

COLDWATER WMA - TREND STUDY NO. 2R-5-11

Vegetation Type: Mountain Big Sagebrush

Range Type: Crucial Deer Winter, Substantial Elk Year-long

NRCS Ecological Site Description: [Upland Stony Loam \(Mountain Big Sagebrush\), R028AY334UT](#)

Land Ownership: DWR

Elevation: 5,100 ft (1,555 m)

Aspect: Southwest

Slope: 18%

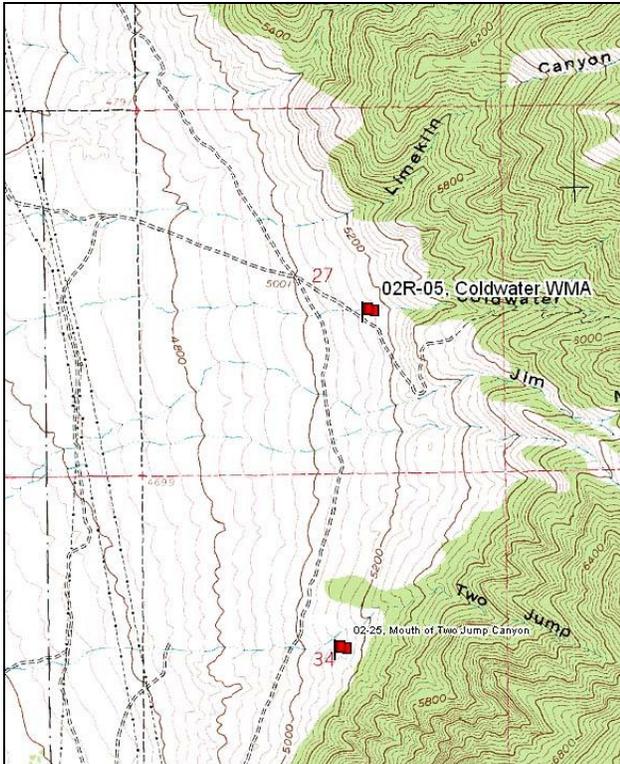
Transect bearing: 240° magnetic

Belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95 ft)

Directions:

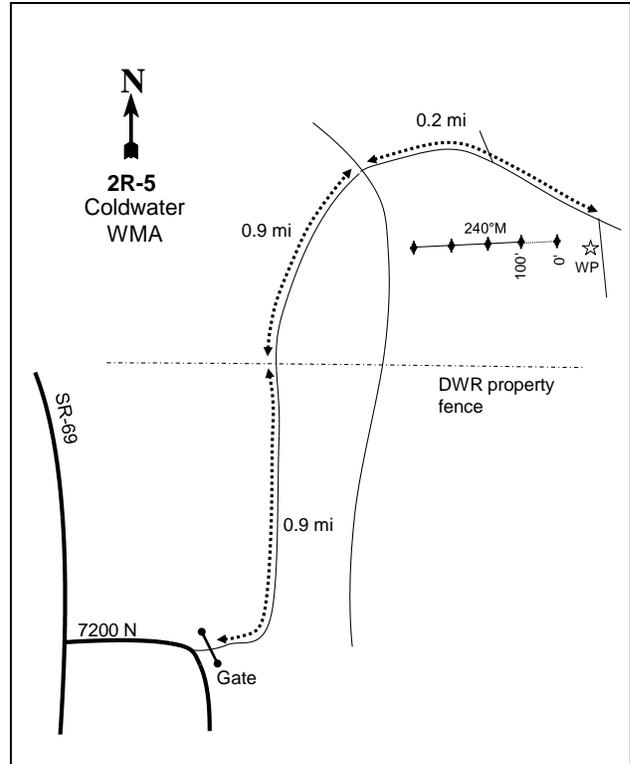
From the junction of 7200 North and SR-69 in Honeyville, proceed east and north for 0.55 miles to a gate. Proceed 0.9 miles to the north to a fence. Continue another 0.9 miles and as the road turn south keep left for 0.2 miles to a fork, keep right for approximately 300 feet to a witness post. Walk 11 paces at 210 degrees magnetic to the 0' stake. The baseline runs 240 degrees magnetic.

Map Name: Honeyville



Township: 11N Range: 2W Section: 34

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 412276 E 4612700 N

COLDWATER WMA - TREND STUDY NO. 2R-5

Site Information

Site Description: This study is located northeast of Honeyville, near the mouth of Coldwater Canyon. The vegetation is a mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) community. The area is administered by the Utah Division of Wildlife Resources (UDWR) as part of the Coldwater Wildlife Management Area (WMA). The spring near the study has been developed into a trough, and the study is nearly surrounded by roads. Deer pellet groups have been sampled in low abundance since 2001. Cattle pats were sampled in low abundance in 2006 (Table - Pellet Group Data).

Browse: The key browse species is mountain big sagebrush, but the study is located just below the steeper slopes covered by Utah juniper (*Juniperus osteosperma*). A few junipers are encroaching into the sagebrush community. The mountain big sagebrush is a dense, mature population, and is spaced uniformly across the site. The sagebrush population is centered within the mature age class. Utilization of sagebrush has been light over the sample years. Decadence and poor vigor have been low throughout the study years. Recruitment of young Wyoming big sagebrush has been nominal, though at the outset of the study recruitment was good. Other shrubs include white rubber rabbitbrush (*Chrysothamnus nauseosus* ssp. *albicaulis*), broom snakeweed (*Gutierrezia sarothrae*), and smooth sumac (*Rhus trilobata*). Young smooth sumac plants were abundant in 1998; however, very little survived to maturity, and smooth sumac was sampled as having low density the following sample years (Table - Browse Characteristics).

Herbaceous Understory: The herbaceous understory is composed mainly of annual weeds and perennial increasers. The most abundant perennial grass species are bulbous bluegrass (*Poa bulbosa*) and Sandberg bluegrass (*P. secunda*). Bulbous bluegrass was not sampled in 1998, but has steadily increased in abundance over the course of the study. The weedy annual species cheatgrass (*Bromus tectorum*) and Japanese chess (*B. japonicus*) are the most common grasses, and provide the bulk herbaceous production. Cheatgrass has historically been the dominant grass; however, Japanese chess has taken the place cheatgrass as the most abundant annual grass species. The forb community is not characterized as noticeably diverse, but forbs occur regularly. White sweetclover (*Melilotus alba*) and yellow sweetclover (*Melilotus officinalis*) are the desirable forbs found on the site, and are encountered regularly, though white sweetclover was not sampled in 2011. The weedy species western ragweed (*Ambrosia psilostachya*) has dominated the site in the past, but has decreased in abundance and production over the course of the study (Table - Herbaceous Trends)

Soil: The soil is part of the Sterling component, which is found on alluvial fans. The parent material consists of alluvium, colluviums, and lacustrine deposits derived from limestone, dolomite sandstone, and quartzite (Soil Survey Staff 2011). The texture is a loam with a neutral soil reaction (pH 7.1) (Table - Soil Analysis Data). Soils are highly rocky on the surface, but not throughout the profile. Bare ground cover is low, with a high amount of vegetation and litter, and moderate amount of rock providing protective ground cover (Table - Basic Cover). The soil erosion condition has been classified as stable since 2006.

Trend Assessments

Browse:

- **1998 to 2006 - stable (0):** The density for mountain big sagebrush remained similar, decreasing from 2,820 plants/acre to 2,780 plants/acre. Decadence of the sagebrush population decreased slightly from 6% to 4%. The sagebrush population decreased in poor vigor from 8% to 1%, and cover increased from 12% to 30%. The increase in cover is due to an increase in the size of plants. Average crown diameter increased from 37in. to 41in. Recruitment of young sagebrush decreased from 11% to 0% of the population, while the decadence decreased slightly from 6% to 4%.
- **2006 to 2011 - stable (0):** The density for mountain big sagebrush increased 9% to 3,040 plants/acre, and cover increased to 32%. The average crown diameter increased to 47 inches. Decadence in the

sagebrush population increased to 9%, and poor vigor increased to 9%. Recruitment of young sagebrush increased to 1%.

Grass:

- **1998 to 2006 - up (+2):** The sum of nested frequency for perennial grasses, excluding bulbous bluegrass, increased 59%. Sandberg bluegrass had a significant increase in nested frequency, and increased in cover from 1% to 5%. The weedy perennial species bulbous bluegrass had a significant increase in nested frequency, and increased in cover from 0% to 6%. The weedy annual species Japanese chess and cheatgrass had a significant decrease in nested frequency, and decreased in cover from 7% to 2% and 11% to 6%, respectively.
- **2006 to 2011 - down (-2):** The sum of nested frequency for perennial grasses, excluding bulbous bluegrass, decreased 74%. Kentucky bluegrass and Sandberg bluegrass decreased significantly in nested frequency. Sandberg bluegrass decreased in cover to 1%. Bulbous bluegrass had a significant increase in nested frequency, and increased in cover to 10%. The annual species Japanese chess increased significantly in nested frequency, and increased in cover to 13%. Cheatgrass decreased significantly in nested frequency, and decreased in cover to less than 1%.

Forb:

- **1998 to 2006 - stable (0):** The sum of nested frequency for perennial forbs remained similar. The weedy species western ragweed (*Ambrosia psilostachya*) decreased significantly in nested frequency, and decreased in cover from 8% to 1%. Spreading dogbane (*Apocynum androsaemifolium*) and death camas (*Zigadenus paniculatus*) had a significant increase in nested frequency, and increased in cover from 0% to 3% and 0% to 1%, respectively. The annual species prickly lettuce (*Lactuca serriola*) decreased significantly in nested frequency.
- **2006 to 2011 - up (+2):** The sum of nested frequency for perennial forbs increased 27%. Yellow sweetclover had a significant increase in nested frequency, and increased in cover from 1% to 3%. The weedy species spreading dogbane increased significantly in nested frequency, and increased in cover to 9%. The annual species prickly lettuce increased significantly in nested frequency, but cover was minimal.

DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --

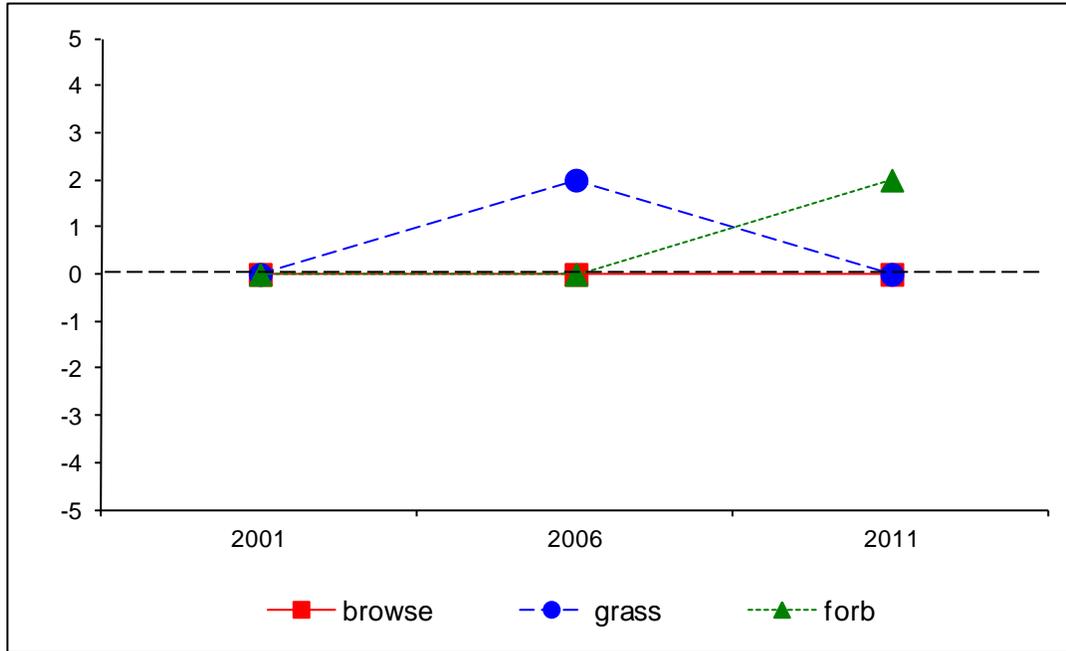
Management unit 2R, study no: 5

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover (-POBU)	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
98	23.0	13.0	3.4	5.5	-13.6	10.0	0.0	41.2	Poor
06	30.0	11.2	0.0	16.8	-6.0	10.0	-2.0	60.1	Fair
11	30.0	10.9	0.5	1.7	-10.0	10.0	0.0	43.1	Poor

Trend Summary

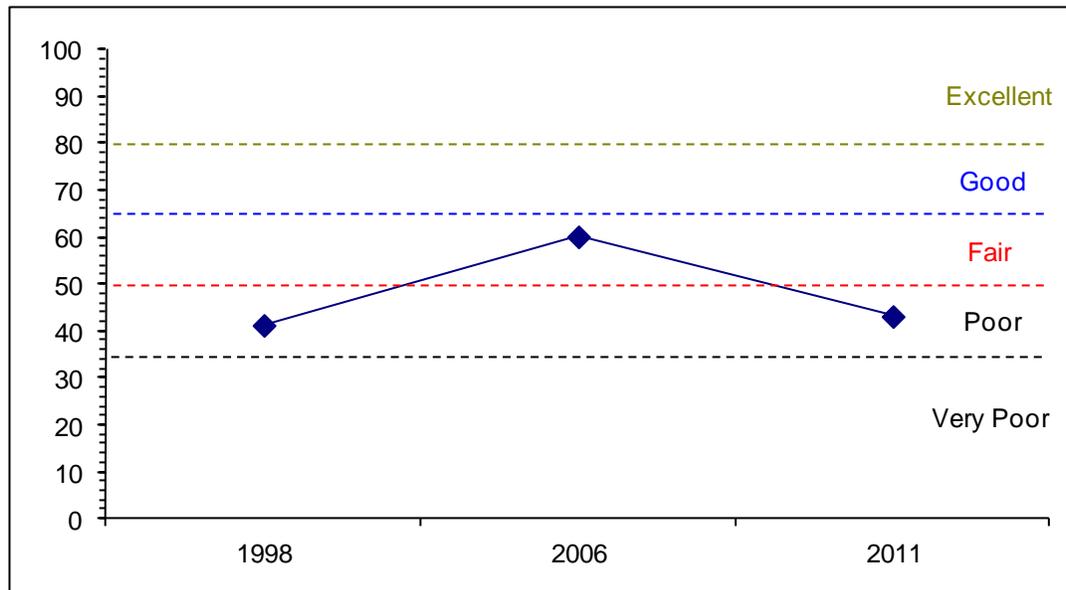
CUMULATIVE RANGE TREND ASSESSMENT--

Management unit 2R Study no: 5



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL--

Management unit 2R, Study no: 5



HERBACEOUS TRENDS--
Management unit 02R, Study no: 5

T y p e	Species	Nested Frequency			Average Cover %		
		'98	'06	'11	'98	'06	'11
G	<i>Bromus brizaeformis</i> (a)	20	13	25	.45	.11	.14
G	<i>Bromus japonicus</i> (a)	_b 320	_a 128	_b 310	6.78	1.61	12.81
G	<i>Bromus tectorum</i> (a)	_c 415	_b 216	_a 43	10.87	6.23	.39
G	<i>Poa bulbosa</i>	_a -	_b 177	_c 288	-	6.16	9.46
G	<i>Poa fendleriana</i>	3	3	4	.06	.03	.15
G	<i>Poa pratensis</i>	_b 80	_b 80	_a 4	1.67	2.69	.00
G	<i>Poa secunda</i>	_a 48	_b 120	_a 45	1.00	5.05	.70
G	<i>Sporobolus cryptandrus</i>	-	5	1	-	.63	.00
Total for Annual Grasses		755	357	378	18.12	7.95	13.35
Total for Perennial Grasses		131	385	342	2.73	14.58	10.33
Total for Grasses		886	742	720	20.86	22.53	23.69
F	<i>Allium</i> sp.	-	2	-	-	.00	-
F	<i>Alyssum alyssoides</i> (a)	_a 63	_a 83	_b 234	.26	.21	6.07
F	<i>Ambrosia psilostachya</i>	_b 178	_a 37	_a 33	8.10	1.23	.30
F	<i>Apocynum androsaemifolium pumilum</i>	_a -	_b 76	_c 124	-	3.07	8.92
F	<i>Artemisia ludoviciana</i>	8	10	6	.53	.93	.41
F	<i>Asclepias asperula</i>	4	11	6	.18	.59	.71
F	<i>Astragalus</i> sp.	3	-	-	.03	-	-
F	<i>Calochortus nuttallii</i>	-	-	5	-	.00	.01
F	<i>Carduus nutans</i> (a)	4	-	-	.00	-	-
F	<i>Cirsium undulatum</i>	1	2	-	.00	.15	-
F	<i>Collinsia parviflora</i> (a)	-	2	2	-	.00	.00
F	<i>Collomia linearis</i> (a)	3	-	-	.00	-	-
F	<i>Cryptantha</i> sp.	-	-	3	-	-	.00
F	<i>Cymopterus</i> sp.	-	2	-	-	.00	-
F	<i>Draba</i> sp. (a)	-	3	7	-	.00	.01
F	<i>Epilobium brachycarpum</i> (a)	_b 79	_b 90	_a 8	.44	.22	.01
F	<i>Erodium cicutarium</i> (a)	_a -	_b 26	_b 31	-	.32	.11
F	<i>Galium aparine</i> (a)	_a -	_a -	_b 14	-	-	.15
F	<i>Helianthus annuus</i> (a)	_a 22	_a 9	_b 69	.26	.16	.41
F	<i>Holosteum umbellatum</i> (a)	7	5	13	.15	.01	.44
F	<i>Isatis tinctoria</i>	-	-	-	-	.00	-
F	<i>Lactuca serriola</i> (a)	_b 15	_a -	_b 10	.09	-	.03
F	<i>Melilotus alba</i>	_b 17	_b 8	_a -	1.47	1.25	-
F	<i>Melilotus officinalis</i>	_a 12	_a 34	_b 88	.90	.87	2.70
F	<i>Microsteris gracilis</i> (a)	-	9	5	-	.01	.01
F	<i>Penstemon</i> sp.	6	-	-	.03	-	-
F	<i>Phlox longifolia</i>	-	4	1	-	.00	.03
F	<i>Tragopogon dubius</i> (a)	_{ab} 9	_a 3	_b 17	.09	.00	.26
F	<i>Veronica biloba</i> (a)	-	-	2	-	-	.00
F	<i>Viola</i> sp.	-	4	15	-	.03	.08
F	<i>Zigadenus paniculatus</i>	_a 7	_b 40	_a 11	.03	.73	.15

Type	Species	Nested Frequency			Average Cover %		
		'98	'06	'11	'98	'06	'11
	Total for Annual Forbs	202	230	412	1.33	0.95	7.53
	Total for Perennial Forbs	236	230	292	11.30	8.89	13.33
	Total for Forbs	438	460	704	12.63	9.85	20.87

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

BROWSE TRENDS--

Management unit 02R, Study no: 5

Type	Species	Strip Frequency			Average Cover %		
		'98	'06	'11	'98	'06	'11
B	Artemisia tridentata vaseyana	70	67	74	11.63	29.52	32.05
B	Chrysothamnus nauseosus albicaulis	15	15	14	5.74	3.78	1.72
B	Gutierrezia sarothrae	35	12	13	4.34	.39	.07
B	Rhus trilobata	15	1	1	1.25	.30	.00
	Total for Browse	135	95	102	22.97	34.00	33.85

CANOPY COVER, LINE INTERCEPT--

Management unit 02R, Study no: 5

Species	Percent Cover	
	'06	'11
Artemisia tridentata vaseyana	32.31	38.11
Chrysothamnus nauseosus albicaulis	6.46	2.58
Gutierrezia sarothrae	.13	.56
Rhus trilobata	.43	-

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 02R, Study no: 5

Species	Average leader growth (in)		
	'01	'06	'11
Artemisia tridentata vaseyana	-	2.1	2.0

BASIC COVER--

Management unit 02R, Study no: 5

Cover Type	Average Cover %		
	'98	'06	'11
Vegetation	53.35	65.52	63.10
Rock	11.89	8.32	10.47
Pavement	6.50	3.90	7.19
Litter	42.60	43.31	49.00
Cryptogams	.00	0	.03
Bare Ground	8.63	3.10	6.32

SOIL ANALYSIS DATA --

Management unit 02R, Study no: 5, Study Name: Cold Water WMA

Effective rooting depth (in)	pH	Loam			%OM	PPM P	PPM K	ds/m
		% sand	% silt	% clay				
7.7	7.1	38.7	36.7	24.6	6.7	11.5	150.4	0.9

PELLET GROUP DATA--

Management unit 02R, Study no: 5

Type	Quadrat Frequency		Days use per acre (ha)	
	'06	'11	'06	'11
Rabbit	17	11	-	-
Deer	6	6	13 (31)	13 (31)
Cattle	-	-	1 (2)	-

BROWSE CHARACTERISTICS--

Management unit 02R, Study no: 5

		Age class distribution					Utilization		
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Artemisia tridentata vaseyana									
98	2820	11	84	6	100	9	0	8	30/37
06	2780	0	96	4	260	6	0	1	33/41
11	3040	1	91	9	1720	1	0	9	32/47
Chrysothamnus nauseosus albicaulis									
98	400	0	90	10	-	0	0	0	45/68
06	420	0	19	81	-	0	0	81	36/58
11	340	0	0	100	-	0	0	94	32/39
Gutierrezia sarothrae									
98	1960	2	98	0	-	0	0	0	18/22
06	320	0	63	38	-	0	0	31	12/12
11	480	17	83	0	-	0	0	4	16/15
Rhus glabra cismontana									
98	0	0	0	-	-	0	0	0	-/-
06	0	0	0	-	-	0	0	0	-/-
11	0	0	0	-	-	0	0	0	20/20
Rhus trilobata									
98	3340	100	0	-	40	0	0	0	-/-
06	20	0	100	-	-	0	0	0	47/87
11	20	100	0	-	-	0	0	0	47/74
Symphoricarpos oreophilus									
98	0	0	0	-	-	0	0	0	-/-
06	0	0	0	-	-	0	0	0	-/-
11	0	0	0	-	-	0	0	0	27/49