

BIRCH CREEK CHAINING - TREND STUDY NO. 16C-27-09

Vegetation Type: Chained, Seeded P-J

Range Type: Crucial Deer Winter, Substantial Elk Winter

NRCS Ecological Site Description: Not Available

Land Ownership: USFS

Elevation: 7,360 ft (2,243 m)

Aspect: West

Slope: 5%

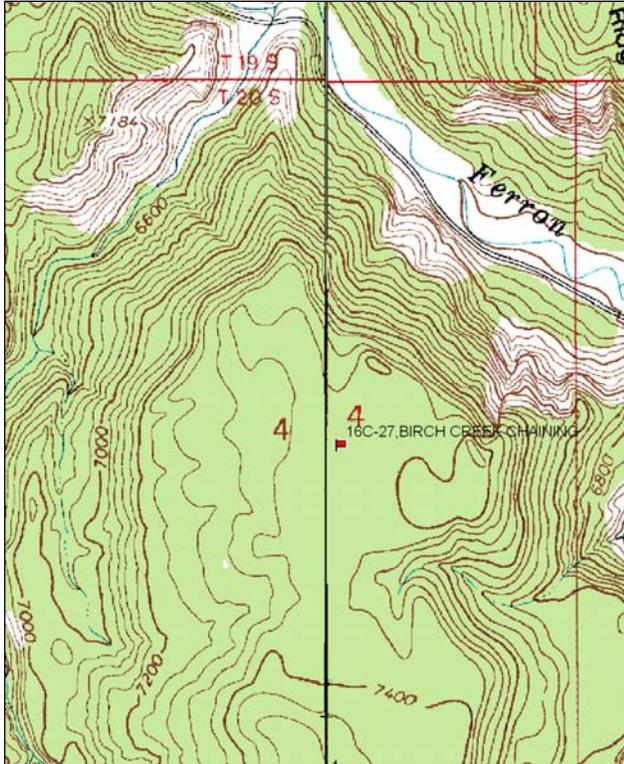
Transect bearing: 180 degrees magnetic.

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

Directions:

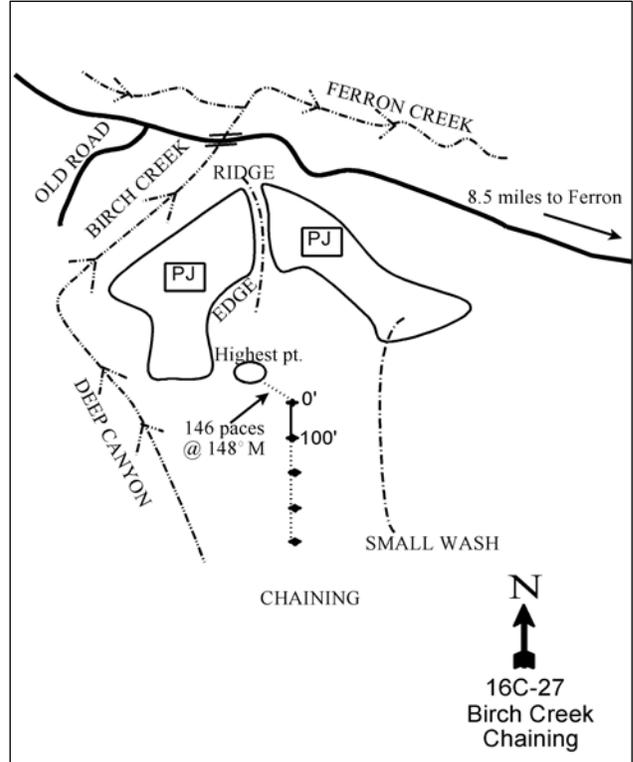
From Ferron, go west up the Ferron Canyon Road approximately 8.5 miles, past Millsite Reservoir and the FS boundary, to a bridge over Birch Creek, a tributary of Ferron Creek (2.1 miles from forest boundary). The Birch Creek chaining is located on top of the bench to the south. The easiest way to the study site is to hike up along the steep and rocky ridge to the P-J on top. Continue south up through the P-J to the edge of the chaining. The study site is in the middle of the chaining, marked by 18" fenceposts. From the highest point along the edge of the P-J, walk south (148° M) for 146 paces to the 0-foot baseline stake. This stake is marked by browse tag #9026.

Map Name: Flagstaff Peak



Township: 20S, Range: 6E, Section: 4

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 478355 E 4328837 N

BIRCH CREEK CHAINING - TREND STUDY NO. 16C-27

Site Information

Site Description: The study is located on the remote, north end of a bench above Ferron Creek. A large area was chained, trenched on contour, and seeded in 1972. Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) is the dominant vegetation over much of the area with grasses fairly abundant within the chaining. The study is located in the center of the chaining. A lop and scatter treatment was done to remove pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) in the fall of 2004, after the site was read. This site is managed by the Forest Service as part of the Ferron allotment. Pellet group data has indicated lightly moderate use by deer and cattle since 1999. Estimated elk use was moderate in 1999, heavy in 2004, and light in 2009 (Table - Pellet Group Data).

Browse: Browse species are limited on the site with mountain big sagebrush providing the majority of the browse cover over the study. Following the removal treatment of pinyon and juniper trees, mountain big sagebrush provided almost all of the browse cover in 2009 (Table - Browse Trends). The sagebrush population is healthy with low decadence, good vigor, and good recruitment of young plants over the length of the study. Sagebrush plants have displayed mostly light with some moderate to heavy utilization since 1994 (Table - Browse Characteristics). Prior to the removal treatment, pinyon and juniper trees had reestablished on the site following the original chaining at moderate densities and size. Following the treatment, there were few trees on the site (Table - Point-Quarter Tree Data) and those sampled were mostly smaller than 4 feet tall. Valuable browse species such as curleaf and true mountain mahogany (*Cercocarpus ledifolius* and *C. montanus*), Utah serviceberry (*Amelanchier utahensis*), ephedra (*Ephedra veridis*), and bitterbrush (*Purshia tridentata*) are found on the undisturbed slopes.

Herbaceous Understory: Grasses are a very important forage resource on this chained site, though they are not very diverse being dominated by seeded species. Seeded species include crested wheatgrass (*Agropyron cristatum*), intermediate wheatgrass (*A. intermedium*), and smooth brome (*Bromus inermis*), with crested wheatgrass being the dominant grass species. Indian ricegrass (*Oryzopsis hymenoides*) is common and is the most prevalent native grass species on the site. Forbs are extremely rare on the site and have provided less than 1% cover since 1994 (Table - Herbaceous Trends).

Soil: Soil texture is a sandy clay loam with a slightly alkaline pH. Potassium has limited availability for plant growth and development 51.2 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Bare ground cover is low with good protective ground cover coming primarily from large debris from the chaining and lop-and-scatter treatments (Table - Basic Cover). The well-vegetated trenches also help to prevent erosion on this gentle slope. The soil erosion condition was classified as stable in 2004 and 2009.

Trend Assessments

Browse:

- **1988 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 the mountain big sagebrush population.
- **1994 to 1999 - up (+2):** Density of mountain big sagebrush increased by 22% from 3,000 plants/acre to 3,660 plants/acre, and cover increased from 8% to 11%. Decadence, vigor, and recruitment of mountain big sagebrush all remained good.
- **1999 to 2004 - stable (0):** There was little change in the density of mountain big sagebrush, though cover increased to 13%. Decadence of sagebrush increased from 13% to 25% and poor vigor increased from 2% to 10%. Recruitment of young sagebrush decreased from 15% to 10%, but is still considered good.

- **2004 to 2009 - up (+2):** The density of mountain big sagebrush increased by 54% from 3,540 plants/acre to 5,480 plants/acre. Decadence of sagebrush decreased to 12% and recruitment of young plants increased to 22% of the population.

Grass:

- **1988 to 1994 - down (-2):** The sum of nested frequency of perennial grasses decreased by 34% with a significant decrease in intermediate wheatgrass and bottlebrush squirreltail (*Sitanion hystrix*) nested frequency.
- **1994 to 1999 - slightly up (+1):** Perennial grass sum of nested frequency increased by 19% and cover increased from 12% to 14%. There was a significant increase in the nested frequency of crested wheatgrass and smooth brome.
- **1999 to 2004 - down (-2):** There was a 47% decrease in the sum of nested frequency of perennial grasses and cover decreased to 8%. There was a significant decrease in the three seeded species, crested wheatgrass, intermediate wheatgrass, and smooth brome.
- **2004 to 2009 - up (+2):** The sum of nested frequency of perennial grasses increased by 28% and cover increased to 11%.

Forb:

- **1988 to 1994 - stable (0):** Forbs are very rare on the site.
- **1994 to 1999 - stable (0):** Forbs are very rare on the site.
- **1999 to 2004 - stable (0):** Forbs are very rare on the site.
- **2004 to 2009 - stable (0):** Forbs are very rare on the site.

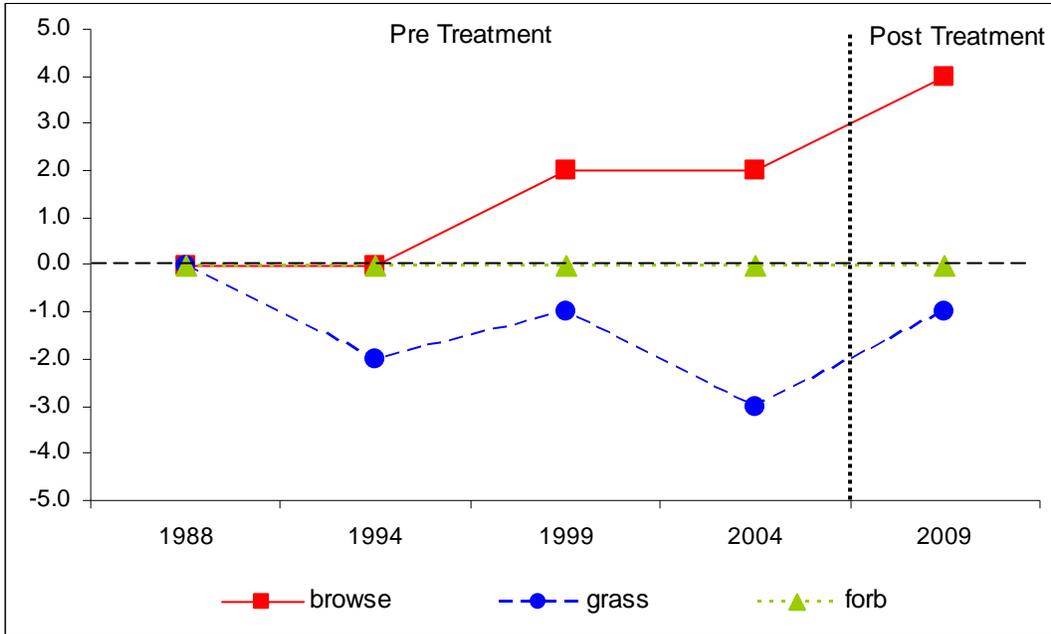
DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --

Management unit 16C, study no: 27

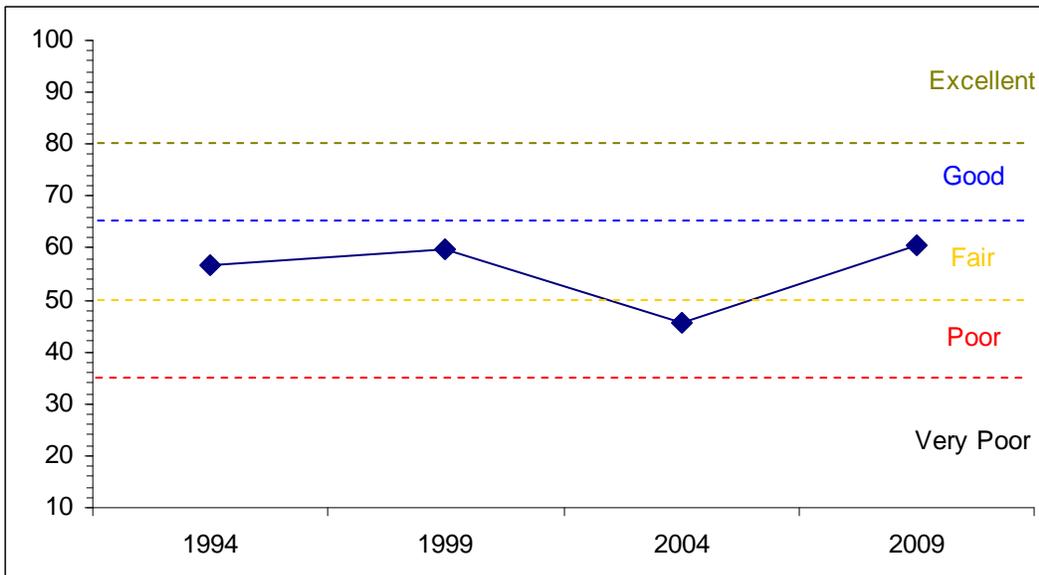
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
94	9.8	11.7	11.5	23.8	0.0	0.1	0.0	56.9	Fair
99	13.8	11.1	7.5	27.4	0.0	0.0	0.0	59.8	Fair
04	16.7	7.5	5.0	16.3	0.0	0.1	0.0	45.5	Poor
09	16.3	11.4	11.0	21.7	0.0	0.0	0.0	60.4	Fair

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 16C Study no: 27



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL
Management unit 16C, Study no: 27



HERBACEOUS TRENDS--

Management unit 16C, Study no: 27

Type	Species	Nested Frequency					Average Cover %			
		'88	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron cristatum	a159	a154	b191	a131	ab157	8.27	10.18	7.07	9.55
G	Agropyron intermedium	d162	c77	bc56	a15	ab25	1.88	.99	.11	.20
G	Bromus inermis	bc77	ab53	c90	a25	a39	1.08	1.47	.28	.17
G	Elymus salina	-	2	-	-	-	.00	-	.00	-
G	Oryzopsis hymenoides	37	18	23	15	28	.61	1.00	.59	.94
G	Sitanion hystrix	b23	a3	a7	a5	a-	.00	.04	.03	-
G	Sporobolus cryptandrus	-	1	-	3	-	.00	-	.03	-
G	Stipa pinetorum	9	-	-	-	-	-	-	-	-
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		467	308	367	194	249	11.88	13.69	8.13	10.87
Total for Grasses		467	308	367	194	249	11.88	13.69	8.13	10.87
F	Arabis sp.	-	2	-	-	-	.03	-	-	-
F	Chenopodium fremontii (a)	-	-	-	2	3	-	-	.03	.00
F	Chenopodium glaucum (a)	b9	a1	a-	a-	a-	.00	-	-	-
F	Chenopodium sp. (a)	-	a-	a-	b12	a-	-	-	.19	-
F	Cryptantha sp.	1	-	-	-	-	-	-	-	-
F	Descurainia pinnata (a)	-	a5	a-	b30	a-	.01	-	.22	-
F	Ipomopsis aggregata	3	3	-	-	-	.00	-	-	-
F	Penstemon caespitosus	5	5	-	-	3	.03	-	-	.00
F	Senecio multilobatus	b11	a-	a-	a1	a-	-	-	.03	-
Total for Annual Forbs		9	6	0	44	3	0.01	0	0.45	0.00
Total for Perennial Forbs		20	10	0	1	3	0.07	0	0.03	0.00
Total for Forbs		29	16	0	45	6	0.09	0	0.48	0.00

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

BROWSE TRENDS--

Management unit 16C, Study no: 27

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	Amelanchier utahensis	0	1	1	1	-	.00	.00	.00
B	Artemisia tridentata vaseyana	56	68	71	81	7.80	11.05	13.35	13.01
B	Chrysothamnus parryi	0	0	0	1	-	-	-	.00
B	Gutierrezia sarothrae	2	5	4	2	.00	.16	.00	.00
B	Juniperus osteosperma	0	1	2	0	2.36	1.62	1.64	.03
B	Opuntia sp.	1	1	3	3	.00	.00	.03	.03
B	Pinus edulis	0	2	2	0	2.64	1.85	2.99	.03
B	Symphoricarpos oreophilus	0	0	1	0	-	-	.00	-
Total for Browse		59	78	84	88	12.81	14.69	18.01	13.10

CANOPY COVER, LINE INTERCEPT--

Management unit 16C, Study no: 27

Species	Percent Cover		
	'99	'04	'09
Artemisia tridentata vaseyana	-	17.36	13.78
Chrysothamnus parryi	-	-	1.36
Juniperus osteosperma	2.00	1.70	-
Opuntia sp.	-	.05	.11
Pinus edulis	-	4.15	-

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 16C, Study no: 27

Species	Average leader growth (in)	
	'04	'09
Artemisia tridentata vaseyana	2.9	0.6

POINT-QUARTER TREE DATA--

Management unit 16C, Study no: 27

Species	Trees per Acre			Average diameter (in)		
	'99	'04	'09	'99	'04	'09
Juniperus osteosperma	76	77	30	3.4	4.3	1.1
Pinus edulis	53	54	9	3.6	3.8	1.3

BASIC COVER--

Management unit 16C, Study no: 27

Cover Type	Average Cover %				
	'88	'94	'99	'04	'09
Vegetation	2.50	25.13	27.78	25.98	24.28
Rock	1.75	2.50	2.96	2.81	2.67
Pavement	2.00	.49	1.72	1.97	3.48
Litter	65.00	44.10	56.28	44.98	53.02
Cryptogams	0	.09	.04	1.07	.07
Bare Ground	28.75	26.70	24.94	38.90	28.48

SOIL ANALYSIS DATA --

Management unit 16C, Study no: 27, Study Name: Birch Creek Chaining

Effective rooting depth (in)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
15	7.4	72.7	5.4	21.8	1.7	9.6	51.2	0.6

PELLET GROUP DATA--

Management unit 16C, Study no: 27

Type	Quadrat Frequency				Days use per acre (ha)		
	'94	'99	'04	'09	'99	'04	'09
Rabbit	31	40	10	20	-	-	-
Elk	23	18	32	21	35 (87)	67 (165)	12 (30)
Deer	24	14	9	4	11 (27)	17 (41)	21 (51)
Cattle	-	3	1	4	23 (57)	22 (56)	7 (18)

BROWSE CHARACTERISTICS--
Management unit 16C, Study no: 27

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<i>Amelanchier utahensis</i>									
88	0	0	0	0	-	0	0	0	-/-
94	0	0	0	0	-	0	0	0	-/-
99	20	100	0	0	-	0	0	0	-/-
04	20	0	100	0	-	100	0	0	17/13
09	20	0	0	100	-	0	100	100	23/17
<i>Artemisia tridentata vaseyana</i>									
88	3131	34	53	13	599	43	28	4	12/18
94	3000	23	65	11	40	31	8	1	17/27
99	3660	15	73	13	-	26	21	2	17/27
04	3540	10	66	25	1020	38	14	10	15/32
09	5480	22	66	12	480	23	16	9	16/28
<i>Chrysothamnus parryi</i>									
88	0	0	0	0	-	0	0	0	-/-
94	0	0	0	0	-	0	0	0	-/-
99	0	0	0	0	-	0	0	0	-/-
04	0	0	0	0	-	0	0	0	-/-
09	20	0	0	100	-	0	100	100	-/-
<i>Gutierrezia sarothrae</i>									
88	66	0	100	-	-	0	0	0	27/11
94	40	0	100	-	-	0	0	0	5/7
99	100	0	100	-	-	0	0	0	6/7
04	140	29	71	-	-	0	0	0	6/11
09	40	0	100	-	-	0	0	0	5/6
<i>Juniperus osteosperma</i>									
88	132	50	50	-	-	0	0	0	47/19
94	0	0	0	-	-	0	0	0	-/-
99	40	0	100	-	-	0	0	0	-/-
04	40	50	50	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
<i>Opuntia sp.</i>									
88	66	0	0	100	-	0	0	100	-/-
94	20	0	100	0	-	0	0	0	2/4
99	20	0	100	0	-	0	0	0	5/11
04	60	0	100	0	-	0	0	0	4/12
09	60	0	100	0	-	0	0	0	4/15

		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>Pinus edulis</i>										
88	332	80	20	-	-	0	0	20	43/57	
94	0	0	0	-	-	0	0	0	-/-	
99	40	50	50	-	-	0	0	0	-/-	
04	40	50	50	-	-	0	0	0	-/-	
09	0	0	0	-	20	0	0	0	-/-	
<i>Purshia tridentata</i>										
88	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	31/80	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	28/75	
<i>Symphoricarpos oreophilus</i>										
88	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	9/10	
09	0	0	0	-	-	0	0	0	-/-	