Trend Study 27-10-08

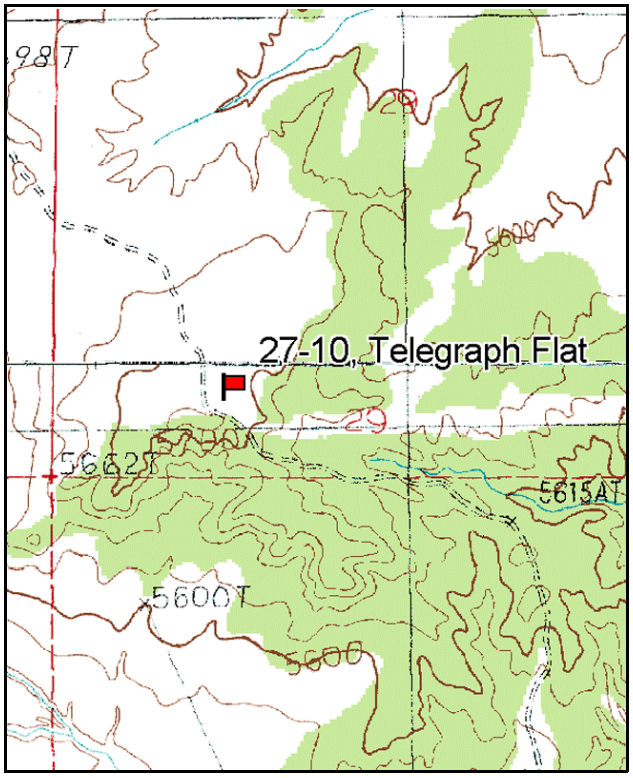
Study site name: Telegraph Flat . Vegetation type: Cliffrose, Pinyon-Juniper .

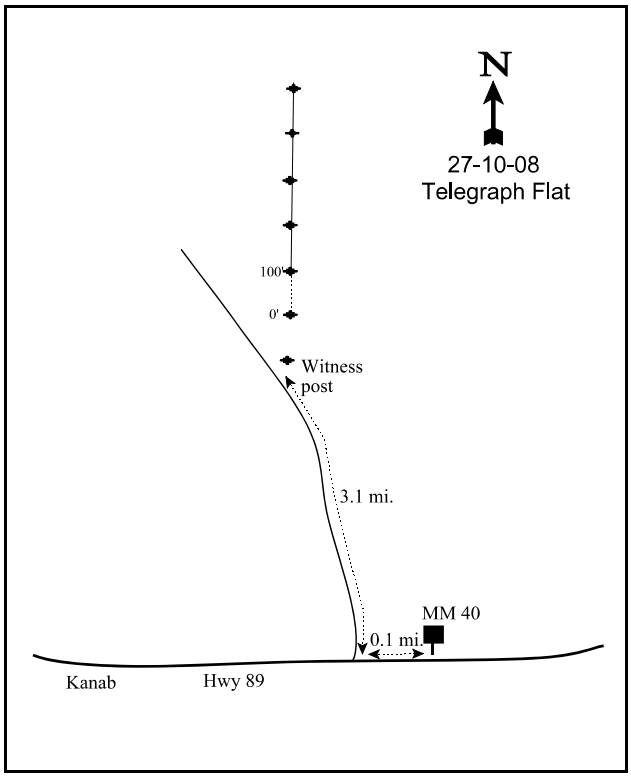
Compass bearing: frequency baseline 358 degrees magnetic.

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

LOCATION DESCRIPTION

From mile marker #40 on Highway 89 east of Kanab, go 0.1 mile east to a road on the north. Go north 2.7 miles to a witness post on the right side of the road. From the witness post walk 14 paces at 0 degrees magnetic to the 0' stake. The study runs north and is marked by green, steel fenceposts approximately 12-18 inches in height.





Map name: Telegraph Flat

Diagrammatic Sketch

Township 42S , Range 3W , Section 29

GPS: NAD 83, UTM 12S 397490 E, 4109268 N

DISCUSSION

Telegraph Flat - Trend Study No. 27-10

Study Information

This study was established in 1997 and is located east of Telegraph Wash and west of Clay Hole Wash [elevation: 5,700 feet (1,737 m), slope: 2%, aspect: northwest]. The site samples a Wyoming big sagebrush (*Artemisia tridentatata* ssp. *wyomingensis*) community with a Stansbury cliffrose (*Cowania mexicana* ssp. *stansburiana*) and pinyon pine (*Pinus edulis*)/Utah juniper (*Juniperus osteosperma*) overstory. This area was chained and seeded in 1963. Pellet group transect data estimated moderate deer use of 28 and 29 days use/acre (69 and 71 ddu/ha) in 2003 and 2008, respectively. Cattle use was estimated to be lightly moderate in 2003 (17 cdu/acre:41 cdu/ha) and light in 2008 (2 cdu/acre:5 cdu/ha). A few elk pellets were found in the quadrat sampling in 1997, and rabbit pellets were moderately abundant in 1997 and 2003.

Soil

Soil on the site has a sandy loam texture with a neutral reaction (pH 7.2). There is no rock and little pavement on the surface or in the profile. There are numerous gullies near the site which have been caused by high intensity summer storms. Relative combined vegetation and litter cover ranged from 49%-53% from 1997 to 2008. Relative bare ground was high at 42%-47% from 1997 to 2008. The erosion condition class assessment rated soils as stable in 2003 and 2008.

Browse

The key browse species is Wyoming big sagebrush which accounted for about 66% of the total browse cover in 1997, 2003, and 2008. Population density of sagebrush was estimated at 12,760 plants/acre in 1997, declining to 8,340 plants/acre in 2003, and increasing slightly to 9,180 plants/acre in 2008. Recruitment was excellent in 1997 with half of the population consisting of young sagebrush plants, decreasing to only 1% in 2003, and then increasing to 12% in 2008. About 67% of the sagebrush showed moderate or heavy use in 1997, declining to 43% in 2003, and increasing to 78% in 2008. Decadence has increased in the sagebrush population from 10% in 1997, to 42% in 2003, and 50% in 2008. Plants displaying poor vigor increased from 4% in 1997 to 21% in 2003, then decreased to 10% in 2008. Annual sagebrush leaders averaged 1.7 inches of annual growth in 2003, but just under an inch of growth in 2008.

Cliffrose density has averaged about 350 plants/acre for the three sample years. Mature plants are large averaging nearlyfivefeet in height, resulting in a portion of the cliffrose forage being unavailable to browsing. As with Wyoming big sagebrush, young cliffrose were abundant in 1997, accounting for 55% of the population, declining to a more moderate level of 25% in 2003, and further to only 5% in 2008. Utilization on cliffrose was moderate in 1997, and mostly heavy in 2003 and 2008. Vigor of cliffrose was normal in 1997 and 2003, but plants displaying poor vigor increased to 21% in 2008. Decadence was also low in 1997 and 2003 at 5% and 19%, respectively, but increased to 68% of the population in 2008. Cliffrose leaders averaged 3.8 inches of growth in 2003 and 5.5 inches of growth in 2008. Pinyon and juniper had a combined estimated density of about 64 trees/acre on the site in 2003 and 2008.

Herbaceous Understory

The herbaceous understory is very poor on this site. Five perennial and two annual grass species were sampled on the site in 1997, but only two perennial grasses and one annual grass were sampled in 2008. Crested wheatgrass (*Agropyron cristatum*) was the only common species as it provided 90% of the herbaceous cover and was initially sampled in 83% of the quadrats in 1997, but was not encountered at all in either 2003 or 2008. Perhaps crested wheatgrass was “droughted out”, which is surprising as this species is typically thought of as drought tolerant. Forbs were rare in all three surveys and provide very little to the site. Cover for both forbs and grasses could be considered insignificant in 2008.

1997 DESIRABLE COMPONENTS INDEX

winter range condition (DCI) - good (57) Low potential scale

2003 TREND ASSESSMENT

Trend for browse is down. Wyoming big sagebrush showed a large decline in total density from 12,760 plants/acre in 1997 to 8,340 plants/acre. Recruitment in sagebrush declined drastically as the number of young plants decreased to only 1% of the population. Sagebrush displaying poor vigor increased from 4% in 1997 to 21%, and decadence increased to 42%. Cliffrose remains healthy overall with little change in its density, good vigor, and low decadence. Trend for the grasses is down. Crested wheatgrass was the only abundant herbaceous species in 1997, but was not sampled on the site in 2003. Crested wheatgrass is typically quite drought and grazing tolerant and the absence from the site in 2003 was surprising. This trend has been seen in other areas of the region where crested wheatgrass has been seeded on sandy soils and declined significantly during drought. The trend for forbs is stable, but in very poor condition. The sum of nested frequency and total cover of perennial forbs changed little from 1997. The sum of nested frequency and total cover of annual forbs increased substantially, but are still so rare that they don't provide a substantial component to the site.

winter range condition (DCI) - poor-fair (27) Low potential scale
browse - down (-2) grass - down (-2) forb - stable (0)

2008 TREND ASSESSMENT

Trend for browse is slightly up. Density of the primary browse species, Wyoming big sagebrush, increased slightly to 9,180 plants/acre. Recruitment of sagebrush improved with young plants comprising 12% of the population. The number of plants displaying poor vigor decreased to 10%, but decadence increased slightly to 50%. The density of cliffrose increased slightly, as well, to 380 plant/acre. Recruitment of young cliffrose decreased, however, from 25% of the population in 2003 to only 5%. Plants displaying poor vigor increased to 21%, and decadence increased from 19% in 2003 to 68%. Trend for grasses is slightly down and in extremely poor condition. Only three grass species, Indian ricegrass (*Oryzopsis hymenoides*), bottlebrush squirreltail (*Sitanion hystrix*), and sixweeks fescue (*Vulpia octoflora*), were encountered on the site and at such low frequency that they didn't provide a notable amount of cover to the total vegetative cover. The sum of nested frequency and total cover of perennial grasses continued to decline. The trend for forbs is stable, but also in extremely poor condition. The sum of nested frequency of perennial forbs had little change, though the sum of nested frequency of annual forbs decreased substantially. As with the grasses, the frequency of forbs was so low that they did not contribute a notable amount to the total cover.

winter range condition (DCI) - poor-fair (24) Low potential scale
browse - slightly up (+1) grass - slightly down (-1) forb - stable (0)

HERBACEOUS TRENDS --
Management unit 27 , Study no: 10

Type	Species	Nested Frequency			Average Cover %		
		'97	'03	'08	'97	'03	'08
G	Agropyron cristatum	$_{b}$252	$_{a}$-	$_{a}$-	5.83	-	-
G	Aristida purpurea	$_{a}$8	$_{b}$21	$_{a}$-	.20	.24	-
G	Bromus tectorum (a)	2	-	-	.00	-	-
G	Festuca ovina	8	-	-	.01	-	-
G	Oryzopsis hymenoides	8	6	1	.06	.03	.00
G	Sitanion hystrix	3	6	12	.03	.01	.10
G	Vulpia octoflora (a)	10	-	4	.04	-	.00
Total for Annual Grasses		12	0	4	0.05	0	0.00
Total for Perennial Grasses		279	33	13	6.15	0.29	0.10
Total for Grasses		291	33	17	6.20	0.29	0.11
F	Agoseris glauca	1	-	-	.00	-	-
F	Astragalus sp.	5	-	-	.03	-	-
F	Calochortus nuttallii	-	3	-	.00	.01	-
F	Castilleja sp.	1	-	-	.00	-	-
F	Eriogonum umbellatum	-	1	1	-	.00	.03
F	Gilia sp. (a)	$_{a}$2	$_{b}$29	$_{a}$-	.00	1.01	-
F	Holosteum umbellatum (a)	3	-	-	.00	-	-
F	Machaeranthera canescens	-	1	-	-	.00	-
F	Microsteris gracilis (a)	3	-	2	.00	-	.00
F	Navarretia intertexta (a)	$_{a}$-	$_{b}$89	$_{a}$18	-	2.49	.03
F	Phlox austromontana	3	7	-	.15	.06	-
F	Phlox hoodii	5	-	-	.03	-	-
F	Sphaeralcea grossulariifolia	-	1	-	-	.00	-
F	Stephanomeria exigua (a)	-	2	-	-	.03	-
F	Swertia albomarginata	-	-	4	-	-	.01
F	Unknown forb-annual (a)	3	-	-	.03	-	-
Total for Annual Forbs		11	120	20	0.04	3.53	0.03
Total for Perennial Forbs		15	13	5	0.23	0.08	0.03
Total for Forbs		26	133	25	0.28	3.62	0.07

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

BROWSE TRENDS --
Management unit 27 , Study no: 10

Type	Species	Strip Frequency			Average Cover %		
		'97	'03	'08	'97	'03	'08
B	Amelanchier utahensis	0	0	0	.03	-	-
B	Artemisia tridentata wyomingensis	85	89	93	11.60	13.33	13.44
B	Chrysothamnus nauseosus	1	0	0	.00	-	-
B	Cowania mexicana stansburiana	15	14	15	1.90	2.35	1.52
B	Ephedra viridis	0	1	1	-	.00	.03
B	Gutierrezia sarothrae	3	8	4	.00	.19	.00
B	Juniperus osteosperma	4	3	4	1.26	2.00	3.15
B	Pinus edulis	2	2	1	1.66	2.62	2.90
B	Yucca sp.	0	0	0	.38	-	-
Total for Browse		110	117	118	16.84	20.52	21.06

CANOPY COVER, LINE INTERCEPT --
Management unit 27 , Study no: 10

Species	Percent Cover		
	'97	'03	'08
Artemisia tridentata wyomingensis	-	13.56	19.48
Cowania mexicana stansburiana	2.20	3.90	4.36
Juniperus osteosperma	3.59	2.59	3.38
Pinus edulis	1.79	4.00	4.41

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 27 , Study no: 10

Species	Average leader growth (in)	
	'03	'08
Artemisia tridentata wyomingensis	1.7	0.9
Cowania mexicana stansburiana	3.8	5.5

POINT-QUARTER TREE DATA --
Management unit 27 , Study no: 10

Species	Trees per Acre	
	'03	'08
Juniperus osteosperma	36	35
Pinus edulis	28	28

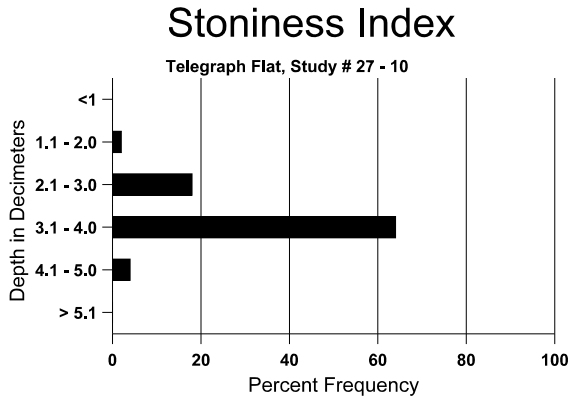
Average diameter (in)	
'03	'08
2.7	6.4
5.4	5.1

BASIC COVER --
Management unit 27 , Study no: 10

Cover Type	Average Cover %		
	'97	'03	'08
Vegetation	22.68	24.62	21.70
Pavement	.06	.05	.10
Litter	28.17	34.32	38.67
Cryptogams	4.69	6.74	3.29
Bare Ground	49.65	48.52	49.61

SOIL ANALYSIS DATA --
Management unit 27, Study no: 10, Study Name: Telegraph Flat

Effective rooting depth (in)	Temp °F (depth)	pH	sandy loam			%0M	PPM P	PPM K	dS/m
			%sand	%silt	%clay				
14.4	73.3 (13.9)	7.2	62.4	19.1	18.6	1.3	20.2	124.8	0.6



PELLET GROUP DATA --
Management unit 27 , Study no: 10

Type	Quadrat Frequency		
	'97	'03	'08
Sheep	1	-	-
Rabbit	18	19	78
Elk	3	-	1
Deer	19	24	20
Cattle	-	7	7

Days use per acre (ha)	
'03	'08
-	-
-	-
-	-
28 (69)	29 (71)
17 (41)	2 (5)

BROWSE CHARACTERISTICS --
Management unit 27 , Study no: 10

		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												
97	**0**	-	-	-	-	-	0	0	-	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	-	0	-/-
08	**0**	-	-	-	-	-	0	0	-	-	0	12/11
Artemisia tridentata wyomingensis												
97	**12760**	140	6400	5060	1300	180	55	12	10	4	4	20/31
03	**8340**	-	80	4740	3520	520	13	30	42	20	21	17/23
08	**9180**	1480	1140	3420	4620	1000	48	30	50	7	10	21/27
Chrysothamnus nauseosus												
97	**80**	-	80	-	-	-	100	0	-	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	-	0	-/-
08	**0**	-	-	-	-	-	0	0	-	-	0	-/-
Cowania mexicana stansburiana												
97	**400**	-	220	160	20	20	60	0	5	-	0	59/68
03	**320**	-	80	180	60	80	13	69	19	-	0	54/66
08	**380**	-	20	100	260	120	26	68	68	16	21	47/54
Ephedra viridis												
97	**0**	-	-	-	-	-	0	0	0	-	0	-/-
03	**20**	-	-	20	-	-	0	0	0	-	0	22/16
08	**20**	-	-	-	20	-	0	0	100	100	100	23/14
Gutierrezia sarothrae												
97	**100**	-	-	80	20	-	0	0	20	-	0	9/10
03	**280**	-	20	260	-	40	0	0	0	-	0	9/12
08	**100**	-	20	60	20	60	0	0	20	-	0	8/8

		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)
Juniperus osteosperma												
97	**80**	-	20	60	-	40	0	0	-	-	0	-/-
03	**60**	-	-	60	-	-	0	0	-	-	0	-/-
08	**80**	-	40	40	-	20	0	0	-	-	0	-/-
Opuntia sp.												
97	**0**	-	-	-	-	-	0	0	-	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	-	0	4/9
08	**0**	-	-	-	-	-	0	0	-	-	0	-/-
Pinus edulis												
97	**40**	-	-	40	-	-	0	0	-	-	0	-/-
03	**40**	-	-	40	-	-	0	0	-	-	0	-/-
08	**20**	-	-	20	-	-	0	0	-	-	0	-/-
Yucca sp.												
97	**0**	-	-	-	-	-	0	0	-	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	-	0	19/24
08	**0**	-	-	-	-	-	0	0	-	-	0	21/23