

WINTER RIDGE ENCLOSURE OUT - TREND STUDY NO. 10R-9-10

Vegetation Type: Mountain Big Sagebrush

Range Type: Substantial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: Upland Loam (Wyoming Big Sagebrush), R034XY306UT

Land Ownership: BLM

Elevation: 7420 ft. (2262 m)

Aspect: West

Slope: 4%

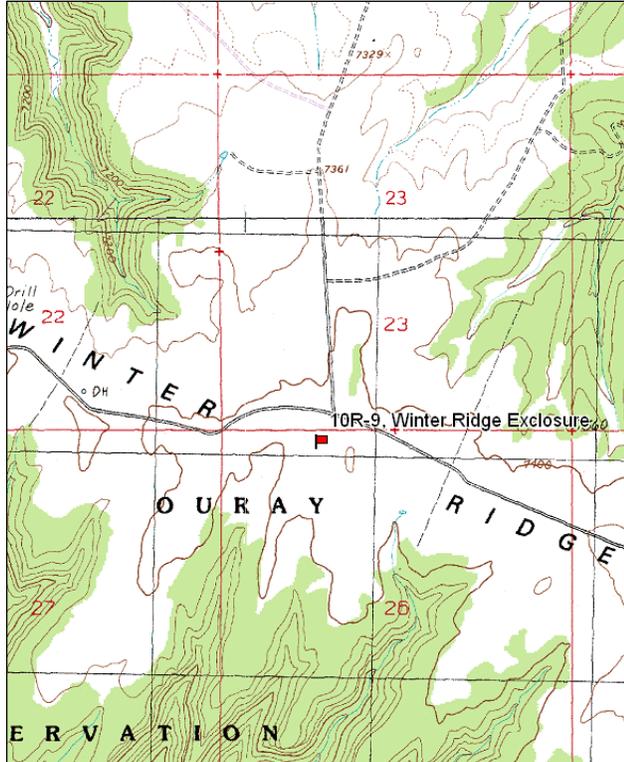
Transect bearing: 94° magnetic

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

Directions:

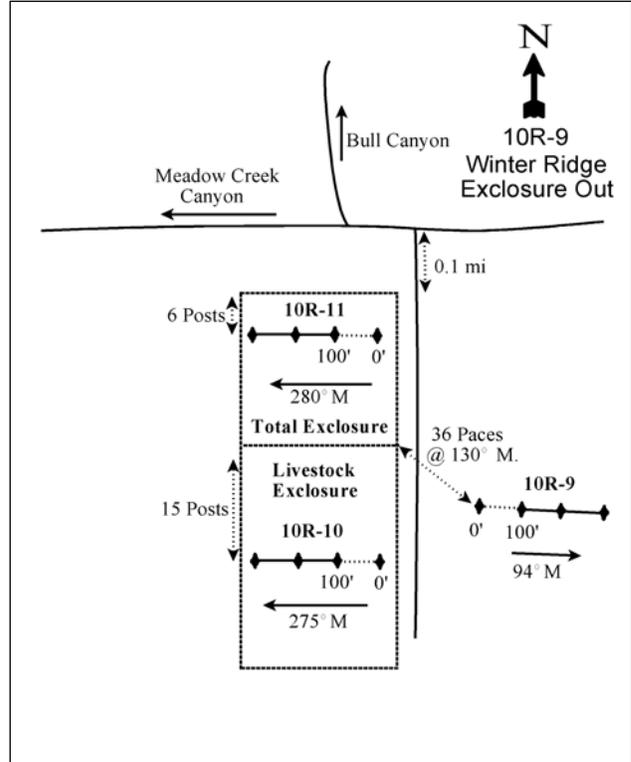
From the intersection of the Seep Ridge and Book Cliff Divide road, proceed west along the divide for 9.4 miles to the major Three Pines-Hay Canyon intersection. Drive west along the Winter Ridge Rd for 9.8 miles to a fork. From the intersection where Meadow Creek Canyon and Bull Canyon meet, take the road to the south. Go 0.1 miles to the Winter Ridge Enclosure. From the "T" in the fence on the west side of the enclosure where the two parts of the enclosure meet, walk 36 paces at 130°M to the 0-foot stake which is marked by browse tag #63.

Map Name: Tenmile Canyon North



Township: 15S Range: 21E Section: 26

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 625704 E 4372166 N

WINTER RIDGE EXCLOSURE OUT - TREND STUDY NO. 10R-9

Site Information

Site Description: The study is located outside of the enclosure complex on Winter Ridge that was constructed in 1964. The area is comprised of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and grass in association with scattered pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*). The area is used as winter range for deer and elk. Grazing in the area is managed by the Bureau of Land Management as part of the Horse Point allotment. Pellet group data has estimated moderate use by elk from 1997 to 2005, with lighter use in 2010. Estimated deer use has been light since 1997. Estimated cattle use has been mostly light with more moderate use in 1997 and estimated horse use has been light since 2005 (Table - Pellet Group Data).

Browse: Mountain big sagebrush is the most abundant browse species, but has decreased in cover since 2000. Broom snakeweed (*Gutierrezia sarothrae*) provided as much cover as sagebrush in 2005, but has been less abundant in all other sample years (Table - Browse Trends). The sagebrush population is a mixture of mature and decadent plants with moderate to heavy use over the sample years. Recruitment of young sagebrush has been mostly marginal, but was very good in 2010. Other browse species encountered in low densities include dwarf rabbitbrush (*Chrysothamnus depressus*), stickyleaf low rabbitbrush (*C. viscidiflorus* ssp. *viscidiflorus*) and winterfat (*Ceratoides lanata*) (Table - Browse Characteristics).

Herbaceous Understory: Perennial grasses are diverse and abundant on the site. Thickspike wheatgrass (*Agropyron dasystachyum*), mutton bluegrass (*Poa fendleriana*), Sandberg bluegrass (*P. secunda*), blue grama (*Bouteloua gracilis*), prairie junegrass (*Hilaria jamesii*) and needle-and-thread (*Stipa comata*) are all common on the site. There was a change in composition after 2000 with a decrease in the two bluegrass species and an increase in prairie junegrass and needle-and-thread. Forbs are diverse, but most species provide little cover. Desert phlox (*Phlox austromontana*) and scarlet globemallow (*Sphaeralcea coccinea*) have been the most abundant forbs. Most of the forbs associated with this site are low growing species, and although they afford some protection to the soil, they offer little forage value. Other prevalent species include rose pussytoes (*Antennaria rosea*), mat penstemon (*Penstemon caespitosus*) and longleaf phlox (*Phlox longifolia*) (Table - Herbaceous Trends).

Soil: The soil has a loam texture with a neutral soil reaction (pH 7.2). Phosphorus and potassium may have limited availability for plant growth and development at 5.4 ppm and 3.2 ppm, respectively (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Bare ground cover is moderately high, but vegetation and litter cover are adequate to provide good protective cover (Table - Basic Cover). Soil pedestaling is evident around the base of shrubs, indicative of soil loss in the past. The soil erosion condition was classified as stable in 2005 and 2010.

Trend Assessments

Browse:

- **1997 to 2000 - stable (0):** The density of mountain big sagebrush increased by 15% from 6,920 plants/acre to 7,960 plants/acre, and cover increased from 13% to 16%. However, decadence and poor vigor of sagebrush doubled from 24% to 51% decadence and from 10% to 20% poor vigor. Recruitment of young sagebrush plants remains low.
- **2000 to 2005 - down (-2):** Mountain big sagebrush density decreased by 35% to 5,140 plants/acre, and cover decreased to 9%. Decadence decreased slightly, but remained high at 42%. Poor vigor of sagebrush increased slightly to 27% and recruitment of young sagebrush remained very low. Broom snakeweed cover was higher than sagebrush cover.
- **2005 to 2010 - stable (0):** There was little change in the density of mountain big sagebrush, though cover decreased to 6%. Decadence of sagebrush decreased, but is still high at 34%, and poor vigor

decreased to 11%. Recruitment of young sagebrush increased to 25% of the population. Broom snakeweed decreased in cover back to 2000 levels.

Grass:

- **1997 to 2000 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, though cover increased from 11% to 16%.
- **2000 to 2005 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 10%, but cover remained similar. There was a change in composition with a significant decrease in the nested frequency of the two bluegrass species and a significant increase in the nested frequency of needle-and-thread.
- **2005 to 2010 - stable (0):** The perennial grass sum of nested frequency changed little, but cover decreased from 17% to 14%. There was a significant increase in the nested frequency of prairie junegrass.

Forb:

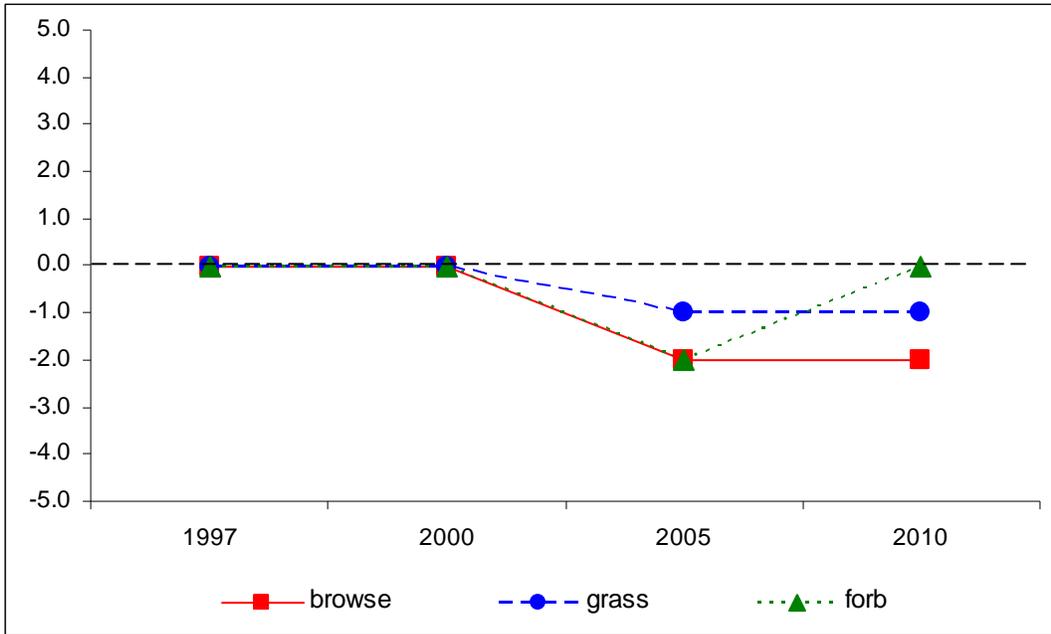
- **1997 to 2000 - stable (0):** The perennial forb sum of nested frequency changed little, but cover increased slightly from 5% to 6%.
- **2000 to 2005 - down (-2):** There was a 51% decrease in the sum of nested frequency of perennial forbs and cover decreased to 4%.
- **2005 to 2010 - up (+2):** The sum of nested frequency of perennial forbs increased by 46%, though there was little change in cover.

DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --
Management unit 10R, study no: 9

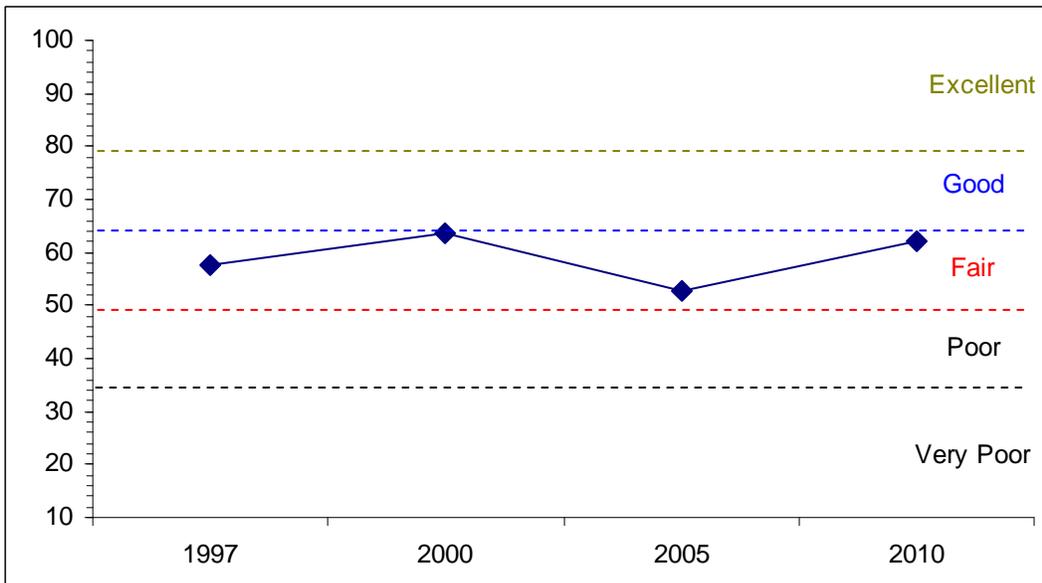
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
97	16.4	7.9	1.6	21.7	0.0	10.0	0.0	57.5	Fair
00	19.7	-0.2	4.1	30.0	0.0	10.0	0.0	63.6	Fair-Good
05	11.6	2.5	1.5	30.0	0.0	7.2	0.0	52.8	Fair
10	7.8	5.4	11.8	28.6	0.0	8.6	0.0	62.3	Fair

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
 Management unit 10R, Study no: 9



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL--
 Management unit 10R, Study no: 9



HERBACEOUS TRENDS--
Management unit 10R, Study no: 9

Type	Species	Nested Frequency				Average Cover %			
		'97	'00	'05	'10	'97	'00	'05	'10
G	<i>Agropyron dasystachyum</i>	_b 340	_b 324	_{ab} 296	_a 247	3.00	4.00	4.88	3.19
G	<i>Bouteloua gracilis</i>	_a 26	_{ab} 37	_{ab} 39	_b 59	.93	1.74	2.40	1.58
G	<i>Koeleria cristata</i>	_b 152	_a 45	_a 84	_b 186	1.75	.48	1.77	4.28
G	<i>Poa fendleriana</i>	_b 171	_c 249	_b 184	_a 79	2.79	5.97	3.26	.78
G	<i>Poa secunda</i>	_b 191	_c 251	_a 43	_a 79	2.06	3.75	.50	.55
G	<i>Stipa comata</i>	_b 56	_a 11	_c 177	_c 202	.26	.07	4.30	3.90
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		936	917	823	852	10.83	16.03	17.12	14.31
Total for Grasses		936	917	823	852	10.83	16.03	17.12	14.31
F	<i>Antennaria rosea</i>	_c 28	_{bc} 25	_a 1	_d 7	.53	.32	.00	.06
F	<i>Arabis sp.</i>	_b 17	_a 2	_a 1	_a -	.03	.00	.00	-
F	<i>Arenaria fendleri</i>	-	3	-	2	-	.00	-	.00
F	<i>Astragalus convallarius</i>	12	10	9	19	.02	.05	.08	.29
F	<i>Astragalus lentiginosus</i>	-	-	1	-	-	-	.00	-
F	<i>Balsamorhiza sagittata</i>	-	-	-	5	-	-	-	.03
F	<i>Castilleja flava</i>	-	-	-	8	-	-	-	.04
F	<i>Castilleja linariaefolia</i>	7	3	-	-	.04	.00	-	.00
F	<i>Crepis acuminata</i>	4	-	1	1	.03	-	.03	.00
F	<i>Cryptantha sp.</i>	4	-	6	7	.04	-	.04	.02
F	<i>Erigeron eatonii</i>	_b 30	_b 16	_a -	_a 6	.06	.06	-	.05
F	<i>Erigeron pumilus</i>	_a -	_c 48	_b 14	_b 21	-	.19	.14	.17
F	<i>Eriogonum alatum</i>	-	-	4	2	-	-	.03	.00
F	<i>Hymenoxys acaulis</i>	-	-	6	13	-	-	.06	.21
F	<i>Lesquerella sp.</i>	22	13	19	15	.10	.20	.06	.07
F	<i>Lithospermum sp.</i>	-	2	-	-	-	.00	-	-
F	<i>Lygodesmia grandiflora</i>	1	-	-	-	.03	-	-	-
F	<i>Machaeranthera grindelioides</i>	-	-	2	2	-	-	.03	.15
F	<i>Penstemon caespitosus</i>	_b 64	_b 54	_a -	_a 6	1.02	.94	-	.07
F	<i>Petradoria pumila</i>	-	3	-	-	-	.03	-	-
F	<i>Phlox austromontana</i>	_b 190	_b 228	_a 65	_a 86	2.20	3.54	.62	1.12
F	<i>Phlox longifolia</i>	_b 56	_a 22	_a 6	_b 41	.15	.06	.02	.14
F	<i>Physaria acutifolia</i>	-	3	-	-	-	.15	-	-
F	<i>Sphaeralcea coccinea</i>	_a 78	_a 104	_b 126	_b 138	.70	.61	2.48	1.80
F	<i>Townsendia sp.</i>	-	-	4	4	-	-	.01	.02
F	<i>Tragopogon dubius</i>	-	-	-	3	-	-	-	.00
Total for Annual Forbs		0	0	0	0	0	0	0	0
Total for Perennial Forbs		513	536	265	386	4.98	6.19	3.62	4.30
Total for Forbs		513	536	265	386	4.98	6.19	3.62	4.30

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

BROWSE TRENDS--

Management unit 10R, Study no: 9

Type	Species	Strip Frequency				Average Cover %			
		'97	'00	'05	'10	'97	'00	'05	'10
B	Artemisia tridentata vaseyana	94	98	91	89	12.95	15.57	9.22	5.88
B	Ceratoides lanata	1	2	3	3	.03	-	.03	.03
B	Chrysothamnus depressus	6	7	4	8	.16	.19	.06	.36
B	Chrysothamnus viscidiflorus viscidiflorus	0	0	0	4	-	.00	-	.00
B	Gutierrezia sarothrae	30	75	81	63	.16	2.52	10.31	1.21
B	Pediocactus simpsonii	6	8	8	3	.01	.01	-	-
B	Pinus edulis	0	2	2	2	.03	-	.15	.38
B	Tetradymia canescens	0	1	0	0	-	-	-	-
Total for Browse		137	193	189	172	13.34	18.30	19.78	7.88

CANOPY COVER, LINE INTERCEPT--

Management unit 10R, Study no: 9

Species	Percent Cover	
	'05	'10
Artemisia tridentata vaseyana	9.25	9.53
Chrysothamnus depressus	.08	.16
Chrysothamnus viscidiflorus viscidiflorus	-	.06
Gutierrezia sarothrae	13.08	1.85
Pinus edulis	-	.41

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 10R, Study no: 9

Species	Average leader growth (in)	
	'05	'10
Artemisia tridentata vaseyana	1.9	1.2

BASIC COVER--

Management unit 10R, Study no: 9

Cover Type	Average Cover %			
	'97	'00	'05	'10
Vegetation	31.92	40.52	37.43	35.50
Rock	.11	.04	.05	.00
Pavement	.54	.18	.07	.01
Litter	25.17	33.08	29.99	42.45
Cryptogams	15.88	12.26	1.79	.41
Bare Ground	31.46	35.23	42.84	34.21

SOIL ANALYSIS DATA --

Management unit 10R, Study no: 9, Study Name: Winter Ridge Exclosure Outside

Effective rooting depth (in)	pH	loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
15.4	7.2	35.6	38.8	25.6	1.4	5.4	3.2	0.5

PELLET GROUP DATA--

Management unit 10R, Study no: 9

Type	Quadrat Frequency				Days use per acre (ha)			
	'97	'00	'05	'10	'97	'00	'05	'10
Rabbit	14	5	20	7	-	-	-	-
Horse	-	-	5	9	-	-	5 (13)	4 (10)
Elk	24	15	24	10	44 (109)	22 (55)	32 (79)	1 (3)
Deer	4	9	9	-	2 (5)	2 (5)	2 (5)	13 (33)
Cattle	2	3	8	4	30 (74)	19 (47)	7 (16)	2 (5)

BROWSE CHARACTERISTICS--

Management unit 10R, Study no: 9

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Artemisia frigida</i>									
97	0	0	0	-	-	0	0	0	-/-
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	-/-
10	0	0	0	-	-	0	0	0	9/7
<i>Artemisia tridentata vaseyana</i>									
97	6920	3	73	24	40	53	25	10	21/27
00	7960	8	40	51	60	44	30	20	20/22
05	5140	3	56	42	1100	49	9	27	19/23
10	5080	25	41	34	600	42	26	11	20/25
<i>Ceratoides lanata</i>									
97	20	0	100	-	-	0	0	0	6/6
00	40	0	100	-	-	0	100	0	4/5
05	80	0	100	-	-	0	100	0	3/4
10	80	25	75	-	-	25	0	0	5/8
<i>Chrysothamnus depressus</i>									
97	260	15	85	0	-	0	0	0	3/7
00	420	24	62	14	-	0	5	10	3/7
05	280	0	86	14	-	100	0	0	3/7
10	380	0	100	0	-	0	0	0	5/8
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
97	0	0	0	-	-	0	0	0	-/-
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	-/-
10	140	71	29	-	-	0	0	0	7/7
<i>Gutierrezia sarothrae</i>									
97	1440	11	89	0	-	0	0	0	5/6
00	19460	28	72	0	1140	0	0	0	4/4
05	29480	13	87	0	520	0	0	.06	7/9
10	8360	53	46	1	880	0	0	1	5/5

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<i>Opuntia</i> sp.									
97	0	0	0	-	-	0	0	0	-/-
00	0	0	0	-	-	0	0	0	4/5
05	0	0	0	-	-	0	0	0	-/-
10	0	0	0	-	-	0	0	0	-/-
<i>Pediocactus simpsonii</i>									
97	120	17	83	-	-	0	0	0	1/3
00	200	50	50	-	-	0	0	0	1/2
05	300	0	100	-	-	0	0	0	1/2
10	60	67	33	-	-	0	0	0	1/2
<i>Pinus edulis</i>									
97	0	0	0	-	-	0	0	0	-/-
00	40	100	0	-	-	0	0	0	-/-
05	40	100	0	-	-	0	0	0	-/-
10	40	100	0	-	-	0	0	0	-/-
<i>Tetradymia canescens</i>									
97	0	0	0	-	-	0	0	0	-/-
00	20	100	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	-/-
10	0	0	0	-	-	0	0	0	-/-