

Trend Study 25C-1-08

Study site name: Yergy.

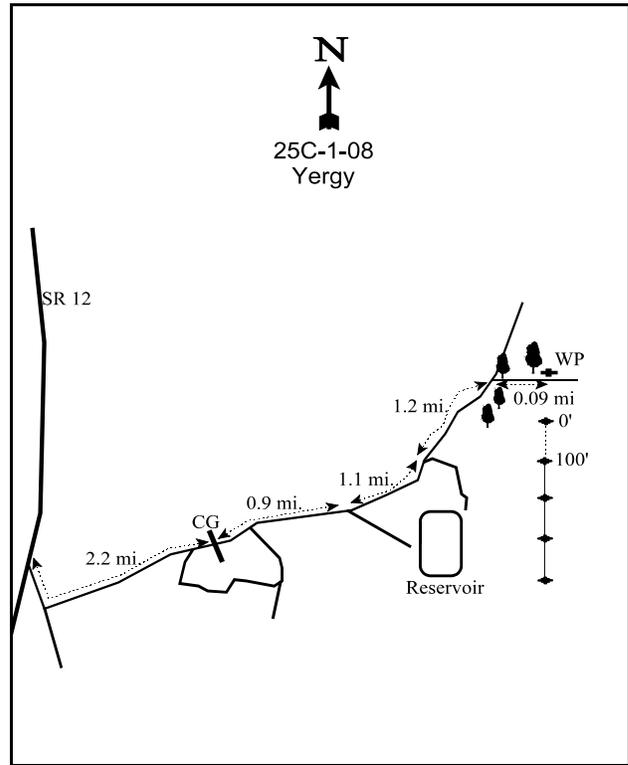
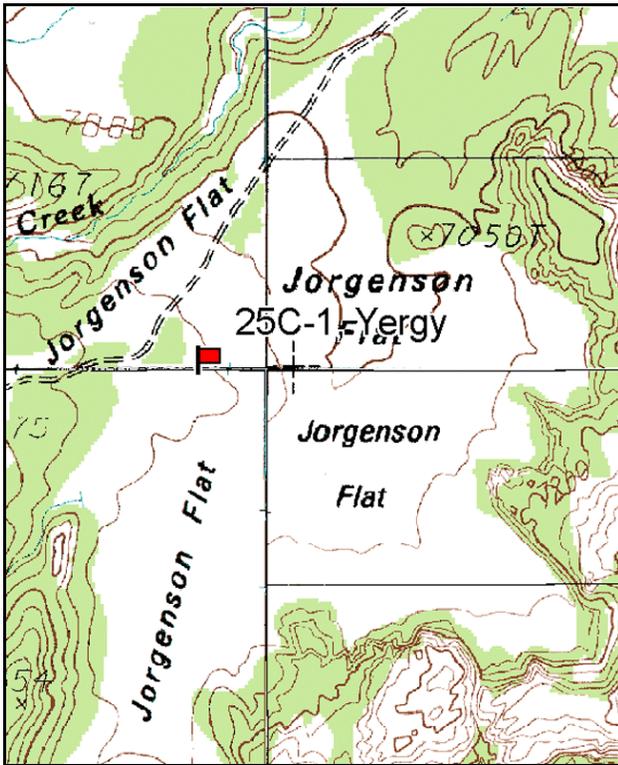
Vegetation type: Chained, Seeded P-J.

Compass bearing: frequency baseline 180 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line4 (71ft). Rebar: belt 1 on 15ft

LOCATION DESCRIPTION

From the Pleasant Creek Campground on the Boulder Grover Road, go south 100 feet to a left turn off the main road. Go down this road 2.2 miles to a cattleguard. From the cattleguard, go 0.9 miles to a fork and go left towards Tantalus Creek. Go 1.1 miles on this road to a fork, stay left (the sign says toward Jorgenson Flat). Go 1.2 miles past a corral on the right to a cattleguard. Go 0.1 miles past the cattleguard to a faint road off to the right. Turn on this road and go 0.09 miles through a gate and out to a lone pinyon on the left. The frequency baseline starts 100 feet south of the lone pine. The 0-foot stake is a rebar tagged #7117.



Map Name: Lower Bowns Res

Diagrammatic Sketch

Township and Range Unsurveyed

GPS: NAD 83, UTM 12S 477868 E, 4219697 N

DISCUSSION

Yergy - Trend Study No. 25C-1

Study Information

This study is located in an open flat surrounded by slickrock cliffs and a dense pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) woodland [elevation: 7,100 feet (2,164 m), slope: 2%, aspect: east]. The flat is a sagebrush-grass type which was chained and seeded in 1970 and the elevation puts it well within the normal and severe winter range limits on the east side of Boulder Mountain. The site was treated by a one-way dixie harrow and seeding in the fall of 2005. Deer use was estimated to be minimal in 1998 and 2008 (1 ddu/acre:2 ddu/ha and 3 ddu/acre:7 ddu/ha, respectively), and light in 2003 (11 ddu/acre:28 ddu/ha). Elk use was estimated to be lightly moderate in 1998 and 2008 (21 edu/acre:52 edu/ha and 18 edu/acre:45 edu/ha, respectively), and minimal in 2003 (1 edu/acre:2 edu/ha). Cattle graze the area on a deferred rotation grazing system. Cattle use was estimated to be moderately heavy in 1998 (41 cdu/acre:101 cdu/ha), moderate in 2003 (24 cdu/acre:59 cdu/ha), and moderately heavy in 2008 (38 cdu/acre:93 cdu/ha). Pellet group quadrat frequency data from 1994 to 2003 indicate a large number of rabbits also utilized the site. Harvester ant hills are fairly common over much of the area.

Soil

Soil texture is a loamy sand which is slightly acidic in reaction (pH 6.2). The soil depth is moderate and very sandy with a texture which is 84% fine red sand. Effective rooting depth is estimated at almost 11 inches. Rock and pavement are uncommon on the soil surface and throughout the profile. Effective depth measurements were limited by the heavy texture of the soil which was very compacted at 10 to 12 inches in depth. There did not appear to be any restrictive rooting barriers. The combined relative vegetation and litter cover was 63% in 1998, 48% in 2003, and 52% in 2008. The relative bare ground cover was 36% in 1998, increasing to 50% in 2003, and 52% in 2008. The erosion condition class was rated as stable in 2003 and 2008.

Browse

Although the flat is dominated by seeded grasses, Basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) increased substantially between 1985 and 1991. There were very few mature sagebrush plants sampled in 1985 but seedling and young plants were abundant. Data from 1991 showed a large increase in sagebrush density, from 8,000 plants/acre in 1985 to 11,531 plants/acre. Density of mature plants increased from 200 plants/acre in 1985 to 4,133 plants/acre in 1991. Young plants were still the most common age class, yet no seedlings were found in 1991. With the larger sample size taken in 1994, density of sagebrush was estimated at only 2,400 plants/acre. The original frequency baseline was placed in an area with few sagebrush, while the density plots happened to be in areas of fairly dense sagebrush and therefore overestimated the actual density of the sagebrush in the area. The sagebrush density remained relatively stable in 1998, 2003, and 2008 at around 2,400 plants/acre. After the harrow treatment in 2005, the age structure of the sagebrush population changed with more young plants and fewer mature plants being sampled. Utilization of the sagebrush has been light to moderate since 1985 with some heavier use reported in 1991. The number of sagebrush showing poor vigor was low from 1985 to 2003, but increased to 42% in 2008. Decadence has remained relatively low throughout the span of the study. Sagebrush sampled in 2003 and 2008 were healthy with good annual leader growth in 2003 and 2008. Other browse species include small numbers of pinyon pine, broom snakeweed (*Gutierrezia sarothrae*), and rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*).

Herbaceous Understory

The herbaceous understory is totally dominated by crested wheatgrass (*Agropyron cristatum*) which has made up over 95% of the grass cover, and 88% or more of the total herbaceous cover since 1994. Blue grama (*Bouteloua gracilis*) and Russian wildrye (*Elymus junceus*) are also present in low numbers. Forbs are very sparse and make up less than 2% of cover in any sample year. Few to none of the species seeded in 2005 were

sampled in 2008.

1991 TREND ASSESSMENT

Browse trend is improving from 1985 with increased density for sagebrush and the disappearance of broom snakeweed. The large increase in density is probably a product of the small sample size, but the increase in browse is considered to be slightly up. The grass trend is stable, but composition is poor with the seeded species crested wheatgrass comprising nearly all of the herbaceous cover. The trend for forbs is stable, but forbs are very rare on the site.

browse - slightly up (+1) grass - stable (0) forb - stable (0)

1994 TREND ASSESSMENT

The browse trend is stable. The new larger sample size used in 1994 gives a better idea of actual population density of sagebrush on the entire flat. Decadence of the sagebrush is very low and vigor is good. Trends for the grasses and forbs is stable. Nested frequency of crested wheatgrass has remained stable since 1985. Production of crested wheatgrass also looks much better than 1991. A few more forb species were picked up with the larger sample taken in 1994, but they are still very scarce.

winter range condition (DCI) - very poor-poor (37) Mid-level potential
browse - stable (0) grass - stable (0) forb - stable (0)

1998 TREND ASSESSMENT

The browse trend is stable as it appears that the population of basin big sagebrush has stabilized at about 2,300 plants/acre. Vigor is normal, and decadence low at 18%. No seedlings were encountered but young plants represent 15% of the population, numerous enough to maintain the stand with good survival. The grass trend is stable. Crested wheatgrass still dominates the site by providing 96% of the grass cover and 77% of the total vegetation cover. Production is up as grass cover is nearly double that of 1994. However, the sum of nested frequency of grasses and forbs has remained similar to 1994 levels. The forb trend is stable, but forbs are still lacking with only two species found in 1998.

winter range condition (DCI) - fair (57) Mid-level potential scale
browse - stable (0) grass - stable (0) forb - stable (0)

2003 TREND ASSESSMENT

Trend for browse is stable. Density has remained similar to 1998 estimates. Utilization is light, vigor is normal, and the portion of the population classified as decadent is small. Recruitment of young is low, but no sagebrush appear to be dying. Most mature plants are vigorous and producing abundant seedheads. The trend for grasses is slightly down. Sum of nested frequency of perennial grasses has declined slightly but, more importantly, nested frequency of crested wheatgrass has declined significantly. Production of perennial grasses also decreased as average cover declined 55% since 1998. The trend for forbs was stable without a significant presence on the site. Herbaceous production was poor in 2003 due to very dry conditions during the springs of 2002 and 2003, which averaged only 31% and 68% or normal respectively. A return to normal precipitation patterns could reverse this trend.

winter range condition (DCI) - fair (55) Mid-level potential scale
browse - stable (0) grass - slightly down (-1) forb - stable (0)

2008 TREND ASSESSMENT

Trend for browse is slightly down. The density of Basin big sagebrush stayed constant, and recruitment was good with 18% of the population consisting of young plants. However, cover has decreased from nearly 11% to just over 3% since 2003. Sagebrush plants displaying poor vigor increased to 42% and decadence rose

slightly to 20%. The trend for grasses is slightly up. The sum of nested frequency for perennial grasses stayed fairly constant, but the cover of crested wheatgrass and blue grama both increased significantly. The trend for forbs is slightly down. There was no change in the sum of nested frequency of perennial forbs and they remain rare. There was, however, a significant increase in annual forbs, primarily from the weedy annual, purslane (*Portulaca oleracea*).

winter range condition (DCI) - very poor-poor (35) Mid-level potential scale
browse - slightly down (-1) grass - slightly up (+1) forb - slightly down (-1)

Durfey Creek Seed Mix

KIND OF SEED	BULK LBS/ACRE
Indian Ricegrass	1.02
Bottlebrush Squirreltail	0.23
Sand Dropseed	0.10
Needle and Threadgrass	0.51
Thickspike Wheatgrass	1.02
Blue Grama 'Bad	0.92
Great Basin Wildrye	1.02
Alfalfa 'Ladak+'	0.47
Small Burnet 'Delar'	2.03
Sagebrush,	1.00
Whitestem Rubber	0.94
Alfalfa 'Spredor'	0.55
Total	9.80

HERBACEOUS TRENDS --
Management unit 25C, Study no: 1

Type	Species	Nested Frequency						Average Cover %			
		'85	'91	'94	'98	'03	'08	'94	'98	'03	'08
G	Agropyron cristatum	ab311	ab312	ab311	b326	a282	ab307	16.90	29.39	13.37	23.36
G	Agropyron elongatum	3	-	-	-	-	-	-	-	-	-
G	Agropyron intermedium	3	-	-	-	-	-	-	-	-	-
G	Agropyron smithii	a-	b23	a-	a-	a-	a-	-	-	-	-
G	Bouteloua gracilis	41	60	48	55	42	38	.29	.87	.53	1.04
G	Elymus junceus	ab27	b26	a6	a7	a6	b25	.18	.18	.18	.55
G	Munroa squarrosa (a)	-	16	a-	a-	a-	b15	-	-	-	.04
G	Poa secunda	-	-	3	-	-	-	.00	-	-	-
G	Sitanion hystrix	1	-	-	-	-	-	-	-	-	-
G	Sporobolus cryptandrus	b14	ab7	a-	a-	a-	a-	-	-	-	-
G	Vulpia octoflora (a)	-	-	-	1	-	-	-	.00	-	-
Total for Annual Grasses		0	16	0	1	0	15	0	0.00	0	0.03
Total for Perennial Grasses		400	428	368	388	330	370	17.38	30.45	14.10	24.95
Total for Grasses		400	444	368	389	330	385	17.38	30.46	14.10	25.00
F	Cordylanthus sp. (a)	-	-	-	a-	b15	ab6	-	-	.18	.02
F	Eriogonum cernuum (a)	-	-	4	-	-	7	.01	-	-	.04
F	Erigeron pumilus	-	-	4	-	-	-	.01	-	-	-
F	Lupinus argenteus	a-	a-	b13	b18	ab7	ab5	.22	.20	.07	.62
F	Orobanche fasciculata	-	-	-	-	6	-	-	-	.01	-
F	Penstemon sp.	-	-	-	-	-	-	.00	-	-	-
F	Polygonum douglasii (a)	-	-	-	-	-	3	-	-	-	.01
F	Portulaca oleracea (a)	-	-	-	a-	a13	b138	-	-	.03	.79
F	Salsola iberica (a)	-	-	-	-	-	3	-	-	-	.00
F	Sphaeralcea coccinea	9	14	7	12	16	24	.20	.08	.28	.17
F	Sphaeralcea parvifolia	-	2	-	-	-	-	-	-	-	-
Total for Annual Forbs		0	0	4	0	28	157	0.00	0	0.20	0.87
Total for Perennial Forbs		9	16	24	30	29	29	0.44	0.28	0.36	0.79
Total for Forbs		9	16	28	30	57	186	0.45	0.28	0.56	1.66

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

BROWSE TRENDS --

Management unit 25C, Study no: 1

Type	Species	Strip Frequency				Average Cover %			
		'94	'98	'03	'08	'94	'98	'03	'08
B	Artemisia tridentata tridentata	43	50	52	47	4.75	7.37	10.52	3.43
B	Chrysothamnus viscidiflorus viscidiflorus	1	1	1	1	.00	.00	.00	.00
B	Gutierrezia sarothrae	0	0	1	0	-	-	.03	-
B	Opuntia sp.	1	0	0	0	.00	-	-	-
Total for Browse		45	51	54	48	4.75	7.37	10.55	3.43

CANOPY COVER, LINE INTERCEPT --

Management unit 25C, Study no: 1

Species	Percent Cover	
	'03	'08
Artemisia tridentata tridentata	12.61	6.19
Chrysothamnus viscidiflorus viscidiflorus	.11	-

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 25C, Study no: 1

Species	Average leader growth (in)	
	'03	'08
Artemisia tridentata tridentata	1.6	2.1

POINT-QUARTER TREE DATA --

Management unit 25C, Study no: 1

Species	Trees per Acre		
	'98	'03	'08
Juniper osteosperma	6	<18	<18
Pinus edulis	8	<18	<18

Average diameter (in)		
'98	'03	'08
2.8	-	-
3.2	-	-

BASIC COVER --

Management unit 25C, Study no: 1

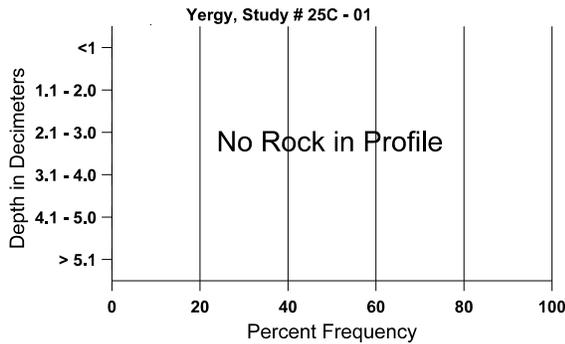
Cover Type	Average Cover %					
	'85	'91	'94	'98	'03	'08
Vegetation	8.00	12.00	21.68	38.29	25.52	30.50
Rock	0	0	.16	.15	.15	.15
Pavement	0	.25	.06	.22	1.91	0
Litter	56.25	39.25	27.68	44.88	27.21	26.34
Cryptogams	0	0	0	0	0	0
Bare Ground	35.75	48.50	54.40	47.36	55.17	53.00

SOIL ANALYSIS DATA --

Management unit 25C, Study no: 1, Study Name: Yergy

Effective rooting depth (in)	Temp °F (depth)	pH	loamy sand			%0M	PPM P	PPM K	ds/m
			%sand	%silt	%clay				
10.8	63.0 (13.5)	6.2	84.0	7.4	8.6	1.1	10.8	64.0	0.5

Stoniness Index



PELLET GROUP DATA --

Management unit 25C, Study no: 1

Type	Quadrat Frequency			
	'94	'98	'03	'08
Rabbit	51	58	73	95
Elk	3	8	3	9
Deer	32	38	8	1
Cattle	10	19	21	23

Days use per acre (ha)		
'98	'03	'08
-	-	-
21 (52)	1 (2)	18 (45)
1 (2)	11 (28)	3 (7)
41 (101)	24 (59)	38 (93)

BROWSE CHARACTERISTICS --
Management unit 25C, Study no: 1

		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)
<i>Artemisia tridentata tridentata</i>												
85	7998	3666	7799	199	-	-	.83	0	0	-	3	10/8
91	11531	-	5999	4133	1399	-	43	26	12	2	12	12/12
94	2400	60	80	2260	60	100	31	0	3	.83	.83	28/41
98	2320	-	340	1560	420	60	49	3	18	-	3	23/34
03	2500	-	120	2040	340	60	8	0	14	-	0	27/46
08	2040	-	260	1460	320	240	13	2	16	4	49	18/28
<i>Chrysothamnus nauseosus</i>												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	35/71
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Chrysothamnus viscidiflorus viscidiflorus</i>												
85	0	-	-	-	-	-	0	0	0	-	0	-/-
91	0	-	-	-	-	-	0	0	0	-	0	-/-
94	20	-	-	20	-	-	0	0	0	-	0	22/10
98	20	-	-	20	-	-	0	0	0	-	0	18/19
03	20	-	-	-	20	-	0	0	100	100	100	21/32
08	20	-	-	20	-	-	0	100	0	-	0	6/8
<i>Gutierrezia sarothrae</i>												
85	2332	466	1466	733	133	-	0	0	6	-	0	7/7
91	0	-	-	-	-	-	0	0	0	-	0	-/-
94	0	-	-	-	-	-	0	0	0	-	0	8/9
98	0	-	-	-	-	-	0	0	0	-	0	-/-
03	20	-	-	20	-	-	0	0	0	-	0	9/8
08	0	-	-	-	-	-	0	0	0	-	0	7/12

		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	66	-	66	-	-	-	0	0	-	-	0	-/-
94	20	-	-	20	-	-	0	0	-	-	0	½
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	-/-
Pinus edulis												
85	66	-	66	-	-	-	0	0	-	-	0	-/-
91	66	-	66	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	-/-