

ISLAND PARK - TREND STUDY NO. 9-5-10

Vegetation Type: Wyoming Big Sagebrush

Range Type: Crucial Deer Year-Long (Fawning habitat), Crucial Elk Winter

NRCS Ecological Site Description: Semidesert Sandy Loam (Fourwing Saltbush), R034XY216UT

Land Ownership: NPS

Elevation: 5000 ft. (1524 m)

Aspect: South-Southwest

Slope: 25%

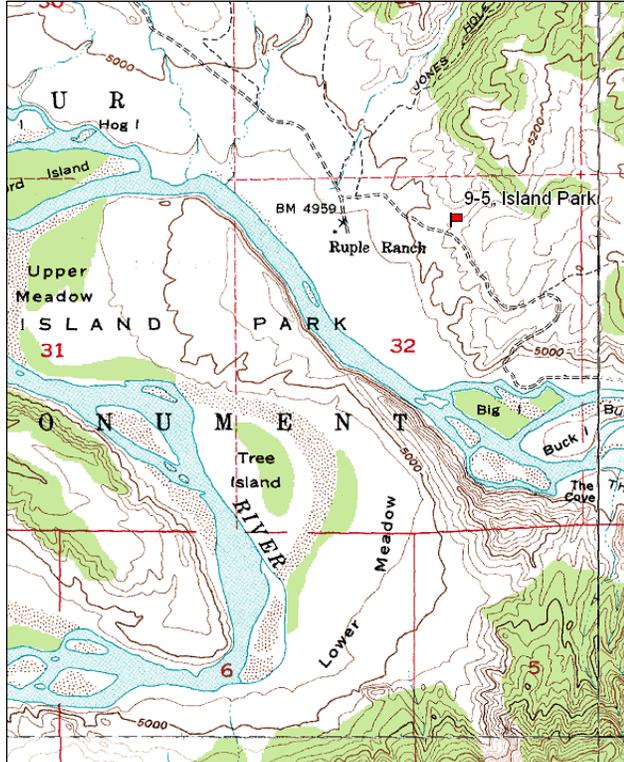
Transect bearing: 12° magnetic

Belt placement: line 1 (9 & 88ft), line 2 (26ft), line 3 (48ft), line 4 (73ft).

Directions:

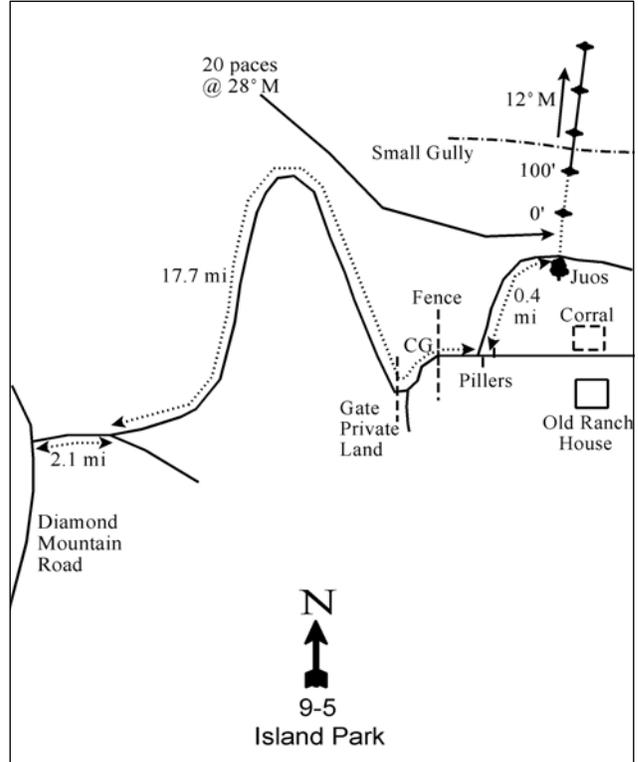
From the Diamond Mountain Road, take the Island Park turnoff to the right. Proceed east for 2.1 miles to a fork. Stay to the left and go 17.7 miles. Just past the Jones Hole trailhead and before Ruple Ranch, there is a turnoff to the left. The road may be closed. Go left and proceed up the ridge for 0.4 miles to a juniper next to the road on the right. From the juniper, the 0-foot baseline stake is 20 paces away at a bearing of 28°M.

Map Name: Island Park



Township: 3S Range: 25E Section: 32

Diagrammatic Sketch:



GPS: NAD 83, UTM 12T 658056 E 4487466 N

ISLAND PARK - TREND STUDY NO. 9-5

Site Information

Site Description: The study is located on a big sagebrush (*Artemisia tridentata*) and grass slope one-half mile north of the Green River in Dinosaur National Monument. There was a small fire that burned most of the study transect just prior to the site being read in 2010, but most of the surrounding area was unaffected. The area is administered by the U.S. National Park Service and livestock grazing is no longer permitted within the national monument. Pellet group transect data has indicated moderately heavy use by deer and elk since 2000, though deer use was lighter in 2005 (Table - Pellet Group Data).

Browse: The key browse species is Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), although there may be some hybridization with basin big sagebrush (*A. tridentata* ssp. *tridentata*). Even before the fire, big sagebrush had been decreasing in cover (Table - Browse Trends) and density since 1995. The fire removed almost all of the remaining sagebrush from the study site. Prior to the fire, the big sagebrush population was comprised of moderately to heavily hedged, decadent plants with little recruitment of young plants. The weedy species, broom snakeweed (*Gutierrezia sarothrae*), has fluctuated in density over the sample years, but at times has dominated the browse component. There were few broom snakeweed plants sampled on the site following the fire in 2010. Other shrubs occur much less frequently, but include slenderbush eriogonum (*Eriogonum microthecum*) and pricklypear cactus (*Opuntia* sp.) (Table - Browse Characteristics).

Herbaceous Understory: Grasses had become dominated by two species prior to the fire, the native perennial needle-and-thread (*Stipa comata*) and the introduced annual cheatgrass (*Bromus tectorum*). Other native perennial species are present and diverse, but provide little cover. Forbs are very rare on the site and provide little usable forage. Perennial forbs have provided less than 1% cover in all sample years (Table - Herbaceous Trends).

Soil: The soils are a sandy loam with a neutral to slightly alkaline soil reaction (pH 7.3). Phosphorus may have limited availability for plant growth and development 4 ppm (Tiedemann and Lopez 2004). Bare ground cover has been moderate on the site. Bare ground decreased in 2010 with a large amount of litter cover from the recent fire. Much of the litter was light and easily susceptible to surface movement. Cryptogam cover slowly increased from 1982 with no grazing, but declined sharply in 2005 with no cryptogams sampled following the fire (Table - Basic Cover). The soil erosion condition was classified as stable in 2005 and 2010.

Trend Assessments

Browse:

- **1982 to 1988 - slightly down (-1):** The density of Wyoming big sagebrush increased markedly with a substantial increase in the recruitment of young plants. However, decadence also increased and is very high at 51% of the population. The density of broom snakeweed also increased to over 30,000 plants/acre, dominating the browse component.
- **1988 to 1995 - stable (0):** Differences in density may be related to the larger sample area used in 1995; therefore, trend was determined using other parameters. Decadence of Wyoming big sagebrush decreased to 39%, but poor vigor increased from 14% to 29%. Broom snakeweed appears to have decreased on the site with cover less than 1%.
- **1995 to 2000 - down (-2):** The density of sagebrush decreased by 16% from 3,300 plants/acre to 2,780 plants/acre, and cover decreased from 8% to 6%. Decadence of sagebrush increased to 82% and poor vigor increased to 50%. Recruitment of young sagebrush plants decreased from 17% to 3% of the population. Broom snakeweed density increased eight-fold from 3,580 plants/acre to 30,120 plants/acre, and cover increased to 12%.
- **2000 to 2005 - down (-2):** Wyoming big sagebrush density decreased 68% to 900 plants/acre and cover decreased to 2%. Decadence of sagebrush decreased slightly, but remained high at 71%, and

poor vigor increased to 60%. Broom snakeweed also decreased substantially in density and cover decreased to 2%.

- **2005 to 2010 - down (-2):** A fire just prior to the sampling removed most of the shrub species from the site.

Grass:

- **1982 to 1988 - no trend (NT):** Only quadrat frequency data for grasses are available from 1982, so no trend was given.
- **1988 to 1995 - up (+2):** The sum of nested frequency of perennial grasses increased by 22%.
- **1995 to 2000 - down (-2):** The perennial grass sum of nested frequency decreased by 27% and cover decreased from 14% to 12%. There was a significant increase in the nested frequency of cheatgrass and cover increased from less than 1% to 2%.
- **2000 to 2005 - slightly down (-1):** There was little change in the sum of nested frequency or cover of perennial grasses, but cheatgrass increased significantly in nested frequency and cover increased to 13%.
- **2005 to 2010 - down (-2):** The fire removed much of the grass cover from the site. The sum of nested frequency of perennial grasses decreased by 32%, but cheatgrass also decreased significantly in nested frequency.

Forb:

- **1982 to 1988 - no trend (NT):** Only quadrat frequency data for forbs are available from 1982, so no trend was given.
- **1988 to 1995 - up (+2):** The sum of nested frequency of perennial forbs increased by 69%, though forbs remained fairly rare on the site.
- **1995 to 2000 - down (-2):** The perennial forb sum of nested frequency decreased by 77% and perennial forbs are very rare on the site.
- **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.

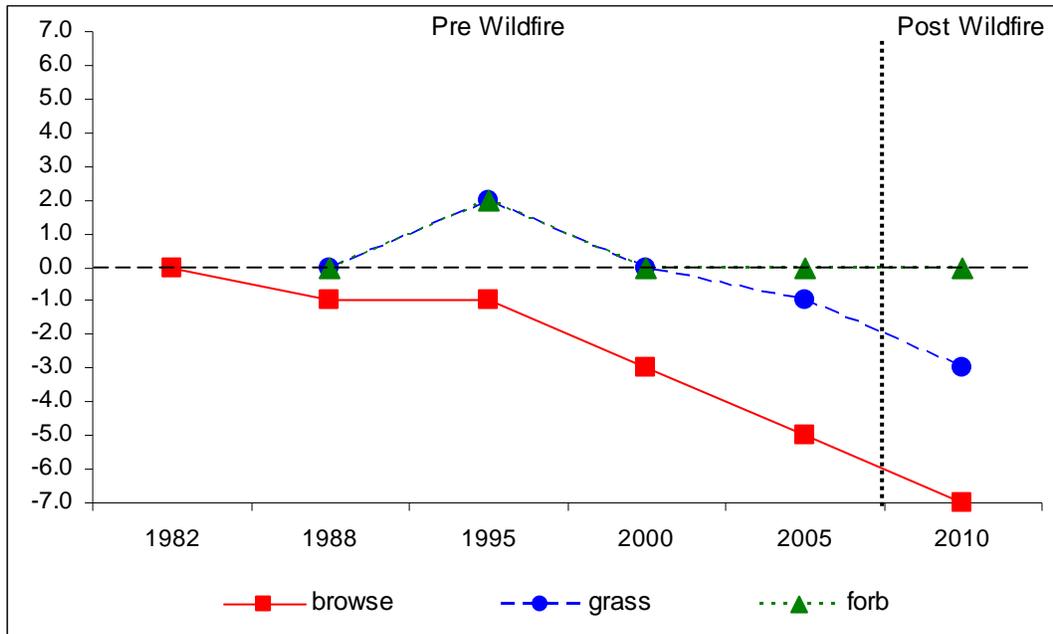
DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --
Management unit 9, study no: 5

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
95	9.9	3.5	8.4	27.5	-2.3	1.7	0.0	48.6	Good
00	7.3	-9.0	1.5	24.3	-1.2	0.5	0.0	23.4	Poor-Fair
05	2.4	0.0	0.0	26.8	-11.6	2.0	0.0	19.5	Poor
10	0.0	0.0	0.0	6.9	-0.8	0.6	0.0	6.7	Very Poor

Trend Summary

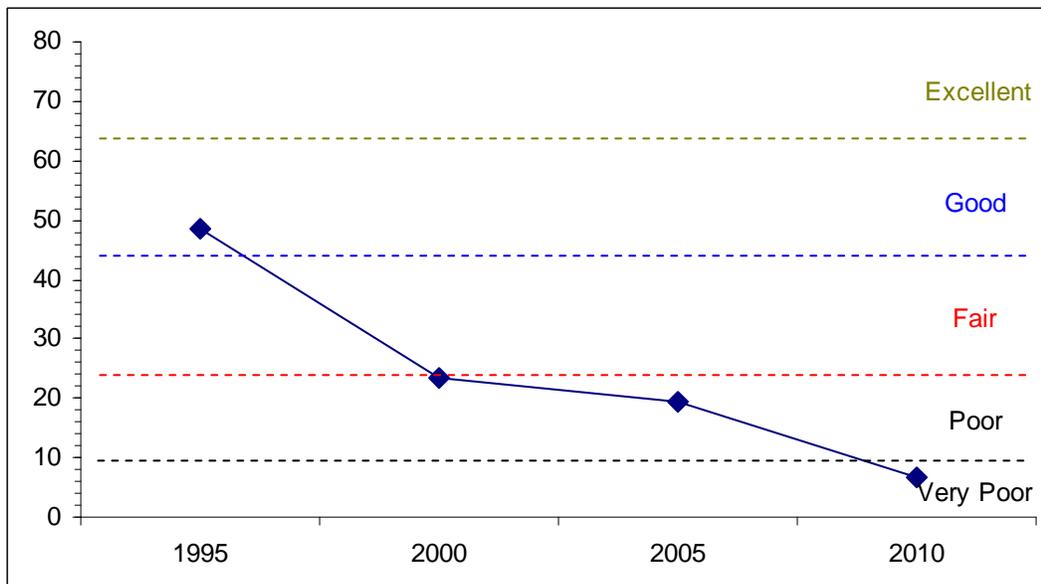
CUMULATIVE RANGE TREND ASSESSMENT--

Management unit 9, Study no: 5



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--

Management unit 9, Study no: 5



HERBACEOUS TRENDS--

Management unit 09, Study no: 5

Type	Species	Nested Frequency					Average Cover %			
		'88	'95	'00	'05	'10	'95	'00	'05	'10
G	Agropyron dasystachyum	ab62	ab38	ab43	a29	a65	.10	1.42	.32	.97
G	Agropyron spicatum	-	4	4	1	-	.03	.18	.15	-

Type	Species	Nested Frequency					Average Cover %			
		'88	'95	'00	'05	'10	'95	'00	'05	'10
G	Bromus tectorum (a)	a ⁻	b ⁴⁰	c ⁹⁷	d ³¹⁴	b ²⁹	.16	1.48	12.54	1.05
G	Dactylis glomerata	-	-	-	-	-	-	-	-	.00
G	Hilaria jamesii	25	43	21	45	39	.50	.24	1.07	.82
G	Oryzopsis hymenoides	12	6	11	6	6	.39	.62	.10	.07
G	Poa fendleriana	-	5	-	-	-	.06	-	-	-
G	Poa secunda	a ²	a ⁴	a ⁷	b ²⁶	a ⁻	.01	.01	.30	-
G	Sitanion hystrix	b ³¹	b ³⁶	a ⁴	a ⁹	a ⁻	.24	.15	.70	-
G	Stipa comata	b ²¹³	c ²⁸⁵	b ²¹⁷	b ²⁰²	a ¹⁰⁶	12.38	9.53	10.72	1.59
G	Vulpia octoflora (a)	-	c ³²⁴	a ⁵	b ²⁰⁸	a ⁻	2.97	.06	2.99	-
Total for Annual Grasses		0	364	102	522	29	3.13	1.55	15.53	1.05
Total for Perennial Grasses		345	421	307	318	216	13.73	12.16	13.38	3.46
Total for Grasses		345	785	409	840	245	16.86	13.71	28.92	4.52
F	Allium sp.	b ⁹	c ¹³⁰	ab ¹	a ⁻	a ⁻	.42	.00	-	-
F	Astragalus convallarius	ab ⁸	b ¹⁸	ab ⁵	a ⁻	a ⁻	.12	.01	-	-
F	Astragalus purshii	-	3	-	-	-	.01	-	-	-
F	Calochortus nuttallii	-	3	6	4	-	.01	.01	.01	-
F	Castilleja chromosa	-	3	4	-	-	.03	.03	-	-
F	Chenopodium leptophyllum(a)	-	1	-	3	-	.00	-	.00	-
F	Collinsia parviflora (a)	-	-	-	3	-	-	-	.00	-
F	Cymopterus sp.	-	-	-	-	2	-	-	-	.00
F	Descurainia pinnata (a)	a ¹	b ⁵⁷	a ⁻	a ⁴	a ¹	.12	-	.01	.00
F	Draba sp. (a)	-	b ³⁵	a ⁻	a ⁻	a ⁻	.06	-	-	-
F	Erigeron sp.	-	3	5	-	-	.00	.01	-	-
F	Euphorbia robusta	-	3	-	-	-	.03	-	-	-
F	Ipomopsis congesta	-	8	-	-	-	.02	-	-	-
F	Lepidium sp. (a)	-	b ²⁴	a ⁻	a ⁴	a ⁻	.09	-	.04	-
F	Lesquerella sp.	1	1	-	-	-	.00	-	-	-
F	Lygodesmia sp.	-	3	-	6	-	.01	-	.07	-
F	Machaeranthera grindelioides	3	-	-	-	-	-	-	-	-
F	Navarretia intertexta (a)	-	-	-	6	-	-	-	.01	-
F	Phlox longifolia	c ⁷²	b ²³	b ²²	a ⁸	a ⁻	.05	.15	.02	-
F	Plantago patagonica (a)	-	b ¹⁶	a ⁻	c ⁵¹	a ⁻	.05	-	.36	-
F	Polygonum douglasii (a)	-	3	4	-	-	.00	.01	-	-
F	Salsola iberica (a)	-	a ⁻	a ⁻	b ¹²	a ⁻	-	-	.04	-
F	Sisymbrium altissimum (a)	-	3	2	6	-	.15	.03	.06	-
F	Sphaeralcea coccinea	a ³	a ¹⁸	a ⁷	b ⁴⁰	b ⁴³	.13	.01	.89	.29
F	Taraxacum officinale	-	3	1	-	-	.00	.00	-	-
F	Unknown forb-perennial	7	-	-	-	-	-	-	-	-
Total for Annual Forbs		1	139	6	89	1	0.49	0.04	0.53	0.00
Total for Perennial Forbs		103	219	51	58	45	0.86	0.24	0.99	0.29
Total for Forbs		104	358	57	147	46	1.35	0.29	1.52	0.30

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

BROWSE TRENDS--

Management unit 09, Study no: 5

Type	Species	Strip Frequency				Average Cover %			
		'95	'00	'05	'10	'95	'00	'05	'10
B	Artemisia tridentata wyomingensis	79	78	34	1	7.76	5.69	1.50	-
B	Eriogonum microthecum	30	15	22	0	.19	.16	.44	-
B	Gutierrezia sarothrae	76	100	66	4	.98	12.44	1.93	.00
B	Leptodactylon pungens	2	2	0	0	.03	.15	-	-
B	Opuntia sp.	20	16	19	13	.07	.36	.64	.30
Total for Browse		207	211	141	18	9.06	18.83	4.53	0.30

CANOPY COVER, LINE INTERCEPT--

Management unit 09, Study no: 5

Species	Percent Cover	
	'05	'10
Artemisia tridentata wyomingensis	2.11	-
Eriogonum microthecum	.25	-
Gutierrezia sarothrae	2.83	-
Opuntia sp.	.51	-

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 09, Study no: 5

Species	Average leader growth (in)	
	'05	'10
Artemisia tridentata wyomingensis	2.3	-

BASIC COVER--

Management unit 09, Study no: 5

Cover Type	Average Cover %					
	'82	'88	'95	'00	'05	'10
Vegetation	2.75	4.75	31.06	35.34	39.24	5.52
Rock	0	0	0	0	0	0
Pavement	0	0	.01	.15	.03	0
Litter	45.50	31.00	32.54	35.04	28.71	79.97
Cryptogams	1.00	4.50	10.82	12.38	1.02	0
Bare Ground	50.75	59.75	31.40	44.68	37.68	15.06

SOIL ANALYSIS DATA --

Management unit 9, Study no: 5, Study Name: Island Park

Effective rooting depth (in)	pH	sandy loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
12.9	7.3	57.4	26.7	15.9	0.6	4.0	112.0	0.6

PELLET GROUP DATA--

Management unit 09, Study no: 5

Type	Quadrat Frequency			
	'95	'00	'05	'10
Rabbit	45	10	51	7
Elk	6	25	48	27
Deer	32	21	29	29

Days use per acre (ha)		
'00	'05	'10
-	-	-
57 (141)	64 (159)	47 (116)
47 (116)	22 (55)	44 (107)

BROWSE CHARACTERISTICS--

Management unit 09, Study no: 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>Artemisia tridentata wyomingensis</i>									
82	3798	4	53	44	-	54	14	30	17/23
88	5665	20	29	51	133	42	34	14	20/21
95	3300	17	44	39	180	50	29	29	16/25
00	2780	3	15	82	20	53	28	50	16/25
05	900	7	22	71	-	29	44	60	17/22
10	20	0	0	100	-	0	0	100	27/28
<i>Eriogonum microthecum</i>									
82	199	0	100	0	-	0	0	0	13/6
88	732	27	73	0	-	0	0	0	9/5
95	1020	6	84	10	20	4	4	0	10/10
00	500	0	96	4	-	12	12	4	5/6
05	780	0	100	0	-	0	31	0	12/13
10	0	0	0	0	-	0	0	0	9/5
<i>Gutierrezia sarothrae</i>									
82	7465	11	89	0	-	0	0	0	12/10
88	30331	10	81	9	66	0	0	1	8/6
95	3580	36	63	1	26560	3	0	0	12/13
00	30120	1	92	7	-	0	0	3	8/9
05	2700	4	96	1	220	0	0	0	12/12
10	140	0	86	14	-	0	0	14	12/15
<i>Leptodactylon pungens</i>									
82	0	0	0	-	-	0	0	0	-/-
88	0	0	0	-	-	0	0	0	-/-
95	60	0	100	-	-	0	0	0	4/8
00	120	17	83	-	-	0	0	0	4/8
05	0	0	0	-	-	0	0	0	-/-
10	0	0	0	-	-	0	0	0	-/-

		Age class distribution			Utilization				
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Opuntia sp.									
82	133	0	100	0	-	0	0	0	3/5
88	599	44	56	0	-	11	0	0	4/8
95	440	0	95	5	-	0	0	0	4/16
00	380	5	84	11	-	0	0	0	4/12
05	560	0	79	21	-	0	0	18	5/18
10	320	0	100	0	-	0	0	56	8/15