

BROWN'S PARK RIVER CORRIDOR-LIVESTOCK - TREND STUDY NO. 9-21-10

Vegetation Type: Wyoming Big Sagebrush

Range Type: Crucial Deer Winter

NRCS Ecological Site Description: Semidesert Gravelly Loam (Wyoming Big Sagebrush), R034XY205UT

Land Ownership: BLM

Elevation: 5600 ft. (1707 m)

Aspect: North

Slope: 3%

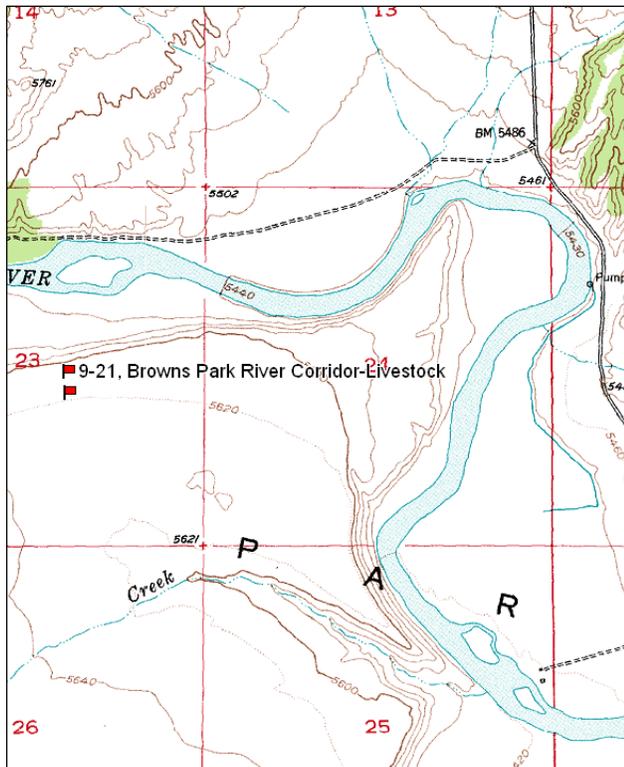
Transect bearing: 69° magnetic

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

Directions:

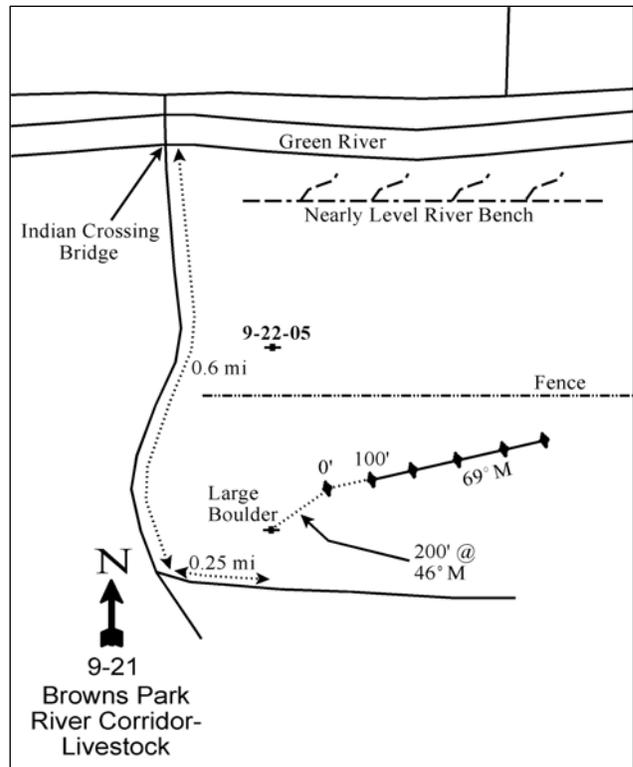
From the Indian Crossing Bridge at Brown's Park travel south for 0.6 miles to a fork. Turn left onto a small road and proceed 0.25 miles. There is a large boulder on the north side of the road. From the boulder the 0-foot baseline stake is 200 feet away at a bearing of 46°M.

Map Name: Clay Basin



Township: 2N Range: 24E Section: 23

Diagrammatic Sketch:



GPS: NAD 83, UTM 12T 653970 E 4528561 N

## BROWN'S PARK RIVER CORRIDOR-LIVESTOCK - TREND STUDY NO. 9-21

### Site Information

Site Description: The study was placed to monitor differences between livestock and wildlife use on two sides of a fence line that was built in 1963. The fence was built to exclude cattle grazing on one side of the fence line, while allowing grazing on the other side. Wildlife is not excluded from either side of the fence line and Brown's Park River Corridor-Wildlife (Study No. 9-22) study samples the other side. This study samples the south side of the fence that is accessible to livestock and wildlife. Grazing in the area is managed by the Bureau of Land Management (BLM) as part of the Taylor Flat allotment. The study is approximately a half mile south of the Green River at Brown's Park on a Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and grass flat. Pellet group transect data has estimated moderate to heavy use by deer since 2000. Estimated use by elk was minimal in 2000 and 2005, but was more moderate in 2010. Cattle use has been minimal on the site since 2000 (Table - Pellet Group Data).

Browse: Browse cover is fairly low on the site. Wyoming big sagebrush is the dominant browse species (Table - Browse Trends). The sagebrush population is comprised of a moderately dense stand of small, mature plants with high decadence and poor vigor. Recruitment of young sagebrush plants into the population has been poor. Utilization of sagebrush has been moderate to heavy with the heaviest use in 2010. Shadscale (*Atriplex confertifolia*) is also moderately abundant, but has had only moderate use. Decadence and poor vigor are also fairly high in the shadscale population, but recruitment of young plants has been mostly good. Broom snakeweed (*Gutierrezia sarothrae*) was prevalent at the outset of the study in 2000, but decreased substantially in density in 2005 (Table - Browse Characteristics).

Herbaceous Understory: Grasses are abundant, but are dominated by needle-and-thread (*Stipa comata*). This species provides nearly all of the grass cover on the site and provided the majority of the vegetation cover in 2010. Other, less abundant perennial grasses include squirreltail bottlebrush (*Sitanion hystrix*), sand dropseed (*Sporobolus cryptandrus*), galleta (*Hilaria jamesii*) and Indian ricegrass (*Oryzopsis hymenoides*). Two annual grasses, cheatgrass (*Bromus tectorum*) and sixweeks fescue (*Vulpia octoflora*), have been sampled in low cover on the site. Perennial forbs are extremely rare on the site. Annual forbs were prevalent in 2005, but were rare in the other sample years (Table - Herbaceous Trends).

Soil: Soils are sandy loam in texture with a slightly alkaline soil reaction (pH 7.8). Phosphorus may have limited availability for plant growth and development at 4.1 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Shrub interspaces between sagebrush contain a lot of bare soil and pavement. Bare ground cover is high, despite the high pavement cover, with low amounts of vegetation and litter cover (Table - Basic Cover). Soil erosion would likely be higher if the terrain wasn't so level. The soil erosion condition was classified as stable in 2005 and 2010.

### Trend Assessments

#### Browse:

- **2000 to 2005 - slightly down (-1):** The density of Wyoming big sagebrush decreased by 9% from 3,740 plants/acre to 3,420 plants/acre, but cover remained similar. Decadence increased slightly from 29% to 33% and poor vigor increased from 12% to 19%. Density of shadscale remained similar, but cover increased from 1% to 3%. Decadence of shadscale decreased from 37% to 7% and poor vigor decreased from 10% to 5%..
- **2005 to 2010 - down (-2):** Wyoming big sagebrush density decreased by 13% to 2,980 plants/acre, but cover decreased from 9% to 5%. Decadence of sagebrush increased to 56% and poor vigor increased to 58%. Shadscale density remained similar but cover decreased to 1%. Decadence of shadscale increased to 52% and poor vigor increased to 38% of the population.

Grass:

- **2000 to 2005 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 12%, although cover increased slightly from 7% to 8%.
- **2005 to 2010 - slightly up (+1):** The perennial grass sum of nested frequency increased by 11% and cover increased to 18%. The increase in cover was due to a substantial increase in the cover of needle-and-thread, though nested frequency remained similar.

Forb:

- **2000 to 2005 - stable (0):** Perennial forbs were very rare on the site.
- **2005 to 2010 - stable (0):** Perennial forbs were very rare on the site.

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

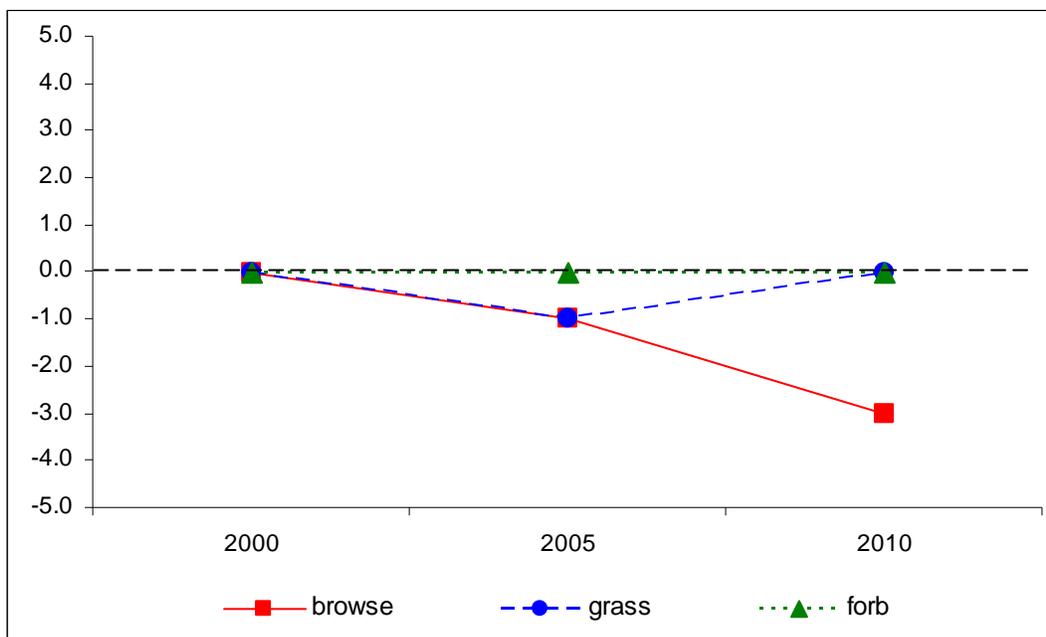
Management unit 9, study no: 21

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
00	12.9	6.0	3.4	14.3	0.0	0.1	0.0	<b>36.7</b>	Fair
05	14.0	7.2	3.9	16.6	-0.3	0.2	0.0	<b>41.6</b>	Fair
10	7.8	-1.6	2.6	30.0	0.0	0.5	0.0	<b>39.4</b>	Fair

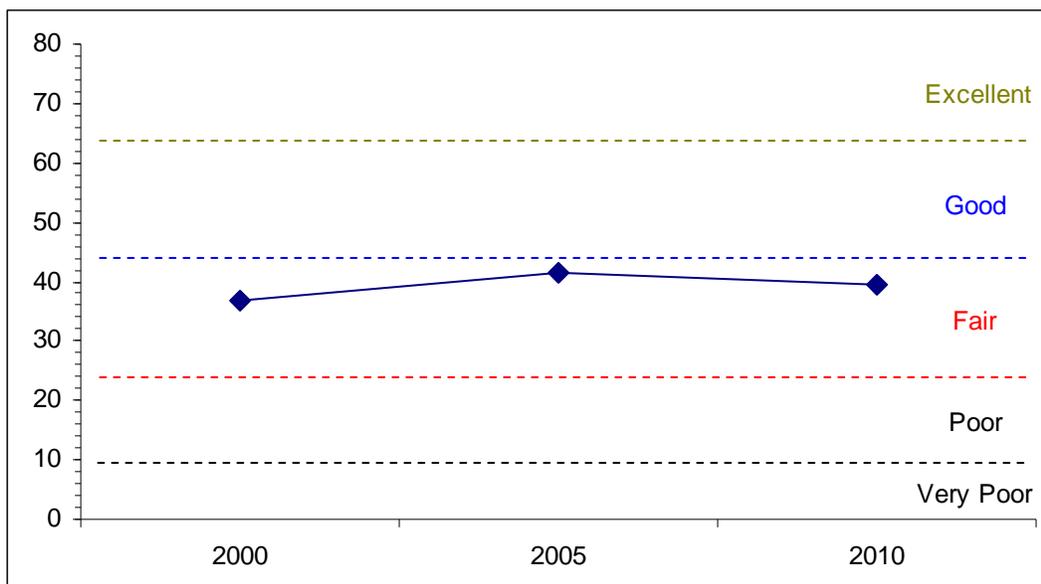
**Trend Summary**

CUMULATIVE RANGE TREND ASSESSMENT--

Management unit 9, Study no: 21



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--  
 Management unit 9, Study no: 21



HERBACEOUS TRENDS--  
 Management unit 09, Study no: 21

Type	Species	Nested Frequency			Average Cover %		
		'00	'05	'10	'00	'05	'10
G	Bromus tectorum (a)	b11	a-	a-	.02	-	-
G	Hilaria jamesii	a-	a-	b18	-	-	1.10
G	Oryzopsis hymenoides	a-	b5	ab4	-	.05	.24
G	Poa fendleriana	a-	a-	b22	-	-	.07
G	Sitanion hystrix	a21	b50	ab31	.18	1.83	.47
G	Sporobolus cryptandrus	20	3	4	.36	.00	.03
G	Stipa comata	b300	a242	a254	6.61	6.39	16.14
G	Vulpia octoflora (a)	a3	b195	a9	.00	.40	.02
Total for Annual Grasses		14	195	9	0.03	0.40	0.02
Total for Perennial Grasses		341	300	333	7.16	8.28	18.06
Total for Grasses		355	495	342	7.19	8.68	18.09
F	Descurainia pinnata (a)	-	6	-	-	.01	-
F	Lappula occidentalis (a)	a-	b60	a4	-	.32	.01
F	Lepidium sp. (a)	a-	b54	a2	-	.33	.00
F	Navarretia intertexta (a)	a-	b118	a2	-	.58	.00
F	Salsola iberica (a)	a-	b30	a3	-	.07	.00
F	Sphaeralcea coccinea	8	17	15	.01	.10	.27
F	Townsendia incana	ab7	b10	a-	.01	.02	-
Total for Annual Forbs		0	268	11	0	1.32	0.02
Total for Perennial Forbs		15	27	15	0.03	0.12	0.27
Total for Forbs		15	295	26	0.03	1.45	0.30

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

BROWSE TRENDS--

Management unit 09, Study no: 21

Type	Species	Strip Frequency			Average Cover %		
		'00	'05	'10	'00	'05	'10
B	Artemisia tridentata wyomingensis	76	80	71	9.28	8.72	5.26
B	Atriplex confertifolia	56	52	54	1.25	3.11	1.26
B	Gutierrezia sarothrae	99	40	43	7.10	.43	.32
B	Opuntia sp.	7	10	8	.18	.21	.48
Total for Browse		238	182	176	17.84	12.48	7.34

CANOPY COVER, LINE INTERCEPT--

Management unit 09, Study no: 21

Species	Percent Cover	
	'05	'10
Artemisia tridentata wyomingensis	9.80	4.09
Atriplex confertifolia	4.58	1.66
Gutierrezia sarothrae	1.78	.36
Opuntia sp.	.38	.16

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 09, Study no: 21

Species	Average leader growth (in)	
	'05	'10
Artemisia tridentata wyomingensis	4.2	1.1

BASIC COVER--

Management unit 09, Study no: 21

Cover Type	Average Cover %		
	'00	'05	'10
Vegetation	25.92	20.60	24.47
Rock	.28	.09	.01
Pavement	31.00	17.22	13.12
Litter	12.51	14.71	25.18
Cryptogams	1.50	.41	1.46
Bare Ground	54.47	56.34	49.87

SOIL ANALYSIS DATA --

Management unit 9, Study no: 21, Study Name: River Corridor Cattle

Effective rooting depth (in)	pH	sandy loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
13.9	7.8	63.6	18.1	18.2	0.8	4.1	131.2	0.5

PELLET GROUP DATA--

Management unit 09, Study no: 21

Type	Quadrat Frequency		
	'00	'05	'10
Rabbit	5	44	9
Elk	-	4	2
Deer	28	37	40
Cattle	7	3	3

Days use per acre (ha)		
'00	'05	'10
-	-	-
-	5 (12)	29 (71)
31 (76)	58 (144)	71 (175)
-	7 (16)	9 (23)

BROWSE CHARACTERISTICS--

Management unit 09, Study no: 21

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 tridentata wyomingensis</i>									
00	<b>3740</b>	7	64	29	-	51	10	12	11/25
05	<b>3420</b>	6	60	33	40	26	28	19	15/29
10	<b>2980</b>	3	41	56	-	9	66	58	9/22
<i>Atriplex confertifolia</i>									
00	<b>1720</b>	6	57	37	20	9	3	10	7/12
05	<b>1740</b>	13	80	7	120	0	0	5	13/23
10	<b>1680</b>	14	33	52	-	13	0	38	10/20
<i>Ceratoides lanata</i>									
00	<b>0</b>	0	0	-	-	0	0	0	-/-
05	<b>0</b>	0	0	-	-	0	0	0	-/-
10	<b>0</b>	0	0	-	-	0	0	0	2/3
<i>Gutierrezia sarothrae</i>									
00	<b>39460</b>	2	92	5	160	0	0	12	4/6
05	<b>1360</b>	0	100	0	100	0	0	0	9/12
10	<b>1440</b>	26	74	0	-	0	0	0	6/7
<i>Opuntia sp.</i>									
00	<b>160</b>	0	88	13	-	0	0	0	3/12
05	<b>220</b>	0	91	9	-	0	0	0	4/16
10	<b>180</b>	0	100	0	-	0	0	0	5/15

BROWN'S PARK RIVER CORRIDOR STUDY COMPARISON  
TREND STUDY NO. 9-21 & 9-22

**Site Information**

Site Description: The studies were placed to monitor differences between livestock and wildlife use on two sides of a fence line that was built in 1963. The fence was built to exclude cattle grazing on one side of the fence line, while allowing grazing on the other side. Wildlife are not excluded from either side of the fence line, but cattle are excluded from the south side of the fence. The Livestock (9-21) study is on the north side of the fence and the Wildlife (9-22) study is on the south side. Grazing in the area is managed by the Bureau of Land Management (BLM) as part of the Taylor Flat allotment. The studies are approximately a half mile south of the Green River at Brown's Park on a Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and grass flat. Pellet group transect data indicated that deer predominantly use the area. Deer use has been similar between the two studies, though it was higher on the Livestock study in 2005. Estimated use by elk was minimal in both studies in 2000 and 2005, but increased to more moderate levels in 2010. Cattle use has been light on the Livestock study throughout the sample years (Table 1).

Browse: The primary browse in the area is a mixture of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and shadscale (*Atriplex confertifolia*). The two studies have displayed similar trends for the species over the sample years. Wyoming big sagebrush cover and density is higher on the Livestock study than the Wildlife study, but there has been a general decrease in the density and cover sagebrush on both studies since 2000 (Table 2). Shadscale cover and density was higher on the Wildlife study than on the Livestock study. However, both studies displayed a similar trend of increased cover and decreased decadence of shadscale in 2005 (Table 3).

Herbaceous Understory: Grasses are similar, but fairly limited in diversity, on both of the studies. The dominant grass species is needle-and-thread (*Stipa comata*). Annual grasses are not abundant on the studies, but there was a significantly higher nested frequency of sixweeks fescue (*Vulpia octoflora*) on both studies in 2005. Cover of perennial grasses was higher on the Wildlife study in 2000, but the sum of nested frequency has remained similar throughout the study years (Table 4). Cover of perennial grasses was higher in 2000 on the Wildlife study due to a higher amount of cover of needle-and-thread. Perennial forbs are extremely rare on both studies (Table 4). There was a large increase of annual forbs on both studies in 2005, but annual forbs decreased again in 2010.

Soil: Due to the close proximity of the studies, soil conditions are nearly identical. The soil texture of the studies is a sandy loam with a slightly alkaline pH. Vegetation cover is typically similar between the studies, but bare ground cover is slightly higher on the Livestock study with higher cover of litter and cryptogams on the Wildlife study.

**Study Summary**

Study Name	Year	Deer	Elk	Cattle
		days use/acre (ha)	days use/acre (ha)	days use/acre (ha)
Livestock (9-21)	2000	31 (76)	--	--
	2005	58 (144)	5 (12)	7 (16)
	2010	71 (175)	29 (71)	9 (23)
Wildlife (9-22)	2000	40 (99)	--	--
	2005	29 (73)	1 (2)	--
	2010	54 (132)	26 (65)	--

**Table 1.** Pellet group transect data estimated use for the Browns Park River Corridor comparison studies.

Study Name	Year	Percent Cover	Density <i>Plants/acre</i>	Percent Young <i>(Plants/acre)</i>	Percent Mature <i>(Plants/acre)</i>	Percent Decadent <i>(Plants/acre)</i>	Ave. height/crown <i>(in)</i>
Livestock (9-21)	2000	9.28	3740	7	64	29	11/25
	2005	8.72	3420	6	60	33	15/29
	2010	5.26	2980	3	41	56	9/22
Wildlife (9-22)	2000	3.39	2240	1	53	46	12/22
	2005	2.01	1280	0	42	58	15/28
	2010	1.16	1260	6	33	60	11/24

**Table 2.** Browse characteristics of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) for the Browns Park River Corridor comparison studies.

Study Name	Year	Percent Cover	Density <i>Plants/acre</i>	Percent Young <i>(Plants/acre)</i>	Percent Mature <i>(Plants/acre)</i>	Percent Decadent <i>(Plants/acre)</i>	Ave. height/crown <i>(in)</i>
Livestock (9-21)	2000	1.25	1720	6	57	37	7/12
	2005	3.11	1740	13	80	7	13/23
	2010	1.26	1680	14	33	52	10/20
Wildlife (9-22)	2000	2.25	2340	2	62	36	8/14
	2005	9.68	2260	1	90	9	16/30
	2010	4.62	1900	2	47	51	12/24

**Table 3.** Browse characteristics of shadscale (*Atriplex confertifolia*) for the Browns Park River Corridor comparison studies.

Study Name	Year	Perennial Grass Species			Perennial Forb Species		
		<i>n</i>	<i>Sum of Nested Frequency</i>	<i>Percent Cover</i>	<i>n</i>	<i>Sum of Nested Frequency</i>	<i>Percent Cover</i>
Livestock (9-21)	2000	3	341	7.16	2	15	0.03
	2005	4	300	8.28	2	27	0.12
	2010	6	333	18.06	1	15	0.27
Wildlife (9-22)	2000	2	366	19.47	1	1	0.0
	2005	5	237	8.18	1	1	0.0
	2010	5	291	18.52	0	0	0.0

**Table 4.** Number of species sampled (*n*), sum of nested frequency and cover of perennial grasses and perennial forbs for the Browns Park River Corridor comparison studies.