

Trend Study 21A-3-07

Study site name: Cascade Spring .

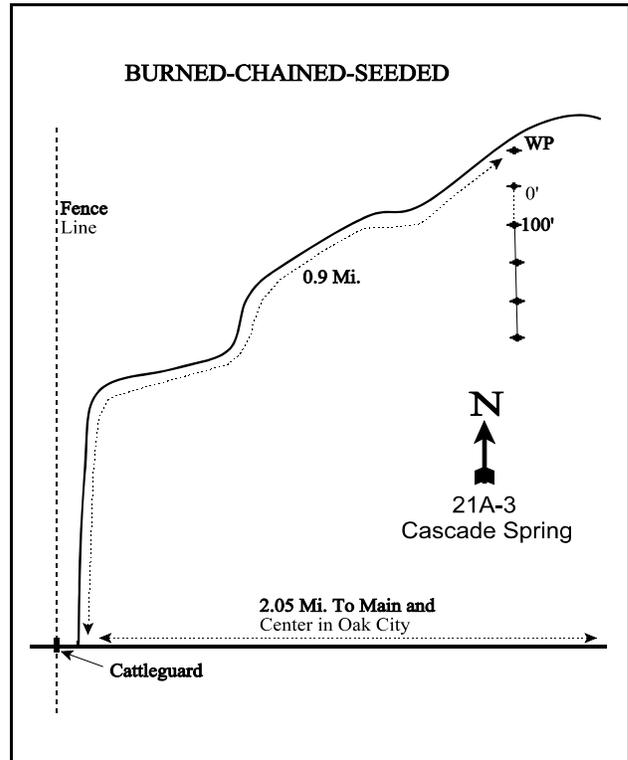
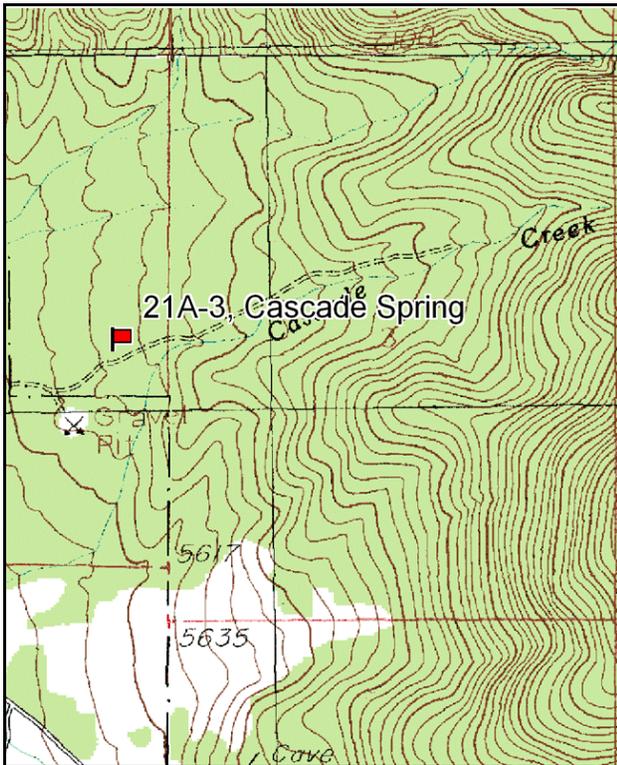
Vegetation type: Burn-perennial grass .

Compass bearing: frequency baseline 180 degrees magnetic.

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

LOCATION DESCRIPTION

From Main Street and Center in Oak City, go east on Center 0.35 miles around an "S" bend to an intersection. Stay left and continue 1.7 miles to a cattleguard. Just beyond the cattleguard, turn left up the road to Cascade Spring. Follow this road around several bends for 0.9 miles to a 5/8" rebar 10 feet off the right side of the road. The baseline starts 55 feet true south of this witness post. The 0-foot baseline stake is tagged #7114. The 100-foot end of the baseline is marked by a rebar that is actually only 99 feet south of the 0-foot baseline stake.



Map Name: Oak City South

Diagrammatic Sketch

Township 17S, Range 4W, Section 4

GPS: NAD 83, UTM 12S 388500 E 4358370 N

DISCUSSION

Cascade Spring - Trend Study No. 21A-3

Study Information

This study is located near the Cascade Spring pellet group transect, 2 miles (3.2 km) east of Oak City [elevation: 5,700 feet (1,737 m), slope: 13%, aspect: west]. It was burned by wildfire in 1981, and the lower slopes were seeded and chained the following year. The vegetative composition has been dominated by annuals and seeded grasses since the treatment. The U.S. Forest Service considered the project successful in establishing range suitable for cattle grazing, however, the area has limited value for wintering deer due to the lack of browse and thermal cover. The study burned again in 2006 in a wildfire. Pellet group transect data were estimated at 12 deer days use/acre (30 ddu/ha) in 1998, 3 deer days use/acre (8 ddu/ha) in 2003, and 15 deer days use/acre (38 ddu/ha) in 2007. A deer was observed during the 2007 sampling. A few elk pellets were also sampled in 2003. Cattle use was estimated at 62 days use/acre (153 cdu/ha) in 1998, 13 days use/acre (32 cdu/ha) in 2003, and 38 days use/acre (95 cdu/ha) in 2007. It was noted that the cattle pats sampled in 2007 were from the previous summer.

Soil

The nearest identified soil series is the Kapod-Collard complex, which lies approximately 300 feet (91 m) from the study (USDA-NRCS 2007). The soils in the Kapod series are very deep and well-drained, and formed in alluvium derived dominantly from sandstone and limestone. The soils in the Collard series are very deep and somewhat excessively drained. They formed in alluvium derived dominantly from quartzite, sandstone, and quartzite conglomerate. The soil on the study is very rocky on the surface and throughout the profile. The texture is a loam and the pH is neutral (6.8). Relative vegetation cover has increased from 32% in 1998 to 49% in 2007, while relative litter cover has decreased from 37% in 1998 to 29% in 2007. A large gully, which is currently covered with vegetation, is evidence that erosion was a concern on the study previous to establishment. The soil erosion condition was classified as stable in 2003 and 2007.

Browse

No browse was sampled when the study was established in 1985. The only browse species that have been sampled are broom snakeweed (*Gutierrezia sarothrae*) and very low densities of echinocereus (*Echinocereus* sp.) and pricklypear (*Opuntia* sp.). The snakeweed density increased from 200 plants/acre (494 plants/ha) in 1991 to 740 plants/acre (1,829 plants/ha) in 1998, decreased to 280 plants/acre (692 plants/ha) in 2003, then increased to 1,860 plants/acre (4,596 plants/ha) by 2007. The plants have been mostly mature, except in 2007 when approximately half of the sampled plants were young. According to the 1981 Forest Service revegetation report, bitterbrush (*Purshia tridentata*) and fourwing saltbush (*Atriplex canescens*) were included in the seed mix, but there are still no preferred browse species present.

Herbaceous Understory

Grasses have comprised over 90% of the total vegetative cover since 1998. Identification of grass species was difficult in 1998 due to intense livestock grazing. Intermediate wheatgrass (*Agropyron intermedium*) is the dominant seeded grass and has maintained a stable cover of 12% between 1998 and 2007. Other perennial species, such as Sandberg bluegrass (*Poa secunda*) and crested wheatgrass (*Agropyron cristatum*) are relatively abundant. Bulbous bluegrass (*Poa bulbosa*) has increased significantly in nested frequency every year since 1991, and increased from 4% cover in 1998 to 13% in 2007. Cheatgrass (*Bromus tectorum*) has also increased substantially. It provided 15% of the total grass cover in 2003, and 45% in 2007. Cheatgrass cover increased from 5% in 2003 to 24% in 2007, and it was the dominant grass in 2007.

Forbs are sparse, and diversity is poor. Alfalfa (*Medicago sativa*) was seeded, and was the most abundant forb in 1985. However, most of the sampled plants were small and almost entirely eaten by insects. The nested frequency of alfalfa declined significantly in subsequent years, and only a few plants were sampled in 1991

and 2007. Forbs provided less than 1% cover in 1998 and 2003. Total forb cover increased to 4% in 2007, however, this increase was mostly attributed to a significant increase in storksbill (*Erodium cicutarium*) cover. Storksbill has been shown to outcompete and prevent the establishment of native species (Kimball and Schiffman 2003), and it largely dominated the forb component in 2003 and 2007. Additionally, field bindweed (*Convolvulus arvensis*), a noxious weed, was sampled in 2003 and 2007.

1991 TREND ASSESSMENT

The trend for browse is stable, due to the continuing lack of browse. The trend for grass is up. The sum of nested frequency for perennial grasses increased almost 30%. Intermediate wheatgrass and Sandberg bluegrass increased significantly in nested frequency. The trend for forbs is down. The sum of nested frequency for perennial forbs decreased almost 80%, and alfalfa decreased significantly in nested frequency.

browse - stable (0)

grass - up (+2)

forb - down (-2)

1998 TREND ASSESSMENT

The trend for browse is stable. No key browse species were sampled. The trend for grass is up. The sum of nested frequency for perennial grasses, excluding bulbous bluegrass, increased 62%. Intermediate wheatgrass continued to increase significantly in nested frequency. However, bulbous bluegrass also increased significantly in nested frequency. The trend for forbs is stable. The sum of nested frequency for perennial forbs remained very low. The number of forb species sampled decreased from five to one. The Desirable Components Index (DCI) was rated as poor-fair due to the lack of browse and perennial forb cover, but perennial grass cover was high.

winter range condition (DCI) - poor-fair (26) Low potential scale

browse - stable (0)

grass - up (+2)

forb - stable (0)

2003 TREND ASSESSMENT

The trend for browse is stable, due to the lack of key browse. The trend for grass is stable. The sum of nested frequency for perennial grasses, with the exception of bulbous bluegrass, changed very little. Sandberg bluegrass increased significantly in nested frequency, while crested wheatgrass decreased significantly in nested frequency. However, bulbous bluegrass nested frequency also significantly increased, and its average cover increased from 4% to 9%. The trend for forbs is slightly down. The sum of nested frequency for perennial forbs remained low. Bindweed was also sampled, but at a very low frequency. The DCI rating remained poor-fair.

winter range condition (DCI) - poor-fair (24) Low potential scale

browse - stable (0)

grass - stable (0)

forb - slightly down (-1)

2007 TREND ASSESSMENT

The trend for browse continued to be stable with the lack of key browse. The trend for grass is down. The sum of nested frequency for perennial grasses, excluding bulbous bluegrass, decreased 17%. Sandberg bluegrass decreased significantly in nested frequency, while bulbous bluegrass and cheatgrass increased significantly in nested frequency. The average cover of bulbous bluegrass continued to increase from 9% to 13%, and cheatgrass cover increased from 5% to 24%. The trend for forbs is slightly up. The sum of nested frequency for perennial forbs, excluding bindweed, increased substantially, and the number of perennial species sampled doubled from two to four. Bindweed was sampled again, but did not change in nested frequency. However, storksbill increased substantially in nested frequency. The DCI rating decreased to very poor-poor due to the increase in annual grass cover.

winter range condition (DCI) - very poor-poor (11) Low potential scale

browse - stable (0)

grass - down (-2)

forb - slightly up (+1)

HERBACEOUS TRENDS --
 Management unit 21A, Study no: 3

Type	Species	Nested Frequency					Average Cover %		
		'85	'91	'98	'03	'07	'98	'03	'07
G	<i>Agropyron cristatum</i>	_b 111	_b 76	_b 88	_a 36	_a 31	4.55	1.60	1.09
G	<i>Agropyron intermedium</i>	_a 33	_b 73	_c 202	_c 205	_c 218	11.82	11.61	12.27
G	<i>Agropyron spicatum</i>	_a 1	_a 4	-	_a 6	_a 9	-	.78	1.17
G	<i>Bromus inermis</i>	_b 34	_{ab} 32	_{ab} 26	-	_a 8	.73	-	.24
G	<i>Bromus tectorum</i> (a)	-	-	_a 191	_a 184	_b 334	5.32	5.44	24.35
G	<i>Poa bulbosa</i>	-	_a 8	_b 77	_c 119	_d 177	4.05	9.20	13.41
G	<i>Poa secunda</i>	_a 31	_b 86	_b 122	_c 182	_b 91	4.02	7.24	2.11
G	<i>Vulpia octoflora</i> (a)	-	-	_a 1	-	_a 6	.00	-	.01
Total for Annual Grasses		0	0	192	184	340	5.32	5.44	24.36
Total for Perennial Grasses		210	279	515	548	534	25.18	30.45	30.31
Total for Grasses		210	279	707	732	874	30.51	35.89	54.68
F	<i>Artemisia ludoviciana</i>	-	-	4	-	-	.06	-	-
F	<i>Astragalus eurekensis</i>	-	-	-	-	6	-	-	.06
F	<i>Calochortus nuttallii</i>	-	-	-	-	9	-	-	.05
F	<i>Convolvulus arvensis</i>	-	-	-	_a 5	_a 5	-	.06	.19
F	<i>Cymopterus</i> sp.	-	-	-	_a 1	_b 8	-	.00	.09
F	<i>Draba</i> sp. (a)	-	-	-	-	1	-	-	.00
F	<i>Erodium cicutarium</i> (a)	_b 54	-	-	_a -	_c 134	-	.38	3.39
F	<i>Erigeron</i> sp.	13	-	-	-	-	-	-	-
F	<i>Lactuca serriola</i>	-	_a 10	_a -	-	_b 88	.03	-	.51
F	<i>Medicago sativa</i>	_b 76	_a 4	-	-	_a 3	-	-	.01
F	<i>Ranunculus testiculatus</i> (a)	-	-	-	-	22	-	-	.09
F	<i>Stephanomeria exigua</i> (a)	11	-	-	-	-	-	-	-
F	<i>Taraxacum officinale</i>	-	-	-	2	-	-	.00	-
F	<i>Tragopogon dubius</i>	-	_a 1	-	-	_a 3	-	-	.03
F	Unknown forb-annual (a)	-	3	-	-	-	-	-	-
F	Unknown forb-perennial	-	4	-	-	-	-	-	-
Total for Annual Forbs		65	3	0	0	157	0	0.37	3.49
Total for Perennial Forbs		89	19	4	8	122	0.09	0.07	0.96
Total for Forbs		154	22	4	8	279	0.09	0.45	4.45

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

BROWSE TRENDS --

Management unit 21A, Study no: 3

Type	Species	Strip Frequency			Average Cover %		
		'98	'03	'07	'98	'03	'07
B	Echinocereus sp.	1	1	1	-	-	-
B	Gutierrezia sarothrae	11	6	15	.69	.15	.51
B	Opuntia sp.	0	1	1	-	.03	.15
Total for Browse		12	8	17	0.69	0.18	0.66

CANOPY COVER, LINE INTERCEPT --

Management unit 21A, Study no: 3

Species	Percent Cover	
	'03	'07
Echinocereus sp.	.05	-
Gutierrezia sarothrae	-	.91
Opuntia sp.	-	.16

BASIC COVER --

Management unit 21A, Study no: 3

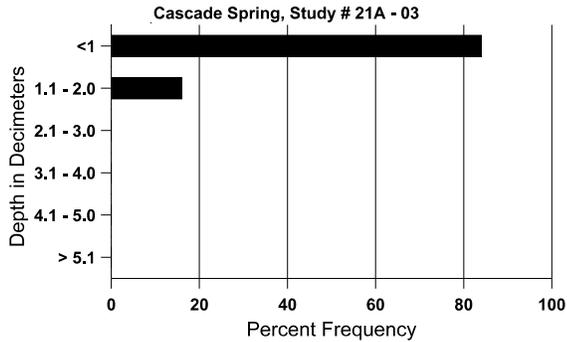
Cover Type	Average Cover %				
	'85	'91	'98	'03	'07
Vegetation	7.25	10.75	35.95	38.94	56.18
Rock	24.25	22.00	14.15	21.33	20.97
Pavement	9.00	6.25	3.32	5.62	3.34
Litter	40.75	44.00	41.01	29.78	32.97
Cryptogams	.75	1.00	.14	.02	.45
Bare Ground	18.00	16.00	16.66	17.68	1.42

SOIL ANALYSIS DATA --

Herd Unit 21A, Study no: 3, Cascade Spring

Effective rooting depth (in)	Temp °F (depth)	pH	Loam			%OM	ppm P	ppm K	dS/m
			%sand	%silt	%clay				
10.5	57.2 (13.1)	6.8	50.9	29.8	19.3	2.2	13.8	140.8	0.7

Stoniness Index



PELLET GROUP DATA --

Management unit 21A, Study no: 3

Type	Quadrat Frequency		
	'98	'03	'07
Rabbit	5	4	3
Deer	7	3	3
Cattle	26	-	9

Days use per acre (ha)		
'98	'03	'07
-	-	-
12 (30)	3 (8)	15 (38)
62 (153)	13 (32)	38 (95)

BROWSE CHARACTERISTICS --

Management unit 21A, Study no: 3

		Age class distribution (plants per acre)					Utilization					
Y	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Echinocereus</i> sp.												
85	0	-	-	-	-	-	0	0	0	-	0	-/-
91	0	-	-	-	-	-	0	0	0	-	0	-/-
98	20	-	-	20	-	-	0	0	0	-	0	-/-
03	20	-	-	-	20	-	0	0	100	100	100	-/-
07	20	-	-	20	-	-	0	0	0	-	0	6/9
<i>Gutierrezia sarothrae</i>												
85	0	-	-	-	-	-	0	0	0	-	0	-/-
91	200	-	-	200	-	-	0	0	0	-	0	10/15
98	740	-	-	740	-	100	0	0	0	-	0	8/15
03	280	-	20	180	80	20	0	0	29	29	29	4/9
07	1860	100	980	840	40	-	0	0	2	2	2	7/7

		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)	
Opuntia sp.													
85	0	-	-	-	-	-	0	0	-	-	0	-/-	
91	0	-	-	-	-	-	0	0	-	-	0	-/-	
98	0	-	-	-	-	-	0	0	-	-	0	-/-	
03	20	-	-	20	-	-	0	0	-	-	0	4/5	
07	20	-	-	20	-	-	0	0	-	-	0	6/16	