

Trend Study 14-24-04

Study site name: Ruin Park.

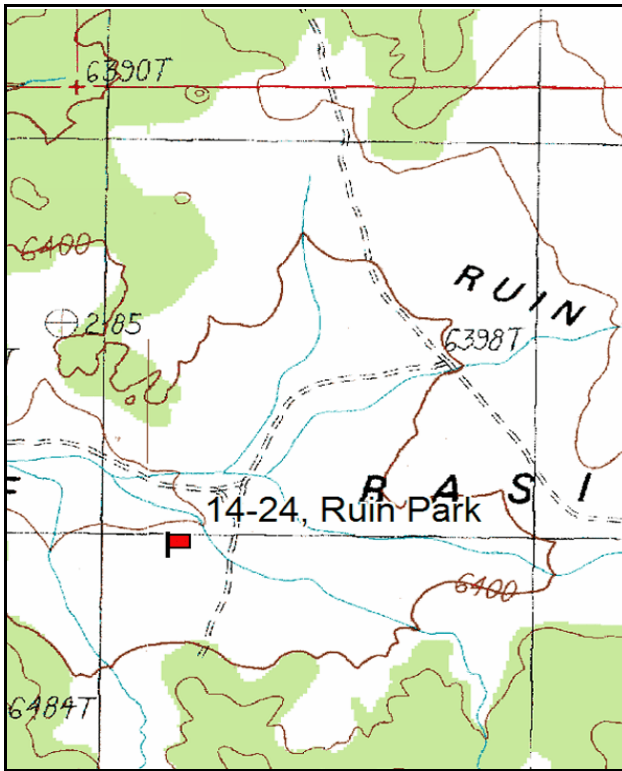
Vegetation type: Wyoming Big Sagebrush.

Compass bearing: frequency baseline 165 degrees magnetic.

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

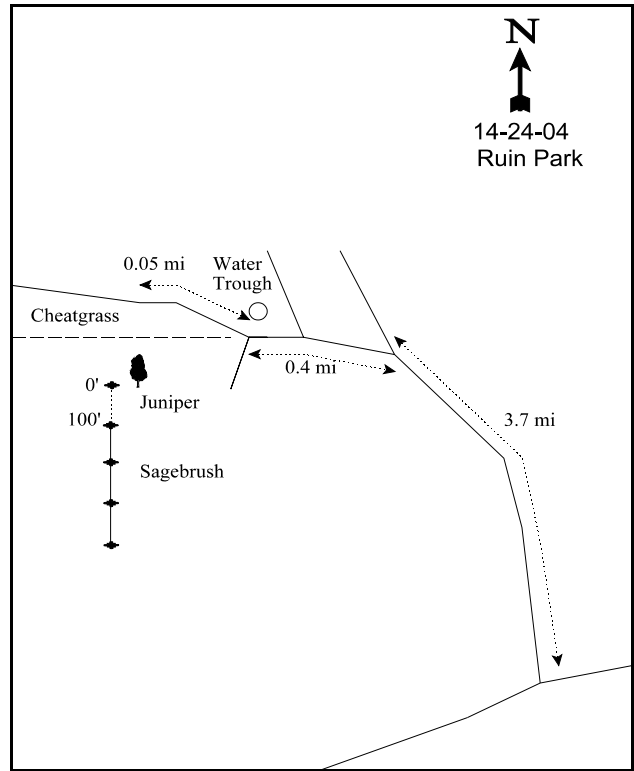
LOCATION DESCRIPTION

At the junction of the Elk Ridge-Salt Creek Mesa-Beef Basin Roads, go north down into the Beef Basin area. Follow the main road for 9.1 miles, passing the FS/BLM boundary, down to an intersection where there is a BLM register box. Bear right and go 3.7 miles on the main road disregarding all forks until you come to a fork at this mileage. Stay left and continue 0.3 miles to a right turnoff to a ruin. Continue left 0.1 miles to a water trough by a fork. Turn right for approximately 0.05 miles before turning south and driving southwest across the cheatgrass flat (no road). Stop at the sagebrush border and look out in the sagebrush flat for a small lone juniper near a shallow gully. The frequency baseline starts by this juniper and runs south towards the P-J covered hills. All stakes are 3 1/2 foot tall green steel fence posts.



Map Name: Cross Canyon

Township 32S, Range 18E, Section 11



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4206937 N, 595157 E

DISCUSSION

Ruin Park - Trend Study No. 14-24

The Ruin Park trend study samples the typical Wyoming big sagebrush-grass range in Beef Basin. The site consists of a large open park surrounded by rocky, pinyon-juniper covered hills. Numerous Anasazi Indian ruins are found in the hills near the study, therefore the name Ruin Park for the large open flat. Located in the lower, western end of the park, the study site has a northern aspect to the intermittent gully, which runs west down the center of Ruin Park. A water development for cattle is located just northeast of the transect, in an area dominated by cheatgrass and a few *Atriplex*. Ruin Park is grazed under the same schedule as South Plain (14-23). Cattle distribution is controlled mainly by water and there are few fences. Deer use has been moderately heavy in this part of Beef Basin. Pellet groups and antler drops were numerous in 1986. Pellet group data from the site in 1999 estimated 70 deer days use/acre (173 ddu/ha) and 26 cow days use/acre (64 cdu/ha). Cattle pats were mostly older, but a few were from the spring. Pellet group data from 2004 estimated only 13 deer days use/acre (31 ddu/ha). Cattle use was estimated at 11 days use/acre (27 cdu/ha).

The reddish sandy loam soil is fairly deep with an effective rooting depth estimated at 18 inches. It has a moderately alkaline pH of 7.9 with low organic matter (0.6%) and phosphorus (5.9 ppm). Phosphorus values of less than 10 ppm are considered minimal for normal plant growth and development. Average soil temperature was high at 76°F at an depth of 18 inches in 1999. In 2004, soil temperature was lower at 66°F. High soil temperatures tend to give winter annuals like cheatgrass, a competitive advantage over perennial grasses, especially during dry years with unusually dry summers. About 50% of the ground surface was bare in 1986 and 2004, due to the patchy distribution of the vegetative cover. Percent bare ground declined to 34% in 1992 and 1999 due to the increase in cheatgrass cover. A buildup of litter and soil, along with some cryptogamic development, is found at the base of sagebrush. A gully runs parallel to the baseline and has grass growing in the bottom. Overall, erosion is not severe, although there is soil movement and deposition from the hills above.

Wyoming big sagebrush is the key browse species in Ruin Park. The plants were severely hedged with 58% being classified as decadent in 1986. Percent decadence increased substantially to 77% in 1992. This trend continued with further increases to 91% in 1999. Protected plants showed better growth and vigor. There were few young plants but no seedlings encountered during any reading. Density was estimated at 2,198 sagebrush/acre in 1986, declining to 1,520 by 1992, then only 640 plants/acre in 1999. In 2004, no live sagebrush plants were sampled.

A large, very woody winterfat ecotype is found on this site which was fairly common in 1986 and 1992. In 1999, only 300 mostly heavily hedged plants/acre were estimated. Density declined to only 160 plants/acre in 2004. Narrowleaf low rabbitbrush was fairly common in 1992 and 1999 at about 1,000 plants/acre. Density declined 54% to 460 plants/acre in 2004.

Perennial grasses provides important ground cover and soil protection. The most abundant perennial species is needle-and-thread grass which shows the influence of heavy cattle grazing. Blue grama and Indian ricegrass are also common. Cheatgrass occurred on the site in 1992 in small numbers. By 1999 cheatgrass frequency and cover exploded and it dominated the site by providing 69% of the grass cover and 61% of the total vegetation cover. Drought conditions prior to the 2004 reading caused cheatgrass to decline significantly. Cheatgrass was found in 97 of the 100 quadrats placed in 1999 with an average cover value of 21%. By 2004, only one cheatgrass plant was sampled and cover declined to zero. Although several species of forbs were encountered on the transect, most species occur rarely. The only fairly common forb is the annual slimleaf goosefoot.

1986 APPARENT TREND ASSESSMENT

This sagebrush flat, as does most all of Beef Basin, receives heavy late fall, winter, and spring use by cattle and winter use by deer. As a consequence, the Wyoming big sagebrush is deteriorating in form, vigor, and recruitment. Forage production has also suffered. Because of the poor site potential and grazing pressure, grasses have not really had the opportunity to respond. Continued persistent use could eliminate the key browse species. A reduction in use, through better distribution and lower animal numbers, seems to be the only feasible answer. Current vegetative trend appears to be declining.

1992 TREND ASSESSMENT

The soil trend for this site is stable, but in only fair to poor condition. Percent cover for bare ground has declined, but so has litter cover. Trend for browse is down due to reduced population density, continued moderate to heavy use, poor vigor, and an increase in percent decadence for Wyoming big sagebrush. Recruitment is also poor with no seedlings and few young plants sampled. Population density for winterfat has also declined slightly, although percent decadence has actually gone down from 54% in 1986 to 4% now with no plants classified with poor vigor. The overall trend for browse would be considered downward. Winterfat, which is a warm season species, is escaping harmful utilization because most of the use is during the cool season (winter and spring) when it is not actively growing. The herbaceous understory is made up mostly of grasses (87% of the herbaceous cover), while forbs are only a minor component. With this in mind, the trend for the herbaceous understory is stable, but only fair condition. The Desirable Components Index (see methods) rating is fair at 36. Low preferred browse cover (primary species is sagebrush) and high decadence prevent this site from a higher rating.

TREND ASSESSMENT

soil - stable (3), but only fair to poor condition

browse - downward (1)

herbaceous understory - stable (3)

winter range condition (DC Index) - 36 (fair) Wyoming big sagebrush type

1999 TREND ASSESSMENT

Trend for soil is stable with similar ground cover characteristics compared to 1992. Some erosion is occurring, but it appears minimal due to the levelness of the terrain. Trend for browse continues to decline with density of Wyoming big sagebrush now at only 640 plants/acre and percent decadence up to 91%. In addition, dead plants are twice as abundant as live plants and 41% of the decadent plants sampled appeared to be dying. With no noticeable recruitment, the population will continue to decline. Density of winterfat has also declined from 640 to only 300 plants/acre. Trend for the herbaceous understory is also down. Sum of nested frequency of perennial grasses has declined and conversely annual cheatgrass has increased significantly. Cheatgrass had a cover value of only .04% in 1992, increasing to 21% by 1999. Quadrat frequency rose from only 3% in 1992 to 97% in 1999. Cheatgrass now totally dominates the site by providing 61% of the total vegetative cover. Forbs are lacking and have also declined in nested frequency since the last reading. Cover of forbs has decreased from 4% in 1992 to less than 1% in 1999. The DCI declined to a very poor rating with a score of -5. Preferred browse cover is even lower and decadence is very high. The high amount of cheatgrass also negatively impacts the rating.

TREND ASSESSMENT

soil - stable, but poor condition (3)

browse - downward (1)

herbaceous understory - down and dominated by cheatgrass (1)

winter range condition (DC Index) - -5 (very poor) Wyoming big sagebrush type

2004 TREND ASSESSMENT

Trend for soil is down due to a 38% increase in cover of bare ground and a 25% decline in vegetation cover. Litter cover declined by 30%. There is some localized soil movement occurring, but it is minimal due to the level terrain. Trend for browse is down. The key browse species, Wyoming big sagebrush has been declining since 1986 and no live plants were sampled in 2004. The only useful browse left on the site is a small population of winterfat which number only 160 plants/acre. This area is no longer an effective winter range for deer due to the lack of sagebrush. Trend for the herbaceous understory is up slightly. Sum of nested frequency for perennial grasses showed some improvement from 1999, while cheatgrass declined from a cover value of 21% to zero in 2004. Only one cheatgrass plant was sampled in 2004. The site is now dominated by needle-and-thread, blue grama, and Indian rice grass. Nested frequency of needle-and-thread grass increased significantly and average cover more than doubled from 7% to 17%. Blue grama remained stable in frequency but cover increased from 1% to over 3%. Indian ricegrass declined significantly in nested frequency and average cover declined slightly. Forbs remain an insignificant part of the understory. The DCI score improved to 31 (fair). This is due to the major decline of cheatgrass and in increase in perennial grasses. However, there is very little preferred browse cover which deer depend on for winter survival.

TREND ASSESSMENT

soil - down (1)

browse - down with no live sagebrush (1)

herbaceous understory - up slightly (4)

winter range condition (DC Index) - 31 (fair) Wyoming big sagebrush type

HERBACEOUS TRENDS --

Management unit 14 , Study no: 24

Type	Species	Nested Frequency				Average Cover %		
		'86	'92	'99	'04	'92	'99	'04
G	Bouteloua gracilis	_a 95	_b 146	_a 58	_a 62	9.26	.80	3.37
G	Bromus tectorum (a)	-	_a 5	_b 336	_a 1	.04	21.28	.00
G	Oryzopsis hymenoides	_a 56	_{ab} 61	_b 96	_a 47	1.40	2.20	1.82
G	Sitanion hystrix	_b 47	_a 11	_a 3	_a 9	.07	.00	.33
G	Sporobolus cryptandrus	_{ab} 10	_b 12	_a 1	_a -	.15	.00	-
G	Stipa comata	_b 278	_b 262	_a 176	_b 244	16.82	6.71	17.45
G	Vulpia octoflora (a)	-	9	5	-	.02	.01	-
Total for Annual Grasses		0	14	341	1	0.05	21.30	0.00
Total for Perennial Grasses		486	492	334	362	27.72	9.74	22.98
Total for Grasses		486	506	675	363	27.78	31.04	22.99
F	Astragalus mollissimus	_b 7	_{ab} 8	_{ab} 6	_a -	.04	.02	-
F	Calochortus nuttallii	-	-	-	-	-	-	.00
F	Chenopodium leptophyllum(a)	_a 8	_b 68	_a -	_b 54	1.44	-	1.36
F	Descurainia pinnata (a)	-	-	-	7	-	-	.04
F	Eriogonum spp.	-	2	-	-	.03	-	-
F	Erigeron pumilus	4	7	2	-	.06	.00	-

Type	Species	Nested Frequency				Average Cover %		
		'86	'92	'99	'04	'92	'99	'04
F	<i>Euphorbia fendleri</i>	11	3	10	8	.06	.24	.07
F	<i>Helianthus annuus</i> (a)	-	2	-	-	.00	-	-
F	<i>Lappula occidentalis</i> (a)	-	a ⁻	ab ⁶	b ¹¹	-	.06	.10
F	<i>Machaeranthera canescens</i>	a ⁴	b ⁴⁰	a ⁷	a ⁻	1.79	.02	-
F	<i>Microsteris gracilis</i> (a)	-	-	1	-	-	.00	-
F	<i>Navarretia intertexta</i> (a)	-	-	-	1	-	-	.00
F	<i>Penstemon</i> spp.	-	1	-	-	.03	-	-
F	<i>Phlox hoodii</i>	a ³	b ²⁰	b ¹⁴	a ⁻	.17	.28	-
F	<i>Phlox longifolia</i>	c ³²	bc ²³	a ²	ab ⁶	.10	.00	.06
F	<i>Plantago patagonica</i> (a)	-	a ⁻	b ²⁸	a ⁶	-	.06	.01
F	<i>Ranunculus testiculatus</i> (a)	-	-	3	-	-	.00	-
F	<i>Salsola iberica</i> (a)	-	3	-	5	.15	-	.01
F	<i>Senecio multilobatus</i>	4	-	-	-	-	-	-
F	<i>Sphaeralcea coccinea</i>	b ¹⁵	a ²	a ⁻	a ¹	.16	-	.03
F	<i>Tragopogon dubius</i>	-	-	2	-	-	.00	-
F	Unknown forb-annual (a)	-	2	-	-	.01	-	-
Total for Annual Forbs		8	75	38	84	1.61	0.13	1.53
Total for Perennial Forbs		80	106	43	15	2.45	0.57	0.17
Total for Forbs		88	181	81	99	4.06	0.71	1.71

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

BROWSE TRENDS --

Management unit 14 , Study no: 24

Type	Species	Strip Frequency			Average Cover %		
		'92	'99	'04	'92	'99	'04
B	<i>Artemisia frigida</i>	4	2	2	.03	-	.06
B	<i>Artemisia tridentata wyomingensis</i>	43	23	0	4.15	1.77	-
B	<i>Ceratoides lanata</i>	13	8	4	.51	.18	.15
B	<i>Chrysothamnus nauseosus albicaulis</i>	1	1	0	-	-	-
B	<i>Chrysothamnus viscidiflorus stenophyllus</i>	25	28	11	1.24	1.43	.31
B	<i>Opuntia</i> spp.	1	0	0	-	-	-
Total for Browse		87	62	17	5.93	3.39	0.51

CANOPY COVER, LINE INTERCEPT --
Management unit 14 , Study no: 24

Species	Percent Cover
	'04
Ceratoides lanata	.30
Chrysothamnus viscidiflorus stenophyllus	1.79

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 14 , Study no: 24

Species	Average leader growth (in)
	'04
Ceratoides lanata	1.8

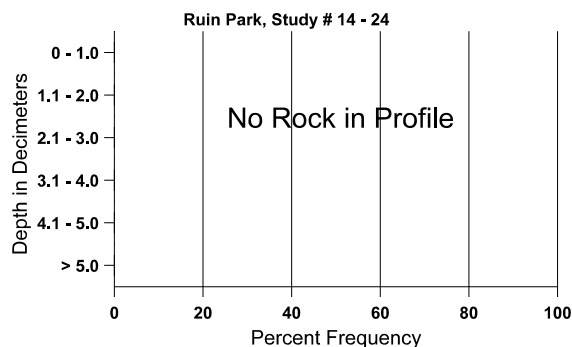
BASIC COVER --
Management unit 14 , Study no: 24

Cover Type	Average Cover %			
	'86	'92	'99	'04
Vegetation	6.50	36.31	36.66	27.64
Rock	0	.83	0	.01
Pavement	0	0	.30	.26
Litter	41.00	22.78	34.33	24.71
Cryptogams	2.50	.55	.24	.18
Bare Ground	50.00	33.97	34.17	55.52

SOIL ANALYSIS DATA --
Management unit 14, Study no: 24, Study Name: Ruin Park

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	ds/m
18.1	66.3 (17.7)	7.9	60.0	21.8	16.6	0.6	5.9	80.0	0.4

Stoniness Index



PELLET GROUP DATA --
 Management unit 14 , Study no: 24

Type	Quadrat Frequency		
	'92	'99	'04
Rabbit	17	19	10
Elk	1	-	-
Deer	57	40	16
Cattle	10	12	2

Days use per acre (ha)	
'99	'04
-	-
-	-
70 (173)	13 (31)
26 (64)	11 (27)

BROWSE CHARACTERISTICS --
 Management unit 14 , Study no: 24

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Artemisia frigida</i>												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
92	140	-	-	140	-	-	0	0	-	-	0	-/-
99	60	-	20	40	-	-	67	0	-	-	0	7/7
04	40	-	-	40	-	-	0	0	-	-	0	2/4
<i>Artemisia tridentata wyomingensis</i>												
86	2198	-	266	666	1266	-	15	85	58	-	0	24/27
92	1520	-	80	280	1160	-	43	38	76	12	24	-/-
99	640	-	-	60	580	1320	9	88	91	38	50	21/29
04	0	-	-	-	-	1900	0	0	0	-	0	-/-
<i>Ceratoides lanata</i>												
86	1732	133	333	466	933	-	73	23	54	-	0	8/9
92	640	-	220	380	40	-	13	6	6	-	0	-/-
99	300	-	140	80	80	-	13	40	27	7	7	13/13
04	160	-	-	160	-	-	13	0	0	-	0	14/16
<i>Chrysothamnus nauseosus albicaulis</i>												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
92	20	-	-	20	-	-	0	0	-	-	0	-/-
99	20	-	-	20	-	-	0	100	-	-	0	14/19
04	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Chrysothamnus viscidiflorus stenophyllus</i>												
86	0	-	-	-	-	-	0	0	0	-	0	-/-
92	900	40	220	680	-	-	0	0	0	-	0	-/-
99	1000	-	60	680	260	20	4	0	26	2	8	12/21
04	460	-	-	380	80	100	0	0	17	13	13	9/15

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Opuntia spp.												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
92	40	-	40	-	-	-	0	0	-	-	0	-/-
99	0	-	-	-	-	-	0	0	-	-	0	6/24
04	0	-	-	-	-	-	0	0	-	-	0	7/21
Sclerocactus												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
92	0	-	-	-	-	-	0	0	-	-	0	-/-
99	0	-	-	-	-	-	0	0	-	-	0	4/6
04	0	-	-	-	-	-	0	0	-	-	0	-/-