may be related to the larger sample area used in 1994; therefore, different parameters were used to determine trend. The population remains healthy with good recruitment.
- **1994 to 1999 - up (+2):** Mountain big sagebrush density increased markedly from 160 plants/acre to 2,740 plants/acre, and cover increased from 1% to 4%. Recruitment of young sagebrush plants is still excellent at 39%.
- **1999 to 2004 - up (+2):** Mountain big sagebrush density doubled to 5,400 plants/acre and cover increased to 8%. Recruitment of young sagebrush plants is still good at 19%.
- **2004 to 2009 - up (+2):** Mountain big sagebrush density more than tripled, though much of that increase is due to a large increase in young sagebrush plants. The density of mature sagebrush plants decreased slightly. Cover of sagebrush increased to over 13%.

Grass:

- **1987 to 1994 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 13%. There was a significant decrease in the nested frequency of bottlebrush squirreltail.
- **1994 to 1999 - stable (0):** There was little change in perennial grasses on the site.
- **1999 to 2004 - down (-2):** The sum of nested frequency of perennial grasses decreased by 18%, and cover decreased from 22% to 11%. There was a significant decrease in the nested frequency of crested wheatgrass.
- **2004 to 2009 - slightly up (+1):** The sum of nested frequency of perennial grasses increased by 11%, and cover increased to 16%.

Forb:

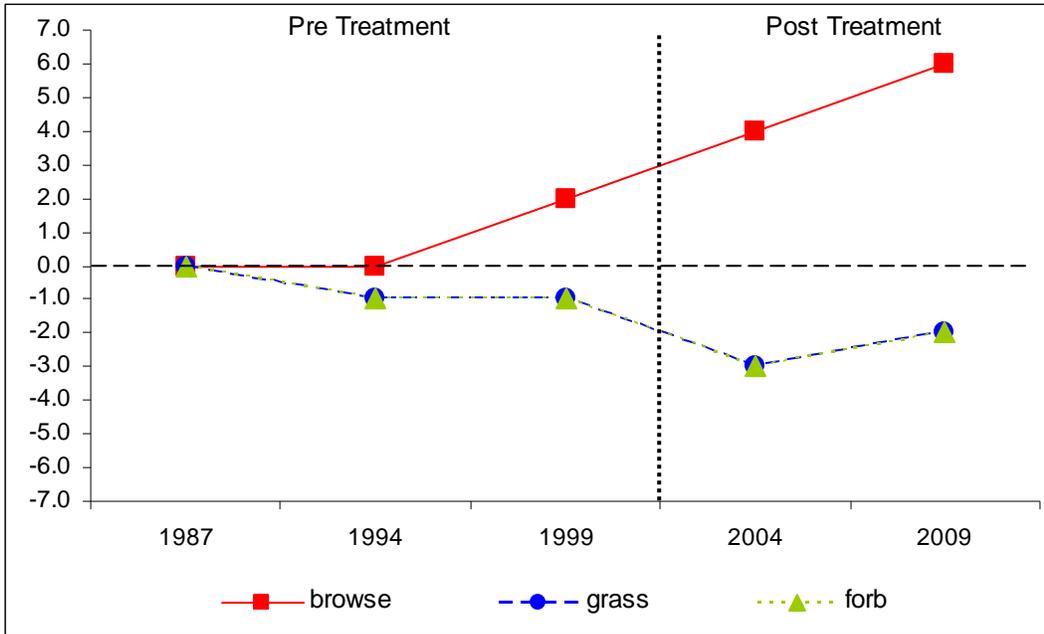
- **1987 to 1994 - slightly down (-1):** The sum of nested frequency of perennial forbs decreased by 12%. There was a significant decrease in the nested frequency of alfalfa.
- **1994 to 1999 - stable (0):** There was little change in perennial forbs.
- **1999 to 2004 - down (-2):** The sum of nested frequency of perennial forbs decreased by 42%, and cover decreased from 6% to 3%.
- **2004 to 2009 - slightly up (+1):** The sum of nested frequency increased by 11%, and cover increased to over 4%.

DEER DESIRABLE COMPONENTS INDEX – MID-LEVEL POTENTIAL SCALE --
Management unit 15, study no: 4

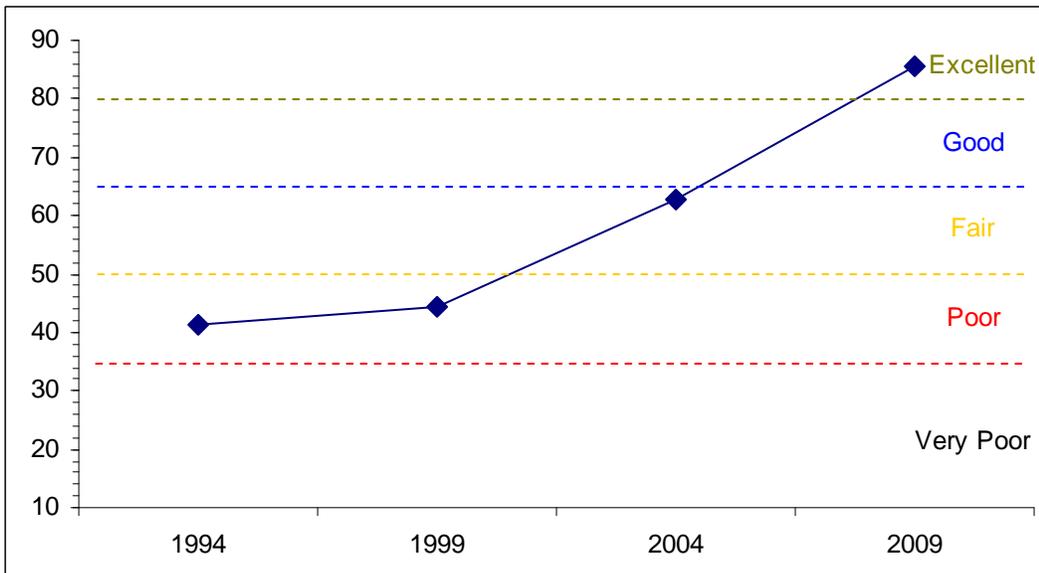
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
94	1.6	0	0	30	-0.2	10	0	41.4	Poor
99	4.8	0	0	30	-0.5	10	0	44.4	Poor
04	10	15	9.5	22.7	-0.3	5.9	0	62.8	Fair
09	16.8	15	15	30	-0.2	9	0	85.6	Excellent

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 15 Study no: 4



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL
Management unit 15, Study no: 4



HERBACEOUS TRENDS--

Management unit 15, Study no: 4

Type	Species	Nested Frequency					Average Cover %			
		'87	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron cristatum	b293	b294	b294	a245	ab269	22.07	20.97	11.25	15.81
G	Agropyron smithii	5	-	13	7	11	-	.77	.06	.33
G	Bromus tectorum (a)	-	a24	b57	b58	a25	.26	.63	.43	.21
G	Poa fendleriana	3	1	2	-	3	.00	.15	-	.03
G	Sitanion hystrix	b42	a4	a-	a3	a-	.01	-	.06	-
Total for Annual Grasses		0	24	57	58	25	0.26	0.62	0.43	0.20
Total for Perennial Grasses		343	299	309	255	283	22.08	21.89	11.37	16.17
Total for Grasses		343	323	366	313	308	22.35	22.52	11.80	16.38
F	Arabis sp.	-	-	2	-	4	-	.00	-	.01
F	Artemisia ludoviciana	3	1	6	5	6	.00	.06	.01	.03
F	Astragalus henrimontanensis	7	5	6	3	5	.01	.04	.06	.03
F	Casella bursa-pastoris	-	-	3	-	-	-	.00	-	-
F	Chaenactis douglasii	-	-	2	3	6	-	.00	.00	.01
F	Chenopodium album (a)	-	3	-	-	-	.01	-	-	-
F	Cirsium vulgare	9	-	-	-	-	-	-	-	-
F	Cryptantha sp.	-	2	-	-	-	.00	-	-	-
F	Descurainia pinnata (a)	-	b33	a9	ab18	a-	.10	.04	.04	-
F	Erigeron eatonii	-	-	-	-	-	-	-	-	.00
F	Erigeron sp.	-	-	1	-	-	-	.03	-	-
F	Eriogonum racemosum	-	-	-	2	-	-	-	.00	-
F	Gayophytum ramosissimum(a)	-	a-	a-	b10	a1	-	-	.05	.00
F	Hymenoxys acaulis	-	3	2	-	-	.00	.00	-	-
F	Lappula occidentalis (a)	-	a-	c64	d157	b19	-	.38	1.61	.07
F	Lesquerella kingii	ab18	c54	bc42	a-	a7	.36	.25	-	.02
F	Lomatium sp.	a-	b16	a-	ab3	a4	.43	-	.04	.01
F	Machaeranthera canescens	1	-	6	8	3	-	.18	.19	.03
F	Malcolmia africana	-	-	3	9	-	-	.38	.33	-
F	Medicago sativa	b110	a73	a71	a50	a56	6.50	4.38	1.94	3.87
F	Microsteris gracilis (a)	-	-	-	2	-	-	-	.00	-
F	Phlox longifolia	-	13	-	10	5	.03	-	.07	.04
F	Polygonum douglasii (a)	-	a57	a41	b240	a57	.51	.11	1.37	.23
F	Ranunculus testiculatus (a)	-	-	-	5	1	-	-	.01	.00
F	Sisymbrium altissimum (a)	-	-	2	-	-	-	.00	-	-
F	Sphaeralcea coccinea	b35	ab20	a17	a12	ab20	.14	.11	.27	.38
F	Taraxacum officinale	b27	a3	b21	a-	a1	.00	.38	-	.03
F	Unknown forb-perennial	6	-	-	-	-	-	-	-	-
Total for Annual Forbs		0	93	116	432	78	0.62	0.54	3.10	0.31
Total for Perennial Forbs		216	190	182	105	117	7.49	5.84	2.93	4.49
Total for Forbs		216	283	298	537	195	8.11	6.38	6.04	4.80

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

BROWSE TRENDS--

Management unit 15, Study no: 4

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	Amelanchier utahensis	2	1	2	3	.00	.00	.00	.00
B	Artemisia tridentata vaseyana	7	33	47	61	1.30	3.87	7.98	13.44
B	Cercocarpus montanus	0	1	1	0	-	.00	.00	-
B	Chrysothamnus depressus	0	0	1	0	-	-	.00	-
B	Chrysothamnus nauseosus graveolens	37	44	48	37	1.46	5.48	4.89	4.94
B	Juniperus osteosperma	0	0	1	0	.85	.15	.38	-
B	Pinus edulis	0	3	1	0	1.74	.85	.00	.41
B	Ribes cereum cereum	0	0	0	1	-	-	-	.00
B	Symphoricarpos oreophilus	2	2	4	7	.00	.18	.15	.81
Total for Browse		48	84	105	109	5.36	10.55	13.40	19.61

CANOPY COVER, LINE INTERCEPT--

Management unit 15, Study no: 4

Species	Percent Cover		
	'99	'04	'09
Artemisia tridentata vaseyana	-	9.60	17.86
Cercocarpus montanus	-	.16	-
Chrysothamnus nauseosus graveolens	-	6.93	6.25
Juniperus osteosperma	1.39	.11	-
Pinus edulis	1.00	.60	.15
Symphoricarpos oreophilus	-	-	.03

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 15, Study no: 4

Species	Average leader growth (in)	
	'04	'09
Amelanchier utahensis	6.6	2.6
Artemisia tridentata vaseyana	2.5	2.5

POINT-QUARTER TREE DATA--

Management unit 15, Study no: 4

Species	Trees per Acre			Average diameter (in)		
	'99	'04	'09	'99	'04	'09
Juniperus osteosperma	25	<18	<18	5.8	-	-
Pinus edulis	47	<18	<18	4.9	-	-

BASIC COVER--

Management unit 15, Study no: 4

Cover Type	Average Cover %				
	'87	'94	'99	'04	'09
Vegetation	7.25	39.24	38.48	32.77	39.15
Rock	12.25	13.10	18.34	14.31	14.85
Pavement	9.75	3.17	6.53	6.56	7.64
Litter	49.75	22.01	28.75	33.16	48.90
Cryptogams	0	.03	.04	0	.10
Bare Ground	21.00	10.62	18.14	28.37	14.72

SOIL ANALYSIS DATA --

Management unit 15, Study no: 4, Study Name: South Creek Chaining

Effective rooting depth (in)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
12.4	6.9	45.6	27.8	26.6	3.7	19.7	156.8	0.7

PELLET GROUP DATA--

Management unit 15, Study no: 4

Type	Quadrat Frequency				Days use per acre (ha)		
	'94	'99	'04	'09	'99	'04	'09
Rabbit	31	39	15	19	-	-	-
Elk	-	-	-	4	-	-	4 (10)
Deer	6	4	2	22	13 (32)	5 (13)	54 (134)
Bison/Cattle	12	22	11	8	46 (112)	50 (123)	18 (45)

BROWSE CHARACTERISTICS--

Management unit 15, Study no: 4

		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									
87	66	100	0	0	-	0	100	0	-/-
94	40	0	100	0	100	0	100	0	34/55
99	20	0	100	0	-	0	100	0	17/30
04	40	0	100	0	-	0	100	0	35/56
09	60	0	67	33	-	0	100	33	44/57
Artemisia tridentata vaseyana									
87	33	100	0	0	-	0	100	0	-/-
94	160	38	63	0	6120	0	0	0	16/28
99	2740	39	61	0	4560	9	0	0	14/22
04	5400	19	81	0	30460	27	31	0	13/23
09	18720	70	30	0	12880	23	1	.10	11/18

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Cercocarpus montanus										
87	66	0	100	-	-	0	100	0	8/12	
94	0	0	0	-	-	0	0	0	9/22	
99	20	0	100	-	-	0	100	0	9/27	
04	20	0	100	-	-	0	100	0	22/33	
09	0	0	0	-	-	0	0	0	29/30	
Chrysothamnus depressus										
87	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	20	0	100	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
Chrysothamnus nauseosus graveolens										
87	33	0	100	0	-	100	0	0	43/33	
94	1340	57	40	3	3880	22	4	1	22/24	
99	3220	58	40	2	1000	25	4	0	25/27	
04	1940	12	78	9	6120	0	1	0	25/27	
09	1480	20	53	27	20	1	19	18	27/26	
Juniperus osteosperma										
87	0	0	0	0	-	0	0	0	-/-	
94	0	0	0	0	-	0	0	0	-/-	
99	0	0	0	0	-	0	0	0	-/-	
04	20	0	0	100	20	0	0	100	-/-	
09	0	0	0	0	-	0	0	0	-/-	
Opuntia 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	0	0	0	-	-	0	0	0	5/13	
Pinus edulis										
87	165	40	60	-	-	0	0	0	64/55	
94	0	0	0	-	-	0	0	0	-/-	
99	60	33	67	-	-	0	0	0	-/-	
04	20	0	100	-	20	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
Ribes cereum cereum										
87	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	20	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	68/68	
04	0	0	0	-	-	0	0	0	62/74	
09	20	100	0	-	-	0	0	0	25/23	

		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>Rosa woodsii</i>										
87	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	13/9	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	37/19	
09	0	0	0	-	-	0	0	0	29/22	
<i>Symphoricarpos oreophilus</i>										
87	165	60	40	-	33	0	100	0	13/24	
94	40	100	0	-	-	0	0	0	18/33	
99	40	50	50	-	-	0	0	0	13/21	
04	100	60	40	-	-	0	0	0	17/31	
09	160	0	100	-	-	0	0	0	17/22	