

Trend Study 28-15-08

Study site name: Sheep Hollow East .

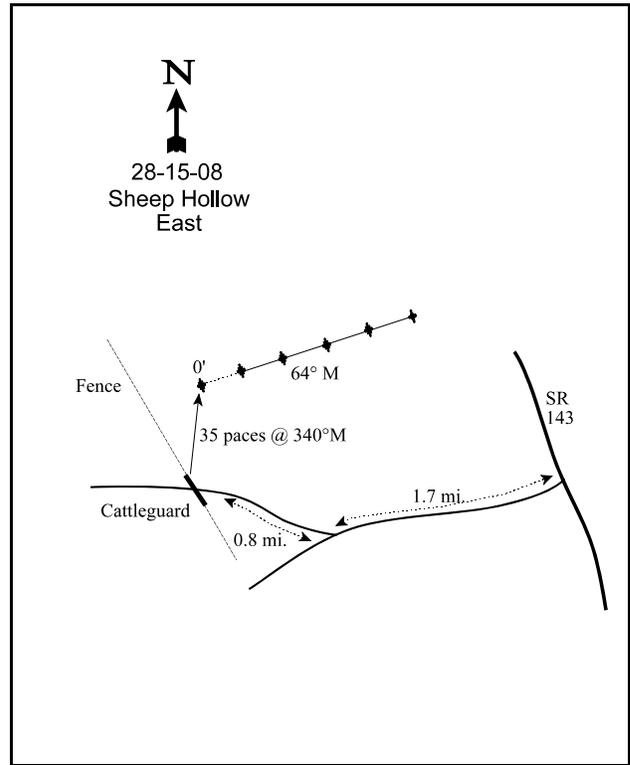
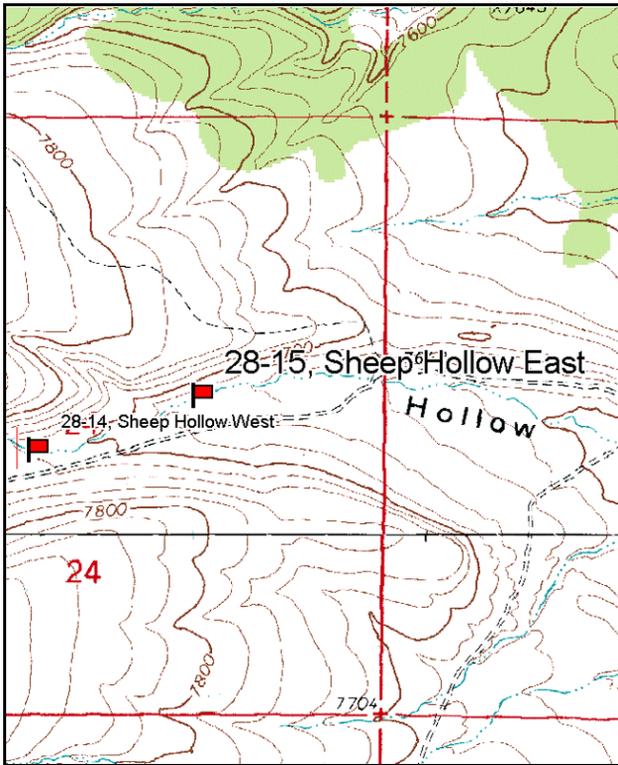
Vegetation type: Black Sagebrush .

Compass bearing: frequency baseline 64 degrees magnetic.

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

LOCATION DESCRIPTION

From Panguitch, head south on SR 143 to mile marker 47. Go 0.1 mile west of mile marker 47 and turn south onto a dirt road heading towards Sheep Hollow. Drive 1.7 miles to a fork. Stay right and continue 0.8 miles to a fence and cattleguard. The witness post is on the right side of the road just before the cattleguard. From the cattleguard, the 0-foot stake is 35 paces away at 340 degrees magnetic and is marked with browse tag #496.



Map Name: Panguitch

Diagrammatic Sketch

Township 35S, Range 6W, Section 24

GPS: NAD 83, UTM 12S 369941 E, 4179446 N

DISCUSSION

Sheep Hollow East - Trend Study No. 28-15

Study Information

This study was established in 1998 in conjunction with study 28-14, which lies a half mile to the west of this site and across the fence in a different grazing regime [elevation: 7,700 feet (2,347 m), slope: 2%-5%, aspect: east]. This site receives heavier grazing pressure than the previous study and was historically grazed by sheep until 1991 when use was changed to cattle. This pasture is permitted for 800 AUM's from June to October (1998 grazing management data). The cows are moved around the pasture by utilizing various water sources at different times of the grazing season. Wildlife also appear to be using this site heavily. Pellet group data from 1998 estimated 27 deer, 15 elk, and 22 antelope days use/acre (67 ddu/ha, 37 edu/ha, and 54 adu/ha). A few antelope were seen near the site. Pellet group data from 2003 estimated 33 deer and 31 cow days use/acre (83 ddu/ha and 77 cdu/ha). Pellet group data in 2008 estimated 42 deer, 4 elk, and 32 cow days use/acre (103 ddu/ha, 10 edu/ha, and 79 cdu/ha). Because of difficulties distinguishing between the two, antelope and deer pellets were classified as deer in 2003 and 2008.

Soils

Ground cover characteristics are very similar to the Sheep Hollow West study (28-14). However, soil on this site is more shallow with more rock concentrated near the surface compared to the adjacent study. Soil texture is a sandy loam with a neutral pH (7.1). Parent material is basalt. Relative combined average vegetation and litter cover has been 63%-76% since 1998, with the lowest cover in 2003. Relative combined average rock and pavement cover has been 11%-12% since 1998. Relative average bare ground cover has been moderate at 13%-25%, with the highest cover in 2003. An erosion condition class assessment rated soils as stable in 2003 and 2008.

Browse

This site supports a mix of black sagebrush (*Artemisia nova*), basin big sagebrush (*Artemisia tridentata* spp. *tridentata*), and bitterbrush (*Purshia tridentata*) with a grass-forb understory. Black sagebrush is the most abundant shrub providing 63%-81% of the browse cover since 1998. The stand of black sagebrush is quite dense with an estimated density ranging from a low of 7,640 plant/acre in 2003 to a high of 9,740 plants/acre in 2008. This is a mostly mature population that showed moderate decadence in 1998 and 2003, but increased to higher rates of decadence in 2008. Recruitment of young black sagebrush has increased since 1998, with a large increase in young plants in 2008. Utilization has been light to moderate, although a few plants are heavily hedged. Vigor has been good on most plants.

The densities of basin big sagebrush and bitterbrush are higher on this site compared to study 28-14. Basin big sagebrush density has fluctuated greatly, but due to hybridization between black sagebrush and basin big sagebrush there may have been some discrepancy in identification between sample years. Decadence of big sagebrush has been moderate to high, but vigor has been good. Recruitment of young big sagebrush plants has been poor to absent. Utilization of big sagebrush has been mostly light. Bitterbrush density has been similar at around 600 plants/acre since 1998. Decadence of bitterbrush was low in the mostly mature population, but increased to over 50% in 2008. Vigor has been good, but recruitment of young bitterbrush plants has been low in all sample years. Utilization of bitterbrush has been moderate to very heavy.

The pinyon pine (*Pinus edulis*) and Utah juniper trees (*Juniperus osteosperma*) on this site were hand cut in the spring of 1998 with only a few scattered trees being left. Stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* spp. *viscidiflorus*), broom snakeweed (*Gutierrezia sarothrae*), Oregon grape (*Mahonia repens*), prickly pear (*Opuntia* sp.), and gray horsebrush (*Tetradymia canescens*) have also been sampled on the site in small numbers.

Herbaceous Understory

The herbaceous understory is similar in diversity but not nearly as abundant compared to the Sheep Hollow West study site (28-14). Eleven species of perennial grasses, one annual grass, and one sedge have been sampled on the site. The dominant species is blue grama (*Bouteloua gracilis*), and other common perennial species include bottlebrush squirreltail (*Sitanion hystrix*), western wheatgrass (*Agropyron smithii*), needle-and-thread grass (*Stipa comata*), Letterman needlegrass (*Stipa lettermani*), and mutton bluegrass (*Poa fendleriana*). Most of the preferred grass species are found growing under the protection of shrubs, with blue grama found in the shrub interspaces. The forb component is very diverse, with fair abundance. Twenty-seven perennial and seven annual forbs have been identified on the site since 1998. As with grasses, fewer forb species were sampled in 2003 due to drought. The most abundant perennial forbs include sulfur and redroot eriogonum (*Eriogonum umbellatum* and *E. racemosum*), Indian paintbrush (*Castilleja linariaefolia*), low fleabane (*Erigeron pumilus*), skeletonweed (*Lygodesmia spinosa*), hoary aster (*Machaeranthera canescens*), and longleaf phlox (*Phlox longifolia*). Groundsmoke (*Gayophytum ramosissimum*) has been the most abundant annual forb on the site.

1998 DESIRABLE COMPONENTS INDEX

winter range condition (DCI) - fair (61) Mid-level potential scale

2003 TREND ASSESSMENT

Trend for browse is stable. Due to possible identification problems from hybridization, trend for black sagebrush and basin big sagebrush will be considered together. Combined sagebrush density increased slightly from 1998. Sagebrush decadence remained moderate and vigor was mostly good. Recruitment of young sagebrush plants was poor. The density of the preferred browse, antelope bitterbrush, remained the same as 1998, and the population has low decadence and good vigor. Trend for both grasses and forbs is down, most likely due to an ongoing drought. Sum of nested frequency of both perennial grasses and perennial forbs decreased markedly, as did their total cover. There was a significant decrease in the nested frequency of mountain brome (*Bromus carinatus*), bottlebrush squirreltail, and Letterman needlegrass.

winter range condition (DCI) - poor (47) Mid-level potential scale

browse - stable (0)

grass - down (-2)

forb - down (-2)

2008 TREND ASSESSMENT

Trend for browse is slightly up. Due to possible identification problems from hybridization, trend for black sagebrush and basin big sagebrush will be considered together. Combined sagebrush density increased, with a large increase in the recruitment of young black sagebrush plants. Decadence increased in sagebrush, but vigor remained good. Combined sagebrush line-intercept canopy cover was similar to 2003. Bitterbrush density is estimated at 620 plants/acre, similar to past years, although recruitment is low and decadence increased to 52%. Trend for both grasses and forbs is up. Sum of nested frequency of perennial grasses and perennial forbs, as well as their total cover, increased to 1998 levels. There was a significant increase in the nested frequency of western wheatgrass, sedge (*Carex sp.*), needle-and-thread grass, and Letterman needlegrass.

winter range condition (DCI) - fair (59) Mid-level potential scale

browse - slightly down (-1)

grass - up (+2)

forb - up (+2)

HERBACEOUS TRENDS --
Management unit 28 , Study no: 15

T y p e	Species	Nested Frequency			Average Cover %		
		'98	'03	'08	'98	'03	'08
G	Agropyron intermedium	3	-	-	.01	-	-
G	Agropyron smithii	_a 2	_a 8	_b 49	.01	.01	.15
G	Bouteloua gracilis	175	137	154	2.76	1.14	3.60
G	Bromus carinatus	23	-	9	.12	-	.09
G	Bromus tectorum (a)	7	9	19	.02	.01	.04
G	Carex sp.	_a 3	_a -	_b 26	.06	.00	.16
G	Koeleria cristata	3	3	3	.03	.15	.06
G	Oryzopsis hymenoides	4	-	-	.18	-	.00
G	Poa fendleriana	40	40	13	.76	.23	.14
G	Sitanion hystrix	_b 116	_a 60	_{ab} 74	1.57	.46	1.25
G	Stipa columbiana	9	7	-	.21	.04	-
G	Stipa comata	_{ab} 16	_a 8	_b 33	.38	.07	.68
G	Stipa lettermani	_b 62	_a 19	_b 64	1.63	.18	.96
Total for Annual Grasses		7	9	19	0.02	0.01	0.04
Total for Perennial Grasses		456	282	425	7.76	2.30	7.12
Total for Grasses		463	291	444	7.78	2.32	7.17
F	Alyssum alyssoides (a)	6	-	-	.01	-	-
F	Arabis sp.	_b 11	_a -	_c 38	.05	-	.33
F	Astragalus convallarius	11	13	3	.22	.11	.09
F	Astragalus sp.	9	13	4	.02	.02	.03
F	Castilleja linariaefolia	17	10	12	.16	.04	.39
F	Calochortus nuttallii	-	5	6	-	.01	.04
F	Chaenactis douglasii	7	1	-	.02	.03	-
F	Chenopodium leptophyllum(a)	_a -	_a 3	_b 10	-	.00	.02
F	Cirsium sp.	-	-	1	-	-	.00
F	Cryptantha sp.	6	-	8	.04	.00	.04
F	Descurainia pinnata (a)	2	-	-	.01	-	-
F	Erigeron divergens	_b 20	_a -	_a -	.15	-	-
F	Erigeron eatonii	7	-	6	.01	-	.07
F	Erigeron flagellaris	8	-	-	.38	-	-
F	Erigeron pumilus	_b 25	_a 6	_{ab} 15	.11	.04	.37
F	Eriogonum racemosum	23	24	25	.21	.17	.37
F	Eriogonum umbellatum	31	28	43	.49	.30	.41
F	Euphorbia robusta	5	4	4	.09	.06	.15

T y p e	Species	Nested Frequency			Average Cover %		
		'98	'03	'08	'98	'03	'08
F	Gayophytum ramosissimum(a)	_a -	_b 108	_b 86	-	.60	.22
F	Gilia sp. (a)	4	-	-	.01	-	-
F	Leucelene ericoides	-	2	4	-	.03	.01
F	Linum lewisii	9	3	2	.05	.01	.00
F	Lotus utahensis	4	-	3	.06	-	.01
F	Lupinus argenteus	12	2	10	.25	.07	.48
F	Lupinus kingii (a)	-	-	11	-	-	.01
F	Lychnis drummondii	1	4	-	.00	.01	-
F	Lygodesmia spinosa	23	29	28	.18	.14	.28
F	Machaeranthera canescens	_b 28	_a 5	_a 2	.15	.09	.03
F	Oenothera pallida	_b 17	_{ab} 3	_a 3	.08	.00	.03
F	Penstemon sp.	-	-	6	-	-	.01
F	Phlox longifolia	23	13	35	.08	.03	.19
F	Polygonum douglasii (a)	_a -	_a -	_b 21	-	-	.04
F	Senecio multilobatus	1	-	10	.03	-	.05
F	Trifolium sp.	2	-	3	.00	-	.00
Total for Annual Forbs		12	111	128	0.03	0.61	0.31
Total for Perennial Forbs		300	165	271	2.89	1.19	3.45
Total for Forbs		312	276	399	2.92	1.80	3.77

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

BROWSE TRENDS --

Management unit 28 , Study no: 15

Type	Species	Strip Frequency			Average Cover %		
		'98	'03	'08	'98	'03	'08
B	Artemisia nova	96	87	100	20.73	21.42	21.17
B	Artemisia tridentata tridentata	9	26	2	.77	6.57	.53
B	Ceanothus fendleri	1	0	0	.00	-	-
B	Chrysothamnus parryi	0	1	3	-	.00	.00
B	Chrysothamnus viscidiflorus viscidiflorus	9	7	9	.24	.59	.22
B	Gutierrezia sarothrae	1	2	2	.03	.00	.00
B	Juniperus osteosperma	0	0	1	-	-	.00
B	Mahonia repens	9	9	10	.01	.06	.04
B	Opuntia sp.	3	2	2	.00	.00	.00
B	Pediocactus simpsonii	0	1	0	-	.00	-
B	Pinus edulis	1	2	1	.03	.30	.15
B	Purshia tridentata	23	21	22	4.14	5.08	3.92
B	Tetradymia canescens	1	0	2	.00	-	.00
Total for Browse		153	158	154	25.96	34.04	26.04

CANOPY COVER, LINE INTERCEPT --

Management unit 28 , Study no: 15

Species		
	'03	'08
Artemisia nova	21.60	30.10
Artemisia tridentata tridentata	10.26	.68
Chrysothamnus viscidiflorus viscidiflorus	.21	.76
Gutierrezia sarothrae	.26	-
Mahonia repens	.05	-
Pinus edulis	.10	.36
Purshia tridentata	7.68	6.84

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 28 , Study no: 15

Species	Average leader growth (in)	
	'03	'08
Artemisia nova	1.0	0.7
Purshia tridentata	1.7	1.3

BASIC COVER --

Management unit 28 , Study no: 15

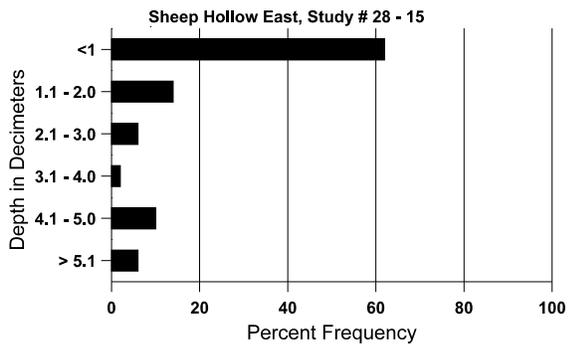
Cover Type	Average Cover %		
	'98	'03	'08
Vegetation	44.70	37.75	36.70
Rock	5.99	8.08	7.09
Pavement	6.91	5.80	5.66
Litter	45.79	37.56	39.92
Cryptogams	.04	.18	.07
Bare Ground	16.03	30.54	23.18

SOIL ANALYSIS DATA --

Management unit 28, Study no: 15, Study Name: Sheep Hollow East

Effective rooting depth (in)	Temp °F (depth)	pH	sandy loam			%OM	PPM P	PPM K	ds/m
			%sand	%silt	%clay				
11.5	59.3 (12.7)	7.1	62.7	21.4	15.8	2.6	24.8	262.4	0.3

Stoniness Index



PELLET GROUP DATA --

Management unit 28 , Study no: 15

Type	Quadrat Frequency		
	'98	'03	'08
Rabbit	3	12	58
Elk	5	1	-
Deer	27	27	23
Cattle	6	3	6

Days use per acre (ha)		
'98	'03	'08
-	-	-
15 (37)	-	4 (10)
49 (121)	33 (83)	42 (103)
-	31 (77)	32 (79)

BROWSE CHARACTERISTICS --
Management unit 28 , Study no: 15

		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 nova</i>												
98	7840	220	320	5320	2200	1180	35	7	28	5	5	18/28
03	7640	-	460	5300	1880	1060	17	1	25	11	11	13/19
08	9740	2720	1340	4300	4100	1180	26	7	42	9	10	16/27
<i>Artemisia tridentata tridentata</i>												
98	260	-	20	180	60	80	31	0	23	-	0	40/48
03	1400	-	-	1000	400	240	6	0	29	7	7	32/37
08	60	-	-	20	40	-	100	0	67	-	0	41/50
<i>Ceanothus fendleri</i>												
98	20	-	20	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	28/29
<i>Chrysothamnus nauseosus</i>												
98	0	-	-	-	-	-	0	0	-	-	0	26/24
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	16/17
<i>Chrysothamnus parryi</i>												
98	0	-	-	-	-	-	0	0	0	-	0	-/-
03	20	-	-	20	-	-	0	0	0	-	0	8/10
08	60	-	-	20	40	-	0	0	67	-	0	7/8
<i>Chrysothamnus viscidiflorus viscidiflorus</i>												
98	260	-	20	220	20	-	8	0	8	-	0	8/15
03	300	-	-	300	-	-	0	0	0	-	0	6/10
08	260	-	-	240	20	-	15	0	8	-	0	9/15
<i>Gutierrezia sarothrae</i>												
98	20	-	-	20	-	-	0	0	0	-	0	7/18
03	40	-	-	40	-	40	0	0	0	-	0	8/16
08	60	-	-	20	40	-	0	0	67	67	67	8/6
<i>Juniperus osteosperma</i>												
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	20	-	20	-	-	-	0	0	-	-	0	-/-

		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)
Mahonia repens												
98	880	-	80	800	-	-	0	0	-	-	0	-/-
03	520	-	40	480	-	-	0	0	-	-	0	2/3
08	780	-	20	760	-	-	0	0	-	-	0	3/4
Opuntia sp.												
98	60	-	-	60	-	-	0	0	0	-	0	8/6
03	40	-	-	40	-	-	0	0	0	-	0	6/9
08	40	-	-	20	20	-	0	0	50	-	0	6/7
Pediocactus simpsonii												
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	20	-	-	20	-	-	0	0	-	-	0	2/3
08	0	-	-	-	-	-	0	0	-	-	0	-/-
Pinus edulis												
98	20	-	20	-	-	20	0	0	-	-	0	-/-
03	40	-	40	-	-	-	0	0	-	-	0	-/-
08	20	-	20	-	-	-	0	0	-	-	0	-/-
Purshia tridentata												
98	600	-	40	540	20	20	53	33	3	-	0	31/50
03	600	-	20	500	80	-	3	97	13	-	0	31/51
08	620	20	-	300	320	20	48	45	52	3	3	26/50
Rhus trilobata												
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	14/23
08	0	-	-	-	-	-	0	0	-	-	0	-/-
Tetradymia canescens												
98	20	-	-	20	-	-	0	0	-	-	0	12/18
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	40	-	-	40	-	-	0	0	-	-	0	11/22