



## BROWN'S PARK RIVER CORRIDOR-WILDLIFE - TREND STUDY NO. 9-22

### Site Information

Site Description: The study was placed to monitor differences between livestock-wildlife use 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-Livestock (Study 9-21) monitors the livestock side. This study samples the north side of the fence that is not accessible to livestock. The area 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 estimated moderate to heavy use by deer since 2000. Estimated use by elk was minimal in 2000 and 2005, with more moderate use in 2010 (Table - Pellet Group Data).

Browse: Browse cover is marginal on this site. Shadscale (*Atriplex confertifolia*) is the dominant key species, providing the majority of the browse cover since 2005 (Table - Browse Trends). The shadscale population has a high amount of decadence and poor vigor. Use of shadscale has been mostly light since 2000, though more moderate use was sampled in 2010. Wyoming big sagebrush is also common on the site, though density is low, and has displayed moderate to heavy use. Sagebrush plants are small and display high decadence and poor vigor. Recruitment of young sagebrush plants has been minimal throughout the study. Other browse species sampled include broom snakeweed (*Gutierrezia sarothrae*) and pricklypear cactus (*Opuntia* sp.) (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 and has provided the majority of the vegetation cover in several sample years. Other perennial grasses include bottlebrush squirreltail (*Sitanion hystrix*), mutton bluegrass (*Poa fendleriana*), sand dropseed (*Sporobolus cryptandrus*) and Indian ricegrass (*Oryzopsis hymenoides*). Two annual grasses, cheatgrass (*Bromus tectorum*) and sixweeks fescue (*Vulpia octoflora*), have been sampled at low cover. There are almost no perennial forbs on the site. Annual forbs were fairly common in 2005, but have been rare in other sample years (Table - Herbaceous Trends).

Soil: Soil is a sandy loam in texture with a moderately alkaline soil reaction (pH 7.9). Phosphorus may have limited availability for plant growth and development at 3.9 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Bare ground cover is moderately high despite the abundant amount of pavement cover. Vegetation and litter cover are relatively low (Table - Basic Cover). Erosion appears to be minimal due to the gentle slope of the terrain. 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 43% from 2,240 plants/acre to 1,280 plants/acre and cover decreased from 3% to 2%. Density of shadscale remained similar, but cover increased from 2% to 10%. Decadence of shadscale decreased from 36% to 9% and poor vigor decreased from 15% to 4%.
- **2005 to 2010 - down (-2):** Density of Wyoming big sagebrush remained similar with high decadence and poor vigor, but cover decreased to 1%. Shadscale density decreased by 16% from 2,260 plants/acre to 1,900 plants/acre and cover decreased to 5%. Decadence of shadscale increased to 51% and poor vigor increased to 56% of the population.

#### Grass:

- **2000 to 2005 - down (-2):** The sum of nested frequency of perennial grasses decreased by 35% and cover decreased from 20% to 8%.
- **2005 to 2010 - up (+2):** The perennial grass sum of nested frequency increased by 23%, though it remains below 2000 levels. Perennial grass cover increased to 19%.

Forb:

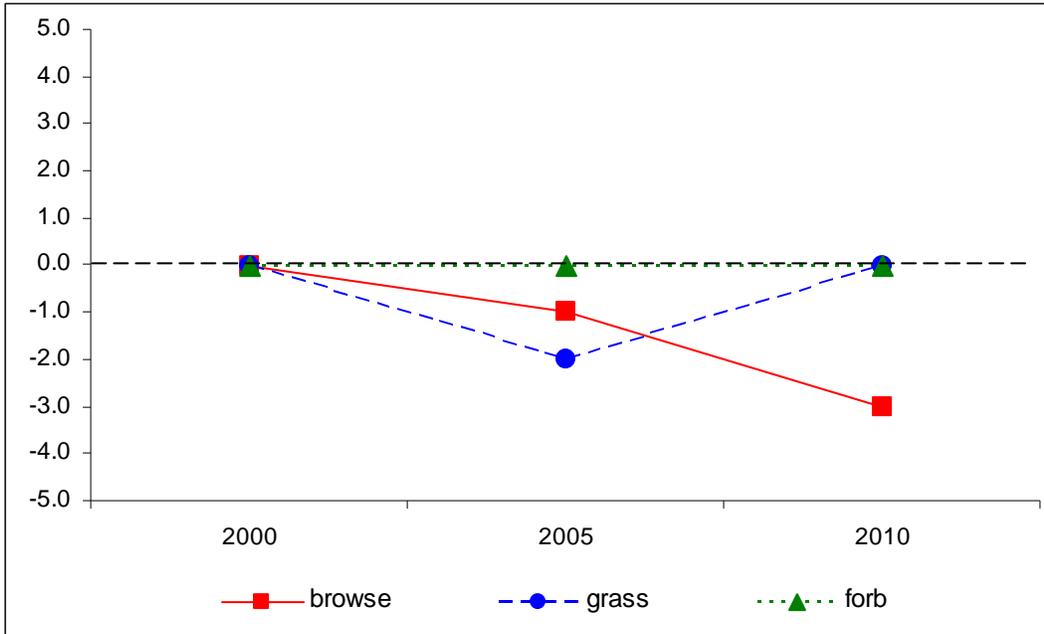
- **2000 to 2005 - stable (0):** There were almost no perennial forbs on the site.
- **2005 to 2010 - stable (0):** There were no perennial forbs sampled on the site.

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
 Management unit 9, study no: 22

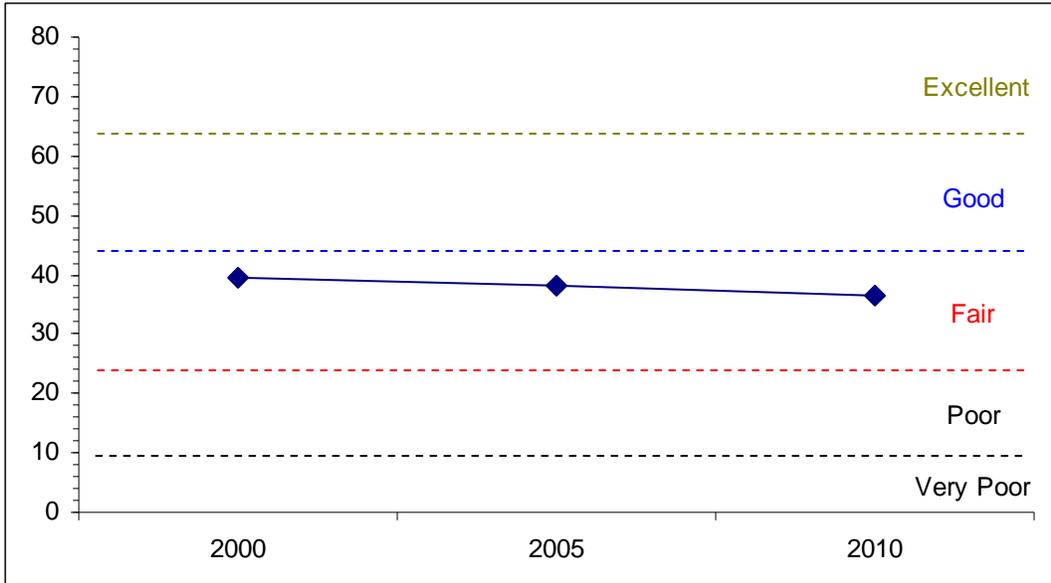
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
00	6.5	2.4	0.7	30.0	-0.1	0.0	0.0	<b>39.5</b>	Fair
05	12.2	9.8	0.4	16.4	-0.4	0.0	0.0	<b>38.3</b>	Fair
10	6.1	-0.8	1.4	30.0	-0.1	0.0	0.0	<b>36.5</b>	Fair

**Trend Summary**

CUMULATIVE RANGE TREND ASSESSMENT--  
 Management unit 9, Study no: 22



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--  
 Management unit 9, Study no: 22



HERBACEOUS TRENDS--  
 Management unit 09, Study no: 22

Type	Species	Nested Frequency			Average Cover %		
		'00	'05	'10	'00	'05	'10
G	Bromus tectorum (a)	8	-	7	.04	-	.02
G	Oryzopsis hymenoides	a <sup>-</sup>	ab <sup>4</sup>	b <sup>10</sup>	-	.03	.25
G	Poa fendleriana	a <sup>-</sup>	ab <sup>5</sup>	b <sup>13</sup>	-	.03	.05
G	Sitanion hystrix	b <sup>42</sup>	a <sup>11</sup>	a <sup>14</sup>	.80	.14	.47
G	Sporobolus cryptandrus	-	7	4	-	.01	.03
G	Stipa comata	c <sup>324</sup>	a <sup>210</sup>	b <sup>250</sup>	18.66	7.96	17.70
G	Vulpia octoflora (a)	a <sup>4</sup>	c <sup>224</sup>	b <sup>64</sup>	.03	.54	.18
Total for Annual Grasses		12	224	71	0.07	0.54	0.19
Total for Perennial Grasses		366	237	291	19.47	8.18	18.52
Total for Grasses		378	461	362	19.54	8.72	18.72
F	Cryptantha sp.	-	1	-	-	.00	-
F	Descurainia pinnata (a)	a <sup>5</sup>	b <sup>21</sup>	a <sup>1</sup>	.00	.32	.00
F	Draba sp. (a)	-	1	2	-	.00	.01
F	Lappula occidentalis (a)	a <sup>-</sup>	b <sup>37</sup>	c <sup>62</sup>	-	.34	.32
F	Lepidium sp. (a)	a <sup>-</sup>	b <sup>14</sup>	ab <sup>2</sup>	-	.13	.01
F	Navaretia intertexta (a)	a <sup>-</sup>	c <sup>77</sup>	b <sup>21</sup>	-	.63	.05
F	Salsola iberica (a)	a <sup>-</sup>	b <sup>10</sup>	a <sup>-</sup>	-	.03	-
F	Townsendia incana	1	-	-	.00	-	-
Total for Annual Forbs		5	160	88	0.00	1.45	0.39
Total for Perennial Forbs		1	1	0	0.00	0.00	0
Total for Forbs		6	161	88	0.00	1.46	0.39

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

BROWSE TRENDS--

Management unit 09, Study no: 22

Type	Species	Strip Frequency			Average Cover %		
		'00	'05	'10	'00	'05	'10
B	Artemisia tridentata wyomingensis	53	47	45	3.39	2.01	1.16
B	Atriplex confertifolia	72	69	66	2.25	9.68	4.62
B	Ceratoides lanata	0	0	1	-	-	-
B	Gutierrezia sarothrae	28	2	6	.73	.00	.15
B	Opuntia sp.	10	11	14	.56	.71	.36
Total for Browse		163	129	132	6.94	12.41	6.30

CANOPY COVER, LINE INTERCEPT--

Management unit 09, Study no: 22

Species	Percent Cover	
	'05	'10
Artemisia tridentata wyomingensis	2.61	1.61
Atriplex confertifolia	13.81	4.59
Gutierrezia sarothrae	-	.13
Opuntia sp.	.61	.66

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 09, Study no: 22

Species	Average leader growth (in)	
	'05	'10
Artemisia tridentata wyomingensis	3.5	1.5

BASIC COVER--

Management unit 09, Study no: 22

Cover Type	Average Cover %		
	'00	'05	'10
Vegetation	27.92	20.73	25.18
Rock	.07	.11	.17
Pavement	20.76	16.83	12.90
Litter	30.07	19.79	29.40
Cryptogams	6.69	1.58	5.72
Bare Ground	40.15	50.43	39.93

PELLET GROUP DATA--

Management unit 09, Study no: 22

Type	Quadrat Frequency			Days use per acre (ha)		
	'00	'05	'10	'00	'05	'10
Rabbit	9	49	21	-	-	-
Elk	-	-	2	-	1 (2)	26 (65)
Deer	24	22	44	40 (99)	29 (73)	54 (132)

BROWSE CHARACTERISTICS--  
Management unit 09, Study no: 22

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 wyomingensis</i>									
00	<b>2240</b>	1	53	46	-	16	2	32	12/22
05	<b>1280</b>	0	42	58	360	33	13	55	15/28
10	<b>1260</b>	6	33	60	-	35	38	62	11/24
<i>Atriplex confertifolia</i>									
00	<b>2340</b>	2	62	36	-	3	0	15	8/14
05	<b>2260</b>	1	90	9	-	0	0	4	16/30
10	<b>1900</b>	2	47	51	140	21	2	56	12/24
<i>Ceratoides lanata</i>									
00	<b>0</b>	0	0	0	-	0	0	0	-/-
05	<b>0</b>	0	0	0	-	0	0	0	-/-
10	<b>20</b>	0	0	100	-	0	0	100	-/-
<i>Chrysothamnus depressus</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	10/22
<i>Gutierrezia sarothrae</i>									
00	<b>1740</b>	0	36	64	-	0	1	80	5/7
05	<b>60</b>	67	33	0	-	0	0	0	10/11
10	<b>140</b>	0	100	0	-	0	0	0	8/11
<i>Opuntia sp.</i>									
00	<b>260</b>	0	92	8	-	0	0	8	3/12
05	<b>360</b>	11	78	11	-	0	0	6	4/15
10	<b>320</b>	0	94	6	-	0	0	6	5/17

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 days use/acre (ha)	Elk days use/acre (ha)	Cattle 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.