

Trend Study 29-4-08

Study site name: Barracks Chaining .

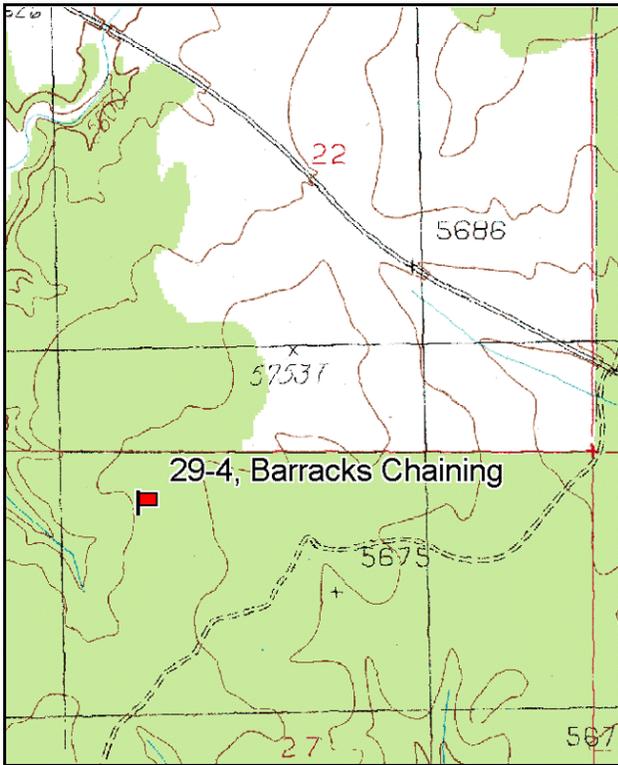
Vegetation type: Chaining .

Compass bearing: frequency baseline 165 degrees magnetic.

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

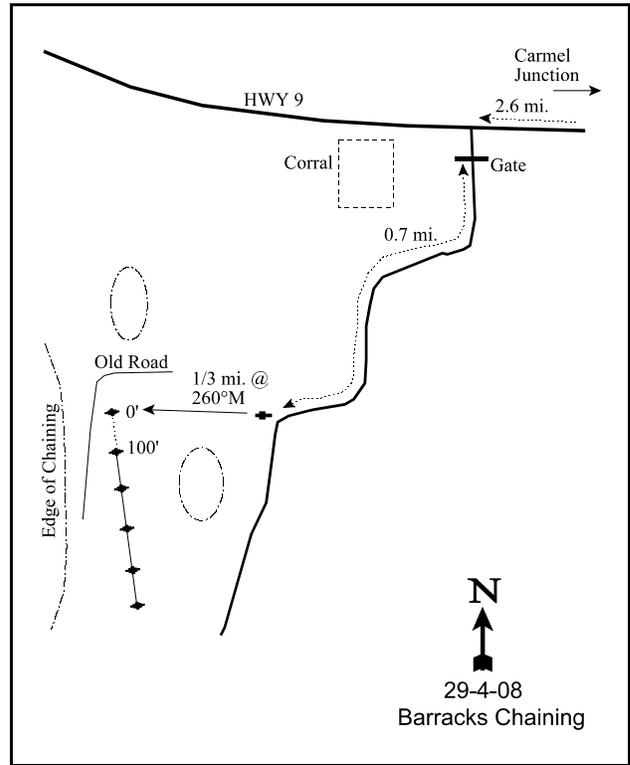
LOCATION DESCRIPTION

From the junction of Hwy 89 and Hwy 9 (Carmel Junction), proceed west on Hwy 9 for 2.6 miles to a road on the left (south) side of the Hwy. Turn left on this road, go through a gate, proceed 0.7 miles passing a corral on the right side of the road to a witness post on the right side of the road. From the witness post, walk ~1/3-1/2 mile at 260 degrees magnetic to the 0-foot stake.



Map Name: Mount Carmel

Township 41S, Range 8W, Section 27



Diagrammatic Sketch

GPS: NAD 83, UTM 12S 346134 E, 4120740 N

DISCUSSION

Barracks Chaining - Trend Study No. 29-4

Study Information

This trend study was established in 2003 on an old chaining located about three miles west of Carmel Junction and approximately one-half mile south of Highway 9 on BLM land [elevation: 5,730 (1,747 m), slope: 7%, aspect: west]. The site samples a chained area surrounded on three sides by unchained pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) woodland. This is an important area for wintering deer. Pellet group data taken on the site estimated 45 deer days use/acre in 2003. Cattle also use the site with 14 days use/acre being estimated (34 cdu/ha). Pellet data from 2008 estimated 56 deer days use/acre (139 ddu/ha) and 25 cow days use/acre (61 cdu/ha).

Soils

Soil at the site is a deep sandy clay loam. Effective rooting depth is estimated at 16 inches. There is very little rock or pavement on the surface or within the soil profile. Phosphorus has a low availability for plant growth and development at only 4 ppm (Tiedemann and Lopez 2004). Organic matter is also low at about 1%. There is still a lot of old chaining litter scattered over the site, but relative bare ground cover was common in 2003 at 42%, dropping to 15% in 2008. There are signs of erosion in the form of pedestalling, flow patterns, and soil movement. Most of this is localized, but due to these factors the erosion condition class was rated as slight in both 2003 and 2008.

Browse

There are several species of preferred browse on the site including serviceberry (*Amelanchier utahensis*), mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), squaw-apple (*Peraphyllum ramosissimum*), and bitterbrush (*Purshia tridentata*). Serviceberry numbered only 100 plants/acre in 2003, decreasing to 20 plants/acre in 2008. Mountain big sagebrush had a density estimated at 60 plants/acre in 2003, but that has increased to 740 plants/acre in 2008. Decadence has decreased from 33% in 2003 to 5% in 2008. No mountain big sagebrush seedlings or young were encountered in 2003 but 620 were seen in 2008. Bitterbrush density averaged 170 plants/acre from 2003 to 2008.

Pinyon and juniper trees are still found in the chaining. Point-quarter data estimated a density of 47 pinyon and 56 juniper trees/acre in 2003 and 36 juniper and 39 pinyon trees/acre in 2008. Average 2008 diameter was estimated at 4.7 inches for pinyon and 6.7 inches for juniper. Approximately 15-18% of the juniper trees sampled in 2003 and 2008 were mature trees that were chained over but still living.

Herbaceous understory

The herbaceous understory is diverse but only moderately abundant. Five perennial and two annual grasses were encountered in 2008 with 14% cover. Seeded species, crested and intermediate wheatgrass (*Agropyron cristatum* and *A. intermedium*), are the most abundant accounting for 26% and 62% of the total grass cover respectively. Forbs are abundant and include Searls prairie clover (*Dalea searlsiae*), coyote tobacco (*Nicotiana attenuata*), lemon scurf-pea (*Psoralea lanceolata*), cutleaf nightshade (*Solanum triflorum*), and gooseberryleaf globemallow (*Sphaeralcea grossulariifolia*).

2003 DESIRABLE COMPONENTS INDEX

Winter range condition (DCI) - poor (43) Mid-level potential scale

2008 TREND ASSESSMENT

Browse trend is slightly up. The three preferred browse species, serviceberry, mountain big sagebrush, and bitterbrush, provided only 5% cover. Mountain big sagebrush increased in density from 60 plants/acre in 2003 to 740 plants/acre, of which 620 plants/acre were young plants. This type of recruitment bodes well for this

population. Serviceberry decreased in density from 100 plants/acre to only 20 plants/acre with no young. Grass trend is up. Perennial grasses increased in sum of nested frequency by 81%, and cover of perennial grasses increased from 6% in 2003 to 14%. Annual grasses increased more than two-fold in sum of nested frequency, and cover of annual grasses increased from 0.5% in 2003 to 1.4%. Crested wheatgrass and intermediate wheatgrass accounted for 88% of the total grass cover. Cheatgrass (*Bromus tectorum*) was the most common annual and accounted for 1% of the total cover. Forb trend is up. Sum of nested frequency of perennial forbs increased 40% since 2003, with a significant increase in the nested frequency of gooseberryleaf globemallow.

Winter range condition (DCI) - fair (61) Mid-level potential scale
browse - slightly up (+1) grasses - up (+2) forbs - up (+2)

HERBACEOUS TRENDS --
 Management unit 29 , Study no: 4

T y p e	Species	Nested Frequency		Average Cover %	
		'03	'08	'03	'08
G	Agropyron cristatum	_a 46	_b 108	1.20	3.94
G	Agropyron intermedium	_a 117	_b 213	3.42	9.59
G	Bouteloua gracilis	_a 1	_b 60	.15	.44
G	Bromus tectorum (a)	_a 9	_b 146	.57	1.36
G	Oryzopsis hymenoides	5	-	.03	-
G	Poa fendleriana	-	1	-	.00
G	Sitanion hystrix	2	7	.00	.02
G	Sporobolus cryptandrus	_b 48	_a 8	.71	.01
G	Vulpia octoflora (a)	2	9	.01	.03
Total for Annual Grasses		11	155	0.57	1.39
Total for Perennial Grasses		219	397	5.53	14.01
Total for Grasses		230	552	6.11	15.41
F	Amaranthus graecizans	4	-	.01	-
F	Chaenactis douglasii	-	5	-	.01
F	Chenopodium fremontii (a)	-	1	.15	.00
F	Collinsia parviflora (a)	_a -	_b 11	-	.05
F	Dalea searlsiae	33	31	2.53	1.99
F	Descurainia pinnata (a)	-	4	-	.04
F	Erigeron divergens	1	6	.03	.04
F	Euphorbia sp.	27	50	.55	.75
F	Gayophytum ramosissimum(a)	-	6	-	.02
F	Gilia sp. (a)	-	7	-	.01
F	Hymenopappus filifolius	5	-	.06	-
F	Lappula occidentalis (a)	_a -	_b 99	-	3.10
F	Lotus utahensis	2	-	.15	-

T y p e	Species	Nested Frequency		Average Cover %	
		'03	'08	'03	'08
F	Lupinus sp.	-	1	-	.01
F	Nicotiana attenuata (a)	6	-	1.04	-
F	Penstemon humilis	1	1	.00	.03
F	Penstemon leonardi	1	8	.03	.04
F	Phlox longifolia	9	3	.02	.00
F	Psoralea lanceolata	15	11	1.61	.24
F	Solanum triflorum (a)	_b 23	_a -	1.40	-
F	Sphaeralcea grossulariifolia	_a 66	_b 113	2.55	3.73
F	Tragopogon dubius	-	-	.03	-
Total for Annual Forbs		29	128	2.59	3.24
Total for Perennial Forbs		164	229	7.60	6.87
Total for Forbs		193	357	10.20	10.12

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

BROWSE TRENDS --

Management unit 29 , Study no: 4

T y p e	Species	Strip Frequency		Average Cover %	
		'03	'08	'03	'08
B	Amelanchier utahensis	3	1	1.70	1.50
B	Artemisia tridentata vaseyana	3	12	.38	.82
B	Juniperus osteosperma	3	3	1.62	2.11
B	Opuntia sp.	0	1	-	.03
B	Peraphyllum ramosissimum	0	1	-	.00
B	Pinus edulis	3	3	1.00	2.11
B	Purshia tridentata	7	7	3.03	2.82
Total for Browse		19	28	7.75	9.40

CANOPY COVER, LINE INTERCEPT --

Management unit 29 , Study no: 4

Species	Percent Cover	
	'03	'08
Amelanchier utahensis	1.60	3.29
Artemisia tridentata vaseyana	.73	1.00
Juniperus osteosperma	1.83	2.48
Pinus edulis	1.23	1.70
Purshia tridentata	3.71	3.54

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 29 , Study no: 4

Species	Average leader growth (in)	
	'03	'08
Amelanchier utahensis	5.0	1.6
Artemisia tridentata vaseyana	4.8	1.5
Purshia tridentata	6.4	1.8

POINT-QUARTER TREE DATA --

Management unit 29 , Study no: 4

Species	Trees per Acre	
	'03	'08
Juniperus osteosperma	47	36
Pinus edulis	56	39

Average diameter (in)	
'03	'08
3.1	6.7
2.6	4.7

BASIC COVER --

Management unit 29 , Study no: 4

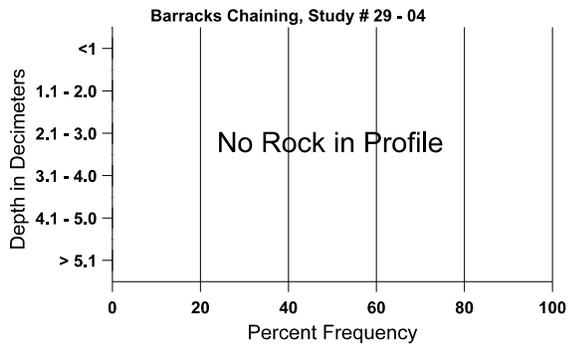
Cover Type	Average Cover %	
	'03	'08
Vegetation	22.40	35.04
Rock	.03	0
Pavement	.04	.04
Litter	42.29	46.73
Cryptogams	.21	.12
Bare Ground	47.20	36.32

SOIL ANALYSIS DATA --

Management unit 29, Study no: 4, Study Name: Barracks Chaining

Effective rooting depth (in)	Temp °F (depth)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
			% sand	% silt	% clay				
16.1	70.8 (18.1)	6.5	62.6	14.7	22.7	1.0	4.0	448.0	0.5

Stoniness Index



PELLET GROUP DATA --

Management unit 29 , Study no: 4

Type	Quadrat Frequency	
	'03	'08
Rabbit	35	89
Horse	1	-
Elk	1	-
Deer	31	24
Cattle	9	6

Days use per acre (ha)	
'03	'08
-	-
-	-
-	-
45 (111)	56 (139)
14 (34)	25 (61)

BROWSE CHARACTERISTICS --
Management unit 29 , Study no: 4

		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)
Amelanchier utahensis												
03	100	-	40	60	-	-	40	0	-	-	0	81/92
08	20	-	-	20	-	-	0	0	-	-	0	108/120
Artemisia tridentata vaseyana												
03	60	-	-	40	20	-	33	33	33	-	0	16/27
08	740	5300	620	80	40	-	5	0	5	-	0	16/17
Chrysothamnus viscidiflorus												
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	17/10
Juniperus osteosperma												
03	120	-	120	-	-	-	0	0	-	-	0	-/-
08	60	-	20	40	-	20	0	0	-	-	0	-/-
Opuntia sp.												
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	20	-	-	20	-	-	0	0	-	-	0	5/9
Peraphyllum ramosissimum												
03	0	-	-	-	-	-	0	0	-	-	0	87/103
08	20	-	-	20	-	-	0	0	-	-	0	76/115
Pinus edulis												
03	60	-	20	40	-	-	0	0	-	-	0	-/-
08	60	-	-	60	-	-	0	0	-	-	0	-/-
Purshia tridentata												
03	180	-	-	120	60	-	56	44	33	11	11	54/86
08	160	-	20	60	80	-	38	0	50	25	25	59/87
Quercus gambelii												
03	0	-	-	-	-	-	0	0	-	-	0	26/25
08	0	-	-	-	-	-	0	0	-	-	0	44/31