

Trend Study 10-18-05

Study site name: East Horse Pasture .

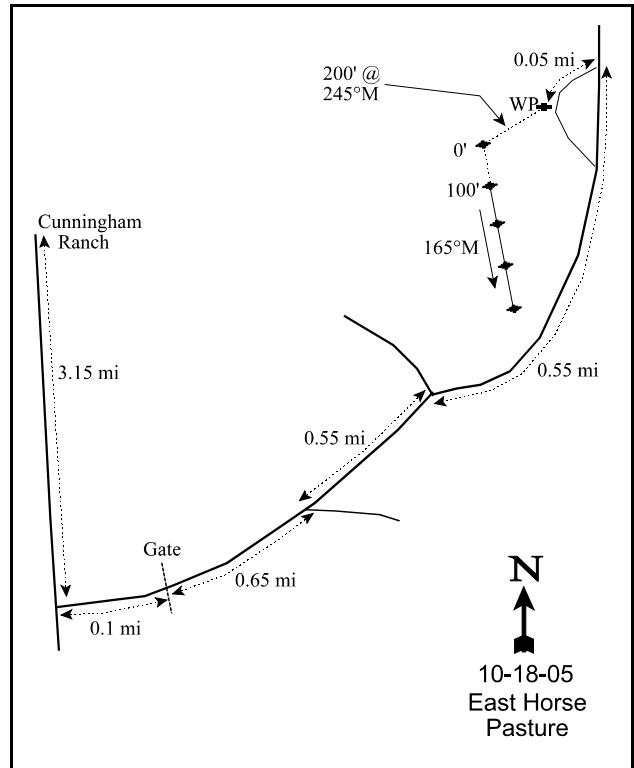
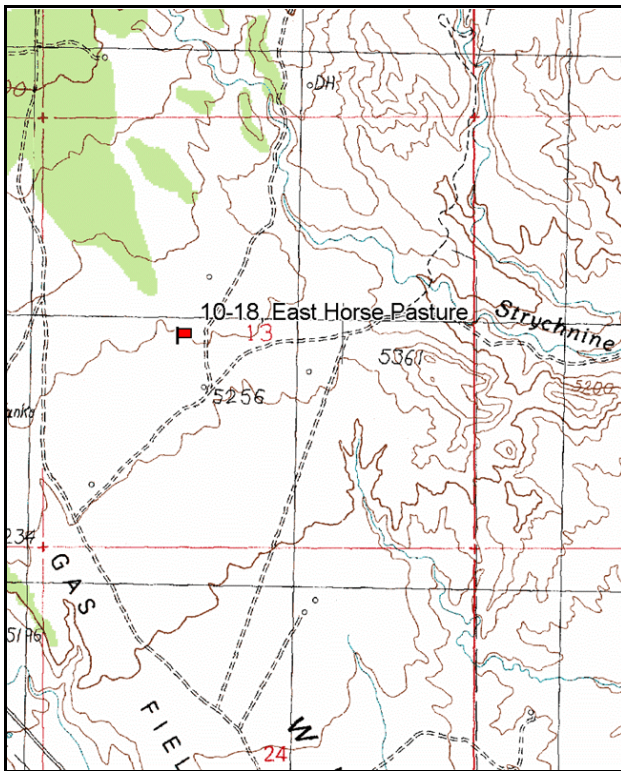
Vegetation type: Wyoming Big Sagebrush .

Compass bearing: frequency baseline 165 degrees magnetic.

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

LOCATION DESCRIPTION

From Cunningham Ranch travel south 3.15 miles to a fork. Turn left and go 0.1 miles to a gate. Continue another 0.65 miles to a fork. Stay left (on main road) and continue 0.55 miles to another fork. Turn right and go 0.55 miles to a faint road turning back to the left. Go 0.05 miles on this faint road to a 2-foot tall rebar witness post on the right. The 0' stake begins 200 feet west of the witness post on a bearing of 245°M.



Map Name: Calf Canyon

Diagrammatic Sketch

Township 20S, Range 21E, Section 13

GPS: NAD 27, UTM 12S 4324894 N, 625552 E

DISCUSSION

East Horse Pasture - Trend Study No. 10-18

The East Horse Pasture study lies in an area of mixed pinyon-juniper and sagebrush flats located to the east of Nash Wash and the Cunningham Ranch at an elevation of 5,300 feet. This site is located within the large Cisco Allotment which is grazed from November 1 to May 10 by 3 cattle permittees. Two sheep permittees also use the allotment from December through early May. Prior to 1986, sheep use occurred in the winter months and cattle were present from mid-October to mid-June. The sagebrush flat where the transect is located has a gentle slope with a south, southeast exposure. The transect runs through a low lying depression where water run-off from the bench flows. This extra amount of water creates a much higher amount of cheatgrass in the draw compared to the rest of the bench. Use by wildlife was light in 2000. Pellet group transect data in 2000 was estimated at 27 deer days use/acre (67 ddu/ha) with no elk use. In 2005, deer use was estimated at 44 days use/acre (107 ddu/ha). Also estimated in 2005 was 4 elk days use/acre (10 edu/ha), 4 cow days use/acre (9 cdu/ha), and 5 sheep days use/acre (12 sdu/ha). More pellets were found on the first half of the transect near the cover of junipers.

The sandy clay loam soil is fine textured and moderately deep. In some areas there are large rocks near the surface, although there is little rock or pavement on the surface or in the profile. Effective rooting depth is estimated at 17 inches. The soil is slightly alkaline (pH of 7.4) and phosphorus levels are low at 4.8 ppm (Tiedemann and Lopez 2004). The soil has a dry crust formed on the surface which is easily broken and disturbed by animal activities. This crusting could impede seedling establishment. Since cover is poor, except for Wyoming big sagebrush and cheatgrass, any soil disturbance could leave the soil subject to wind and water erosion. There are rills and gullies present with evidence of soil loss, but due to the gentle terrain, erosion does not appear to be excessive. Bare ground is abundant in the shrub interspaces on the slightly higher terrain. The lower draw, where water accumulates, had robust amounts of cheatgrass in 2005. An erosion condition class assessment rated erosion as stable in 2005.

Wyoming big sagebrush is the key browse species on this site. Sagebrush cover was 9% in 1995, 12% in 2000, and 7% in 2005. Density was estimated at 3,833 plants/acre in 1986, 2,660 plants/acre in 1995, 2,940 plants/acre in 2000. This declined to 2,200 plants/acre in 2005. The decrease between the 1986 reading and 1995 is primarily due to the greatly increased sample size used beginning in mid-1992. This modification more accurately estimates shrub populations with clumped and/or discontinuous distributions. Density dropped in 2005 after many years of drought. Decadency increased to 41% in 2005 from 25% in 2000 and 18% in 1995. Nineteen percent of the population was classified as dying in 2005. This is much higher than the number of young plants that are being recruited into the population. Although grazing intensity has been reduced, it may not be enough for the Wyoming big sagebrush population during drought to fully recover with the competition it receives from cheatgrass. Cheatgrass is the dominant understory plant that provides intense competition for sagebrush seedling establishment. This competition does not allow the development of seed or the germination and establishment of sagebrush seedlings.

Broom snakeweed was very abundant in 1995, but declined sharply in 2000 with drought conditions. Density was increasing in 2005. Other shrubs sampled on the site include: fourwing saltbush, winterfat, spiny hopsage, and a cactus, all of which are in low densities. Fourwing saltbush density was much higher in 2005 and many young plants were sampled. Junipers appear to be encroaching from the north, although there are none within the sampling area. The nearby stand provides fair resting and thermal cover and the older trees are highlined with the younger ones appearing to be only lightly utilized.

Cheatgrass was extremely abundant in 1995 and 2005, which were wet years. Cover was 27% in 1995 and 33% in 2005. Cheatgrass was so robust in 2005 it completely engulfed some sagebrush plants so they could not be seen. Cheatgrass abundance was much lower in 2000, when conditions were dryer. Perennial grasses

are sparse and include: galleta, bottlebrush squirreltail, and sand dropseed. Galleta and sand dropseed significantly increased in nested frequency in 2000, while squirreltail increased but not significantly. Sand dropseed decreased significantly in 2005. Desirable forbs are rare. Annual forbs were very abundant in 2000 and 2005. This type of range site is not known for its diversity and abundance of herbaceous vegetation, but this site has definitely suffered the effects of long-term overgrazing and drought.

1986 APPARENT TREND ASSESSMENT

The soil and vegetation trends indicated by current management practices appear to be downward. There is inadequate ground cover and soil movement is ongoing. The key species is severely hedged. The sagebrush will likely become more decadent with no recruitment from young plants into the population. Besides these problems found in all three transects in the Nash Wash area, there is a continued loss of habitat due to oil and gas leasing and road building. As a very important deer wintering area, it seems necessary to protect and even improve range conditions. Possible solutions are more restrictive oil and gas leasing regulations, manipulation of livestock classes, their distribution and season of use, antlerless hunts to reduce the deer population and implementation of land treatments (chaining) to increase the carrying capacity for wildlife.

1995 TREND ASSESSMENT

Although the grazing pressure appears to be reduced, this Wyoming big sagebrush stand may be past the point of naturally reclaiming itself. The dense cheatgrass understory makes it difficult for sagebrush to produce seed, or for seedlings to become established if they germinate. This has resulted in the creation of a primarily mature or decadent stand. Sagebrush density has declined but the remaining population is healthier. Percent decadence has declined from 60% to 18%. Utilization is also lighter, declining from 90% heavy use in 1986 to 14% in 1995. These factors lead to a slightly upward browse trend for Wyoming big sagebrush. The herbaceous understory is comprised primarily of cheatgrass and very few forbs. Although cheatgrass is still very abundant, the total sum of nested frequency for the perennial grasses and forbs has increased, leading to a slightly upward herbaceous understory trend. It still is in poor condition. Soil erosion is limited to the disturbed interspaces between the sagebrush. Erosion is not extensive and apparently has not increased since 1986, leading to a stable, yet only fair soil trend. The Desirable Components Index score is very poor due to only moderate browse cover and high annual grass cover.

TREND ASSESSMENT

soil - stable (0)

browse - slightly up (+1)

herbaceous understory - slightly up (+1)

winter range condition (DC Index) - very poor (7) Lower potential scale

2000 TREND ASSESSMENT

Trend for soil is slightly down. Bare ground cover increased in 2000, while vegetation and litter cover decreased. As a result, the ratio of protective ground cover to bare soil decreased also. Trend for the key browse species, Wyoming big sagebrush, is stable but only in fair condition. Percent decadence slightly increased from 18% to 25% with 10% of the population classified as dying. Recruitment remains very low at 1%. Trend could go down in the future if recruitment remains low and the proportion of dying individuals continues to increase. Heavy use is about the same as in 1995, with moderate use decreasing somewhat. Trend for the herbaceous understory is up. Sum of nested frequency for perennials increased while the abundance of cheatgrass decreased. However, cheatgrass remains the most abundant herbaceous species even with drought conditions. The DCI score increased to fair due to decreased annual grass cover and increased perennial forb cover.

TREND ASSESSMENT

soil - slightly down (-1)

browse - stable (0)

herbaceous understory - up (+2)

winter range condition (DC Index) - fair (33) Lower potential scale

2005 TREND ASSESSMENT

The soil trend is slightly up. Vegetation cover increased and bare soil decreased, due to the increase in cheatgrass. The browse trend is down. Wyoming big sagebrush density dropped 25%. Percent decadency and the percent of dying plants increased since 2000. Recruitment is low at only 5% and no seedlings were encountered. Competition with cheatgrass is hampering sagebrush recruitment. Broom snakeweed density also increased in 2005. The herbaceous understory trend is slightly down. The understory conditions are very similar to those in 1995. Cheatgrass increased and perennial grasses decreased, with most of the decrease from sand dropseed. Perennial forbs are rare, while annual forbs are very abundant. Although perennial forbs increased, that increase was not enough to compensate for the loss of perennial grasses. The DCI score decreased to very poor due to increased annual grass cover, decreased browse cover, and decreased perennial grass cover.

TREND ASSESSMENT

soil - slightly up (+1)

browse - down (-2)

herbaceous understory - slightly down (-1)

winter range condition (DC Index) - very poor (9) Lower potential scale

HERBACEOUS TRENDS --

Management unit 10 , Study no: 18

T y p e	Species	Nested Frequency				Average Cover %		
		'86	'95	'00	'05	'95	'00	'05
G	Bromus tectorum (a)	-	_b 352	_a 176	_b 348	27.40	7.01	33.48
G	Hilaria jamesii	_a 6	_b 56	_c 84	_{bc} 84	1.25	3.27	2.53
G	Oryzopsis hymenoides	-	2	-	8	.00	.01	.21
G	Sitanion hystrix	_a 4	_{ab} 19	_b 28	_{ab} 11	.27	.47	.09
G	Sporobolus cryptandrus	_a -	_b 14	_c 32	_{ab} 3	.05	.55	.04
G	Stipa comata	-	3	3	-	.03	.00	-
G	Vulpia octoflora (a)	-	_b 28	_a -	_c 77	.06	-	.53
Total for Annual Grasses		0	380	176	425	27.47	7.01	34.02
Total for Perennial Grasses		10	94	147	106	1.61	4.32	2.88
Total for Grasses		10	474	323	531	29.09	11.33	36.90
F	Astragalus sp.	-	-	1	-	-	.00	-
F	Calochortus nuttallii	-	-	-	-	-	-	.00
F	Cryptantha sp.	-	-	-	5	-	-	.04
F	Descurainia pinnata (a)	-	_a 7	_a 3	_b 83	.02	.00	.71

T y p e	Species	Nested Frequency				Average Cover %		
		'86	'95	'00	'05	'95	'00	'05
F	<i>Draba</i> sp. (a)	-	-	1	-	-	.00	-
F	<i>Erodium cicutarium</i> (a)	-	-	11	13	-	.21	.48
F	<i>Erigeron utahensis</i>	7	4	-	-	.00	-	-
F	<i>Gilia hutchinifolia</i> (a)	-	-	-	6	-	-	.03
F	<i>Lappula occidentalis</i> (a)	-	_b 30	_a -	_c 90	.08	-	.52
F	<i>Lactuca serriola</i>	-	3	-	-	.00	-	-
F	<i>Leucelene ericoides</i>	_a -	_{ab} 9	_b 15	_a -	.06	.15	-
F	<i>Lepidium montanum</i>	_a -	_b 31	_a 3	_b 45	.06	.03	.95
F	<i>Machaeranthera grindelioides</i>	-	2	-	-	.00	-	-
F	<i>Orobancha corymbosa</i>	3	-	-	-	-	-	-
F	<i>Phlox longifolia</i>	6	4	3	4	.01	.01	.01
F	<i>Plantago patagonica</i> (a)	-	_b 145	_a -	_b 119	.28	-	1.48
F	<i>Salsola iberica</i> (a)	-	_a -	_b 106	_a 9	-	1.35	.01
F	<i>Schoenrambe linifolia</i>	-	2	-	6	.00	-	.01
F	<i>Sisymbrium altissimum</i> (a)	-	_a 30	_b 51	_{ab} 39	.18	2.49	3.70
F	<i>Sphaeralcea coccinea</i>	15	27	31	32	.68	.76	.60
F	Unknown forb-perennial	1	-	-	-	-	-	-
Total for Annual Forbs		0	212	172	359	0.57	4.07	6.95
Total for Perennial Forbs		32	82	53	92	0.84	0.96	1.62
Total for Forbs		32	294	225	451	1.41	5.03	8.58

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

BROWSE TRENDS --

Management unit 10 , Study no: 18

T y p e	Species	Strip Frequency			Average Cover %		
		'95	'00	'05	'95	'00	'05
B	<i>Artemisia tridentata</i> <i>wyomingensis</i>	65	67	56	8.57	11.68	7.06
B	<i>Atriplex canescens</i>	0	1	13	-	.00	.55
B	<i>Ceratoides lanata</i>	1	0	0	-	-	-
B	<i>Grayia spinosa</i>	1	1	1	.00	1.01	.00
B	<i>Gutierrezia sarothrae</i>	68	29	42	2.53	.97	1.66
B	<i>Opuntia</i> sp.	5	4	7	.00	.01	.09
Total for Browse		140	102	119	11.12	13.68	9.38

CANOPY COVER, LINE INTERCEPT --
Management unit 10 , Study no: 18

Species	Percent Cover
	'05
Artemisia tridentata wyomingensis	11.28
Atriplex canescens	.56
Grayia spinosa	.06
Gutierrezia sarothrae	2.31
Opuntia sp.	.15

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 10 , Study no: 18

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

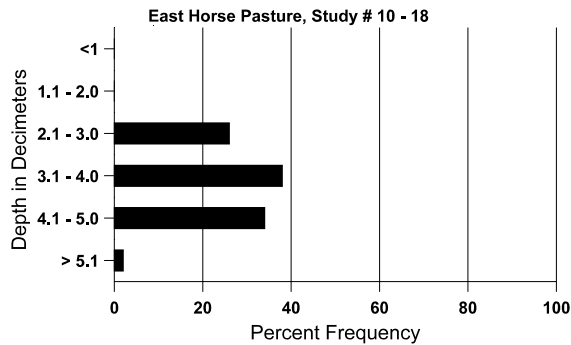
BASIC COVER --
Management unit 10 , Study no: 18

Cover Type	Average Cover %			
	'86	'95	'00	'05
Vegetation	8.25	43.52	32.86	51.50
Rock	0	.15	.04	.01
Pavement	.25	.12	.88	.47
Litter	56.50	48.29	36.91	19.11
Cryptogams	1.75	2.11	1.41	.33
Bare Ground	33.25	28.83	44.73	36.01

SOIL ANALYSIS DATA --
Herd Unit 10, Study # 18, Study Name: East Horse Pasture

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	ppm P	ppm K	dS/m
17.0	63.4 (15.2)	7.4	48.0	24.0	28.0	1.1	4.5	108.8	0.7

Stoniness Index



PELLET GROUP DATA --

Management unit 10 , Study no: 18

Type	Quadrat Frequency		
	'95	'00	'05
Sheep	-	-	2
Rabbit	22	23	28
Elk	1	-	3
Deer	17	41	28
Cattle	1	-	-

Days use per acre (ha)	
'00	'05
-	5 (12)
-	-
-	4 (10)
27 (67)	44 (107)
-	4 (9)

BROWSE CHARACTERISTICS --

Management unit 10 , Study no: 18

		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)
86	3833	-	133	1400	2300	-	7	90	60	6	10	21/23
95	2660	-	-	2180	480	520	50	14	18	7	8	22/34
00	2940	-	40	2160	740	640	33	18	25	10	12	20/32
05	2200	-	100	1200	900	480	45	38	41	19	19	24/36
<i>Atriplex canescens</i>												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
95	0	-	-	-	-	-	0	0	-	-	0	43/65
00	20	-	20	-	-	-	0	0	-	-	0	32/65
05	340	20	260	80	-	-	0	35	-	-	0	26/33

		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>Ceratoides lanata</i>												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
95	20	-	-	20	-	-	0	0	-	-	0	11/6
00	0	-	-	-	-	-	0	0	-	-	0	-/-
05	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Grayia spinosa</i>												
86	33	-	-	-	33	-	0	100	100	-	0	-/-
95	20	-	-	-	20	-	0	0	100	100	100	11/7
00	20	20	-	-	20	-	0	0	100	100	100	35/75
05	20	-	-	-	20	-	0	100	100	100	100	17/14
<i>Gutierrezia sarothrae</i>												
86	5065	333	1733	3166	166	-	0	0	3	-	0	9/6
95	8860	640	3420	5440	-	20	0	0	0	-	0	12/12
00	1220	-	560	660	-	-	0	0	0	-	0	8/9
05	2440	-	20	2420	-	-	0	0	0	-	0	13/12
<i>Opuntia sp.</i>												
86	199	-	33	66	100	-	0	0	50	-	0	5/4
95	100	-	20	80	-	-	0	0	0	-	0	5/14
00	80	20	-	80	-	20	0	0	0	-	0	4/14
05	160	-	20	120	20	-	0	0	13	13	13	7/20
<i>Sclerocactus sp.</i>												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
95	0	-	-	-	-	-	0	0	-	-	0	-/-
00	0	-	-	-	-	-	0	0	-	-	0	-/-
05	0	-	-	-	-	-	0	0	-	-	0	9/5