

Trend Study 25B-2-04

Study site name: Horse Valley.

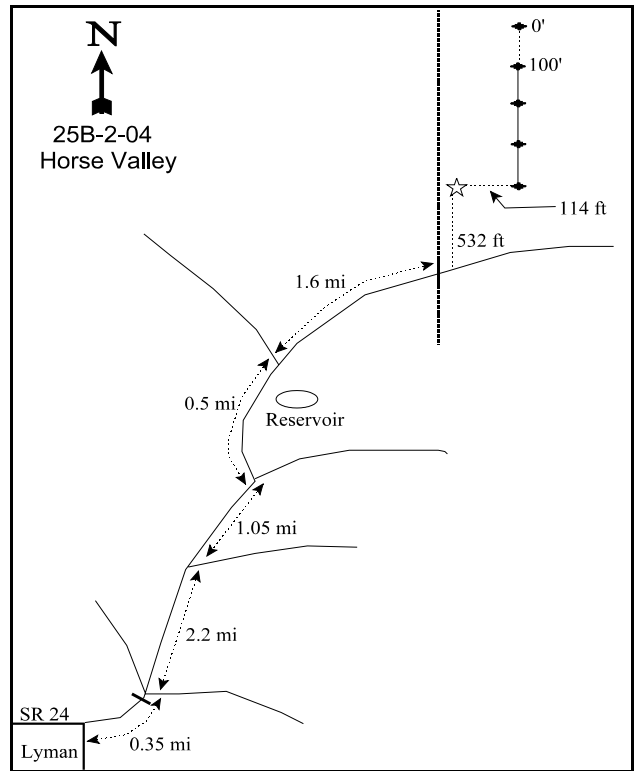
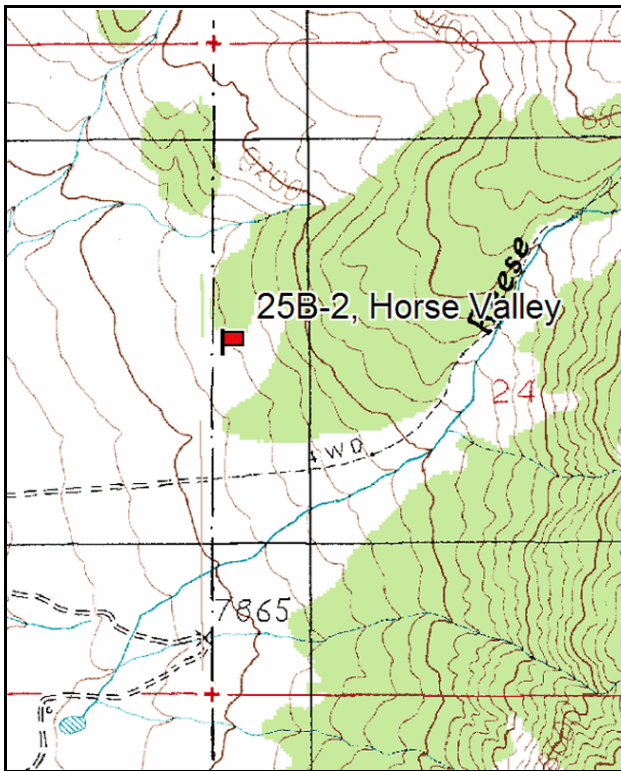
Vegetation type: Wyoming Big Sagebrush.

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

At the north end of main street (SR 24) in Lyman, SR 24 turns west towards Loa. Turn east here and go 0.35 miles to a 3-way split just beyond a cattleguard. Take the middle fork (the main road) and go 2.2 miles to a fork. Stay left and continue 1.05 miles on the main road to another fork. Again stay left and proceed 0.5 miles north just past a small reservoir to an intersection. Take the right fork toward Neffs Reservoir. On the main road, go 1.6 miles up and east across the top of some private land to a cattleguard at the Forest Service boundary. Park here, then walk 532 feet north along the east side of the fence to a witness post (rebar) next to the fence. The 400' stake is 114 feet east of the witness post. The 0-foot baseline stake lies 400 feet north, and has a red browse tag #7065 attached.



Map Name: Loa 1 NE, Utah

Diagrammatic Sketch

Township 27S, Range 3E, Section 24

GPS: NAD 27, UTM 12S 4255460 N, 452786 E

DISCUSSION

Horse Valley - Trend Study No. 25B-2

This transect is located in a sagebrush opening just east of the Forest Service boundary fence in Horse Valley. The west side of the fence is a strip of BLM land which has been proposed for a pinyon-juniper chaining and seeding treatment. Most of the valley is privately owned farmland. The study site has a gentle slope (5-10%) with a southwest aspect at an elevation of 8,000 feet. The key species is Wyoming big sagebrush. Cattle graze in the area as part of the Thousand Lakes allotment. The area is thought to be a winter deer concentration area, with many moving into the lower fields in late winter or early spring. However, the pellet group transect read along the baseline has shown very light use in both 1999 and 2004. In 1999, pellet group data estimated 1 days use/acre (3 du/ha) for both cattle and deer. In 2004, 1 deer and 1 elk days use/acre (3du/ha) were estimated.

The light brown-orange soil appears to be moderate deep with an effective rooting depth of almost 15 inches. It is composed mainly of sand and some silt with little organic matter. Textural analysis indicates it is a sandy clay loam soil that is mildly alkaline (pH of 7.6). Soil phosphorus (7.7 ppm) could be limiting to plant growth and development because it is below what is thought the minimal value of 10 ppm. Rocks and pavement together make up over 30% of the ground cover. Percent bare soil has varied from year to year, however the ratio of bare soil to protective cover improved from 1:1.8 in 1994 to 1:2.1 in 1999, but declined slightly in 2004 to 1:1.9. This would indicate a stable trend for soil, but still poor condition with herbaceous cover only contributing 8% of the total vegetative cover. Active gullies up to 1.5 feet deep are common. Movement of soil and rock fragments is detectable and in some places plant roots are exposed. A soil erosion condition rating rated erosion as slight in 2004.

Wyoming big sagebrush provides almost all of the browse cover on this site. However, there has been a lot difficulty through the years differentiating between black sagebrush and Wyoming big sagebrush on this site. There is obviously a high occurrence of hybridizing between the two and the great deal of variation expressed in the plants within the area sampled. Wyoming big sagebrush is the most dominant species. The population has many individuals that have hybridized with black sagebrush or with mountain big sagebrush. Forty percent of the leaf samples fluoresced with a black light, indicating regression with the higher elevation mountain big sagebrush. These sagebrush average 1.5 feet in height and 2.5 feet crowns. Wyoming big sagebrush was generally vigorous and growing well in 1985, but since then decadency has increased and remained between 37 and 45%. Utilization has been light and was very light in 2004. A few individuals have been more heavily utilized, usually individuals that are hybrids of mountain big sagebrush and Wyoming big sagebrush. The young age class was higher in 1985 and 1991, but has been smaller in subsequent readings with only 4% classified as young in 2004. Density has been stable since 1985 with the exception of 1994 when some plants were classified as black sagebrush.

Broom snakeweed and narrowleaf low rabbitbrush are also commonly found here. The narrowleaf low rabbitbrush is moderately abundant, but is generally small in stature. It displayed moderate to heavy use in past years (57% in '91 and 37% in '94), with some of the plants displaying poor vigor. Density has been lower in recent readings and utilization has been very light. Broom snakeweed density was very high in 1985 and 1991, but decreased rapidly by a factor of more than four times in 1994. It increased to 4,890 plants/acre in 1999 and remained relatively stable at 5,320 plants/acre in 2004. These kind of fluctuations in density occur often for this species with the variable precipitation patterns of southern Utah. Pinyon density was 53 trees/acre in 1999 using the point-quarter method. Average diameter was 2.3 inches. In 2004, this density increased to 118 trees/acre with an average diameter of only 1.0 inch. In 2004, 89% of the trees sampled were classified less than 4 feet tall.

Forbs and grasses are scarce and diversity is low with Wyoming big sagebrushes cover at nearly 20%. Grass frequency is very low and the most common species are blue grama and bottlebrush squirreltail. The total cover from grasses and forbs was just over 4% in 1999 and less than 2% in 2004. The most abundant forb has been pingue hymenoxys, an increaser which is often poisonous to sheep and sometimes to cattle. It decreased significantly in 2004.

1985 APPARENT TREND ASSESSMENT

Soil trend appears to be down. The soil is fairly unstable and has a low amount of cover. Small gullies are common and active. Vegetative trend appears slightly down because of the increase of undesirable increasers. The Wyoming big sagebrush population appears stable and moderately used. A proposed chaining would be helpful on the adjacent mature pinyon-juniper woodlands and older sagebrush stands as long as adequate cover is left for wildlife. More herbaceous vegetation is needed in the area to provide green forage for transitional spring range.

1991 TREND ASSESSMENT

Soil trend appears to be continuing slightly down because percent bare ground increased substantially with a corresponding loss of litter cover. Key browse species have decreased densities. Black sagebrush has decreased with percent decadency going from 14% up to 75%. Wyoming big sagebrush densities decreased only slightly, but percent decadency went from 14% up to 45%. Narrowleaf low rabbitbrush density decreased 13% due to drought and 96% are decadent. Broom snakeweed density increased by 24% from 6,199 to 8,199 plants per acre. This trend for broom snakeweed is contrary to most other sites in Utah this year.

TREND ASSESSMENT

soil - slightly down, poor condition (2)

browse - slightly down (2)

herbaceous understory - slightly up, but still very poor condition (4)

1994 TREND ASSESSMENT

Soil trend now appears to be stabilizing with percent bare ground cover slightly lower than 1991 estimates. The soils are considered in poor condition, but the trend has remained stable at this time. The key browse species (Wyoming big sagebrush) has a lower density, although this is primarily because of the increased sample size giving better density estimates for populations with discontinuous and/or clumped distributions. The principal feature changes noted for monitoring the condition and trend of this sagebrush population is that there are no seedlings (which is not unusual for Wyoming big sagebrush), the percent young is about 3%, and the percent of the population that are classified as decadent has slightly improved from 45% to 41%. However, 24% are now displaying poor vigor, up from 13% in 1991. Of major concern is that one in six Wyoming big sagebrush plants are dead. The proportion of black sagebrush displaying poor vigor has decreased to 33%, which is an improvement from 1991 when it was 75%. The increasers, narrowleaf low rabbitbrush and broom snakeweed, have experienced large decreases in their respective populations, 61% and 83%. Trend for browse is slightly down. The herbaceous understory trend is down for nested frequency values for both grasses and forbs has gone down since 1991. The Desirable Components Index (see methods) rating is fair at 32.

TREND ASSESSMENT

soil - stable, but poor condition (3)

browse - slightly down (2)

herbaceous understory - slightly down (2)

winter range condition (DC Index) - 32 (fair) Wyoming big sagebrush type

1999 TREND ASSESSMENT

Soil trend appears to be improving slightly with improving ratios of bare soil to protective cover. However, soils would still be considered in poor condition, but slightly improved at this time. Protective cover is still very low (herbaceous, litter, and cryptogamic cover), as illustrated by the number of active small gullies and pedestaling of most all the sagebrush. The key browse species (Wyoming big sagebrush) has a higher density, primarily because some of the plants were classified as black sagebrush during past readings. The principal feature changes noted for monitoring the condition and trend of this population is that there are few seedlings, the percent young is about 10%, and the percent of the population that are classified as decadent has remained in the low 40's (41%, still considered high). Although, those classified with poor vigor have decreased to 13%. The proportion of the sagebrush population classified as black sagebrush has gone down to where it is a very small portion of the sagebrush population. The increasers, low rabbitbrush and broom snakeweed, have again experienced a large decrease and increase in their respective populations, -65% and +71%. The herbaceous understory trend is stable for nested frequency values for grasses and forbs, but herbaceous vegetation is lacking.

TREND ASSESSMENT

soil - slightly up, but still poor condition (4)

browse - stable (3)

herbaceous understory - stable, but still very poor (3)

winter range condition (DC Index) - 45 (fair to good) Wyoming big sagebrush type

2004 TREND ASSESSMENT

The soil trend is stable, but still in poor condition. Herbaceous cover is very low and active gullies are found on the site. Rock and pavement help to prevent erosion from being worse. The trend for browse is stable. Wyoming big sagebrush density and cover has remained stable since 1999. Recruitment is poor as young and seedling plants are rare. Percent decadence improved slightly to 37%, but is still higher than desired. Broom snakeweed and low rabbitbrush increased in density and cover since 1999 and make up 21% of the total browse cover. The herbaceous understory is in poor condition and the trend is slightly down. Perennial grass frequency decreased slightly (15%) while perennial forb frequency decreased by 70%.

TREND ASSESSMENT

soil - stable, but still poor condition (3)

browse - stable (3)

herbaceous understory - slightly down, and very poor (2)

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

HERBACEOUS TRENDS --

Management unit 25B, Study no: 2

T y p e	Species	Nested Frequency					Average Cover %		
		'85	'91	'94	'99	'04	'94	'99	'04
G	Bouteloua gracilis	48	66	61	64	56	1.16	1.66	1.24
G	Carex spp.	-	6	-	-	-	-	-	-
G	Oryzopsis hymenoides	_a 1	_a 3	_a -	_a 1	_b 14	-	.00	.12
G	Sitanion hystrix	_{ab} 43	_b 72	_{ab} 56	_{ab} 50	_a 29	.34	.55	.18

Type	Species	Nested Frequency					Average Cover %		
		'85	'91	'94	'99	'04	'94	'99	'04
G	<i>Stipa comata</i>	ab ⁹	b ¹⁷	a ⁻	a ¹	a ⁻	.00	.00	-
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		101	164	117	116	99	1.50	2.22	1.54
Total for Grasses		101	164	117	116	99	1.50	2.22	1.54
F	<i>Androsace septentrionalis</i> (a)	-	-	-	7	-	-	.02	-
F	<i>Arabis demissa</i>	-	3	-	-	-	-	-	-
F	<i>Astragalus convallarius</i>	1	2	3	3	-	.00	.01	-
F	<i>Chaenactis douglasii</i>	-	3	-	-	-	-	-	-
F	<i>Cryptantha jamesii</i>	c ³⁰	bc ²⁴	ab ⁶	a ⁻	bc ¹¹	.04	-	.06
F	<i>Cryptantha</i> spp.	-	-	3	-	-	.03	-	-
F	<i>Erigeron pumilus</i>	4	8	3	3	-	.01	.01	-
F	<i>Hymenoxys richardsonii</i>	b ³⁹	b ⁵⁹	b ⁴²	b ⁵¹	a ⁷	1.16	2.17	.15
F	<i>Phlox longifolia</i>	-	-	-	3	-	-	.00	-
F	<i>Townsendia incana</i>	-	3	-	-	-	-	-	-
Total for Annual Forbs		0	0	0	7	0	0	0.01	0
Total for Perennial Forbs		74	102	57	60	18	1.25	2.19	0.21
Total for Forbs		74	102	57	67	18	1.25	2.21	0.21

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

BROWSE TRENDS --

Management unit 25B, Study no: 2

Type	Species	Strip Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
B	<i>Artemisia tridentata wyomingensis</i>	82	84	83	15.11	18.95	17.78
B	<i>Atriplex canescens</i>	0	3	0	-	-	-
B	<i>Chrysothamnus viscidiflorus stenophyllus</i>	46	25	36	1.06	.46	1.72
B	<i>Echinocereus</i> spp.	0	1	1	-	-	-
B	<i>Gutierrezia sarothrae</i>	41	68	75	.18	1.15	3.43
B	<i>Leptodactylon pungens</i>	0	1	0	-	-	-
B	<i>Opuntia</i> spp.	7	17	13	.04	.13	.21
B	<i>Pinus edulis</i>	0	4	5	-	.15	.21
Total for Browse		176	203	213	16.39	20.85	23.37

CANOPY COVER, LINE INTERCEPT --
Management unit 25B, Study no: 2

Species	Percent Cover
	'04
Artemisia tridentata wyomingensis	18.28
Chrysothamnus viscidiflorus stenophyllus	.75
Gutierrezia sarothrae	4.80
Pinus edulis	.65

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 25B, Study no: 2

Species	Average leader growth (in)
	'04
Artemisia tridentata wyomingensis	1.4

POINT-QUARTER TREE DATA --
Management unit 25B, Study no: 2

Species	Trees per Acre		Average diameter (in)	
	'99	'04	'99	'04
Pinus edulis	53	118	2.3	1.0

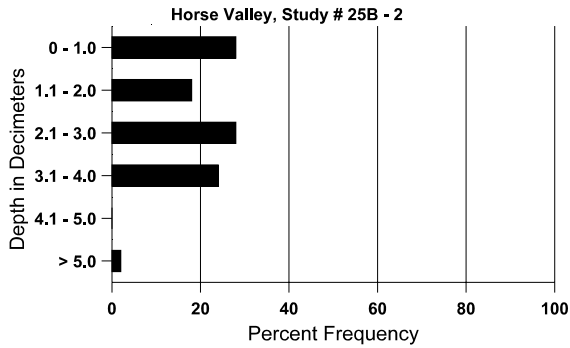
BASIC COVER --
Management unit 25B, Study no: 2

Cover Type	Average Cover %				
	'85	'91	'94	'99	'04
Vegetation	6.50	5.75	18.79	24.79	24.46
Rock	11.00	17.25	18.92	12.81	16.38
Pavement	31.50	25.75	8.72	22.56	27.48
Litter	23.50	14.50	16.85	21.91	23.25
Cryptogams	1.75	.75	1.15	2.45	1.54
Bare Ground	25.75	36.00	34.85	24.42	25.75

SOIL ANALYSIS DATA --
Management unit 25B, Study no: 2, Study Name: Horse Valley

Effective rooting depth (in)	Temp °F (depth)	pH	% sand	% silt	% clay	%OM	PPM P	PPM K	ds/m
14.5	59.3 (10.5)	7.6	50.9	27.8	21.3	2.2	7.7	112.0	0.5

Stoniness Index



PELLET GROUP DATA --

Management unit 25B, Study no: 2

Type	Quadrat Frequency		
	'94	'99	'04
Rabbit	14	9	3
Elk	-	-	-
Deer	8	3	-
Cattle	-	-	-

Days use per acre (ha)	
'99	'04
-	-
-	1 (3)
1 (2)	1 (3)
1 (2)	-

BROWSE CHARACTERISTICS --

Management unit 25B, Study no: 2

		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)
Artemisia frigida												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	66	-	-	66	-	-	0	0	-	-	0	3/3
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	0	-	-	-	-	-	0	0	-	-	0	-/-
04	0	-	-	-	-	-	0	0	-	-	0	-/-
Artemisia tridentata wyomingensis												
85	4799	266	733	3400	666	-	69	6	14	-	8	19/25
91	4399	66	600	1733	2066	-	29	14	47	3	17	17/23
94	3820	200	100	2100	1620	1100	24	3	42	26	26	19/35
99	4520	60	440	2240	1840	980	28	3	41	14	14	18/28
04	4400	100	180	2600	1620	980	7	0	37	23	23	17/27

		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)
Atriplex canescens												
85	0	-	-	-	-	-	0	0	0	-	0	-/-
91	0	-	-	-	-	-	0	0	0	-	0	-/-
94	0	-	-	-	-	-	0	0	0	-	0	-/-
99	80	-	-	60	20	-	25	0	25	25	25	-/-
04	0	-	-	-	-	-	0	0	0	-	0	-/-
Chrysothamnus viscidiflorus stenophyllus												
85	8666	400	1000	3733	3933	-	22	10	45	.69	13	5/7
91	7532	-	66	266	7200	-	35	22	96	16	62	5/7
94	2940	-	-	2040	900	420	30	7	31	12	12	4/6
99	1180	20	180	740	260	220	0	0	22	12	12	6/10
04	1480	-	80	940	460	120	8	7	31	12	12	7/11
Echinocereus triglochidatus												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	20	-	-	20	-	-	0	0	-	-	0	4/6
04	20	-	-	20	-	-	0	0	-	-	0	3/6
Gutierrezia sarothrae												
85	6199	9466	1000	5066	133	-	9	0	2	.64	9	7/6
91	8199	66	666	6533	1000	-	2	.81	12	-	2	5/4
94	1420	-	200	1120	100	380	0	0	7	1	1	7/6
99	4980	2340	3180	1300	500	200	0	0	10	.40	.40	7/8
04	5320	-	120	5180	20	40	0	0	0	-	0	7/9
Leptodactylon pungens												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	40	-	40	-	-	-	0	0	-	-	0	-/-
04	0	-	-	-	-	-	0	0	-	-	0	-/-
Opuntia spp.												
85	1799	-	133	1466	200	-	0	0	11	-	33	3/4
91	932	-	266	466	200	-	7	0	21	-	0	3/4
94	160	-	-	140	20	-	0	0	13	-	0	3/7
99	600	20	160	320	120	60	0	0	20	20	20	3/11
04	400	-	-	400	-	-	0	0	0	-	0	3/12

		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)
Pinus edulis												
85	66	266	66	-	-	-	0	0	-	-	0	-/-
91	66	133	66	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	80	40	80	-	-	-	0	0	-	-	0	-/-
04	120	20	100	20	-	-	0	0	-	-	0	-/-