

Trend Study 13A-4-04

Study site name: Slaughter Flat.

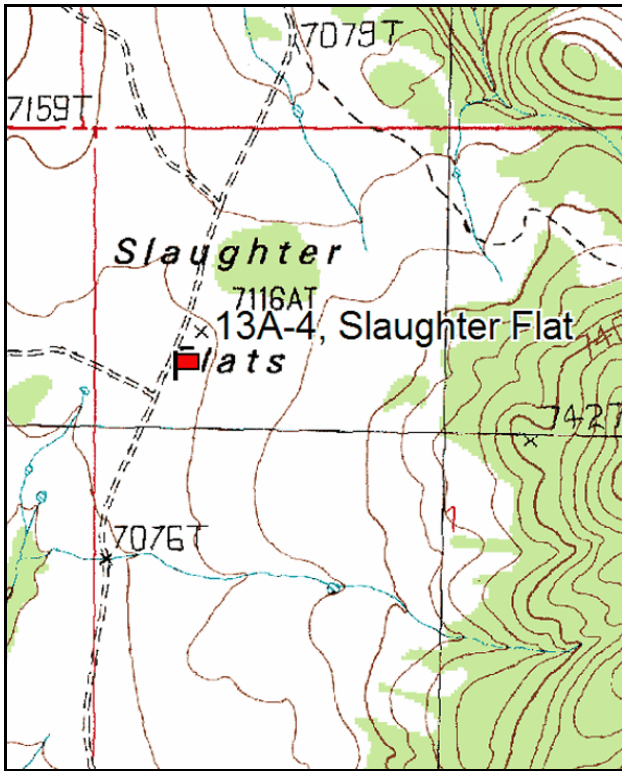
Vegetation type: Chained, Seeded P-J.

Compass bearing: frequency baseline 165 degrees magnetic.

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

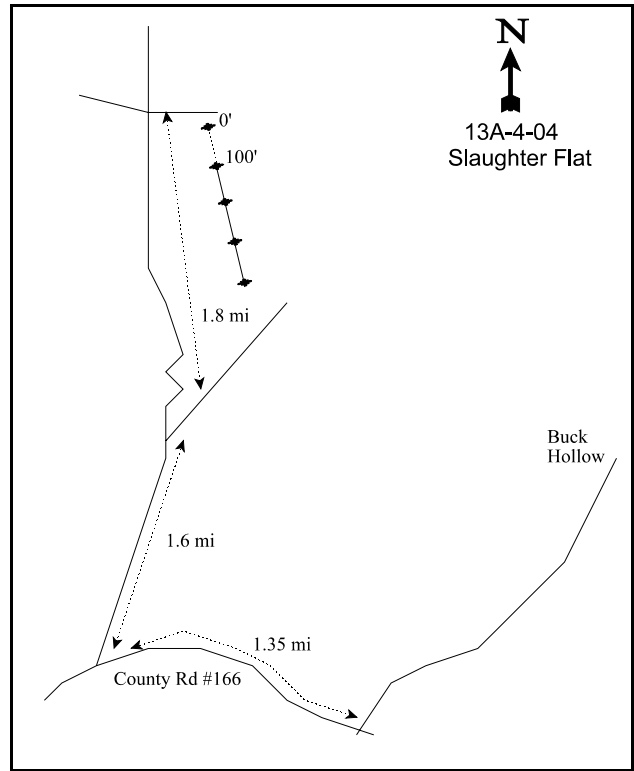
LOCATION DESCRIPTION

Take SR 191 south from Moab, At mile marker 113, continue 0.15 miles south and turn left (east) on county road #166. Continue south on main road for 10.05 miles and turn left (east). Go 1.6 miles to a fork. Stay left at fork and drive 1.8 miles to a witness post on the right. The transect is located in the SE quarter, marked by short fence posts. The transect starts 90 feet away from the intersection at 157 degrees magnetic. The 0-foot baseline stake is tagged #7125.



Map Name: Mount Tukuunikivatz

Township 28S, Range 23E, Section 1



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4251102 N, 644400 E

DISCUSSION

Slaughter Flat - Trend Study No. 13A-4

The Slaughter Flat Study area has long been recognized as important big game winter range. The transect is located in an open flat valley between pinyon-juniper ridges to the east and west. The chaining extends to the north. Due to the level valley bottom, there is not a distinguishable aspect for the site and slope is negligible. The site elevation is approximately 7,100 feet, which drains to the west. In 1999, pellet group transects estimated 25 deer (62 ddu/ha), 53 elk (131 edu/ha), and 22 cow days use/acre (53 cdu/ha). In 2004, pellet group data estimated 27 deer (91 ddu/ha), 37 elk (91 edu/ha), and 1 cow days use/acre (2 cdu/ha). In 1974, 940 acres were chained and seeded. It is successional now a sagebrush-grass community. This Forest Service land is part of the Squaw Spring grazing allotment which uses a rest/deferred rotation system from mid-June through mid-October.

The orange, sandy clay loam soil is moderately deep (effective rooting depth of almost 14 inches), with a loose structure on the surface. The soil has a neutral pH (7.2) and site potential may be limited by phosphorus levels (5.4 ppm). Values below 10 ppm may limit normal plant growth and development. There is soil loss from the bare interspaces and evidence of sheet and rill erosion, but no gullies are on the site. There is some pedestaling of the bunch grasses. The erosion condition class determined soil movement as stable in 2004.

Wyoming big sagebrush is the key browse species on the site. Identification of the *Artemisia* subspecies was difficult because of hybridization with other sagebrush subspecies and different varieties which may have been seeded onto the site after the chaining treatment. The most frequently found sagebrush subspecies on this site would be Wyoming big sagebrush. Wyoming sagebrush made up 60% of the browse cover in 1994, 56% in 1999, and 53% in 2004. There has been steady slight decrease in the sagebrush population since 1987. The population has gone from 3,298 plants/acre in 1987, 2,940 plants/acre in 1994, 2,560 plants/acre in 1999 and 2,340 plants/acre in 2004. Sagebrush loss has most likely been caused by years of drought and associated winter injury. The population of sagebrush shows moderate to heavy use. Percent decadency has increased from 10% in 1994, 20% in 1999, to 25% in 2004. Twenty-six percent of the population was classified as young in 1987, now this is only 2%. Seedling density has typically varied greatly through the years, 0% in 1987, 15% in 1994, 2% in 1999, and 19% in 2004.

The larger, more vigorous plants (which display characteristics of Basin big sagebrush) appear to produce the most seed and show only light to moderate hedging, as opposed to the appearance of moderate to heavy hedging on the relatively smaller, mature individuals that resemble more that of Wyoming big sagebrush. Low rabbitbrush is prominent because of its relatively high density and it provides 31% of the browse cover. Other more palatable browse species are uncommon, comprising only a minor percentage of the browse population.

In 1987, it was noted that grasses were an important vegetative component on this site and the most abundant perennial species were needle-and-thread, muttongrass, crested wheatgrass, and Indian ricegrass. Total grass cover in 1994 was 15%, which was 43% of the total vegetative cover at that time. Cheatgrass was fairly common throughout and dense in localized areas, yet it only made up 2% of the grass cover. Twenty species of forbs were encountered on the site, but all together they contributed to a little more than 3% cover. In 1999, forbs contributed less than 1% of the cover, but rose to over 3% in 2004. Of the eight perennial grass species, only needle and thread showed a significant increase. There were significant losses to needle-and-thread grass in 1999 (3% of grass cover), which was fairly abundant in 1994 and 2004 (40% and 23% of grass cover). There were significant losses to crested wheatgrass, Sandberg bluegrass, and western wheatgrass. Long-term drought has had a detrimental effect on most of the native grasses and forbs. Cheatgrass has greatly increased its downward influence on the successional development of this community. Cheatgrass was estimated at 2% of the grass cover in 1994, 36% in 1999, 27% in 2004.

1994 TREND ASSESSMENT

The trend for the soil is somewhat mixed, but the percentage of bare soil has not shown a significant change and the slight decrease in litter cover is to be expected with the extended drought. Trend for now is considered stable. The trend for the key browse is slightly down. Especially with a ratio of one in eight plants being dead. With the high biotic potential and establishment of the seedlings, this should turn around. The trend for the perennial species in the herbaceous understory is stable. The Desirable Components Index rated this site as excellent with a score of 69 due to good perennial grass and shrub cover.

TREND ASSESSMENT

soil - stable (3)

browse - slightly down (2)

herbaceous understory - stable (3)

winter range condition (DC Index) - 69 (excellent) Wyoming big sagebrush type

1999 TREND ASSESSMENT

The trend for the soil is still somewhat mixed, however relative percent bare soil is very close to that of previous years. There appears to be some photographic evidence of more pedestaling of herbaceous species, but should be expected with the amount of bare soil there is on this site. Trend for soil is stable. The trend for the key browse is again slightly down. This is because the ratio of dead to live plants has increased from 1:8 (11%) to 1:5 (17%). Percent decadence has also increased from 10% to 20%. The percentage of decadent plants that were classified as dying has also increased from 33% to 36%. There has also been a significant increase in the low rabbitbrush population. The trend for the perennial species in the herbaceous understory would be down overall, even with the significant increases for crested wheatgrass and western wheatgrass. These increases have not made up for the decreases for the other five native perennial species. Cheatgrass is increasing to where it elevates the hazard of fire which would cause the loss of the sagebrush component and the communities use as a big game winter range. The Desirable Components Index rated this site as good with a score of 56 due to good perennial grass, increased decadence, and increased annual grasses (cheatgrass).

TREND ASSESSMENT

soil - stable (3)

browse - slightly down (2)

herbaceous understory - down (1)

winter range condition (DC Index) - 56 (good) Wyoming big sagebrush type

2004 TREND ASSESSMENT

The trend for soil is stable. Bare ground has remained at previous levels, although there is still some pedestaling around the base of plants. Trend for key browse continues to be slightly down. Density for Wyoming big sagebrush has continually declined since 1987. The main difference from 1999 to 2004 has been the number of young plants in the population. Use on sagebrush has increased from 54% to 87% showing moderate to heavy use. Percent decadency increased from 20% in 1999 to 25% in 2004. Percent dying has also increased from 7% in 1999 to 12% in 2004. Trend for the herbaceous understory is slightly down. Crested wheatgrass and western wheatgrass declined significantly, but needle-and-thread grass increased significantly. Overall, cheatgrass remained the same, but perennial grasses decreased. Forbs increased in percent cover and sum of nested frequency, but they contribute little (8%) to total vegetation cover. The Desirable Components Index rated this site as good with a score of 53 due to good perennial grass, increased decadence, and increased annual grasses (cheatgrass).

TREND ASSESSMENT

soil - stable (3)

browse - slightly down (2)

herbaceous understory - slightly down (2)

winter range condition (DC Index) - 53 (good) Wyoming big sagebrush type

HERBACEOUS TRENDS --

Management unit 13A, Study no: 4

T y p e	Species	Nested Frequency				Average Cover %		
		'87	'94	'99	'04	'94	'99	'04
G	Agropyron cristatum	a57	ab79	c211	b94	2.23	8.42	6.65
G	Agropyron smithii	a8	b42	b64	a13	.31	.49	.09
G	Bromus inermis	-	1	1	-	.00	.00	-
G	Bromus tectorum (a)	-	a83	b237	b212	.32	7.39	5.36
G	Oryzopsis hymenoides	a24	b66	a25	a35	1.71	.83	1.22
G	Poa fendleriana	c232	b146	a97	a75	3.84	2.91	1.77
G	Poa secunda	b20	c47	b14	a-	.53	.07	-
G	Sitanion hystrix	b24	b18	a1	a4	.13	.03	.03
G	Stipa comata	c221	b168	a26	b135	6.00	.63	4.50
G	Vulpia octoflora (a)	-	1	1	5	.00	.00	.15
Total for Annual Grasses		0	84	238	217	0.32	7.39	5.51
Total for Perennial Grasses		586	567	439	356	14.77	13.41	14.28
Total for Grasses		586	651	677	573	15.10	20.81	19.80
F	Agoseris glauca	-	-	-	1	-	-	.00
F	Antennaria rosea	-	3	-	-	.00	-	.03
F	Arabis spp.	a-	b17	a-	a-	.04	-	-
F	Astragalus convallarius	a11	b35	a3	b28	1.37	.00	1.37
F	Castilleja chromosa	6	4	-	-	.04	-	-
F	Cirsium spp.	-	3	-	-	.00	-	-
F	Cordylanthus wrightii (a)	ab16	ab17	a2	b21	.04	.03	.15
F	Crepis acuminata	b9	ab5	a-	a2	.01	-	.00
F	Cryptantha spp.	b12	b8	a-	ab3	.02	-	.00
F	Draba reptans (a)	-	c39	b4	a-	.09	.00	-
F	Erigeron pumilus	8	3	1	4	.00	.00	.03
F	Gayophytum ramosissimum(a)	-	b13	a-	a-	.02	-	-
F	Lappula occidentalis (a)	-	ab5	a-	b11	.01	-	.05
F	Microsteris gracilis (a)	-	b73	a15	a7	.38	.03	.04
F	Petradoria pumila	-	3	-	-	.03	-	-
F	Phlox longifolia	a-	c98	a-	b37	.27	-	.17
F	Polygonum douglasii (a)	-	c49	a-	b8	.10	-	.03

T y p e	Species	Nested Frequency				Average Cover %		
		'87	'94	'99	'04	'94	'99	'04
F	Ranunculus testiculatus (a)	-	12	-	-	.02	-	-
F	Sphaeralcea coccinea	_a 17	_b 78	_b 64	_b 78	.57	.71	1.21
F	Taraxacum officinale	_{ab} 1	_c 12	_a -	_{ab} 2	.04	-	.00
F	Tragopogon dubius	1	-	-	-	-	-	-
F	Trifolium gymnocarpon	_c 118	_c 102	_a 3	_b 47	.32	.00	.21
F	Unknown forb-perennial	3	-	-	-	-	-	-
F	Zigadenus paniculatus	_b 15	_a -	_a -	_a -	-	-	-
Total for Annual Forbs		16	208	21	47	0.68	0.06	0.27
Total for Perennial Forbs		201	371	71	202	2.74	0.72	3.05
Total for Forbs		217	579	92	249	3.43	0.79	3.33

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

BROWSE TRENDS --

Management unit 13A, Study no: 4

T y p e	Species	Strip Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
B	Artemisia tridentata wyomingensis	68	69	66	10.17	10.57	9.43
B	Chrysothamnus nauseosus albicaulis	1	1	0	-	-	-
B	Chrysothamnus viscidiflorus viscidiflorus	83	86	84	4.55	5.58	5.60
B	Coryphantha vivipara arizonica	0	2	1	-	.00	.03
B	Eriogonum microthecum	0	1	1	-	-	-
B	Gutierrezia sarothrae	6	2	1	.02	.15	-
B	Juniperus osteosperma	0	1	1	.15	.38	.38
B	Opuntia polyacantha	42	44	45	.89	1.16	1.41
B	Pediocactus simpsonii	0	1	0	-	-	-
B	Pinus edulis	0	1	1	1.16	.93	1.00
Total for Browse		200	208	200	16.95	18.79	17.86

CANOPY COVER, LINE INTERCEPT --
Management unit 13A, Study no: 4

Species	Percent Cover
	'04
Artemisia tridentata wyomingensis	9.68
Chrysothamnus viscidiflorus viscidiflorus	5.76
Eriogonum microthecum	.01
Opuntia polyacantha	1.96
Pinus edulis	1.29

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 13A, Study no: 4

Species	Average leader growth (in)
	'04
Artemisia tridentata wyomingensis	2.4

POINT-QUARTER TREE DATA --
Management unit 13A, Study no: 4

Species	Trees per Acre	
	'99	'04
Juniperus osteosperma	16	24
Pinus edulis	18	22

Average diameter (in)	
'99	'04
2.9	3.5
2.7	3.8

BASIC COVER --
Management unit 13A, Study no: 4

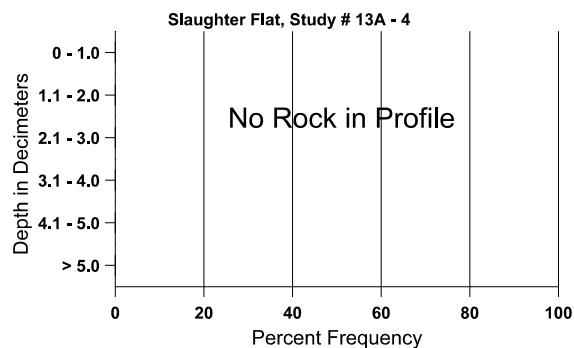
Cover Type	Average Cover %			
	'87	'94	'99	'04
Vegetation	12.75	35.90	38.68	42.65
Rock	0	.27	.06	.07
Pavement	0	.24	.52	.29
Litter	53.25	39.65	41.77	34.25
Cryptogams	.75	.36	.52	.65
Bare Ground	33.25	35.01	37.35	37.05

SOIL ANALYSIS DATA --

Management unit 13A, Study no: 4, Study Name: Slaughter Flat

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
13.5	71.0 (10.5)	7.2	52.9	19.8	27.3	1.9	50.4	89.6	0.4

Stoniness Index



PELLET GROUP DATA --

Management unit 13A, Study no: 4

Type	Quadrat Frequency			Days use per acre (ha)	
	'94	'99	'04	'99	'04
Rabbit	11	19	11	-	-
Elk	41	34	33	53 (131)	37 (91)
Deer	14	36	28	25 (62)	27 (68)
Cattle	1	1	1	22 (53)	1 (2)

BROWSE CHARACTERISTICS --

Management unit 13A, 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												
87	33	-	33	-	-	-	0	100	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	44/54
99	0	-	-	-	-	-	0	0	-	-	0	37/51
04	0	-	-	-	-	-	0	0	-	-	0	52/67
Artemisia tridentata wyomingensis												
87	3298	-	866	2166	266	-	40	22	8	-	6	23/22
94	2940	440	380	2260	300	360	14	2	10	3	21	19/28
99	2560	60	420	1640	500	480	34	20	20	7	7	20/28
04	2340	440	40	1720	580	520	58	29	25	12	12	19/29

		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)
Chrysothamnus nauseosus albicaulis												
87	33	-	-	33	-	-	0	100	0	-	0	31/28
94	20	-	-	-	20	-	0	0	100	-	0	32/27
99	20	-	-	-	20	-	100	0	100	-	0	-/-
04	0	-	-	-	-	-	0	0	0	-	0	-/-
Chrysothamnus viscidiflorus viscidiflorus												
87	4133	100	1233	2400	500	-	3	0	12	-	0	5/10
94	6960	1380	580	6300	80	60	.28	0	1	.28	.28	5/12
99	7340	220	1120	6120	100	-	10	0	1	-	0	5/12
04	6220	20	120	5880	220	60	0	0	4	3	3	7/13
Coryphantha vivipara arizonica												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	40	-	-	40	-	-	0	0	-	-	0	3/3
04	20	-	-	20	-	-	0	0	-	-	0	4/4
Eriogonum microthecum												
87	33	-	-	33	-	-	0	100	-	-	0	12/7
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	20	-	-	20	-	-	0	0	-	-	0	6/9
04	20	-	-	20	-	-	0	0	-	-	0	-/-
Gutierrezia sarothrae												
87	232	33	66	166	-	-	0	0	-	-	0	7/6
94	200	120	100	100	-	-	0	0	-	-	0	1/2
99	40	-	-	40	-	20	0	0	-	-	0	8/10
04	120	-	-	120	-	-	0	0	-	-	0	5/9
Juniperus osteosperma												
87	33	-	33	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	20	-	-	20	-	-	0	0	-	-	0	-/-
04	20	-	-	20	-	-	0	0	-	-	0	-/-
Opuntia polyacantha												
87	1166	133	433	600	133	-	0	0	11	-	26	5/7
94	2200	200	560	1480	160	60	0	2	7	2	13	4/16
99	2420	40	340	1800	280	240	0	2	12	4	6	4/10
04	2300	-	260	1860	180	-	0	0	8	-	.86	5/11

		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)	
Pediocactus simpsonii													
87	0	-	-	-	-	-	0	0	-	-	0	-/-	
94	0	-	-	-	-	-	0	0	-	-	0	-/-	
99	20	-	20	-	-	-	0	0	-	-	0	-/-	
04	0	-	-	-	-	-	0	0	-	-	0	-/-	
Pinus edulis													
87	0	-	-	-	-	-	0	0	-	-	0	-/-	
94	0	-	-	-	-	-	0	0	-	-	0	-/-	
99	20	20	20	-	-	-	0	0	-	-	0	-/-	
04	20	-	20	-	-	-	0	0	-	-	0	-/-	