

Trend Study 27-13-03

Study site name: Heaton .

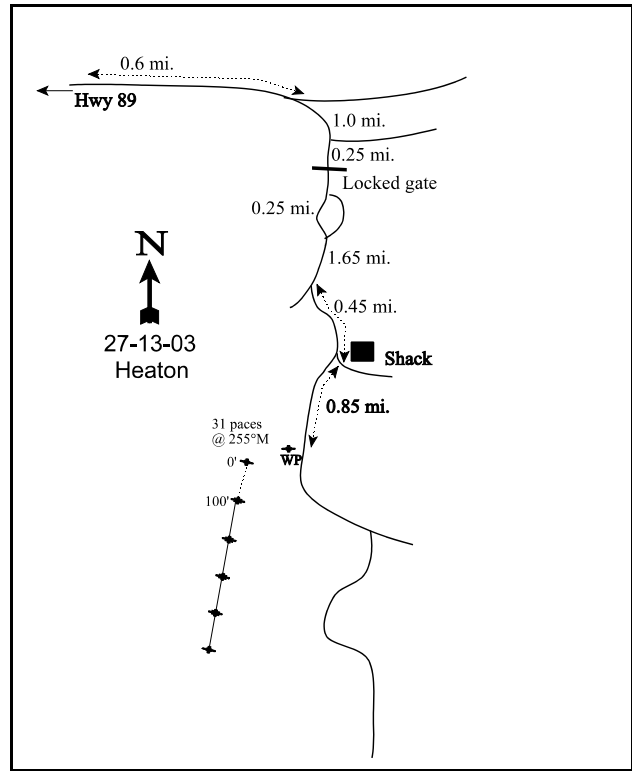
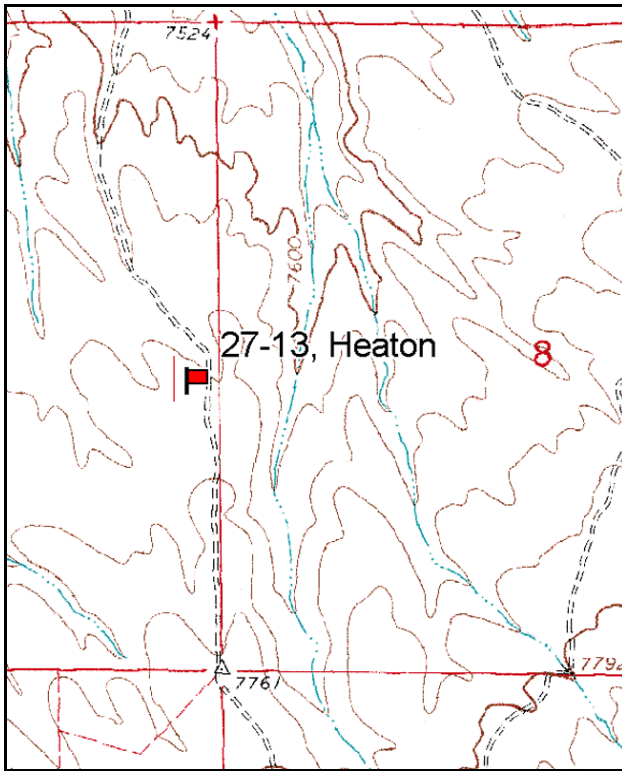
Vegetation type: Black Sagebrush .

Compass bearing: frequency baseline 195 degrees magnetic.

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

LOCATION DESCRIPTION

From U. S. 89 go approximately 0.4 miles south of mile marker 111 to a road on the left. Go 0.6 miles to a fork. Stay on Bryce Road (right) and go 1 mile to a fork. Continue straight and go 0.25 to a locked gate (get combination). Go through the gate and go 1.65 miles, staying on the main road, to a fork. Go left 0.45 miles to another fork with a shack on the left. Go right for 0.85 miles to a witness post on the right (west). From the witness post walk 31 paces at 255 degrees magnetic to the 0-foot stake. The 0-foot stake is marked by browse tag #289. The study is marked by green, steel fenceposts approximately 12-18 inches in height.



Map name: George Mountain

Diagrammatic Sketch

Township 38S, Range 5W, Section 7

GPS: NAD 27, UTM 12S 4153324 N, 371811 E

DISCUSSION

Heaton - Trend Study No. 27-13

This study was established in 1997 in conjunction with the previous one to monitor transitional range on the west side of the Paunsaugunt Plateau. It is found east of U.S. 89 about 2 miles north of the Moons Landing study site. The study area is on private land owned by the Heaton family and is part of the Heaton private hunting unit. It samples a sagebrush/bitterbrush flat with a northerly aspect and a gentle slope of 3%. Elevation is approximately 7,700 feet. Deer use was also heavy here with a total of 113 days use/acre (279 ddu/ha) being estimated in 1997. Deer use was much lower in 2003 at 45 days use/acre (111 ddu/ha). Elk use was estimated at 5 days use/acre (12 edu/ha) in 1997 and 2 days use/acre (5 edu/ha) in 2003. Cattle grazing on the site resulted in 79 cow days use/acre (195 cdu/ha) being estimated in 1997 and 25 cow days use/acre (61 cdu/ha) in 2003. This site was aerated between the initial reading in 1997 and the 2003 survey, with the last 4 belts on the transect being effected.

Soil at the site is moderately deep with an effective rooting depth of almost 17 inches. There is little rock on the surface or in the profile. Texture is a sandy loam with a slightly acidic pH (6.1). This site supports a black sagebrush/mountain big sagebrush hybrid population which suggests some sort of physical and/or physiological rooting barrier not discovered by the soil penetrometer. Erosion is not a problem locally due to the gentle terrain and adequate vegetation and litter cover. Ground cover characteristics changed somewhat in 2003 with bare ground increasing, and vegetation and litter cover both decreasing. The aerator treatment, coupled with drought, likely accounts for most of these changes. An erosion condition class assessment rated soils as stable in 2003.

Shrubs, particularly sagebrush, dominate the vegetational aspect of the site. Sagebrush on the site is a hybrid between black sagebrush and mountain big sagebrush as determined by a florescence test under a black light. Sagebrush provided 69% and 75% of the total browse cover in 1997 and 2003 respectively. Total browse cover, including sagebrush cover, declined between 1997 and 2003 due to the aerator treatment. However, the most abundant browse species either increased or remained stable in overall density. Sagebrush density was estimated at 8,800 plants/acre in 1997 and 11,140 plants/acre in 2003. Decadence was low in both sampling years at 12% and 9%, although poor vigor increased in 2003 as some of the plants that had been aerated were in poor condition. Use was light on sagebrush in both years. Bitterbrush has a stable population at nearly 1,300 plants/acre. Use on bitterbrush was moderate to heavy in 1997 and 2003, but decadence was low. Poor vigor increased to 53% in 2003 with the aerator treatment effecting a lot of the bitterbrush on the site. As this site is more transitional range for big game, and is also grazed by livestock, a more aggressive treatment would have yielded better results as far as decreasing the browse component. Although total browse cover declined from 35% to 21%, shrub density remained stable or slightly increased and this site will likely show very little herbaceous understory improvement in the long term.

The herbaceous understory accounted for 28% of the total vegetation cover on the site in 1997 and 33% in 2003. Nine species of perennial grasses have been sampled between the 2 surveys, with mutton bluegrass, prairie Junegrass, and needle-and-thread being the most common. As a group, perennial grasses showed a large decline in sum of nested frequency between 1997 and 2003. Forbs are diverse on the site but not abundant. Twenty-four species were sampled on the site between 1997 and 2003. Perennial forbs also declined in sum of nested frequency in 2003. The loss of herbaceous species abundance could be attributed to several factors including a temporary decline due to the aerator treatment, drought, and grazing.

1997 APPARENT TREND ASSESSMENT

The soil is relatively well protected on the site by the abundant vegetation and litter cover combined with the gentle terrain. Unfortunately, 72% of the vegetation cover comes from shrubs which are not as effective at protecting the soil from high intensity summer storm events as herbaceous cover is. The herbaceous cover is

lacking, especially forbs. Browse are abundant. The age class distribution of black sagebrush appears to be capable of maintaining itself on this site, however the proportion of dead plants in the population should be monitored closely. The population is already moderately dense and an increase will only further suppress the herbaceous understory. The more preferred bitterbrush is receiving some very heavy use but the population is healthy with good recruitment, normal vigor, and low percent decadence. The few serviceberry plants on the site are very severely hedged. The herbaceous understory is lacking on this site perhaps due to a long history of livestock grazing. The herbaceous understory will likely further decline if the already dense population of black sage continues to increase.

2003 TREND ASSESSMENT

Trend for soil is slightly down. Bare ground increased to 29%, and vegetation and litter cover both declined due to drought and the aerator treatment. Soils show minimal erosion, and trend should improve as the site has time to recover from the aerator treatment and with better precipitation. Trend for browse is stable. Black sagebrush increased in density even with the aerator treatment that was done on the site. Bitterbrush density remained stable. Decadence is low for both species, although vigor was reduced in both populations with the treatment. Black sagebrush is still very abundant, and this site will recover quickly. A more aggressive treatment would yield better results to decrease the browse component and favor the herbaceous species. Trend for the herbaceous understory is down. Perennial grasses and forbs both showed declined sum of nested frequency values in 2003. A combination of the mechanical treatment and drought account for this loss. It appears that the herbaceous understory may not gain any long term benefits from the treatment.

TREND ASSESSMENT

soil - slightly down (2)

browse - stable (3)

herbaceous understory - down (1)

HERBACEOUS TRENDS --

Management unit 27 , Study no: 13

Type	Species	Nested Frequency		Average Cover %	
		'97	'03	'97	'03
G	Agropyron cristatum	4	6	.53	.30
G	Agropyron smithii	23	26	.07	.45
G	Bouteloua gracilis	35	15	.28	.11
G	Koeleria cristata	_b 155	_a 92	2.65	1.73
G	Poa fendleriana	_b 273	_a 194	6.67	4.59
G	Poa secunda	6	4	.15	.00
G	Sitanion hystrix	-	2	-	.06
G	Stipa comata	90	103	1.12	1.64
G	Stipa lettermani	_b 29	_a -	.59	-
Total for Annual Grasses		0	0	0	0
Total for Perennial Grasses		615	442	12.09	8.90
Total for Grasses		615	442	12.09	8.90

Type	Species	Nested Frequency		Average Cover %	
		'97	'03	'97	'03
F	<i>Agoseris glauca</i>	a-	b13	-	.03
F	<i>Alyssum alyssoides</i> (a)	-	9	-	.01
F	<i>Allium</i> spp.	1	-	.00	-
F	<i>Antennaria rosea</i>	13	1	.21	.00
F	<i>Arabis</i> spp.	2	-	.00	-
F	<i>Astragalus</i> spp.	b41	a-	.37	-
F	<i>Calochortus nuttallii</i>	1	-	.00	-
F	<i>Castilleja</i> spp.	2	1	.00	.00
F	<i>Cirsium</i> spp.	5	-	.00	-
F	<i>Collinsia parviflora</i> (a)	a12	b123	.05	.52
F	<i>Crepis acuminata</i>	-	2	-	.00
F	<i>Eriogonum racemosum</i>	b31	a20	.37	.29
F	<i>Eriogonum umbellatum</i>	7	13	.03	.08
F	<i>Gayophytum ramosissimum</i> (a)	-	5	-	.04
F	<i>Gilia</i> spp. (a)	8	-	.04	-
F	<i>Lomatium</i> spp.	3	-	.03	-
F	<i>Lotus utahensis</i>	b45	a6	.22	.01
F	<i>Lychnis drummondii</i>	-	2	-	.00
F	<i>Microsteris gracilis</i> (a)	-	14	-	.09
F	<i>Oenothera</i> spp.	1	-	.00	-
F	<i>Orthocarpus luteus</i> (a)	3	7	.01	.06
F	<i>Penstemon</i> spp.	b22	a2	.09	.01
F	<i>Phlox longifolia</i>	43	51	.14	.09
F	<i>Polygonum douglasii</i> (a)	b44	a9	.08	.01
Total for Annual Forbs		67	167	0.19	0.75
Total for Perennial Forbs		217	111	1.51	0.54
Total for Forbs		284	278	1.70	1.29

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

BROWSE TRENDS --

Management unit 27 , Study no: 13

Type	Species	Strip Frequency		Average Cover %	
		'97	'03	'97	'03
B	Amelanchier utahensis	1	2	.03	-
B	Artemisia nova	96	98	24.60	15.75
B	Chrysothamnus depressus	8	1	.24	.03
B	Chrysothamnus nauseosus hololeucus	1	0	-	-
B	Chrysothamnus viscidiflorus viscidiflorus	22	29	.55	.66
B	Gutierrezia sarothrae	1	12	-	.39
B	Opuntia spp.	6	3	.18	.00
B	Purshia tridentata	43	44	10.25	4.25
B	Rosa woodsii	1	0	-	-
B	Symphoricarpos oreophilus	0	1	-	-
B	Tetradymia canescens	1	2	-	.06
Total for Browse		180	192	35.86	21.14

CANOPY COVER, LINE INTERCEPT --

Management unit 27 , Study no: 13

Species	Percent Cover
	'03
Artemisia nova	17.88
Chrysothamnus depressus	.23
Chrysothamnus viscidiflorus viscidiflorus	.85
Purshia tridentata	3.76
Tetradymia canescens	.11

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 27 , Study no: 13

Species	Average leader growth (in)
	'03
Artemisia nova	1.1
Purshia tridentata	2.7

BASIC COVER --

Management unit 27 , Study no: 13

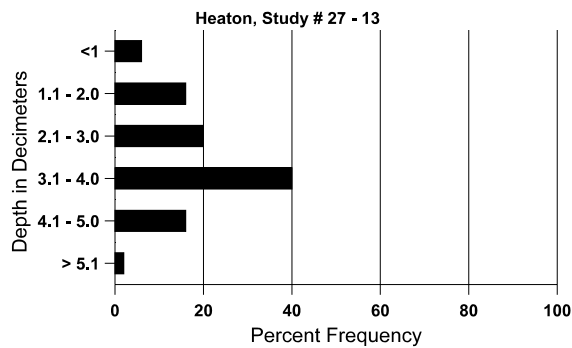
Cover Type	Average Cover %	
	'97	'03
Vegetation	49.70	32.78
Rock	.14	.22
Pavement	3.04	3.96
Litter	53.33	42.73
Cryptogams	.06	.03
Bare Ground	20.90	28.71

SOIL ANALYSIS DATA --

Management unit 27, Study no: 13, Study Name: Heaton

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
16.5	65.3 (10.6)	6.1	65.0	19.2	15.8	2.1	13.4	131.2	0.4

Stoniness Index



PELLET GROUP DATA --

Management unit 27 , Study no: 13

Type	Quadrat Frequency		Days use per acre (ha)
	'97	'03	
Rabbit	3	2	-
Elk	8	2	2 (5)
Deer	51	19	45 (111)
Cattle	13	5	25 (61)

BROWSE CHARACTERISTICS --
Management unit 27 , Study no: 13

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Amelanchier utahensis											
97	20	20	-	20	-	-	0	100	-	0	-/-
03	40	-	20	20	-	-	0	50	-	50	26/33
Artemisia nova											
97	8800	2180	2820	4940	1040	700	10	2	12	7	15/28
03	11140	20	2820	7360	960	300	4	2	9	29	15/21
Chrysothamnus depressus											
97	240	-	20	220	-	-	0	0	-	0	6/10
03	60	-	-	60	-	-	0	100	-	0	6/8
Chrysothamnus nauseosus hololeucus											
97	20	-	-	20	-	-	0	0	-	0	24/30
03	0	-	-	-	-	-	0	0	-	0	-/-
Chrysothamnus viscidiflorus viscidiflorus											
97	1060	-	120	940	-	-	0	0	0	0	6/11
03	1440	-	80	1320	40	-	0	0	3	14	7/12
Gutierrezia sarothrae											
97	20	-	-	20	-	-	0	0	-	0	-/-
03	360	-	-	360	-	-	0	0	-	6	5/10
Opuntia spp.											
97	160	-	40	100	20	-	0	0	13	13	4/13
03	60	-	-	60	-	-	0	0	0	0	3/8
Purshia tridentata											
97	1220	180	140	1000	80	-	61	21	7	3	22/51
03	1280	-	60	1080	140	-	36	61	11	53	16/32
Rosa woodsii											
97	20	-	-	-	20	-	0	0	100	100	-/-
03	0	-	-	-	-	-	0	0	0	0	8/6
Symphoricarpos oreophilus											
97	0	-	-	-	-	-	0	0	-	0	-/-
03	20	-	-	20	-	-	0	100	-	0	12/17
Tetradymia canescens											
97	20	-	-	20	-	-	0	0	-	0	-/-
03	40	-	-	40	-	-	0	0	-	0	7/10