

Trend Study 17-31-07

Study site name: Round Peak

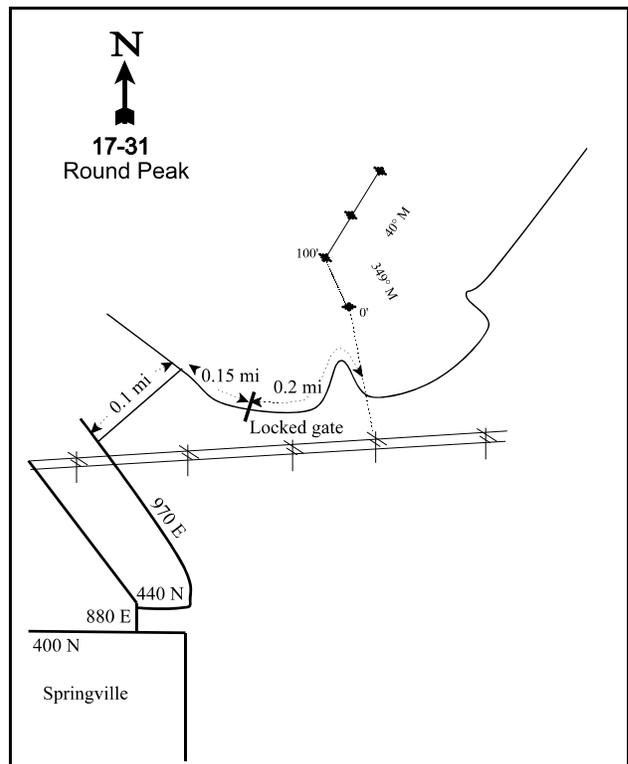
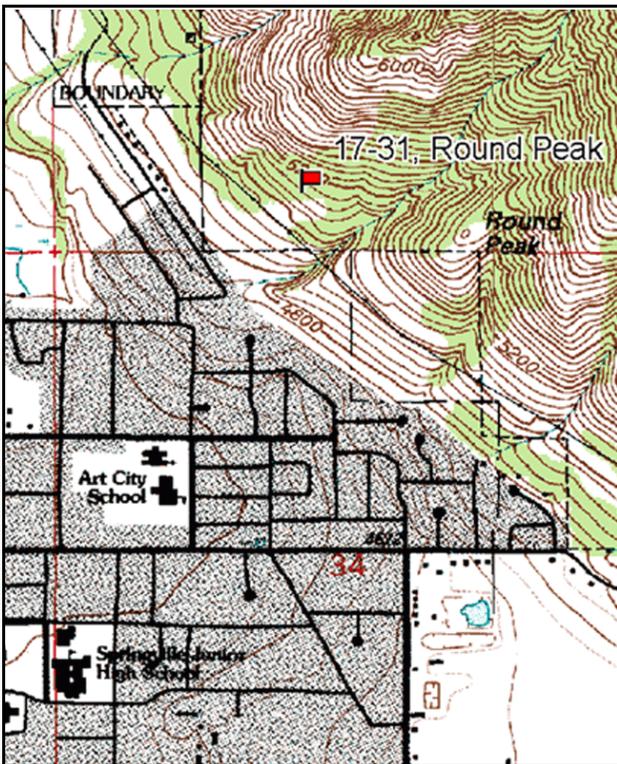
Vegetation type: Smooth Sumac

Compass bearing: frequency baseline 349 degrees magnetic (line 2-3 @ 40°M).

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

LOCATION DESCRIPTION

From the town of Springville, take 440 North and 970 East to an intersection at the end of the paved road. Turn right and proceed 0.1 miles to an intersection. Turn right and go southeast along the foothills for 0.15 miles to a locked gate. Walk 0.2 miles along the road and stop even with 2 power poles which are 50 yards south of the road. From the power poles, the 0-foot baseline stake is 95 paces north (343 degrees) marked with browse tag #419.



Map Name: Springville

Diagrammatic Sketch

Township 75, Range 3E, Section 27

GPS: NAD 83, UTM 12T 449748 E 4447396 N

DISCUSSION

Round Peak - Trend Study No. 17-31

Study Information

This severe winter range study is located in the Uinta National Forest to the east of Springville [elevation: 5,100 feet (1,555 m), slope: 25-45%, aspect: southwest]. The nearest source of perennial water is the Spring Creek wetland 0.8 miles (1.2 km) to the northwest. Like the Spring Canyon study (17-30), this site is typical of the depleted foothills north of Hobble Creek. Vegetative composition consists of grasses, annual forbs, and isolated patches of shrubs. In the summer of 1989, several fawn carcasses were found, most likely winter-killed from the deep snows of the 1988-89 winter. In 2007, a deer skeleton was found on the baseline, and there were several game trails traversing the study. Deer pellet quadrat frequency has been 11%-20% since 1997, while that for elk has been 8%-24%. From the pellet group transect, there were an estimated 44 deer days use/acre (107 ddu/ha) in 2002 and 74 deer days use/acre (184 ddu/ha) in 2007. Elk use was estimated at 9 days use/acre (23 edu/ha) in 2002 and 36 days use/acre (89 edu/ha) in 2007. All but one of the pellet groups appeared to be from winter use, and the exception was from the summer of 2007.

Soil

The soil has a clay loam texture and a neutral soil reaction (pH of 7.2). Bare ground cover has been low in all sample years, and has ranged from 1% to 3% of the total ground cover. The soil layer is thin, and there is an abundance of rock in the profile. Rock cover is relatively high, and has averaged 20% of the relative ground cover since 1997. A talus slide occupies the northern one-third of the study, and is composed of rocks too large to be transported by runoff. However, erosion and soil compaction are evident on the many trails interconnecting the area. The erosion condition was classified as stable in 2002 and 2007.

Browse

Browse cover is low and has averaged 6% since 1997. Browse use has been highest on Rocky Mountain smooth sumac (*Rhus glabra* ssp. *cismontana*), which is an increaser/invader plant. Sumac canopy cover was 6% in 2007. Sumac density increased from 1,433 stems/acre (3,547 stems/ha) in 1983 to 2,299 stems/acre (5,890 stems/ha) in 1989. The density was estimated at approximately 1,120 stems/acre (2,772 stems/ha) in 1997 and 2002, and decreased to 740 stems/acre (1,830 stems/ha) in 2007. The young age class has comprised 7%-22% of the population. Decadence increased from 0% of the population in 1983 to 24% in 1997, then decreased to 5% by 2007. Dead plants were first sampled in 1997, and since then, the density of dead plants has ranged from 200 stems/acre (495 stems/ha) to 300 stems/acre (743 stems/ha). Sumac vigor has been good, except in 1997 and 2002 when 4% and 11% of the population, respectively, was classified as dying. Browse use has ranged from light to heavy.

The most numerous browse species is broom snakeweed (*Gutierrezia sarothrae*). Snakeweed density has fluctuated each sample year and has ranged from 1,032 plants/acre (2,555 plants/ha) to 3,820 plants/acre (9,455 plants/ha). Changes in snakeweed density have been attributed to precipitation patterns (Utah Climate Summaries 2007). Other shrubs found on the site include netleaf hackberry (*Celtis reticulata*), skunkbush sumac (*Rhus trilobata*), and Gambel oak (*Quercus gambelii*).

Herbaceous Understory

The herbaceous understory is dominated by perennial grasses. Perennial grasses provided 24% cover in 1997, 30% in 2002, and 20% in 2007. The two perennial grass species present are bulbous bluegrass (*Poa bulbosa*) and bluebunch wheatgrass (*Agropyron spicatum*). Bulbous bluegrass has accounted for slightly more cover than bluebunch wheatgrass since 1997. Additionally, bulbous bluegrass has a phenology similar to that of annual grasses (Stewart and Hull 1949), and may be limiting the establishment of other species. Annual grasses are present and include wildoat (*Avena fatua*), cheatgrass (*Bromus tectorum*), rattlesnake brome (*Bromus brizaeformis*), and Japanese brome (*Bromus japonicus*). Since 1997, annual grass cover has averaged

2%. Cheatgrass quadrat frequency has increased from 44% in 1997 to 76% in 2007.

Perennial forbs provided 8% cover in 1997, 5% in 2002, and 6% in 2007. Most of the species present have low forage value, and perennial forbs are more abundant than annual forbs. The dominant perennial forbs include western ragweed (*Ambrosia psilostachya*), cudweed sagewort (*Artemisia ludoviciana*), and Bonneville pea (*Lathyrus brachycalyx*). Storksbill (*Erodium cicutarium*) and pale alyssum (*Alyssum alyssoides*) are the most abundant annual species.

1989 TREND ASSESSMENT

The browse trend is up. The density of sumac increased 60%, and much of the increase was attributed to the young and mature age classes. Young stems increased from 7% to 22% of the population. Decadence increased from 0% to 6%. There continued to be no sumac plants that were classified as having poor vigor. Browse use shifted from heavy to light-moderate. The grass trend is stable. The nested frequency of bluebunch wheatgrass increased 4%. Although the frequency of bulbous bluegrass appears to have been 0 in 1983, it was assumed from the stable frequencies of bluegrass in subsequent years that bulbous bluegrass was present, but was not recorded in 1983. This is more likely than having such an abundant population become established so quickly. The forb trend is up. The sum of nested frequency of perennial forbs increased 44%, and most of the increase was attributed to narrowleaf gromwell (*Lithospermum incisum*).

browse - up (+2)

grass - stable (0)

forb - up (+2)

1997 TREND ASSESSMENT

The browse trend is down. The density sumac decreased 52%, but most of this decrease was the result of the increased sample area. Young stems decreased to 15% of the population. Decadence increased to 24%, and the density of dead stems increased from 0 to 200 stems/acre (495 stems/ha). The proportion of stems exhibiting poor vigor increased to 4%, all of which were classified as dying. Additionally, the average crown height decreased 17 inches (43 cm). Browse use on sumac shifted to moderate-heavy. The grass trend is slightly up. The nested frequency of bluebunch wheatgrass increased 11%, and the nested frequency of bulbous bluegrass decreased 16%. The forb trend is slightly up. The sum of nested frequency of perennial forbs increased 19%, and the number of perennial species present increased from seven to 12. However, most of the increase in frequency and species richness are from species with poor forage value. The Desirable Components Index (DCI) score was

winter range condition (DCI) - very poor (35) Mid-level potential scale

browse - down (-2)

grass - slightly up (+1)

forb - slightly up (+1)

2002 TREND ASSESSMENT

The browse trend is stable. The density of sumac increased 4%. Young stems comprised 16% of the population, and decadence decreased to 19%. The density of dead sumac increased to 300 stems/acre (743 stems/ha). Dying stems increased to 11% of the population. Additionally, the average crown height decreased 18 inches (46 cm). Forty-five percent of the population showed light use, while 44% displayed heavy use. The grass trend is down. The nested frequency of bluebunch wheatgrass decreased 26%, and the nested frequency of bulbous bluegrass increased 20%. The forb trend is slightly down. The sum of nested frequency of perennial forb species decreased 58%. The majority of the decrease was attributed to western ragweed and wavyleaf thistle (*Cirsium undulatum*), both of which have poor forage value. The DCI score improved slightly to very poor-poor due to an increase in bluebunch wheatgrass.

winter range condition (DCI) - very poor-poor (35) Mid-level potential scale

browse - stable (0)

grass - down (-2)

forb - slightly down (-1)

2007 TREND ASSESSMENT

The browse trend is down. The density of sumac decreased 35%, and most of the decrease was from the mature age class. Young stems comprised 22% of the population, and decadence decreased to 5% of the population. The density of dead stems decreased to 240 stems/acre (595 stems/ha). No stems were classified with poor vigor. The average crown height and width increased 14 inches (36 cm) and 19 inches (48 cm), respectively. Browse use on sumac shifted to light. The grass trend is slightly down. Although there was a 28% decrease in the nested frequency of bulbous bluegrass, the nested frequency of bluebunch wheatgrass decreased 15%, and cheatgrass increased significantly in nested frequency. Bluebunch wheatgrass had low vigor. Cheatgrass quadrat frequency increased from 47% to 76%. The forb trend is slightly up. The sum of nested frequency of perennial forbs increased more than two-fold. There were significant increases in the nested frequencies of western ragweed, Beckwith milkvetch (*Astragalus beckwithii*), and narrowleaf gromwell. As mentioned above, two of these species have poor forage values. Yellow salsify (*Tragopogon dubius*) plants had been heavily grazed. The DCI score decreased slightly to very poor due to a decrease in bluebunch wheatgrass cover, and an increase in annual grass cover.

winter range condition (DCI) - very poor (27) Mid-level potential scale

browse - down (-2)

grass - slightly down (-1)

forb - slightly up (+1)

HERBACEOUS TRENDS --

Management unit 17 , Study no: 31

T y p e	Species	Nested Frequency					Average Cover %		
		'83	'89	'97	'02	'07	'97	'02	'07
G	<i>Agropyron spicatum</i>	b ₂₁₄	b ₂₂₃	b ₂₄₇	a ₁₈₄	a ₁₅₆	11.68	12.51	8.71
G	<i>Avena fatua</i> (a)	-	b ₁₁₉	-	ab ₁₃₉	a ₇₅	-	.85	.69
G	<i>Bromus brizaeformis</i> (a)	-	a ₁	b ₂₃	-	a ₋	.12	-	.00
G	<i>Bromus japonicus</i> (a)	-	-	a ₂₁	a ₉	a ₆	.09	.02	.01
G	<i>Bromus tectorum</i> (a)	-	-	a ₁₂₁	a ₁₂₈	b ₂₂₁	.59	.76	3.70
G	<i>Poa bulbosa</i>	-	b ₃₀₄	ab ₂₅₇	ab ₃₀₇	a ₂₂₀	12.75	17.63	10.84
Total for Annual Grasses		0	120	165	276	302	0.80	1.63	4.40
Total for Perennial Grasses		214	527	504	491	376	24.43	30.15	19.54
Total for Grasses		214	647	669	767	678	25.23	31.78	23.95
F	<i>Alyssum alyssoides</i> (a)	-	-	b ₁₃₂	a ₂₈	b ₁₁₈	.35	.06	.46
F	<i>Allium</i> sp.	-	-	a ₄	a ₁	-	.00	.00	-
F	<i>Ambrosia psilostachya</i>	-	-	c ₁₂₆	a ₂	b ₁₀₄	2.98	.06	3.37
F	<i>Artemisia ludoviciana</i>	c ₅₄	bc ₃₆	ab ₂₀	a ₁₇	abc ₃₆	.15	.15	.50
F	<i>Astragalus beckwithii</i>	-	-	a ₂	a ₂	b ₃₅	.15	.38	.68
F	<i>Aster</i> sp.	-	-	a ₃	a ₄	-	.38	.01	-
F	<i>Calochortus nuttallii</i>	-	-	-	1	-	-	.00	-
F	<i>Cirsium undulatum</i>	a ₁	ab ₁₁	b ₂₈	a ₅	-	.58	.04	-
F	<i>Cryptantha nana</i>	a ₁	-	-	-	a ₆	-	-	.15
F	Cruciferae	-	10	-	-	-	-	-	-
F	<i>Cymopterus</i> sp.	-	-	b ₁₇	a ₆	a ₂	.49	.33	.00

Type	Species	Nested Frequency					Average Cover %		
		'83	'89	'97	'02	'07	'97	'02	'07
F	<i>Draba</i> sp. (a)	-	-	-	-	1	-	-	.00
F	<i>Epilobium brachycarpum</i> (a)	-	-	b5	-	a2	.01	-	.03
F	<i>Erodium cicutarium</i> (a)	-	-	a13	b56	b63	.05	.41	.41
F	<i>Erigeron divergens</i>	a1	-	a-	-	a2	.00	-	.03
F	<i>Eriogonum racemosum</i>	-	-	-	3	-	-	.01	-
F	<i>Galium aparine</i> (a)	-	-	b37	a15	a14	.18	.04	.13
F	<i>Grindelia squarrosa</i>	-	-	-	14	-	-	.25	-
F	<i>Helianthus annuus</i> (a)	-	b19	a3	-	-	.01	-	-
F	<i>Heterotheca villosa</i>	-	-	-	-	3	-	-	.03
F	<i>Holosteum umbellatum</i> (a)	-	-	a32	a26	-	.07	.05	-
F	<i>Lathyrus brachycalyx</i>	ab54	b62	b57	b54	a22	3.20	3.63	.31
F	<i>Lappula occidentalis</i> (a)	-	-	a1	b25	-	.00	.05	-
F	<i>Lithospermum incisum</i>	ab18	c105	ab8	a6	b29	.22	.01	.17
F	<i>Lithospermum ruderales</i>	ab5	b16	a10	-	ab7	.01	-	.93
F	<i>Macherauthera commixta</i>	3	-	-	-	-	-	-	-
F	<i>Phlox longifolia</i>	a4	a5	a11	a2	a8	.02	.06	.02
F	<i>Taraxacum officinale</i>	-	-	-	2	-	-	.00	-
F	<i>Tragopogon dubius</i>	b29	-	a5	a3	ab18	.04	.01	.19
Total for Annual Forbs		0	19	223	150	198	0.68	0.63	1.05
Total for Perennial Forbs		170	245	291	122	272	8.25	4.98	6.42
Total for Forbs		170	264	514	272	470	8.94	5.61	7.47

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

BROWSE TRENDS --

Management unit 17 , Study no: 31

Type	Species	Strip Frequency			Average Cover %		
		'97	'02	'07	'97	'02	'07
B	<i>Celtis reticulata</i>	3	2	6	1.88	2.36	3.40
B	<i>Gutierrezia sarothrae</i>	31	24	41	1.57	1.61	.75
B	<i>Rhus glabra cismontana</i>	35	30	24	2.25	1.10	2.33
B	<i>Rhus trilobata</i>	0	0	1	-	-	-
Total for Browse		69	56	72	5.71	5.08	6.48

CANOPY COVER, LINE INTERCEPT --
 Management unit 17 , Study no: 31

Species	Percent Cover	
	'02	'07
Celtis reticulata	-	6.58
Gutierrezia sarothrae	-	.78
Rhus glabra cismontana	-	6.06

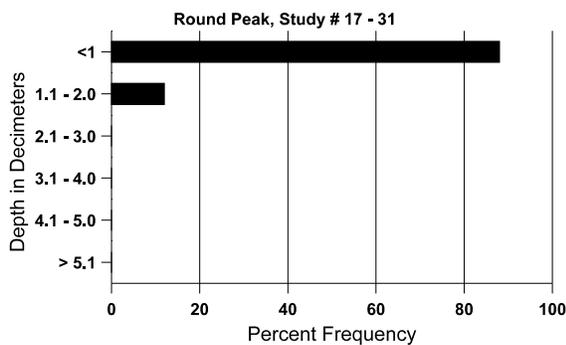
BASIC COVER --
 Management unit 17 , Study no: 31

Cover Type	Average Cover %				
	'83	'89	'97	'02	'07
Vegetation	.75	9.00	39.23	46.85	43.36
Rock	30.25	26.50	22.02	22.23	20.86
Pavement	22.00	24.50	12.78	14.84	16.57
Litter	44.00	37.50	29.04	24.94	29.02
Cryptogams	.50	0	.37	.02	.00
Bare Ground	2.50	2.50	3.45	.62	3.30

SOIL ANALYSIS DATA --
 Herd Unit 17, Study no: 31, Round Peak

Effective rooting depth (in)	Temp °F (depth)	pH	Loam			%OM	ppm P	ppm K	dS/m
			%sand	%silt	%clay				
17.1	53.8 (17.7)	7.3	36.9	38.4	24.7	2.0	14.2	256.0	1.0

Stoniness Index



PELLET GROUP DATA --

Management unit 17 , Study no: 31

Type	Quadrat Frequency		
	'97	'02	'07
Rabbit	3	-	-
Elk	22	8	24
Deer	19	20	11

Days use per acre (ha)	
'02	'07
-	-
9 (23)	36 (89)
44 (107)	74 (184)

BROWSE CHARACTERISTICS --

Management unit 17 , Study no: 31

		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>Celtis reticulata</i>												
83	33	-	-	33	-	-	0	0	0	-	0	39/26
89	33	-	33	-	-	-	0	0	0	-	100	-/-
97	60	140	20	40	-	-	0	0	0	-	0	80/225
02	40	20	-	20	20	-	0	0	50	-	50	28/53
07	300	-	-	280	20	40	0	0	7	7	7	36/39
<i>Gutierrezia sarothrae</i>												
83	1800	366	1000	800	-	-	0	0	0	-	0	7/4
89	1032	-	166	733	133	-	0	0	13	-	19	8/10
97	3280	880	1340	1940	-	-	0	0	0	-	8	9/15
02	1400	-	20	1260	120	220	0	0	9	-	0	9/11
07	3820	-	180	3640	-	200	0	0	0	-	.52	8/9
<i>Mahonia repens</i>												
83	0	-	-	-	-	-	0	0	-	-	0	-/-
89	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
02	0	-	-	-	-	-	0	0	-	-	0	3/4
07	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Quercus gambelii</i>												
83	0	-	-	-	-	-	0	0	-	-	0	-/-
89	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
02	0	20	-	-	-	-	0	0	-	-	0	-/-
07	0	-	-	-	-	-	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)
Rhus glabra cismontana												
83	1433	33	100	1333	-	-	19	79	0	-	0	50/34
89	2299	-	500	1666	133	-	45	16	6	-	0	66/41
97	1100	-	160	680	260	200	60	29	24	4	4	49/37
02	1140	-	180	740	220	300	11	44	19	11	11	31/23
07	740	20	160	540	40	240	3	11	5	-	0	45/42
Rhus trilobata												
83	0	-	-	-	-	-	0	0	-	-	0	-/-
89	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
02	0	-	-	-	-	-	0	0	-	-	0	-/-
07	20	-	-	20	-	20	0	0	-	-	0	38/73