

Trend Study 20-5-08

Study site name: Upper Hamblin Valley .

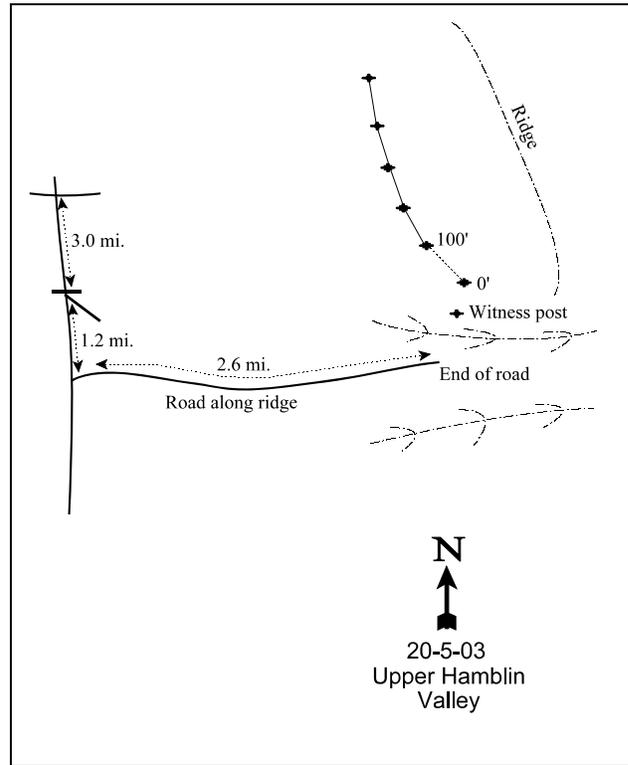
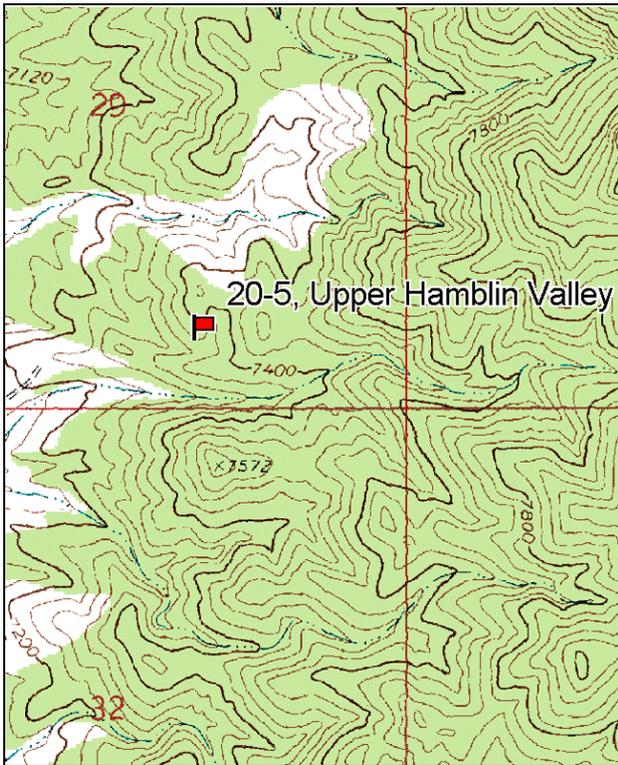
Vegetation type: Curleaf Mtn Mahogany .

Compass bearing: frequency baseline 320 degrees magnetic (line 2 @ 335° M, line 3 @ 340° M, line 4-5 @ 356° M).

Frequency belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft). Rebar: belt 2 on 5ft, belt 4 on 18ft.

LOCATION DESCRIPTION

From the Indian Peaks cabin, go north and west over the Pine Valley Pass Road to Hamblin Valley Road. This intersection has a cattle corral. From this intersection, drive north 17.8 miles to another intersection. Turn right and drive 3.0 miles to a cattleguard. At the cattleguard, stay right and travel south 1.2 miles to a intersection. Turn left and travel east 2.6 miles until the road ends. Park here. The site is on the ridge across the gully to the northwest. The 0-foot stake is 50 feet west of the witness post and can be seen on the ridge from the end of the road. The 0-foot stake is marked with browse tag #205.



Map Name: Mountain Home Pass

Diagrammatic Sketch

Township 26S, Range 19W, Section 29

GPS: NAD 83, UTM 12S 239099 E, 4266940 N

DISCUSSION

Upper Hamblin Valley - Trend Study No. 20-5

Study Information

This study was established in 1998 to sample important winter range in upper Hamblin Valley [elevation: 7,350 feet (2,240 m), slope: 22%, aspect: southwest]. The vegetation community consists of a singleleaf pinyon pine (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) overstory with an understory of curlleaf mountain mahogany (*Cercocarpus ledifolius*). The area is used by elk, deer, and wild horses. Pellet group transect data estimated elk use at 21 days use/acre (52 edu/ha) in 1998, 44 days use/acre (109 edu/ha) in 2003, and 29 days use/acre (71 edu/ha) in 2008. Deer use was estimated at 9 days use/acre (22 ddu/ha) in 1998, 11 days use/acre (27 ddu/ha) in 2003, and 21 days use/acre (51 ddu/ha) in 2008. Horse use was estimated at 4 days use/acre (10 hdu/ha) in 1998, 3 days use/acre (9 hdu/ha) in 2003, and 2 days use/acre (6 hdu/ha) in 2008. Sign of horses is evident all over the area including several stud piles along the road to the study, and several horses were observed while driving to the study in 2008.

Soil

The soil is a loam with a neutral reaction (pH 7.0). Soil phosphorus is low at 4.5 ppm and may be limiting to plant growth and development (Tiedemann and Lopez 2004). The soil is very rocky on the surface and within the profile. Relative combined rock and pavement cover has remained stable between 45% and 49% since 1998. Relative combined vegetation and litter cover has also remained stable between 43% and 46%. The majority of vegetation cover is provided by trees and shrubs. The soil erosion condition was classified as stable in 2003 and slight in 2008 due to the formation of flow patterns, evidence of soil movement, and pedestalling.

Browse

Preferred browse on the study consists of curlleaf mountain mahogany, black sagebrush (*Artemisia nova*), and Mormon tea (*Ephedra viridis*). Mahogany exhibits some characteristics of littleleaf mountain mahogany (*Cercocarpus intricatus*), including narrow leaf forms. They are most likely hybrid forms between curlleaf and littleleaf mahogany, which occurs often in this area. Mahogany provided 7%-9% quadrat cover since 1998, and Density ranged between 400 plants/acre and 520 plants/acre. The population has been largely mature. Decadent plants comprised 14% of the population in 1998, 0% in 2003, and 25% in 2008. Young recruitment steadily decreased from 10% of the population in 1998 to 0% by 2008. Vigor has been good on most plants in all sampled years. Browse use on mahogany was heavy in 1998, moderate-heavy in 2003, and varied between light and heavy in 2008. Annual leader growth averaged 1 inch (2.5 cm) in 2003 and 2008.

Black sagebrush has consistently provided 1% quadrat cover since 1998. Density increased steadily from 700 plants/acre in 1998 to 1,260 plants/acre in 2008. Decadence decreased from 14% of the population in 1998 to 4% in 2003, then increased to 57% in 2008. Young recruitment decreased from 14% of the population in 1998 to 2% in 2003 and 5% in 2008. Vigor was good on most plants in 1998 and 2003, and 11% of the population displayed poor vigor and was classified as dying in 2008. Browse use was light in all sample years.

Mormon tea provided 1% quadrat cover in 1998 and 2008, and 2% in 2003. Density has remained stable between 140 plants/acre and 160 plants/acre in all sample years. The population has been largely mature. Decadence was 38% of the population in 1998, decreased to 13% in 2003, and increased to 29% in 2008. Young plants comprised 13% of the population in 1998, but no young plants were sampled in 2003 or 2008. Vigor was excellent in 1998 and 2003, but 14% of the population displayed poor vigor in 2008. Browse use on Mormon tea was light-moderate in 1998 and 2003, mostly moderate in 2008, with some heavy use in all sample years.

Singleleaf pinyon pine has provided 9%-10% canopy cover since 1998. Point-centered quarter data estimated

pinyon density at 82 trees/acre in 1998, 126 trees/acre in 2003, and 117 trees/acre in 2008. Average trunk diameter was 7.4 inches (18.8 cm) in 2003 and 7.9 inches (20.1 cm) in 2008. Fifty percent of the trees sampled in 2003 and 2008 were greater than 8 feet (2.4 m) in height. Additionally, seedlings increased from 5% of the sampled trees in 2003 to 15% in 2008. Utah juniper density was 13 trees/acre in 1998, 36 trees/acre in 2003, and 38 trees/acre in 2008. Average trunk diameter was 5.5 inches (14.0 cm) in 2003 and 9.3 inches (23.6 cm) in 2008. Seventy-seven percent of the sampled trees were 1-8 feet (0.3-2.4 m) in height in 2003, while 87% were 4-12 feet (1.2-3.7 m) in height in 2008.

Herbaceous Understory

The herbaceous understory has provided little cover since 1998 and is composed mostly of low value species. Total herbaceous cover was 10% in 1998 and 2008 and 8% in 2003. Perennial grasses have comprised 14%-22% of the total herbaceous cover. Bluebunch wheatgrass (*Agropyron spicatum*) was the most abundant grass species in all sample years. Indian ricegrass (*Oryzopsis hymenoides*), Sandberg bluegrass (*Poa secunda*), bottlebrush squirreltail (*Sitanion hystrix*), and pine needlegrass (*Stipa pinetorum*) have also been sampled. Cheatgrass (*Bromus tectorum*) was sampled only in 1998, and provided little cover.

Forbs are relatively diverse, but most species are infrequent. Rock goldenrod (*Petradoria pumila*) was the most abundant forb in all sample years and provided 45%-73% of the total herbaceous cover. Heath aster (*Leucelele ericoides*) was also abundant in all sample years, and draba (*Draba* sp.) was abundant in 1998.

1998 Desirable Components Index

winter range condition (DCI) - poor (43) Mid-level potential scale

2003 Trend Assessment

The browse trend is slightly up. Curlleaf mountain mahogany density increased 24%, and decadence decreased from 14% of the population to 0%. However, young recruitment also decreased from 10% of the population to 4%. Plants displaying poor vigor decreased from 5% of the population to 0%. Black sagebrush density increased 43%, and decadence decreased from 14% of the population to 4%. Young recruitment decreased from 14% of the population to 2%, and plants displaying poor vigor decreased from 3% of the population to 0%. Mormon tea density remained stable, but decadence decreased from 38% of the population to 13%. Young recruitment also decreased from 13% of the population to 0%, and vigor remained excellent. The trend for grass is down. The sum of nested frequency for perennial grasses decreased 39%. Bluebunch wheatgrass and Sandberg bluegrass decreased significantly in nested frequency. Cheatgrass was sampled at a quadrat frequency of 7% in 1998, but was not sampled in 2003. The trend for forbs is slightly down. The sum of nested frequency for perennial forbs decreased 26%. Desert parsley (*Lomatium* sp.), sandwort (*Arenaria* sp.), and draba decreased significantly in nested frequency. The 1998 winter range condition, determined by the Desirable Components Index (DCI), was rated as poor due to low preferred browse and perennial grass cover. In 2003, the DCI remained poor.

winter range condition (DCI) - poor (46) Mid-level potential scale

browse - slightly up (+1)

grass - down (-2)

forb - slightly down (-1)

2008 Trend Assessment

The browse trend is slightly down. Curlleaf mountain mahogany density decreased 23%, and decadence increased from 0% of the population to 25%. Young recruitment continued to decrease from 4% of the population to 0%. However, vigor remained excellent. Black sagebrush density increased 26%, but decadence also increased from 4% of the population to 57%. Young recruitment remained low at 5% of the population, and vigor declined, with 11% of the population displaying poor vigor. Mormon tea density decreased slightly, and decadence increased from 13% of the population to 29%. Young recruitment remained 0% of the population. Vigor declined, with 14% of the population displaying poor vigor. The trend for grass is up. The sum of nested frequency for perennial grasses increased 31%. Sandberg bluegrass increased

significantly in nested frequency, while pine needlegrass decreased significantly in nested frequency. The trend for forbs is slightly up. The sum of nested frequency for perennial forbs increased 20%. Spring parsley (*Cymopterus* sp.) increased significantly in nested frequency. The DCI rating declined to very poor-poor due to a decrease in preferred browse cover and young recruitment, as well as an increase in browse decadence.

winter range condition (DCI) - very poor-poor (34) Mid-level potential scale
browse - slightly down (-1) grass - up (+2) forb - slightly up (+1)

HERBACEOUS TRENDS --
 Management unit 20 , Study no: 5

T y p e	Species	Nested Frequency			Average Cover %		
		'98	'03	'08	'98	'03	'08
G	<i>Agropyron spicatum</i>	_b 87	_a 49	_a 54	1.29	.58	1.52
G	<i>Bromus tectorum</i> (a)	_b 17	_a -	_a -	.06	-	-
G	<i>Oryzopsis hymenoides</i>	10	14	17	.06	.22	.20
G	<i>Poa secunda</i>	_b 58	_a 21	_b 51	.78	.27	.31
G	<i>Sitanion hystrix</i>	4	-	4	.06	-	.15
G	<i>Stipa comata</i>	-	2	-	-	.01	-
G	<i>Stipa pinetorum</i>	_a -	_b 11	_a 1	-	.05	.03
Total for Annual Grasses		17	0	0	0.06	0	0
Total for Perennial Grasses		159	97	127	2.20	1.14	2.23
Total for Grasses		176	97	127	2.25	1.14	2.23
F	<i>Alyssum alyssoides</i> (a)	-	-	3	-	-	.00
F	<i>Arabis</i> sp.	2	-	3	.01	-	.01
F	<i>Arenaria</i> sp.	_b 31	_a 7	_{ab} 15	.19	.02	.07
F	<i>Balsamorhiza hookeri</i>	-	-	5	-	-	.03
F	<i>Castilleja linariaefolia</i>	-	-	3	-	-	.03
F	<i>Cryptantha</i> sp.	30	-	20	.45	-	.12
F	<i>Cymopterus</i> sp.	_b 10	_a 10	_b 26	.07	.04	.28
F	<i>Delphinium nuttallianum</i>	_a 1	_a 1	_b -	.00	.00	-
F	<i>Descurainia pinnata</i> (a)	3	-	-	.00	-	-
F	<i>Draba</i> sp. (a)	_b 193	_a 2	_a -	1.47	.00	-
F	<i>Epilobium brachycarpum</i> (a)	3	-	-	.01	-	-
F	<i>Erigeron eatonii</i>	_b 12	_a -	_a 1	.08	-	.00
F	<i>Gilia</i> sp. (a)	10	5	-	.03	.01	-
F	<i>Leucelene ericoides</i>	69	79	69	.68	.90	1.08
F	<i>Lomatium</i> sp.	_b 31	_a 10	_a -	.22	.05	.00
F	<i>Oenothera</i> sp.	5	-	-	.16	-	-
F	<i>Petradoria pumila</i>	150	156	174	4.73	5.77	6.38
F	<i>Physaria chambersii</i>	11	1	-	.07	.00	-

T y p e	Species	Nested Frequency			Average Cover %		
		'98	'03	'08	'98	'03	'08
F	<i>Senecio multilobatus</i>	3	-	-	.00	-	-
Total for Annual Forbs		209	7	3	1.51	0.01	0.00
Total for Perennial Forbs		355	264	316	6.67	6.80	8.01
Total for Forbs		564	271	319	8.19	6.82	8.02

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

BROWSE TRENDS --

Management unit 20 , Study no: 5

T y p e	Species	Strip Frequency			Average Cover %		
		'98	'03	'08	'98	'03	'08
B	<i>Artemisia nova</i>	17	17	19	.76	1.37	1.29
B	<i>Ceratoides lanata</i>	0	0	1	-	-	.00
B	<i>Cercocarpus ledifolius</i>	18	19	17	7.16	9.25	6.98
B	<i>Chrysothamnus parryi</i>	0	0	1	-	-	.00
B	<i>Ephedra viridis</i>	7	7	6	1.08	1.94	.98
B	<i>Gutierrezia sarothrae</i>	3	11	9	.03	.24	.19
B	<i>Pediocactus simpsonii</i>	0	0	2	-	-	.00
B	<i>Pinus monophylla</i>	6	6	6	5.34	3.16	5.59
B	<i>Sclerocactus sp.</i>	2	3	0	.00	.03	-
B	<i>Symphoricarpos oreophilus</i>	10	9	8	1.62	1.46	1.75
Total for Browse		63	72	67	16.01	17.48	16.81

CANOPY COVER, LINE INTERCEPT --

Management unit 20 , Study no: 5

Species	Percent Cover		
	'98	'03	'08
Artemisia nova	-	1.71	2.06
Cercocarpus ledifolius	-	8.11	8.63
Ephedra viridis	-	1.50	.25
Pediocactus simpsonii	-	-	.03
Pinus monophylla	10.19	8.61	9.26
Symphoricarpos oreophilus	-	1.45	1.31

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 20 , Study no: 5

Species	Average leader growth (in)	
	'03	'08
Cercocarpus ledifolius	1.0	1.0

POINT-QUARTER TREE DATA --

Management unit 20 , Study no: 5

Species	Trees per Acre		
	'98	'03	'08
Juniperus osteosperma	13	36	38
Pinus monophylla	82	126	117

Average diameter (in)		
'98	'03	'08
9.9	5.5	9.3
7.1	7.4	7.9

BASIC COVER --

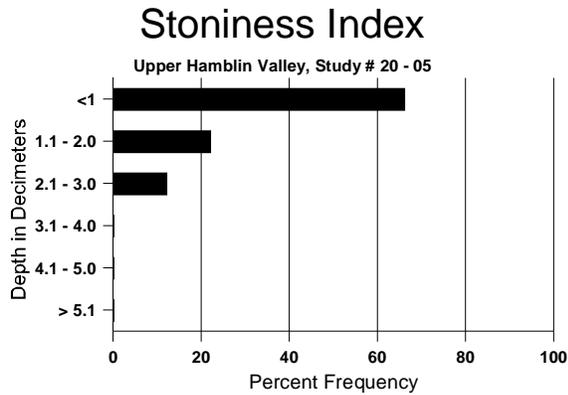
Management unit 20 , Study no: 5

Cover Type	Average Cover %		
	'98	'03	'08
Vegetation	24.20	24.50	26.43
Rock	27.03	23.28	28.42
Pavement	28.82	31.09	29.83
Litter	30.17	24.95	28.57
Cryptogams	1.11	.81	.22
Bare Ground	14.01	8.71	5.63

SOIL ANALYSIS DATA --

Management unit 20, Study no: 5, Study Name: Upper Hamblin Valley

Effective rooting depth (in)	Temp °F (depth)	pH	Loam			%OM	PPM P	PPM K	ds/m
			%sand	%silt	%clay				
13.0	64.0 (12.2)	7.0	44.0	35.4	20.6	3.5	4.5	64.0	0.8



PELLET GROUP DATA --
Management unit 20 , Study no: 5

Type	Quadrat Frequency		
	'98	'03	'08
Rabbit	2	2	19
Horse	3	2	-
Elk	8	8	7
Deer	2	1	3

Days use per acre (ha)		
'98	'03	'08
-	-	-
4 (10)	3 (9)	-
21 (51)	44 (109)	29 (71)
6 (15)	11 (26)	21 (51)

BROWSE CHARACTERISTICS --
Management unit 20 , Study no: 5

		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)
98	700	20	100	500	100	60	3	0	14	3	3	9/19
03	1000	-	20	940	40	-	2	0	4	-	0	6/13
08	1260	-	60	480	720	20	2	0	57	11	11	8/20
<i>Ceratoides lanata</i>												
98	0	-	-	-	-	-	0	0	0	-	0	-/-
03	0	-	-	-	-	-	0	0	0	-	0	-/-
08	20	-	-	-	20	-	100	0	100	-	0	-/-
<i>Cercocarpus ledifolius</i>												
98	420	20	40	320	60	60	5	90	14	5	5	41/58
03	520	-	20	500	-	40	23	65	0	-	0	47/63
08	400	20	-	300	100	20	25	35	25	-	0	40/53

		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)
Chrysothamnus parryi												
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	20	-	-	20	-	-	0	0	-	-	0	6/3
Ephedra viridis												
98	160	-	20	80	60	-	25	25	38	-	0	28/43
03	160	-	-	140	20	20	25	13	13	-	0	24/32
08	140	-	-	100	40	-	71	14	29	-	14	24/30
Gutierrezia sarothrae												
98	100	-	-	100	-	-	0	0	0	-	0	4/6
03	240	-	20	220	-	-	0	0	0	-	0	5/5
08	280	-	-	180	100	60	0	0	36	29	29	4/7
Juniperus osteosperma												
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	20	-	-	-	-	0	0	-	-	0	-/-
Pediocactus simpsonii												
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	1/4
08	40	-	-	40	-	-	0	0	-	-	0	2/2
Pinus monophylla												
98	120	100	40	80	-	-	0	0	-	-	0	-/-
03	200	60	60	140	-	-	0	0	-	-	0	-/-
08	120	20	40	80	-	-	0	0	-	-	0	-/-
Sclerocactus sp.												
98	40	20	-	40	-	-	0	0	-	-	0	2/3
03	60	-	-	60	-	-	0	0	-	-	0	2/6
08	0	-	-	-	-	-	0	0	-	-	0	-/-
Symphoricarpos oreophilus												
98	260	-	60	200	-	-	31	8	0	-	0	23/34
03	240	-	20	160	60	-	33	0	25	-	0	24/29
08	240	20	40	140	60	-	25	17	25	-	0	27/33