

Trend Study 30-61-08

Study site name: Tobin Bench.

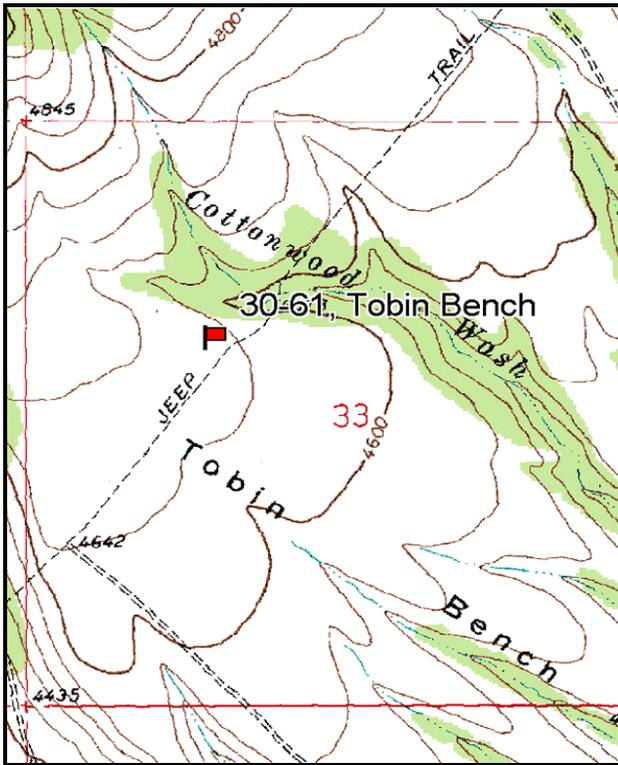
Vegetation type: Cliffrose-sagebrush.

Compass bearing: frequency baseline 272 degrees magnetic.

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

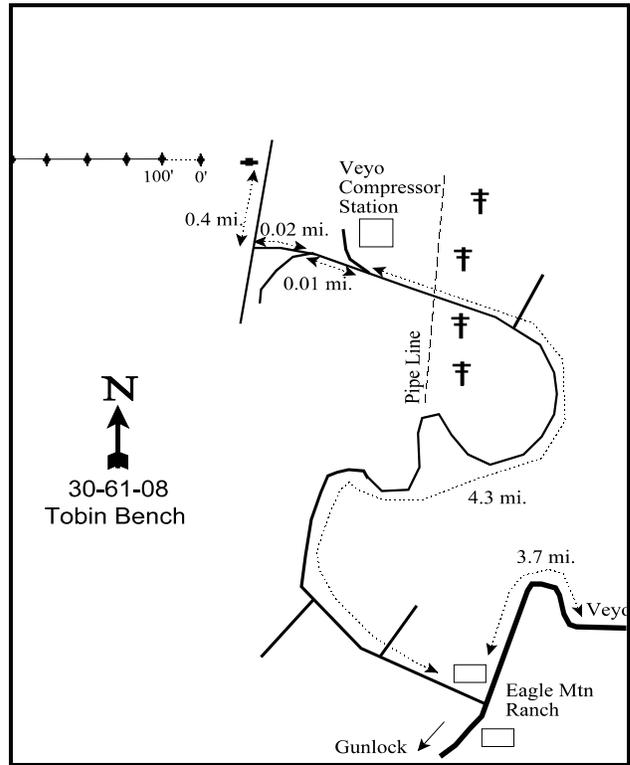
LOCATION DESCRIPTION

From Veyo, drive west on Center St. for 5.7 miles to a road on the right (north) side of the road. The Eagle Mountain Ranch will be on the left side of the road at this turn. Drive on this oiled road for 4.3 miles to Veyo Compressor Station and a fork in the road. Take the left fork for 0.01 miles to another fork. Stay right and drive 0.02 miles to an intersection and a wire gate. Turn right and drive 0.4 miles on an old powerline road to the witness post on the left side of the road. The 0-foot stake is 7 paces at 306 degrees magnetic from the witness post. The baseline runs approximately west. The study is marked by green steel "T" fence posts approximately 12 to 14 inches in height with browse tag number 244.



Map Name: Gunlock

Township 39S, Range 17W, Section 33



Diagrammatic Sketch

GPS: NAD 83, UTM 12S 255113 E, 4137729 N

DISCUSSION

Tobin Bench - Trend Study No. 30-61

Study Information

This study was established in 2003 and sampled a cliffrose/sagebrush winter range near the blackbrush ecotone, prior to the site burning between 2003 and 2008 [elevation: 4,650 (1,417 m), slope: 3%, aspect: east]. The area is now dominated by annuals. The site likely burned as part of the 2006 Bull Complex Fire, which was aerielly seeded. The transect is located west of the town of Veyo, and about one and a half miles east of the Grapevine Spring trend study. This area receives heavy winter deer use and experienced severe sagebrush die-off in 2003, likely due to drought. Pellet group data from 2003 estimated heavy deer use at 225 deer days use/acre (555 ddu/ha). Pellet group data from 2008 estimated 1 elk day use/acre (3 edu/ha) and 42 deer days use/acre (103 ddu/ha). Prior to the fire, the local DWR biologist estimated that 1,000 deer routinely used this area from October through March.

Soils

Soil at the site is deep with an effective rooting depth estimated at a little over 17 inches. Texture is a sandy clay loam, and reactivity is neutral (pH 7.1). There is some rock and pavement on the surface and abundant litter mostly from dead sagebrush plants. Relative combined vegetation and litter cover was moderate at 55%-62% since 2003, and relative combined rock and pavement cover was 16%-17% since 2003. Bare ground is found in the shrub interspace with soil pedestalling around shrubs. Relative bare ground cover was 22%-28% since 2003. There are some signs of erosion on the site but it is limited by the gentle terrain. The soil erosion condition was classified stable in 2003 and 2008.

Browse

Prior to the fire, this area supported a moderately dense stand of low elevation mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) possibly hybridized with Wyoming big sagebrush (*A. tridentata* ssp. *wyomingensis*). Intermixed with the sagebrush is a population of moderately tall Stansbury cliffrose (*Cowania mexicana* ssp. *stansburiana*) plants/acre. This area has experienced severe drought in the past. Precipitation data from the town of Veyo show several of the years prior to 2008 have below normal annual precipitation, especially 2002, which was only 37% of normal. In addition, spring precipitation (April to June) has been drier than normal for the past 4 years. The spring of 2002 was exceptionally dry at only 5% of normal (Utah climate summaries 2008). This dry period is likely the cause of a major sagebrush die-off on Tobin Bench. In 2003, shrub density data estimated 4,340 dead sagebrush plants/acre with another 600 plants/acre of decadent plants. Only about 20 plants/acre are mature plants with normal vigor. Utilization of the surviving plants was moderate to heavy. There were no seedlings or young encountered. After the fire, there were no mountain big sagebrush plants sampled in 2008

The cliffrose population was healthy and vigorous when sampled in 2003. The 2003 density estimate was 500 plants/acre with 4% young and 53% decadence. There was a 40% decrease in 2008 to 300 plants/acre with no decadence and 13% young. Mature plants average nearly 5 feet in height, making some plants partly unavailable to browsing. Vigor is normal on most plants but half of the population was classified as decadent in 2003. Reproduction is minimal but cliffrose is a long-lived species. The only other shrubs on the site consist of some oakbrush (*Quercus turbinella*) and three species of cactus (*Opuntia* sp. and *Sclerocactus* spp.).

Herbaceous Understory

The 2003 herbaceous understory was very poor. Perennial grasses were rare and represented by a few intermediate wheatgrass (*Agropyron intermedium*) and bottlebrush squirreltail (*Sitanion hystrix*) plants. Forbs were somewhat more abundant but only four species were encountered. A euphorbia sp. and weakstem mariposa lily (*Calochortus flexuosus*) were the only common species. Total grass and forb cover averaged less than 4% in 2003. Cheatgrass (*Bromus tectorum*) was sampled for the first time in 2008, although infrequently. Forbs increased greatly in 2008, but were dominated by storksbill (*Erodium cicutarium*) and tumbled mustard (*Sisymbrium altissimum*).

Seed Mix - Bull Complex Fire

Seeded Species	lbs./acre
Pubescent	3.0
Hycrest Wheatgrass	1.0
Sideoats Grama	2.0
Smooth Brome	1.0
Small Burnett	1.0
Alfalfa	1.0
Palmer Penstemon	0.1
Yellow Sweetclover	0.5
Prostrate Kochia	1.0

2003 DESIRABLE COMPONENTS INDEX

winter range condition (DCI) - very poor (20) mid-level potential scale

2008 TREND ASSESSMENT

Trend for browse is down. Mountain big sagebrush was completely lost, and cliffrose has declined in density from 500 to 300 plants/acre. Cliffrose cover has decreased from 7% to 1%. Perennial grasses are stable but very poor, though cheatgrass has entered the system. Perennial forb sum of nested frequency increased 87%, though the annual species, storksbill, was the dominant forb on the site. Storksbill was not sampled in 2003. Storksbill accounted for 74% of herbaceous cover and 72% of vegetation cover.

winter range condition (DCI) - very poor (7) mid-level potential scale

browse - down (-2) grass - stable (0) forb -stable (0)

HERBACEOUS TRENDS --

Management unit 30 , Study no: 61

T y p e	Species	Nested Frequency		Average Cover %	
		'03	'08	'03	'08
G	Agropyron cristatum	-	2	-	.00
G	Agropyron intermedium	2	-	.03	-
G	Bromus tectorum (a)	-	6	-	.02

Type	Species	Nested Frequency		Average Cover %	
		'03	'08	'03	'08
G	<i>Sitanion hystrix</i>	7	7	.01	.04
G	<i>Vulpia octoflora</i> (a)	-	4	-	.01
Total for Annual Grasses		0	10	0	0.02
Total for Perennial Grasses		9	9	0.04	0.04
Total for Grasses		9	19	0.04	0.07
F	<i>Alyssum desertorum</i> (a)	-	1	-	.03
F	<i>Aster</i> sp.	1	-	.00	-
F	<i>Calochortus flexuosus</i>	37	13	.37	.08
F	<i>Chenopodium fremontii</i> (a)	-	6	-	.01
F	<i>Descurainia pinnata</i> (a)	_a -	_b 85	-	1.25
F	<i>Erodium cicutarium</i> (a)	_a -	_b 298	-	35.71
F	<i>Eriogonum umbellatum</i>	_a -	_b 19	-	1.92
F	<i>Euphorbia</i> sp.	_a 46	_b 121	2.89	.62
F	<i>Lappula occidentalis</i> (a)	_a -	_b 34	-	.57
F	<i>Navarretia intertexta</i> (a)	_a 2	_b 104	.03	.52
F	<i>Salsola iberica</i> (a)	_a -	_b 67	-	.13
F	<i>Sisymbrium altissimum</i> (a)	_a -	_b 104	-	7.53
F	<i>Sphaeralcea grossulariifolia</i>	-	4	-	.11
Total for Annual Forbs		2	699	0.03	45.76
Total for Perennial Forbs		84	157	3.27	2.73
Total for Forbs		86	856	3.30	48.50

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

BROWSE TRENDS --

Management unit 30 , Study no: 61

Type	Species	Strip Frequency		Average Cover %	
		'03	'08	'03	'08
B	<i>Artemisia tridentata vaseyana</i>	24	0	6.11	-
B	<i>Cowania mexicana stansburiana</i>	25	15	7.29	1.12
B	<i>Gutierrezia sarothrae</i>	0	8	-	.15
B	<i>Kochia prostrata</i>	0	2	-	.03
B	<i>Quercus turbinella</i>	2	2	.53	.00
Total for Browse		51	27	13.94	1.30

CANOPY COVER, LINE INTERCEPT --

Management unit 30 , Study no: 61

Species	Percent Cover	
	'03	'08
Artemisia tridentata vaseyana	.93	-
Cowania mexicana stansburiana	7.88	1.33
Quercus turbinella	1.36	-

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 30 , Study no: 61

Species	Average leader growth (in)	
	'03	'08
Cowania mexicana stansburiana	2.5	2.9

BASIC COVER --

Management unit 30 , Study no: 61

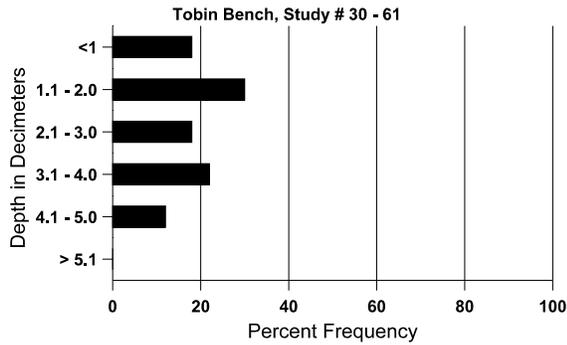
Cover Type	Average Cover %	
	'03	'08
Vegetation	17.18	49.00
Rock	7.96	11.91
Pavement	9.61	7.57
Litter	50.40	13.06
Cryptogams	.09	.01
Bare Ground	23.35	31.44

SOIL ANALYSIS DATA --

Management unit 30, Study no: 61, Study Name: Tobin Bench

Effective rooting depth (in)	Temp °F (depth)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
			%sand	%silt	%clay				
17.2	72.8 (16.6)	7.1	58.6	14.7	26.7	1.3	10.3	486.4	0.6

Stoniness Index



PELLET GROUP DATA --

Management unit 30 , Study no: 61

Type	Quadrat Frequency		Days use per acre (ha)	
	'03	'08	'03	'08
Rabbit	7	36	-	-
Elk	-	-	-	1 (3)
Deer	50	40	225 (555)	42 (103)

BROWSE CHARACTERISTICS --

Management unit 30 , Study no: 61

		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>Artemisia tridentata vaseyana</i>												
03	620	-	-	20	600	4340	32	16	97	74	74	31/41
08	0	-	-	-	-	-	0	0	0	-	0	-/-
<i>Cowania mexicana stansburiana</i>												
03	500	20	20	220	260	20	24	48	52	8	8	57/67
08	300	20	40	260	-	-	0	7	0	-	80	16/21
<i>Coryphantha vivipara</i>												
03	0	-	-	-	-	-	0	0	-	-	0	6/5
08	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Ephedra viridis</i>												
03	0	-	-	-	-	-	0	0	-	-	0	30/34
08	0	-	-	-	-	-	0	0	-	-	0	10/7

		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)	
<i>Gutierrezia sarothrae</i>													
03	0	-	-	-	-	-	0	0	-	-	0	-/-	
08	200	-	-	200	-	-	0	0	-	-	0	10/9	
<i>Kochia prostrata</i>													
03	0	-	-	-	-	-	0	0	-	-	0	-/-	
08	40	-	20	20	-	-	0	0	-	-	0	9/6	
<i>Opuntia sp.</i>													
03	0	-	-	-	-	-	0	0	-	-	0	13/26	
08	0	-	-	-	-	-	0	0	-	-	0	-/-	
<i>Quercus turbinella</i>													
03	240	-	-	240	-	40	0	0	-	-	0	52/44	
08	220	-	-	220	-	-	0	0	-	-	100	19/16	
<i>Sclerocactus sp.</i>													
03	0	-	-	-	-	-	0	0	-	-	0	11/11	
08	0	-	-	-	-	-	0	0	-	-	0	-/-	