

Trend Study 6-3-06

Study site name: Spring Hollow Burn .

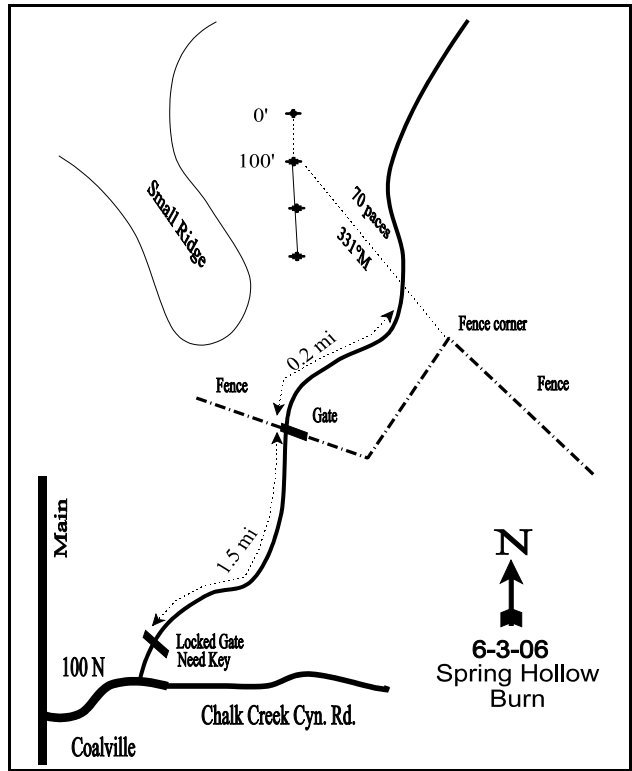
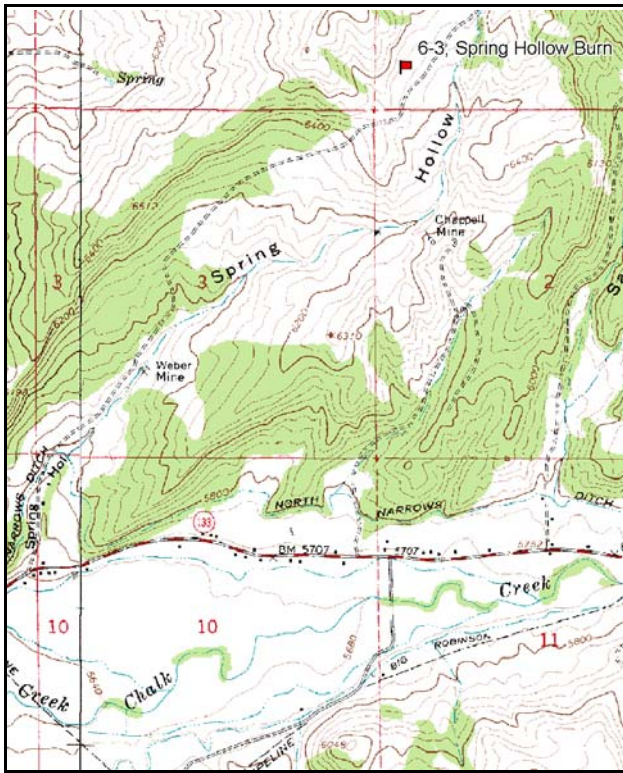
Vegetation type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 165 degrees magnetic.

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

LOCATION DESCRIPTION

From 100 North and Main in Coalville, travel east 1.3 miles to Spring Hollow Road. Turn left (northeast) and proceed 0.2 mile to a locked gate. Proceed through gate, and continue 1.5 miles to a gate. Continue 0.2 miles to a fence line corner on the right. From corner post, walk 70 paces at 331 degrees magnetic to the 100-foot stake of the baseline. The 0-foot stake is marked by browse tag #7974.



Map Name: Turner Hollow

Diagrammatic Sketch

Township 3N, Range 5E, Section 35

UTM NAD 27, UTM 12T 4532493 N 469930 E

DISCUSSION

Spring Hollow Burn - Trend Study No. 6-3

Study Information

This study is located near an old line-intercept study on an old burn in the upper part of Spring Hollow (elevation: 6,500 feet, slope: 20%, aspect: southeast). The area was dominated by sagebrush-grass and juniper-pinyon communities. After the burn, the area was seeded with perennial grasses, mostly crested and intermediate wheatgrass. It is privately-owned and grazed by a variety of domestic animals in addition to winter use by deer and elk. During heavy winters, it may not be as critical for wildlife due to the lack of browse. In 1984, deer pellet groups occurred frequently, and 3 deer and 1 elk antler sheds were found. The study was not read in 1996 because access to the private property was not obtained. However, permission was obtained to monitor the study in 2001 and 2006. In 2001, the pellet group transect data estimated 9 elk days use/acre (21 edu/ha), 6 deer days use/acre (15 ddu/ha), and 21 cow days use/acre (52 cdu/ha). Livestock were also observed nearby in 2001. The 2006 pellet group data estimates were 17 elk, 13 deer, and 14 cow days use/acre (41 edu/ha, 33 ddu/ha, and 34 cdu/ha). A deer carcass was identified in 2006. Deer and elk pellets were from winter and spring use and cattle pats were from the previous summer.

Soil

The soil is in the Ant Flat series, which are very deep, well drained, slowly permeable soils on terraces and mountain slopes. They formed in colluvium, residuum, and alluvium from calcareous sandstone and some quartzite, conglomerate, limestone, and shale (USDA-NRCS 2006). The soil texture is a clay loam with a slightly acidic soil reaction (6.5 pH). Soil depth is quite shallow with an estimated effective rooting depth of less than 9 inches. Organic matter is relatively high at 4.6%. Erosion is minimal due to the abundance of herbaceous vegetation cover, litter cover, and low percent bare ground. Relative bare ground cover was 11% in 2001 and 10% in 2006. The erosion condition class assessment determined soils as stable in 2001 and 2006.

Browse

Browse is very limited on the site. It provided only 2% cover in 2001 and 3% in 2006. Mountain big sagebrush and serviceberry are the most abundant preferred species. In 1984, sagebrush density was 966 plants/acre, but had decreased to 699 plants/acre in 1990. No serviceberry plants were sampled in 1984 or 1990. Both species have had densities estimated at 40 plants/acre or less since 2001 and both have also showed moderate to heavy use since 2001. Population densities decreased from 1990 to 2001 due to the increase in sample area, which better estimates clumped and/or discontinuous distributions. The sagebrush and serviceberry populations will remain small due to high resource competition with the dense crested wheatgrass. The sagebrush defoliator moth (*Aroga websterii*) was identified on a few sagebrush plants in 2006, but was not sampled in the density measurements. Broom snakeweed is the most abundant species with an estimated density of 4,100 plants/acre in 2001 and 3,480 plants/acre in 2006.

Herbaceous Understory

The herbaceous understory is dominated by crested wheatgrass and Sandberg bluegrass. Crested wheatgrass displayed moderate to heavy utilization in 2001 and light in 2006. It was reported in 1990 that grasses appeared less vigorous than normal because of grazing effects and damage by ants and aphids. Grass cover was 36% in 2001 and 28% in 2006. Forbs provided 7% cover in 2001 and 13% in 2006. Perennial species increased in sum of nested frequency between 1990 and 2001, partially because of the change in sample area. Annual forbs, which were not sampled in 1984 or 1990, were quite abundant in 2001 and 2006.

1990 TREND ASSESSMENT

There was a significant increase in percent decadence in this low density, heavily used big sagebrush population. Sagebrush density decreased 28% from 1984 to 1990. The site has an incredible infestation of ants and aphids on the sagebrush. In spite of these factors, the sagebrush display fair growth and seed production. No seedlings were found. Any openings in the dense crested wheatgrass stand that would allow

young sagebrush to become established are crowded with snakeweed seedlings and young. The dense stand of small crested wheatgrass plants had increased in nested frequency values. It shows 40-60% utilization, and cattle are still in the area utilizing the fall green-up.

browse - down (-2) grass - up (+2) forb - slightly down (-1)

2001 TREND ASSESSMENT

Trend for browse is stable, although browse is limited with only 20 sagebrush and 40 serviceberry plants/acre. Due to the lack of dead sagebrush plants, the large decrease in sagebrush density since 1990 is due to the increased sample size used in 2001, which more accurately estimates browse populations that have clumped and/or discontinuous distributions. Sagebrush is very patchy throughout the area. Recruitment by residual plants seems unlikely in the future due to competition with understory of crested wheatgrass. Broom snakeweed has a much lower density compared to 1984 and 1990 estimates. The population appears stable with an age class consisting of 94% mature plants. The grass trend is slightly up. The nested frequency of perennial grasses increased 11%, due to significant increases in the nested frequencies of thickspike and bluebunch wheatgrass. The forb trend is slightly up. The nested frequency of perennial forbs increased substantially and many new species were sampled for the first time in this reading. The Desirable Components Index score is poor due to the very low browse cover.

winter range condition (DC Index) - poor (41) Mid-level potential scale
browse - stable (0) grass - slightly up (+1) forb - slightly up (+1)

2006 TREND ASSESSMENT

The browse trend is stable. The density and use of the key browse species changed little. The density of broom snakeweed decreased 15%. The grass trend is down. The nested frequency of perennial grasses (excluding bulbous bluegrass) decreased 27%, due to significant decreases in the nested frequencies of thickspike wheatgrass, bluebunch wheatgrass, prairie junegrass, and Sandberg bluegrass. Cheatgrass was sampled for the first time at this study in 2006. The forb trend is slightly up. The nested frequency of perennial forbs increased 11%, some of which are desirable species. The DCI score remained poor.

winter range condition (DC Index) - poor (41) Mid-level potential scale
browse - stable (0) grass - down (-2) forb - slightly up (+1)

HERBACEOUS TRENDS --
Management unit 06 , Study no: 3

T y p e	Species	Nested Frequency				Average Cover %	
		'84	'90	'01	'06	'01	'06
G	Agropyron cristatum	a312	b348	b323	ab317	27.98	24.37
G	Agropyron dasystachyum	ab10	a-	b11	a-	.67	-
G	Agropyron intermedium	a-	b9	ab5	b13	.04	.42
G	Agropyron spicatum	a5	a7	b46	a24	2.08	1.18
G	Bromus tectorum (a)	-	-	-	3	-	.00
G	Elymus cinereus	-	-	3	-	.03	-
G	Koeleria cristata	a14	a2	b44	a12	.59	.10
G	Poa bulbosa	-	-	9	4	.12	.03

Type	Species	Nested Frequency				Average Cover %	
		'84	'90	'01	'06	'01	'06
G	<i>Poa fendleriana</i>	-	5	-	-	-	-
G	<i>Poa pratensis</i>	1	-	8	10	.07	.09
G	<i>Poa secunda</i>	_a 77	_b 214	_b 205	_a 92	4.55	1.52
G	<i>Stipa</i> sp.	-	3	-	-	-	-
Total for Annual Grasses		0	0	0	3	0	0.00
Total for Perennial Grasses		419	588	654	472	36.16	27.73
Total for Grasses		419	588	654	475	36.16	27.73
F	<i>Achillea millefolium</i>	_a 3	_a 4	_b 20	_{ab} 7	.11	.21
F	<i>Agoseris glauca</i>	_a -	_a -	_b 12	_c 96	.04	.36
F	<i>Alyssum alyssoides</i> (a)	-	-	42	58	.25	.16
F	<i>Allium</i> sp.	_a -	_a -	_c 54	_b 12	.18	.03
F	<i>Antennaria rosea</i>	-	-	2	3	.03	.03
F	<i>Arabis</i> sp.	-	4	-	-	-	-
F	<i>Artemisia ludoviciana</i>	4	8	8	5	.06	.21
F	<i>Aster chilensis</i>	_a 7	_a 8	_b 60	_b 61	1.82	2.24
F	<i>Astragalus cibarius</i>	_a -	_a -	_b 59	_c 138	.39	3.90
F	<i>Astragalus convallarius</i>	-	-	2	-	.03	-
F	<i>Calochortus nuttallii</i>	_a -	_a -	_{ab} 3	_b 9	.01	.05
F	<i>Cirsium undulatum</i>	5	3	4	3	.06	.06
F	<i>Collomia linearis</i> (a)	-	-	_a 34	_b 68	.08	.22
F	<i>Collinsia parviflora</i> (a)	-	-	98	80	.33	.21
F	<i>Crepis acuminata</i>	-	-	-	1	-	.00
F	<i>Cryptantha</i> sp.	-	-	-	4	-	.01
F	<i>Descurainia pinnata</i> (a)	-	-	6	-	.01	-
F	<i>Draba</i> sp. (a)	-	-	_b 85	_a 33	.18	.10
F	<i>Epilobium brachycarpum</i> (a)	-	-	_a 85	_b 221	.46	2.70
F	<i>Erodium cicutarium</i> (a)	-	-	3	7	.01	.01
F	<i>Erigeron divergens</i>	_c 124	_b 56	_b 46	_a 6	.65	.09
F	<i>Holosteum umbellatum</i> (a)	-	-	31	38	.09	.10
F	<i>Lappula occidentalis</i> (a)	-	-	9	8	.04	.04
F	<i>Lactuca serriola</i>	_a -	_a -	_a 8	_b 23	.04	.09
F	<i>Lithospermum ruderales</i>	_b 45	_b 42	_a 8	_a 1	.49	.33
F	<i>Lupinus argenteus</i>	_a -	_a -	_a 2	_b 14	.06	.36
F	<i>Microsteris gracilis</i> (a)	-	-	27	44	.11	.10
F	<i>Oenothera pallida</i>	_b 40	_b 32	_a 14	_{ab} 21	.23	.29
F	<i>Phlox longifolia</i>	-	-	7	-	.01	-

T y p e	Species	Nested Frequency				Average Cover %	
		'84	'90	'01	'06	'01	'06
F	<i>Polygonum douglasii</i> (a)	-	-	34	46	.07	.11
F	<i>Ranunculus testiculatus</i> (a)	-	-	_a 46	_b 82	.15	.30
F	<i>Senecio integerrimus</i>	-	-	2	-	.01	-
F	<i>Sphaeralcea coccinea</i>	_a -	_{ab} 4	_{ab} 4	_b 8	.02	.07
F	<i>Tragopogon dubius</i>	_a 8	_a 12	_b 56	_a 11	.42	.19
F	<i>Viguiera multiflora</i>	-	1	-	-	-	-
F	<i>Zigadenus paniculatus</i>	_a -	_a -	_b 13	_a 4	.19	.06
Total for Annual Forbs		0	0	500	685	1.80	4.09
Total for Perennial Forbs		236	174	384	427	4.89	8.63
Total for Forbs		236	174	884	1112	6.70	12.72

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

BROWSE TRENDS --

Management unit 06 , Study no: 3

T y p e	Species	Strip Frequency		Average Cover %	
		'01	'06	'01	'06
B	<i>Amelanchier alnifolia</i>	2	2	.03	.15
B	<i>Artemisia tridentata vaseyana</i>	1	1	.63	.38
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	8	7	.18	.03
B	<i>Gutierrezia sarothrae</i>	63	37	1.19	2.45
B	<i>Leptodactylon pungens</i>	1	0	-	-
B	<i>Opuntia sp.</i>	3	4	-	-
B	<i>Symphoricarpos oreophilus</i>	1	2	-	-
Total for Browse		79	53	2.03	3.01

CANOPY COVER, LINE INTERCEPT --
Management unit 06 , Study no: 3

Species	Percent Cover
	'06
Amelanchier alnifolia	.20
Chrysothamnus viscidiflorus viscidiflorus	.71
Gutierrezia sarothrae	3.11
Opuntia sp.	.03
Symphoricarpos oreophilus	.13

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 06 , Study no: 3

Species	Average leader growth (in)	
	'01	'06
Artemisia tridentata vaseyana	2.3	1.9

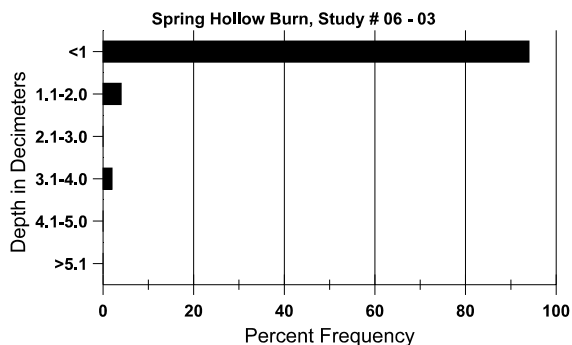
BASIC COVER --
Management unit 06 , Study no: 3

Cover Type	Average Cover %			
	'84	'90	'01	'06
Vegetation	3.50	15.50	49.49	45.59
Rock	7.00	3.25	3.73	5.75
Pavement	11.50	15.75	6.90	10.15
Litter	49.50	43.25	43.11	43.63
Cryptogams	11.25	2.00	.07	0
Bare Ground	17.25	20.25	13.19	11.42

SOIL ANALYSIS DATA --
Herd Unit 06, Study no: 03, Spring Hollow Burn

Effective rooting depth (in)	Temp °F (depth)	PH	Clay loam			%0M	PPM P	PPM K	dS/m
			% sand	% silt	% clay				
8.6	66.0 (12.0)	6.5	30.9	38.4	30.6	4.6	25.8	384.0	0.9

Stoniness Index



PELLET GROUP DATA --
 Management unit 06 , Study no: 3

Type	Quadrat Frequency		Days use per acre (ha)	
	'01	'06	'01	'06
Rabbit	10	10	-	-
Horse	1	-	-	-
Elk	5	4	9 (22)	17 (41)
Deer	2	11	6 (15)	13 (33)
Cattle	16	6	21 (52)	14 (34)

BROWSE CHARACTERISTICS --
 Management unit 06 , Study no: 3

		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 alnifolia												
84	0	-	-	-	-	-	0	0	0	-	0	-/-
90	0	-	-	-	-	-	0	0	0	-	0	-/-
01	40	-	-	-	40	-	50	50	100	-	0	21/23
06	40	-	-	20	20	-	50	0	50	-	0	25/25
Artemisia tridentata vaseyana												
84	966	66	66	700	200	-	59	34	21	-	0	17/23
90	699	-	-	366	333	-	62	38	48	-	5	23/36
01	20	-	-	20	-	-	100	0	0	-	0	22/34
06	20	-	-	-	20	-	100	0	100	-	100	22/38
Chrysothamnus nauseosus albicaulis												
84	0	-	-	-	-	-	0	0	-	-	0	-/-
90	0	-	-	-	-	-	0	0	-	-	0	-/-
01	0	-	-	-	-	-	0	0	-	-	0	-/-
06	0	-	-	-	-	-	0	0	-	-	0	24/28
Chrysothamnus viscidiflorus viscidiflorus												
84	66	-	-	33	33	-	0	0	50	-	50	11/17
90	333	-	100	33	200	-	10	0	60	12	20	12/11
01	320	-	-	320	-	-	0	0	0	-	0	9/13
06	180	-	40	140	-	20	11	11	0	-	0	12/24

		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)
Gutierrezia sarothrae												
84	20333	1433	4133	16200	-	-	0	0	0	-	0	7/6
90	16999	966	8000	8133	866	-	.78	0	5	.47	3	7/7
01	4100	-	220	3860	20	-	0	0	0	.48	.48	7/8
06	3480	-	120	3220	140	200	10	5	4	2	3	8/10
Leptodactylon pungens												
84	0	-	-	-	-	-	0	0	-	-	0	-/-
90	0	-	-	-	-	-	0	0	-	-	0	-/-
01	60	-	-	60	-	-	0	0	-	-	0	-/-
06	0	-	-	-	-	-	0	0	-	-	0	-/-
Opuntia sp.												
84	399	-	33	366	-	-	0	0	0	-	0	3/3
90	299	66	200	66	33	-	0	0	11	-	11	5/10
01	60	-	-	60	-	-	0	0	0	-	0	4/9
06	80	-	20	60	-	-	0	0	0	-	0	6/21
Symphoricarpos oreophilus												
84	0	-	-	-	-	-	0	0	0	-	0	-/-
90	33	-	-	-	33	-	0	0	100	-	0	-/-
01	20	-	-	20	-	-	0	0	0	-	0	15/23
06	40	-	-	40	-	-	0	0	0	-	0	23/53