

Trend Study 2-17-06

Study site name: Meadowville .

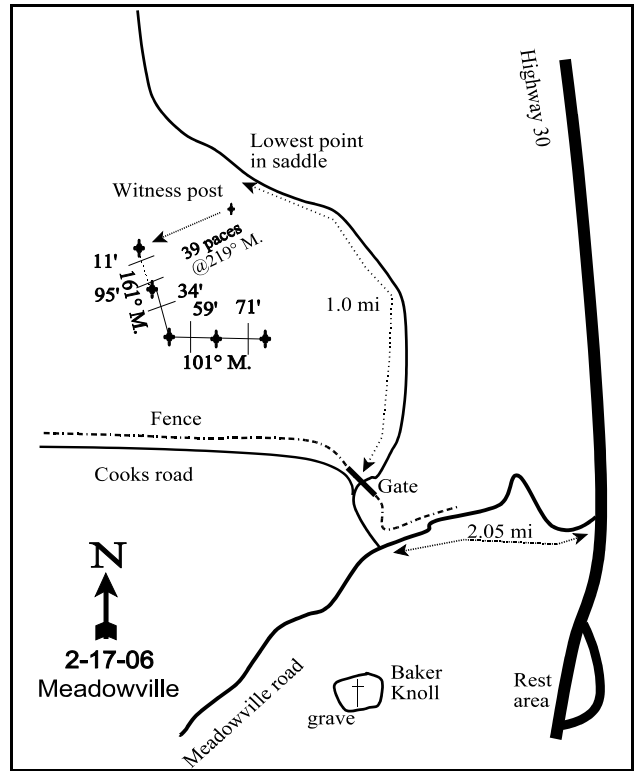
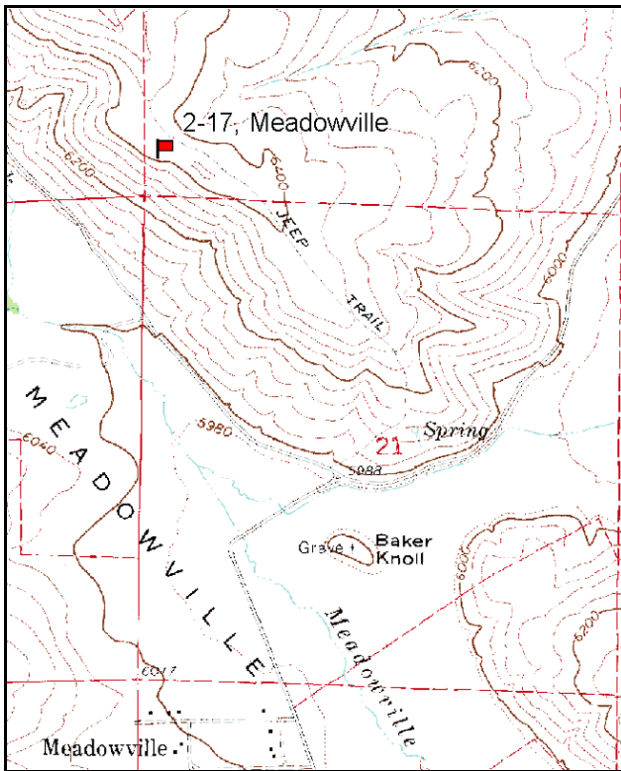
Vegetation type: Big Sagebrush .

Compass bearing: frequency baseline 161 degrees magnetic.

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

LOCATION DESCRIPTION

At the intersection of Highway 30 and Meadowville Road, turn west on Meadowville Road and proceed 2.05 miles. Turn right (north) onto Cook's Road and turn immediately right through a large gate. Proceed 1.1 miles, passing a spring on the right and following the ridgetop, to the witness post in the low spot of a small saddle. Walk 39 paces at 219 degrees magnetic from the witness post to the 0-foot baseline stake. The 0-foot stake of the baseline is marked by browse tag # 7939. The 0-foot stake is also approximately 75 yards from a fence to the west. The baseline runs 161 degrees magnetic. Line three and four dogleg and run parallel to the fence at a bearing of 101 degrees magnetic.



Map Name: Meadowville

Diagrammatic Sketch

Township 13N, Range 5E, Section 16

UTM NAD 27, UTM 12T 4634407 N, 466814 E

DISCUSSION

Meadowville - Trend Study No. 2-17

Study Information

This study is located on private land, which is part of the Hideaway Ranch and overlooks the north end of the Meadowville Valley (elevation: 6,400 feet, slope: 35%, aspect: southwest). The vegetation type is mountain big sagebrush/grass. The area is considered critical deer winter range. Two winter killed deer carcasses and five antlers sheds were found in 1984. Pellet groups were reported to be abundant in 1984 and 1990. Pellet group transect data taken in 2001 estimated 56 deer, 3 elk, and 4 cow days use/acre (139 ddu/ha, 7 edu/ha, and 9 cdu/ha). Pellet group data from 2006 were estimated at 24 deer, 19 elk, and 6 cow days use/acre (60 ddu/ha, 46 edu/ha, and 14 cdu/ha). A deer carcass was found just east of the study transect in 2006.

Soil

Soil is classified in the Solak series, a shallow sandstone-limestone-quartzite conglomerate, where bedrock is normally found 10 to 20 inches below the surface. Solak soil is moderately permeable to water, but runoff is rapid and the erosion hazard is high. The principal limiting factors are low available water capacity and a limited root zone (Campbell and Lacey 1982). The soil has a clay loam texture with a neutral soil reaction (pH of 7.1). Effective rooting depth was estimated at nearly 16 inches. Rock and pavement are fairly common on the surface and within the profile. The ratio of protective cover (vegetation, litter, and cryptograms) to bare ground was fair at 3.4:1 in 2006. There is some soil movement and pedestalling is apparent, but the erosion condition class was determined to be stable in 2001 and slight in 2006.

Browse

Mountain big sagebrush and antelope bitterbrush are the key browse species. The sagebrush population has consistently declined with each reading since 1984. In 1984, density was estimated at 1,466 plants/acre and has decreased to 400 plants/acre in 2006. Cover has also decreased from 4% in 1996 to less than 1% in 2006. Decadence has been high at every reading until 2006. The entire population was classified as decadent in 1984 and remained over 45% until 2006, when it decreased to 10%. Recruitment from young plants was minimal from 1990-2001 and none were observed in 2006. This sagebrush population will continue to decline with high decadence and no young recruitment. Utilization was heavy in 1984 and has been mostly light with some moderate use since 1990. Annual leader growth averaged only 1.2 inches in 2001 and 2.3 inches in 2006.

Additional forage is available from a few scattered antelope bitterbrush and serciveberry plants. Density of bitterbrush doubled in 2006 from 200 plants/acre in 1996 and 2001 to 400 plants/acre. Cover has averaged between 1-2% since 1996. Bitterbrush plants display moderate to heavy use but with normal vigor. Annual leader growth averaged only 4.6 inches in 2001 and 6.1 inches in 2006.

The dominant shrub is the increaser, stickyleaf low rabbitbrush. Cover has been estimated at 3-5% since 1996. Density was estimated at about 1,900 plants/acre in 1996 and 2001, but had decreased to 1,720 plants/acre in 2006. Broom snakeweed was also abundant, but has declined from a high of 11,932 plants/acre in 1990 to 480 plants/acre in 2006.

Herbaceous Understory

The most abundant perennial grasses are bluebunch wheatgrass, Indian ricegrass, and Sandberg bluegrass. All of these showed evidence of light to moderate utilization by cattle in 1984. Cheatgrass was very dominant in 1996 with 20% cover, but has declined to 7-8% in 2001 and 2006, which is still higher than would be desired. It is very widely distributed across the site with 96% quadrat frequency in 2006 and can be detrimental to sagebrush recruitment. Forb growth is sparse and generally low in stature. The most numerous perennial forbs are Utah milkvetch, arrowleaf balsamroot, thistle, wayside gromwell, and yellow salsify.

1990 TREND ASSESSMENT

As in 1984, there is still a large and increasing population of undesirable increasers and a high percentage of decadent plants in the sagebrush population. All the sagebrush were classified as decadent in 1984, but now decadence is 69% and 10% of the population consists of young plants. Sagebrush canopy cover is estimated at 6%. The sagebrush population density has declined by 34%. Bitterbrush has conversely increased in density by 62%. Sagebrush is the key species and therefore the browse trend is slightly down. Trend for grasses is up. Perennial grass sum of nested frequency increased by 33%, mostly due a significant increase in Sandberg bluegrass. Trend for forbs is stable. Perennial forb sum of nested frequency remained similar to 1984.

browse - slightly down (-1) grasses - up (+2) forbs -stable (0)

1996 TREND ASSESSMENT

Trend for the key browse species, mountain big sagebrush and bitterbrush, is stable. Density decreased from 966 plants/acre in 1990 to 860 in 1996. Some of the differences in density estimates can be attributed to the larger sample taken in 1996, which gives better estimates for populations that are discontinuous and/or clumped. Utilization is heavier than in 1990, with 28% of the plants sampled displaying heavy use. Reproduction is limited and the proportion of shrubs displaying poor vigor has increased from 28% to 58%. Decadence is still high at 60%. Bitterbrush density decreased from 432 plants/acre in 1990 to 200 in 1996 and is moderately to heavily utilized. Undesirable increasers, stickyleaf low rabbitbrush and broom snakeweed, are numerous. Trend for grasses is stable. Perennial grass sum of nested frequency remained similar despite a significant decline in Sandberg bluegrass. Cheatgrass was included in the sample for the first time and cover was high at 20%, which causes a fire hazard. Trend for forbs is up. Sum of nested frequency increased by 38%, mostly due to a significant increase in yellow salsify. Forbs still remain a minor component of the herbaceous understory. The Desirable Components Index rated this study as very poor due to low browse and forb cover, but good perennial grass cover. Cheatgrass cover was very high, which also lowered the rating.

winter range condition (DC Index) - very poor (33) Mid-level potential scale
browse - stable (0) grasses - stable (0) forbs - up (+2)

2001 TREND ASSESSMENT

Trend for browse is down due to a continual decline in sagebrush. The current population of just 520 plants/acre is moderately utilized and nearly half are classified as decadent (46%). In addition, 38% of the population was classified as dying. Young recruitment is poor and there are not enough young plants to maintain the population. Density of the increaser, stickyleaf low rabbitbrush is stable at about 1,900 plants/acre and the density of broom snakeweed has declined. The small population of bitterbrush is stable with good vigor and no decadent plants. Utilization of bitterbrush was moderate to heavy but plants are healthy and vigorous. Unfortunately, bitterbrush is not abundant. Trend for grasses is slightly up. Perennial grass sum of nested frequency increased by 16% due a significant increase in Sandberg bluegrass. Cheatgrass nested frequency decreased significantly and cover decreased from 20% to 7%, but quadrat frequency was still very high at 91%. Trend for forbs is stable. Very little change in sum of nested frequency and forbs still remain a minor component of the herbaceous understory. The Desirable Components Index rated this study as poor due to decreasing browse cover, even though cheatgrass cover decreased. Perennial grass cover remained high.

winter range condition (DC Index) - poor (38) Mid-level potential scale
browse - down (-2) grasses - slightly up (+1) forbs - stable (0)

2006 TREND ASSESSMENT

Trend for key browse, mountain big sagebrush and bitterbrush, is slightly down. Density of mountain big sagebrush declined from 520 plants/acre in 2001 to 400 plants/acre in 2006. Decadence decreased from 46% in 2001 to 10% in 2006, but several of the decadent plants died. Sagebrush cover decreased from 3% to less than

1%. Utilization is light to moderate. Bitterbrush density doubled from 200 plants/acre in 2001 to 400 plants/acre in 2006. Utilization is moderate and vigor is good. Trend for grasses is stable. Sum of nested of perennial grasses remained similar to 2001, even though bluebunch wheatgrass increased significantly. Cover increased from 7% to 12%. Cheatgrass remained similar to 2001 at 8% cover. Trend for forbs is stable. The sum of nested frequency changed little and forbs still remain a minor component of the herbaceous understory. The Desirable Components Index rated this study as very poor-poor due to decreasing browse cover and moderate cheatgrass cover. Perennial grass cover remained high.

winter range condition (DC Index) - very poor-poor (36) Mid-level potential scale
browse - slightly down (-1) grasses - stable (0) forbs - stable (0)

HERBACEOUS TRENDS --
Management unit 02 , Study no: 17

Type	Species	Nested Frequency					Average Cover %		
		'84	'90	'96	'01	'06	'96	'01	'06
G	Agropyron dasystachyum	5	-	-	-	-	-	-	-
G	Agropyron spicatum	a ⁹⁵	ab ¹²⁰	b ¹⁴⁶	b ¹⁵⁶	c ¹⁸⁷	6.50	7.13	11.75
G	Bromus tectorum (a)	-	-	b ³⁶⁷	a ²⁹⁴	a ³⁰⁷	19.65	6.85	8.19
G	Oryzopsis hymenoides	61	61	73	71	46	3.82	5.69	1.89
G	Poa bulbosa	-	-	-	-	4	-	-	.01
G	Poa pratensis	ab ³	a ⁻	ab ³	a ¹	b ¹⁵	.03	.03	.97
G	Poa secunda	a ⁸³	b ¹⁵²	a ⁸⁹	b ¹³⁸	b ¹²⁷	1.50	1.41	1.83
G	Sitanion hystrix	5	3	4	-	2	.03	-	.03
Total for Annual Grasses		0	0	367	294	307	19.65	6.85	8.19
Total for Perennial Grasses		252	336	315	366	381	11.90	14.27	16.50
Total for Grasses		252	336	682	660	688	31.56	21.13	24.69
F	Achillea millefolium	-	-	5	6	7	.04	.06	.06
F	Agoseris glauca	a ⁻	a ⁴	a ⁻	a ⁻	b ²¹	-	-	.10
F	Alyssum alyssoides (a)	-	-	b ²⁹²	b ²⁹³	a ¹⁸⁷	2.44	2.25	.61
F	Astragalus sp.	-	-	-	-	4	-	-	.06
F	Astragalus utahensis	c ⁵⁶	bc ⁵¹	bc ³⁴	ab ¹⁷	a ¹³	.48	.17	.14
F	Balsamorhiza sagittata	a ²	ab ⁶	a ⁴	ab ¹³	b ¹⁵	.39	.30	.83
F	Castilleja chromosa	8	1	4	-	3	.01	-	.00
F	Camelina microcarpa (a)	-	-	2	2	4	.01	.00	.01
F	Chaenactis douglasii	1	8	5	-	4	.04	-	.01
F	Cirsium sp.	-	-	-	-	1	-	-	.03
F	Cirsium undulatum	ab ²²	b ¹⁹	b ²⁵	ab ¹⁹	a ⁵	.39	.55	.04
F	Collomia linearis (a)	-	-	-	10	-	-	.02	-
F	Comandra pallida	a ¹	a ⁻	a ⁻	b ¹⁰	a ²	-	.10	.01
F	Collinsia parviflora (a)	-	-	a ³	ab ⁹	b ¹⁶	.00	.04	.08
F	Crepis acuminata	-	-	-	7	9	-	.21	.30

Type	Species	Nested Frequency					Average Cover %		
		'84	'90	'96	'01	'06	'96	'01	'06
F	<i>Descurainia pinnata</i> (a)	-	-	15	14	5	.03	.03	.01
F	<i>Draba</i> sp. (a)	-	-	-	1	3	-	.00	.01
F	<i>Holosteum umbellatum</i> (a)	-	-	-	-	3	-	-	.00
F	<i>Lactuca serriola</i>	-	-	-	2	3	-	.00	.03
F	<i>Linum lewisii</i>	a-	a-	b10	ab5	a2	.02	.06	.00
F	<i>Lithospermum ruderales</i>	11	16	22	22	20	1.00	1.33	1.13
F	<i>Microsteris gracilis</i> (a)	-	-	-	3	7	-	.03	.01
F	<i>Navarretia intertexta</i> (a)	-	-	3	-	-	.00	-	-
F	<i>Oenothera</i> sp.	-	-	-	-	-	-	.00	-
F	<i>Phlox hoodii</i>	8	4	16	18	9	.16	.28	.27
F	<i>Phlox longifolia</i>	a-	a3	ab11	c36	bc23	.02	.35	.32
F	<i>Polygonum douglasii</i> (a)	-	-	3	3	-	.00	.00	-
F	<i>Sisymbrium altissimum</i> (a)	-	-	a3	a-	b12	.03	-	.51
F	<i>Tragopogon dubius</i>	ab26	a19	b49	ab43	b48	.54	.38	.44
F	Unknown forb-perennial	-	3	-	-	-	-	-	-
F	<i>Zigadenus paniculatus</i>	a-	a-	a-	a-	b12	-	-	.05
Total for Annual Forbs		0	0	321	335	237	2.53	2.39	1.25
Total for Perennial Forbs		135	134	185	198	201	3.09	3.82	3.88
Total for Forbs		135	134	506	533	438	5.63	6.22	5.14

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

BROWSE TRENDS --

Management unit 02 , Study no: 17

Type	Species	Strip Frequency			Average Cover %		
		'96	'01	'06	'96	'01	'06
B	<i>Amelanchier alnifolia</i>	0	1	2	-	-	-
B	<i>Artemisia tridentata vaseyana</i>	35	18	14	4.47	2.40	.66
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	44	43	43	3.99	2.88	4.51
B	<i>Eriogonum microthecum</i>	3	1	4	.15	-	.00
B	<i>Gutierrezia sarothrae</i>	24	20	12	.32	.36	.21
B	<i>Opuntia</i> sp.	7	10	11	.27	.46	.91
B	<i>Purshia tridentata</i>	9	9	10	1.14	1.93	2.22
B	<i>Tetradymia canescens</i>	21	18	20	.60	.97	1.67
Total for Browse		143	120	116	10.96	9.04	10.21

CANOPY COVER, LINE INTERCEPT --
 Management unit 02 , Study no: 17

Species	Percent Cover
	'06
Artemisia tridentata vaseyana	.81
Chrysothamnus viscidiflorus viscidiflorus	8.21
Gutierrezia sarothrae	.31
Opuntia sp.	.18
Purshia tridentata	3.23
Tetradymia canescens	1.00

KEY BROWSE ANNUAL LEADER GROWTH --
 Management unit 02 , Study no: 17

Species	Average leader growth (in)	
	'01	'06
Artemisia tridentata vaseyana	1.2	2.8
Purshia tridentata	4.6	6.1

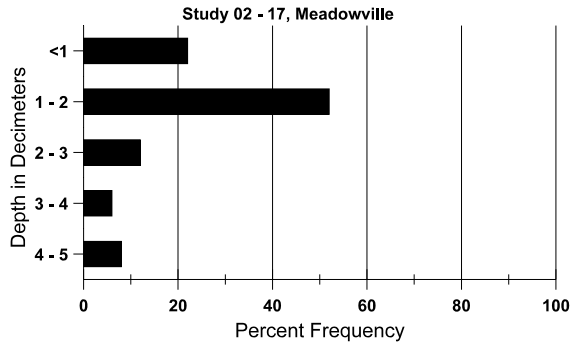
BASIC COVER --
 Management unit 02 , Study no: 17

Cover Type	Average Cover %				
	'84	'90	'96	'01	'06
Vegetation	2.50	11.50	53.66	41.42	40.98
Rock	10.00	9.00	10.95	8.15	8.44
Pavement	13.75	16.25	3.86	17.51	11.26
Litter	66.25	45.00	52.17	38.69	43.56
Cryptogams	.25	1.75	.09	.18	.19
Bare Ground	7.25	16.50	4.17	10.99	12.70

SOIL ANALYSIS DATA --
 Herd Unit 02, Study no: 17, Meadowville

Effective rooting depth (in)	Temp °F (depth)	PH	Sandy clay loam			%OM	PPM P	PPM K	dS/m
			%sand	%silt	%clay				
15.7	59.8 (14.8)	7.03	46.16	20.0	33.84	2.2	14.18	192.0	0.72

Stoniness Index



PELLET GROUP DATA --

Management unit 02 , Study no: 17

Type	Quadrat Frequency		
	'96	'01	'06
Rabbit	3	2	6
Elk	7	4	8
Deer	15	25	16
Cattle	2	1	3

Days use per acre (ha)	
'01	'06
-	-
3 (7)	19 (46)
56 (139)	24 (60)
4 (9)	6 (14)

BROWSE CHARACTERISTICS --

Management unit 02 , Study no: 17

		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	33	-	-	-	33	-	0	100	100	-	0	-/-
96	0	40	-	-	-	-	0	0	0	-	0	-/-
01	20	-	-	20	-	-	0	0	0	-	0	17/19
06	40	-	20	20	-	-	50	0	0	-	0	28/38
Artemisia tridentata vaseyana												
84	1466	-	-	-	1466	-	9	91	100	1	48	-/-
90	966	100	100	200	666	-	24	7	69	14	28	24/22
96	860	60	80	260	520	1160	28	28	60	40	58	25/33
01	520	-	20	260	240	820	38	4	46	38	42	21/34
06	400	-	-	360	40	840	25	0	10	5	5	15/23

		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 viscidiflorus viscidiflorus												
84	233	-	33	200	-	-	0	0	0	-	0	9/11
90	133	-	-	133	-	-	0	0	0	-	0	10/10
96	1900	40	40	1800	60	-	0	0	3	-	0	13/24
01	1960	20	40	1560	360	20	0	0	18	2	2	11/20
06	1720	-	60	1540	120	-	3	1	7	2	3	13/24
Eriogonum microthecum												
84	0	-	-	-	-	-	0	0	-	-	0	-/-
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	100	-	20	80	-	-	0	0	-	-	0	12/11
01	20	-	-	20	-	-	0	0	-	-	0	14/17
06	120	-	-	120	-	-	0	0	-	-	0	15/24
Gutierrezia sarothrae												
84	7599	-	3700	3733	166	-	0	0	2	-	0	7/11
90	11932	1400	9266	2400	266	-	2	0	2	.16	.27	9/11
96	1400	120	160	1200	40	-	0	0	3	1	1	7/10
01	820	40	20	800	-	-	0	0	0	-	0	5/8
06	480	-	20	440	20	-	0	0	4	-	0	6/11
Opuntia sp.												
84	0	-	-	-	-	-	0	0	-	-	0	-/-
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	180	20	80	100	-	-	0	0	-	-	0	5/12
01	300	-	20	280	-	-	0	0	-	-	0	5/11
06	320	-	60	260	-	-	0	0	-	-	0	5/14
Purshia tridentata												
84	166	-	100	66	-	-	40	20	0	-	20	11/49
90	432	-	166	200	66	-	23	62	15	-	0	13/21
96	200	-	60	120	20	-	30	40	10	10	10	14/44
01	200	-	-	200	-	20	50	50	0	-	0	21/48
06	400	-	40	360	-	-	30	0	0	-	0	25/54
Tetradymia canescens												
84	133	-	-	100	33	-	0	0	25	-	0	7/12
90	99	-	-	66	33	-	0	0	33	-	0	8/15
96	600	-	100	440	60	-	10	10	10	3	3	11/17
01	820	40	60	660	100	-	2	0	12	2	2	9/14
06	860	-	80	760	20	20	16	0	2	-	0	10/19