

HARTS DRAW - TREND STUDY NO. 14-9-09

Vegetation Type: Wyoming Big Sagebrush

Range Type: Crucial Deer Winter

NRCS Ecological Site Description: [Upland Loam \(Basin Big Sagebrush\), R035XY306UT](#)

Land Ownership: BLM

Elevation: 6,400 ft (1,951 m)

Aspect: Southwest

Slope: 4%

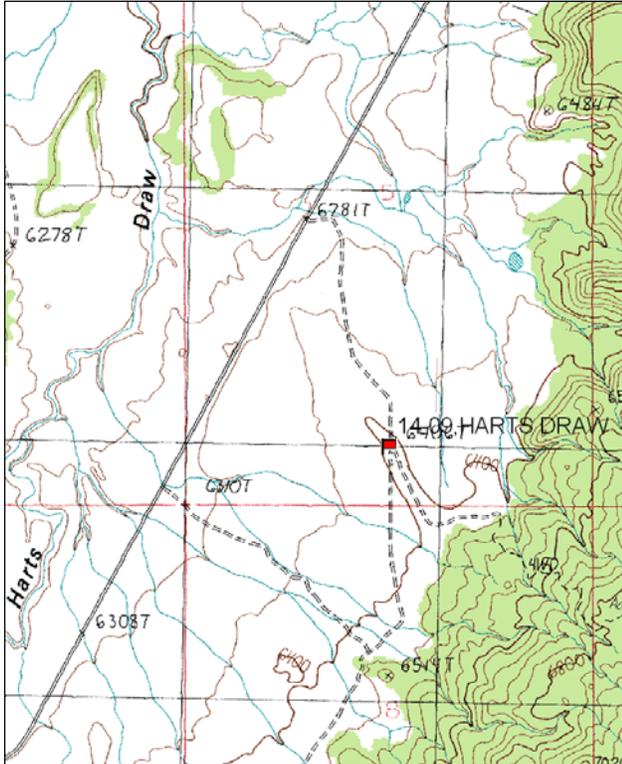
Transect bearing: 180 degrees magnetic.

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

Directions:

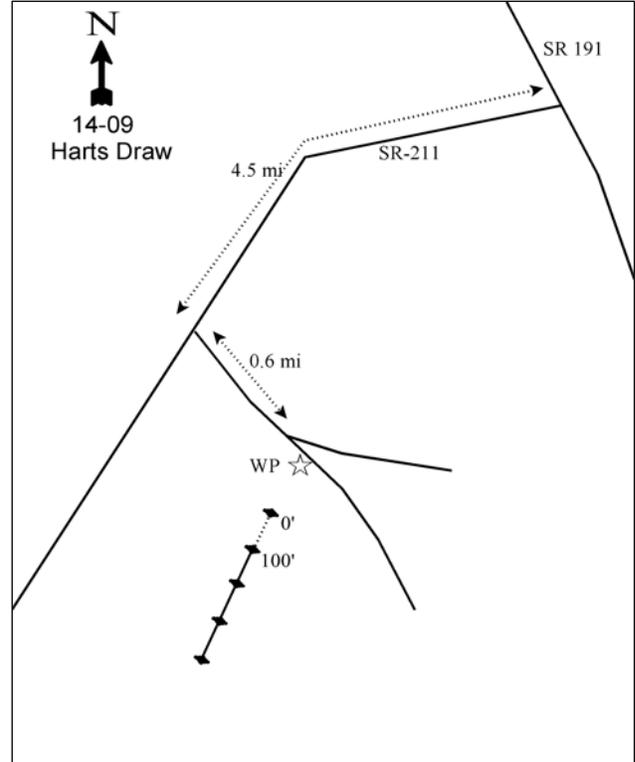
Go north from Monticello on SR 191 to the turnoff to Canyonlands National Park (0.3 miles north of mile marker 86). Turn left (west) onto SR-211 and proceed approximately 4.0 miles to mile marker 14. Continue 0.5 miles past the mile marker, then turn left onto a dirt road that goes up and along a small ridge. Go 0.6 miles, bearing right at a faint fork and looking for two green fence posts on your left between the roads. There is a witness post on the right hand side of the road. The 0-foot stake is 19 paces away from the witness post at 218°M. The 0 ft baseline stake is also near a small juniper.

Map Name: Photograph Gap



Township: 32S, Range: 23E, Section: 5

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 638774 E 4209177 N

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Site Information

Site Description: The study is located in an extensive Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) community below the pinyon-juniper covered slopes of Peters Point mesa. In the valley below the ridge, sagebrush has been removed and the flat has been planted to crested wheatgrass. Cattle use the flat rather heavily, with sign of grazing less common further up the hill. A pellet group transect located nearby at an elevation of 6,600 feet continually shows the highest use of any transect on the herd unit with a 10 year average ('87-'97) of 91 deer days use/acre (225 ddu/ha). Pellet group data on the site has indicated very heavy use by deer since 1999. Estimated cattle use was mostly light in 1999 and 2004, with more moderate use measured in 2009 (Table - Pellet Group Data).

Browse: The key browse species is Wyoming big sagebrush, but sagebrush has been steadily decreasing on the site in cover and density since 1994 (Table - Herbaceous Trends). Decadence in the sagebrush population has been relatively high, especially in 2004 when it increased to 92% of the population. Sagebrush plants displaying poor vigor have also been relatively high with a large increase to 82% in 2004. Both decadence and vigor returned to more normal levels in 2009. Recruitment of young sagebrush plants has been fairly low over all the sample years. Utilization of sagebrush has been mostly moderate, but there was a lot of heavy use of sagebrush in 2004 (Table - Browse Characteristics). Much of the decline in the sagebrush population in 2004 is attributed to drought conditions in the years prior to the 2004 sampling. Two weedy increaser species, narrowleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *stenophyllus*) and broom snakeweed (*Gutierrezia sarothrae*), are the only other common browse species on the site.

Herbaceous Understory: Blue grama (*Bouteloua gracilis*), a warm season grass, is fairly abundant on the site and forms thick low mats on the side hill. It has increased steadily in cover since 1999 and was the dominant species in cover in 2009. Other native perennial grasses found on the site include bottlebrush squirreltail (*Sitanion hystrix*), needle-and-thread (*Stipa comata*), Indian ricegrass (*Oryzopsis hymenoides*), and galleta (*Hilaria jamesii*). Cheatgrass (*Bromus tectorum*) is common on the site, but cover has fluctuated drastically with climatic variables. Forbs are insignificant with a total cover of only about 1% in each reading (Table - Herbaceous Trends).

Soil: The soil on the site is a reddish sandy loam with a slightly alkaline pH and relatively shallow effective rooting depth (Table - Soil Analysis Data). Much of the sandy soil is exposed on the site. Grasses provide good protection against erosion where they occur, but the amount of herbaceous vegetation and litter cover is low and variable. The soil erosion condition was classified as stable in 2004 and 2009.

Trend Assessments

Browse:

- **1986 to 1994 - stable (0):** Differences in density may be related to the larger sample area used in 1994; therefore, trend was determined using other parameters. The proportion of Wyoming big sagebrush plants displaying poor vigor increased from 16% to 32%. Decadence of sagebrush decreased slightly, but is still high.
- **1994 to 1999 - slightly down (-1):** The density of the primary browse species, Wyoming big sagebrush, decreased by 7% from 3,580 plants/acre to 3,340 plants/acre. Cover of sagebrush also decreased from 12% to 10%, though both decadence and vigor improved. The density of the undesirable species, broom snakeweed, increased more than three-fold and cover increased from 1% to 4%.
- **1999 to 2004 - down (-2):** The density of Wyoming big sagebrush decreased by 37% to 2,120 plants/acre and cover decreased to 7%. Decadence increased to 92% and plants displaying poor vigor increased to 82%. There was, however, a substantial decrease in broom snakeweed as well.

- **2004 to 2009 - slightly up (+1):** There was a slight decrease in the density and cover of sagebrush, but decadence and the proportion of plants displaying poor vigor decreased to 37% and 31%, respectively. While these measurements are still relatively high, it is a large improvement over 2004 conditions. Recruitment of young sagebrush plants also increased slightly, but is still low at only 5% of the population.

Grass:

- **1986 to 1994 - stable (0):** There was little change in the sum of nested frequency of perennial grasses. There was a significant increase in nested frequency of bottlebrush squirreltail and a significant decrease in nested frequency of needle-and-thread.
- **1994 to 1999 - slightly down (-1):** There was a slight increase in the sum of nested frequency of perennial grasses, but cover decreased slightly. There was also a significant decrease in the nested frequency of the dominant perennial grass, blue grama, and a significant increase in the nested frequency of cheatgrass. The cover of cheatgrass increased to nearly 13% and was the dominant species on the site.
- **1999 to 2004 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 24%, though cover increased from 8% to 15%. Most of this increase was due to a significant increase in the nested frequency of blue grama and subsequent increase in cover. However, there was a significant decrease in most of the other important native perennial grasses on the site as well. Cheatgrass also had a significant decrease in nested frequency and had less than 1% cover.
- **2004 to 2009 - up (+2):** The sum of nested frequency increased by 59% and cover increased to 20%. There was a significant increase in the nested frequency of blue grama and bottlebrush squirreltail. Cheatgrass also had a significant increase in nested frequency and cover increased to 3%.

Forb:

- **1986 to 1994 - down (-2):** There was a significant decrease in the nested frequency of the only two common perennial forbs, scarlet globemallow (*Sphaeralcea coccinea*) and low fleabane (*Erigeron pumilus*).
- **1994 to 1999 - stable (0):** There was a slight increase in the sum of nested frequency of perennial forbs, but forbs are so rare that there was little real change.
- **1999 to 2004 - stable (0):** Forbs are very rare on the site with little change in the sum of nested frequency or cover of perennial forbs.
- **2004 to 2009 - stable (0):** There was little change in the sum of nested frequency and cover of perennial forbs.

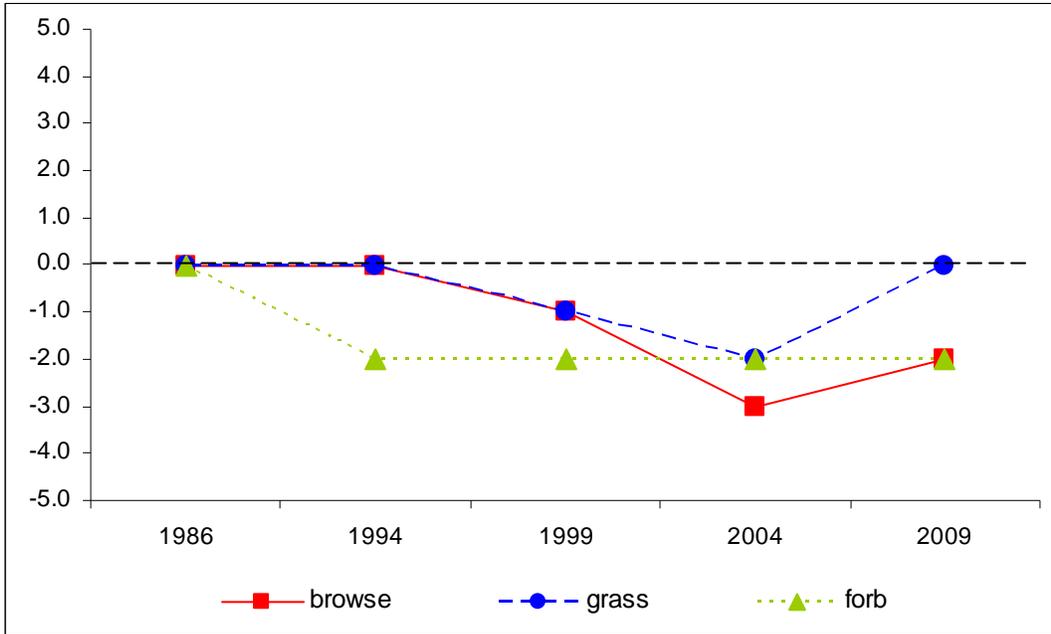
DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 14, study no: 9

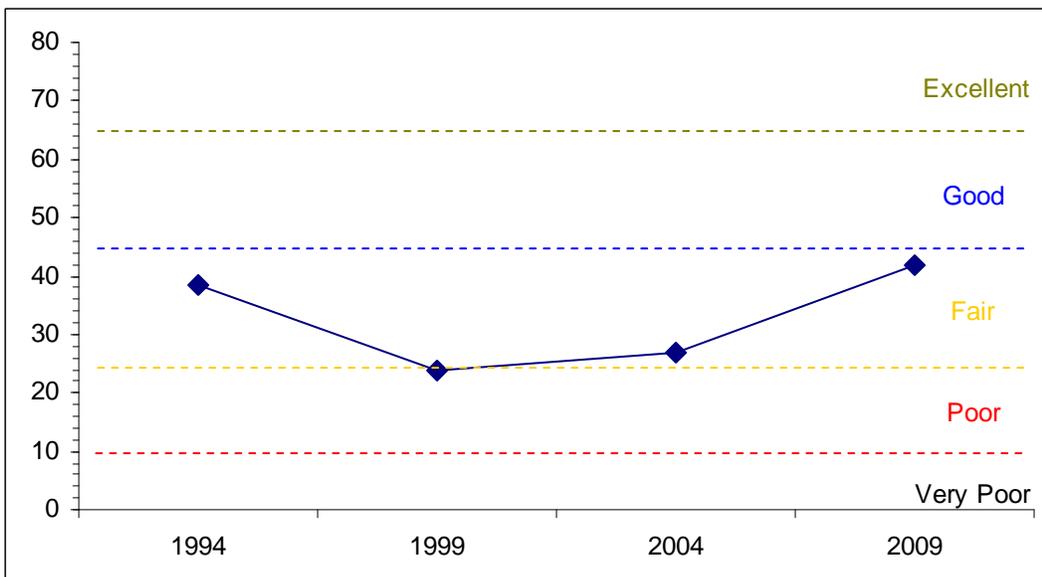
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
94	14.8	1.2	1.0	21.2	-0.5	0.8	0.0	38.5	Fair
99	11.9	5.1	0.5	15.0	-9.9	1.3	0.0	23.9	Poor-Fair
04	8.9	-12.6	1.0	29.5	-0.4	0.4	0.0	26.8	Poor-Fair
09	7.1	3.9	2.5	30.0	-2.4	0.7	0.0	41.8	Fair

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 14, Study no: 9



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE
Management unit 14, Study no: 9



HERBACEOUS TRENDS--
Management unit 14, Study no: 9

Type	Species	Nested Frequency					Average Cover %			
		'86	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron cristatum	a-	a6	a4	a-	b17	.03	.06	-	.34
G	Bouteloua gracilis	b165	b130	a77	b166	c210	5.41	2.97	12.73	17.41
G	Bromus tectorum (a)	-	a16	c344	a19	b165	.07	12.91	.52	3.25
G	Hilaria jamesii	a1	a5	b39	a-	ab15	.04	1.52	-	.31
G	Oryzopsis hymenoides	a-	b15	b20	b9	b27	.39	.27	1.03	.72
G	Sitanion hystrix	a25	b123	c153	a46	b82	4.70	2.62	.93	1.12
G	Sporobolus cryptandrus	-	-	-	2	-	-	-	.00	-
G	Stipa comata	b81	a-	a4	a4	a9	-	.04	.03	.07
G	Vulpia octoflora (a)	-	d240	c99	b11	a-	.55	.33	.02	-
Total for Annual Grasses		0	256	443	30	165	0.62	13.24	0.54	3.25
Total for Perennial Grasses		272	279	297	227	360	10.59	7.50	14.73	19.99
Total for Grasses		272	535	740	257	525	11.21	20.75	15.28	23.25
F	Arnica mollis	7	-	-	-	-	-	-	-	-
F	Astragalus mollissimus	2	-	5	-	-	-	.06	-	-
F	Chenopodium album (a)	-	-	-	3	-	-	-	.01	-
F	Chenopodium sp. (a)	-	2	-	-	-	.00	-	-	-
F	Cryptantha sp.	a-	b12	b20	a-	a-	.03	.23	-	-
F	Descurainia pinnata (a)	-	b38	a1	a10	a7	.09	.00	.21	.44
F	Erigeron pumilus	c44	a1	b17	a1	a3	.03	.31	.01	.03
F	Erigeron sp.	b9	a-	a-	a-	ab3	-	-	-	.04
F	Eriogonum cernuum (a)	-	1	-	-	-	.00	-	-	-
F	Gilia hutchinfolia (a)	-	ab20	a8	b34	a-	.05	.02	.30	-
F	Lappula occidentalis (a)	-	a-	a1	b17	a6	-	.00	.27	.01
F	Lepidium sp. (a)	-	c20	ab7	a3	bc17	.42	.23	.07	.26
F	Leucelene ericoides	-	10	-	7	-	.33	-	.09	-
F	Orobancha fasciculata	-	-	4	-	-	-	.01	-	-
F	Phlox longifolia	-	-	-	3	-	-	-	.00	-
F	Ranunculus testiculatus (a)	-	-	-	1	-	-	-	.00	-
F	Schoenrambe linifolia	-	-	-	-	-	-	-	-	.00
F	Sclerocactus sp.	2	-	-	-	-	-	-	-	-
F	Senecio multilobatus	-	-	-	4	-	-	-	.00	-
F	Sphaeralcea coccinea	b52	a14	a13	a6	a18	.03	.05	.07	.28
F	Unknown forb-perennial	-	-	-	1	-	-	-	.03	-
Total for Annual Forbs		0	81	17	68	30	0.58	0.26	0.87	0.71
Total for Perennial Forbs		116	37	59	22	24	0.42	0.67	0.21	0.35
Total for Forbs		116	118	76	90	54	1.00	0.94	1.09	1.07

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

BROWSE TRENDS--

Management unit 14, Study no: 9

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	Artemisia tridentata wyomingensis	77	78	70	64	11.80	9.50	7.10	5.69
B	Chrysothamnus viscidiflorus stenophyllus	10	6	9	10	.18	.46	1.77	1.21
B	Gutierrezia sarothrae	70	94	38	56	1.02	3.95	2.40	1.46
B	Opuntia sp.	11	5	3	4	.04	.18	.18	.30
B	Sclerocactus sp.	0	0	0	4	.01	-	-	.15
Total for Browse		168	183	120	138	13.07	14.11	11.46	8.82

CANOPY COVER, LINE INTERCEPT--

Management unit 14, Study no: 9

Species	Percent Cover	
	'04	'09
Artemisia tridentata wyomingensis	8.23	8.18
Chrysothamnus viscidiflorus stenophyllus	1.01	1.93
Gutierrezia sarothrae	2.53	1.46

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 14, Study no: 9

Species	Average leader growth (in)	
	'04	'09
Artemisia tridentata wyomingensis	2.4	0.9

BASIC COVER--

Management unit 14, Study no: 9

Cover Type	Average Cover %				
	'86	'94	'99	'04	'09
Vegetation	4.25	21.01	34.93	28.69	34.25
Rock	0	.45	.09	.04	.06
Pavement	8.25	1.01	2.01	2.56	3.79
Litter	35.75	18.98	30.61	27.45	35.43
Cryptogams	.75	1.52	1.99	1.28	.57
Bare Ground	51.00	51.87	41.37	48.84	41.95

SOIL ANALYSIS DATA --

Management unit 14, Study no: 9, Study Name: Harts Draw

Effective rooting depth (in)	pH	sandy loam			%0M	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
13.4	7.6	72.9	12.6	14.6	1.3	8.8	51.2	0.4

PELLET GROUP DATA--

Management unit 14, Study no: 9

Type	Quadrat Frequency			
	'94	'99	'04	'09
Sheep	-	1	-	1
Rabbit	14	53	9	36
Elk	8	1	-	-
Deer	36	40	41	29
Cattle	-	1	5	4

Days use per acre (ha)		
'99	'04	'09
-	-	-
-	-	-
-	-	-
84 (207)	104 (256)	68 (167)
7 (17)	15 (38)	30 (73)

BROWSE CHARACTERISTICS--

Management unit 14, 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 tridentata wyomingensis</i>									
86	3331	2	48	50	-	46	14	16	20/19
94	3580	2	51	46	40	60	9	32	20/33
99	3340	1	66	33	-	53	23	14	23/31
04	2120	2	7	92	40	32	63	82	23/34
09	2000	5	58	37	-	29	17	31	20/33
<i>Chrysothamnus viscidiflorus stenophyllus</i>									
86	199	33	67	0	-	0	0	33	9/11
94	480	8	92	0	-	0	0	0	10/18
99	300	20	53	27	20	0	0	0	12/16
04	400	0	85	15	-	0	0	10	13/23
09	460	9	65	26	-	17	4	9	16/26
<i>Gutierrezia sarothrae</i>									
86	12865	29	66	5	3533	.51	0	.51	8/6
94	5480	11	88	2	260	1	0	2	5/6
99	19600	17	82	2	80	0	0	2	7/8
04	2580	2	97	2	-	0	0	2	8/11
09	3020	16	83	1	40	0	0	.66	6/8
<i>Opuntia sp.</i>									
86	133	0	100	0	-	0	0	50	3/6
94	360	33	61	0	20	0	0	0	2/10
99	120	17	83	0	-	0	0	17	3/7
04	60	0	67	33	-	0	0	33	2/4
09	80	0	100	0	-	0	0	0	3/7
<i>Sclerocactus sp.</i>									
86	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	3/9
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	80	25	75	-	-	0	0	25	1/1