

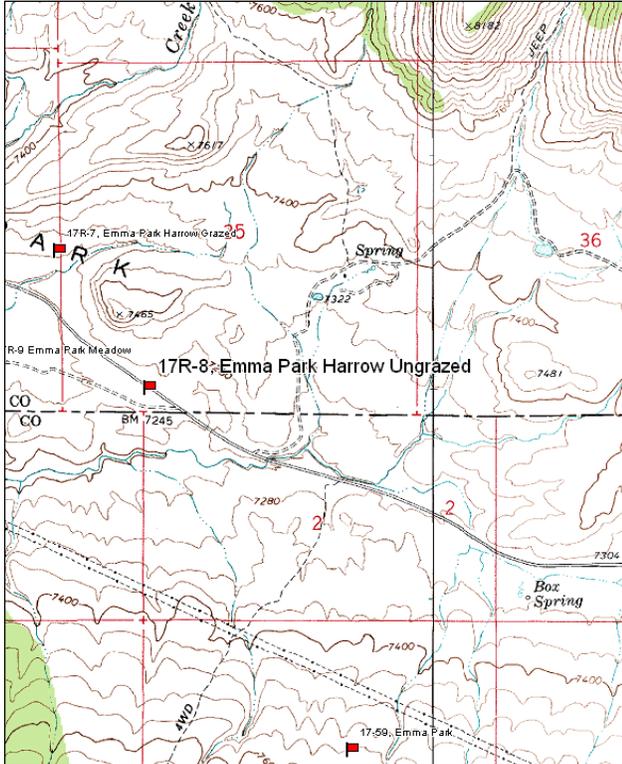
EMMA PARK HARROW UNGRAZED - TREND STUDY NO. 17R-8-10

Vegetation Type: Harrowed, Seeded Mountain Big Sagebrush
Range Type: Crucial Deer Summer, Crucial Elk Summer (Calving habitat)
NRCS Ecological Site Description: Not Available
Land Ownership: BLM
Elevation: 7245 ft. (2209 m)
Aspect: South-Southwest
Slope: 5%
Transect bearing: 298° magnetic
Belt placement: line 1(11ft), line 2(34 ft), line 3(59 ft), line 4(71 ft), line 5 (95 ft).

Directions:

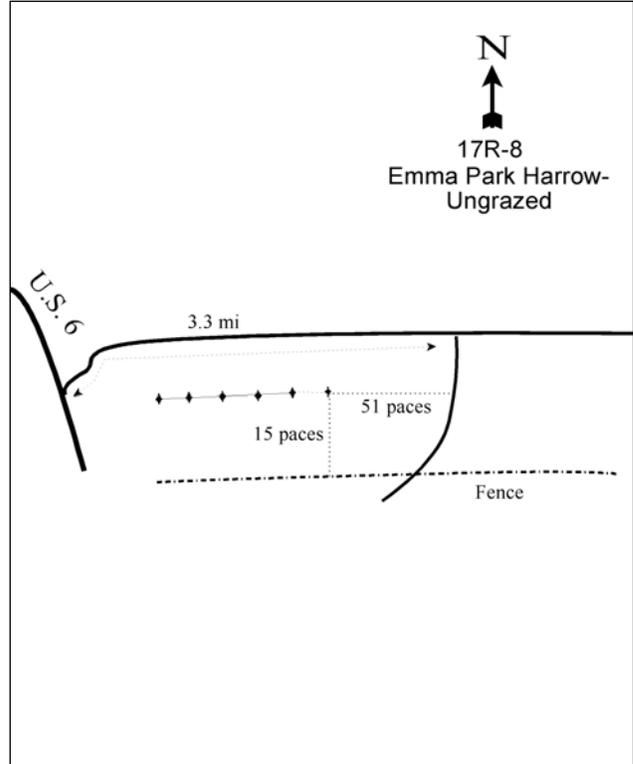
From the Kyune turnoff on U.S. 6 travel 3.3 miles to a turnoff on the south side of the road. The study site is located between the road and the fence. From the gate, go northwest along the fence to the 27th post. The 0-foot stake is 15 paces north of the fence post and is marked by browse tag #425.

Map Name: Kyune



Township: 11S Range: 9E Section: 35

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 509329 E 4407117 N

EMMA PARK HARROW UNGRAZED - TREND STUDY NO. 17R-8

Site Information

Site Description: The study is located about three and a half miles east of the junction of Highway 6 and Kyune in Spanish Fork Canyon, just off of the Emma Park Highway. The area had been pipe harrowed one-way and seeded prior to site placement. This study was paired with study 17R-7 to monitor site differences with and without livestock grazing following a pipe harrow treatment. Cattle grazing is not supposed to occur on this location, but will occur on study 17R-7. Pellet group transect data has estimated very light use by deer, elk and cattle since 2001. Grouse pellets were sampled in 2005 (Table - Pellet Group Data).

Browse: The dominant browse species is mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). The sagebrush population is comprised of mostly mature plants with light use and good recruitment of young plants. Decadence and poor vigor were high in the sagebrush population at the outset of the study in 2001, but have been good since 2005. Other common browse species include stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) and rubber rabbitbrush (*C. nauseosus*). Other less abundant browse species include snowberry (*Symphoricarpos oreophilus*) and gray horsebrush (*Tetradymia canescens*). All of these browse species displayed light use (Table - Browse Characteristics).

Herbaceous Understory: Grasses are fairly diverse and abundant, consisting of a mixture of native and seeded perennial species. The most abundant species include western wheatgrass (*Agropyron smithii*), bluebunch wheatgrass (*A. spicatum*) and Salina wildrye (*Elymus salina*). It appears that Salina wildrye was identified as western wheatgrass in 2001. In 2005, western wheatgrass was differentiated from Salina wildrye, so 2005 data showed decreases in western wheatgrass cover. Forbs are diverse and fairly abundant. Sweetvetch (*Hedysarum boreale*), desert phlox (*Phlox austromontana*) and chickpea milkvetch (*Astragalus cicer*) are the most abundant forbs (Table - Herbaceous Trends).

Soil: The soils are clay loam in texture with a soil reaction that is slightly alkaline (pH 7.6). Phosphorus may have limited availability for plant growth and development at 2.9 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Bare ground cover has been moderate to low with most of the protective ground cover being provided by vegetation and litter (Table - Basic Cover). The soil erosion condition was classified as stable in 2001 and 2010, but slight in 2005 because of pedestals around vegetation and a few small gullies and rills.

Trend Assessments

Browse:

- **2001 to 2005 - stable (0):** The density of mountain big sagebrush decreased by 17% from 4540 plants/acre to 3,760 plants/acre and cover decreased from 13% to 11%. However, decadence of sagebrush decreased from 42% to 14% and poor vigor decreased from 72% to 7%. Recruitment of young sagebrush plants decreased from 12% to 8% of the population.
- **2005 to 2010 - up (+2):** Mountain big sagebrush density increased by 29% to 4,840 plants/acre and cover increased to 14%. Decadence and poor vigor remained low, and recruitment of young sagebrush plants increased to 22%.

Grass:

- **2001 to 2005 - up (+2):** The sum of nested frequency of perennial grasses increased by 28% and cover increased from 14% to 20%.
- **2005 to 2010 - slightly up (+1):** The perennial grass sum of nested frequency increased 14% and cover remained similar at 18%.

Forb:

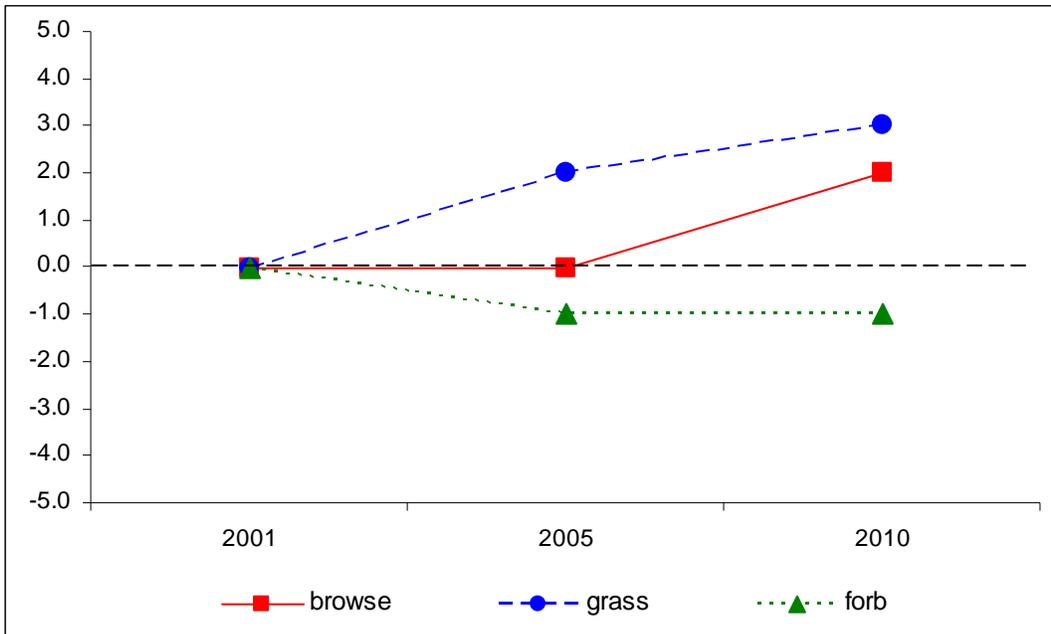
- **2001 to 2005 - slightly down (-1):** There was a 14% decrease in the sum of nested frequency of perennial forbs, but cover increased from 2% to 4%.
- **2005 to 2010 - stable (0):** The sum of nested frequency of perennial forbs remained similar, though cover decreased to 3%.

DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --
Management unit 17R, study no: 8

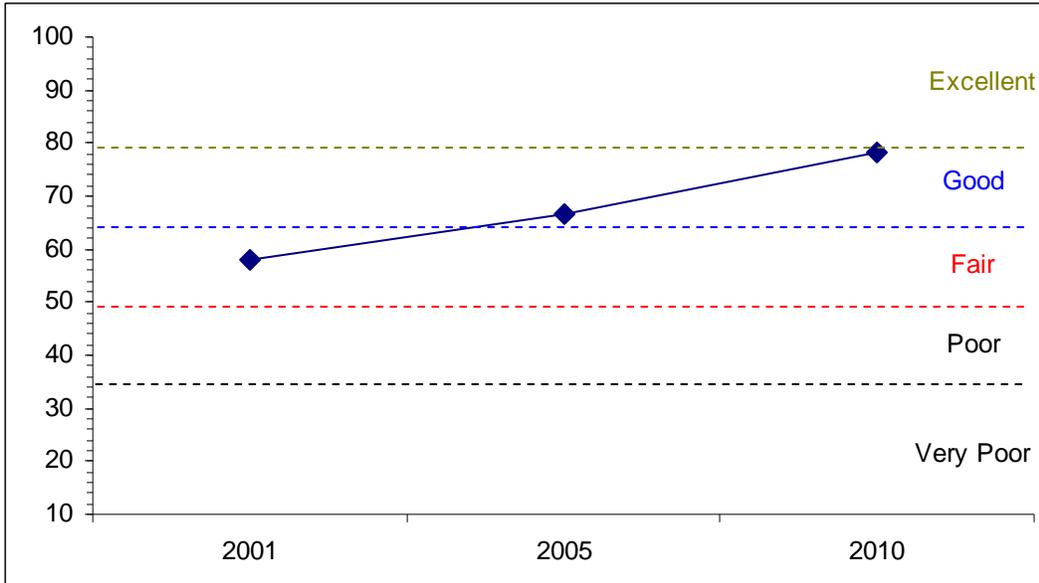
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
01	16.5	2.4	6.0	28.8	0.0	4.3	0.0	58.0	Fair
05	13.5	10.8	4.0	30.0	0.0	8.2	0.0	66.6	Fair-Good
10	17.8	12.9	11.0	30.0	0.0	6.5	0.0	78.2	Good-Excellent

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 17R, Study no: 8



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL--
 Management unit 17R, Study no: 8



HERBACEOUS TRENDS--
 Management unit 17R, Study no: 8

Type	Species	Nested Frequency			Average Cover %		
		'01	'05	'10	'01	'05	'10
G	Agropyron intermedium	3	3	8	.03	.15	.19
G	Agropyron smithii	c ₂ 43	a ₆ 8	b ₁ 54	12.08	3.02	3.09
G	Agropyron spicatum	a ₅ 3	b ₁ 04	b ₁ 09	2.00	7.48	5.69
G	Bromus inermis	1	4	7	.00	.06	.18
G	Carex sp.	2	-	-	.00	-	-
G	Elymus salina	a ⁻	b ₁ 51	b ₁ 65	-	8.07	8.73
G	Koeleria cristata	-	2	-	-	.06	-
G	Oryzopsis hymenoides	-	-	4	-	.00	.15
G	Poa fendleriana	a ⁻	ab ₁ 2	b ₈	.00	.07	.19
G	Poa pratensis	1	4	-	.00	.03	-
G	Poa secunda	a ₁	b ₃ 9	a ⁻	.00	1.06	-
G	Stipa lettermani	ab ₁ 0	b ₁ 4	a ⁻	.24	.36	-
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		314	401	455	14.40	20.40	18.23
Total for Grasses		314	401	455	14.40	20.40	18.23
F	Achillea millefolium	8	5	10	.09	.18	.21
F	Arabis sp.	-	3	-	-	.04	-
F	Aster sp.	-	10	10	-	.06	.19
F	Astragalus cicer	b ₂ 5	a ₅	ab ₁ 8	.66	.03	.85
F	Astragalus convallarius	a ⁻	b ₉	ab ₁	-	.03	.00
F	Astragalus tenellus	b ₁ 3	a ⁻	a ₃	.21	-	.03
F	Calochortus nuttallii	-	-	1	-	-	.00
F	Chenopodium leptophyllum(a)	a ₅	b ₂ 2	a ⁻	.00	.04	-
F	Cirsium sp.	3	2	1	.00	.03	.03

Type	Species	Nested Frequency			Average Cover %		
		'01	'05	'10	'01	'05	'10
F	Descurainia pinnata (a)	-	3	-	-	.03	-
F	Erigeron sp.	4	-	9	.01	-	.01
F	Hedysarum boreale	_a 6	_b 35	_a 13	.21	2.18	.86
F	Lactuca serriola	2	1	-	.00	.00	-
F	Linum lewisii	9	3	-	.01	.03	-
F	Machaeranthera canescens	2	3	3	.01	.16	.04
F	Medicago sativa	3	-	-	.03	-	-
F	Penstemon caespitosus	_b 31	_a 8	_a 8	.19	.07	.01
F	Phlox austromontana	34	39	47	.60	1.13	.98
F	Potentilla gracilis	7	7	3	.03	.07	.01
F	Sanguisorba minor	6	2	-	.04	.03	-
F	Senecio multilobatus	-	2	-	-	.03	-
F	Taraxacum officinale	1	-	-	.00	-	-
F	Trifolium sp.	2	-	-	.00	-	-
Total for Annual Forbs		5	25	0	0	0.07	0
Total for Perennial Forbs		156	134	127	2.13	4.11	3.25
Total for Forbs		161	159	127	2.14	4.19	3.25

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

BROWSE TRENDS--

Management unit 17R, Study no: 8

Type	Species	Strip Frequency			Average Cover %		
		'01	'05	'10	'01	'05	'10
B	Artemisia tridentata vaseyana	77	74	82	13.20	10.83	14.25
B	Chrysothamnus nauseosus	26	24	23	2.26	2.54	2.51
B	Chrysothamnus viscidiflorus viscidiflorus	57	62	65	3.26	7.40	6.00
B	Gutierrezia sarothrae	3	1	0	.41	-	-
B	Symphoricarpos oreophilus	1	1	1	-	.00	.03
B	Tetradymia canescens	1	1	1	.03	.03	-
Total for Browse		165	163	172	19.18	20.81	22.80

CANOPY COVER, LINE INTERCEPT--

Management unit 17R, Study no: 8

Species	Percent Cover	
	'05	'10
Artemisia tridentata vaseyana	15.30	22.54
Chrysothamnus nauseosus	4.63	4.50
Chrysothamnus viscidiflorus viscidiflorus	8.21	7.23
Gutierrezia sarothrae	.15	-
Symphoricarpos oreophilus	.28	.51

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 17R, Study no: 8

Species	Average leader growth (in)	
	'05	'10
Artemisia tridentata vaseyana	2.2	1.4

BASIC COVER--

Management unit 17R, Study no: 8

Cover Type	Average Cover %		
	'01	'05	'10
Vegetation	34.19	43.14	41.94
Rock	.02	.01	0
Pavement	.10	.43	.03
Litter	55.72	38.42	55.31
Cryptogams	.85	.37	.04
Bare Ground	28.29	32.29	15.34

SOIL ANALYSIS DATA --

Management unit 17R, Study no: 8, Study Name: Emma Park Harrow-Ungrazed

Effective rooting depth (in)	pH	clay loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
17.2	7.6	33.9	32.4	33.7	2.2	2.9	297.6	0.6

PELLET GROUP DATA--

Management unit 17R, Study no: 8

Type	Quadrat Frequency		
	'01	'05	'10
Rabbit	39	16	7
Grouse	-	2	-
Elk	-	5	1
Deer	5	2	5
Cattle	-	-	-

Days use per acre (ha)		
'01	'05	'10
-	-	-
-	12/acre	-
1 (2)	8 (20)	2 (5)
12 (30)	1 (3)	11 (28)
-	1 (2)	1 (2)

BROWSE CHARACTERISTICS--
Management unit 17R, Study no: 8

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>Artemisia tridentata vaseyana</i>									
01	4540	12	45	42	20	.44	0	72	20/24
05	3760	8	78	14	1100	0	.53	7	22/32
10	4840	22	71	7	260	18	0	7	22/32
<i>Chrysothamnus nauseosus</i>									
01	840	21	71	7	-	0	0	5	17/22
05	740	0	95	5	-	0	0	3	23/33
10	740	3	86	11	-	0	0	8	26/32
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
01	6440	3	90	7	-	0	0	14	6/9
05	7400	2	96	2	-	0	0	.54	8/15
10	6680	11	89	0	220	0	3	0	7/14
<i>Gutierrezia sarothrae</i>									
01	180	0	89	11	-	0	0	0	4/7
05	40	0	100	0	-	0	0	0	6/13
10	0	0	0	0	-	0	0	0	-/-
<i>Symphoricarpos oreophilus</i>									
01	40	100	0	-	-	0	0	0	-/-
05	20	0	100	-	-	0	0	0	-/-
10	20	0	100	-	-	0	0	0	21/40
<i>Tetradymia canescens</i>									
01	60	0	0	100	-	0	0	0	-/-
05	40	0	100	0	-	100	0	0	10/12
10	20	0	100	0	-	0	0	0	13/11