Trend Study 11B-2-05

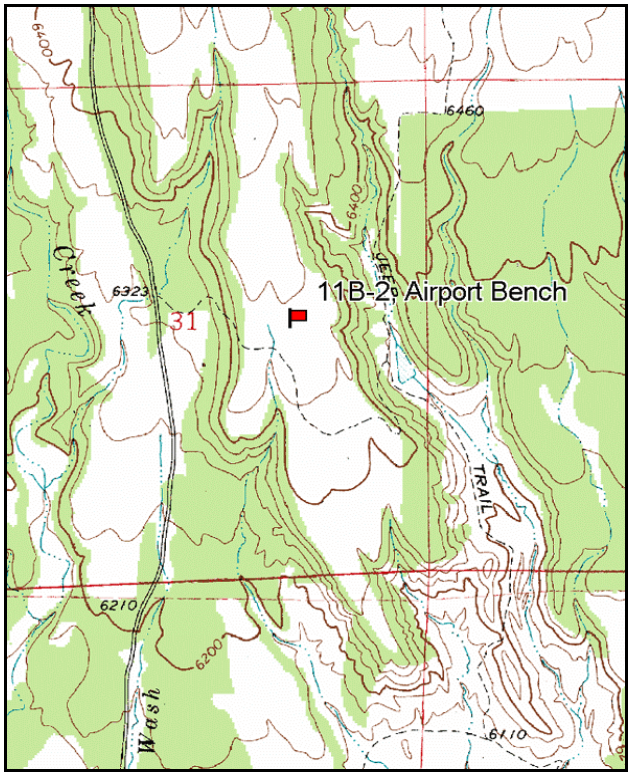
Study site name: Airport Bench . Vegetation type: Chained, Seeded P-J .

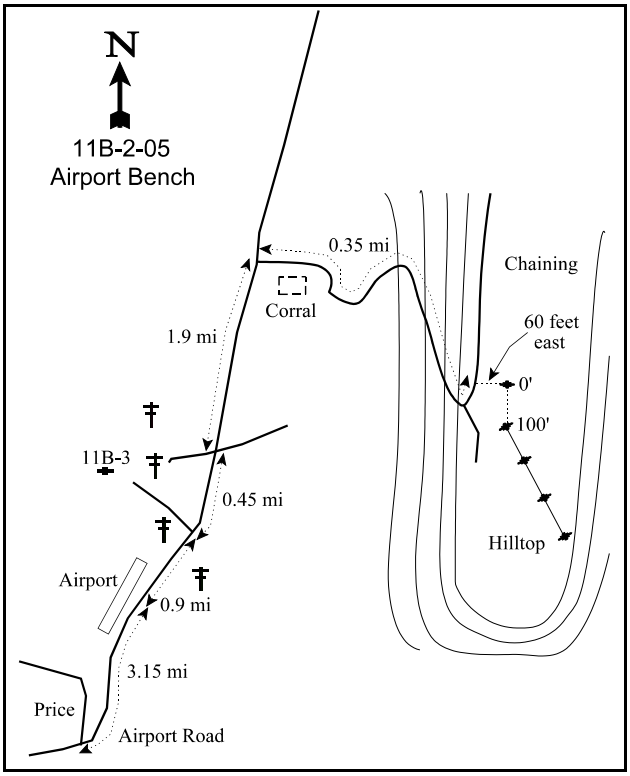
Compass bearing: frequency baseline 170 degrees magnetic.

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

LOCATION DESCRIPTION

Turn east on the Airport Road at the southeast end of Price and go 3.15 miles to the airport. After another 0.9 miles on the main road, you cross under a power line. Continue 0.45 miles to an intersection. Stay left. Go another 1.9 miles and turn right onto a dirt road just beyond a corral. Drive up this rocky road 0.35 miles to a fork on top of the bench. Bear left and go approximately 100 feet. The transect is in the chaining on the right side of the road. The 100-foot end of the baseline is 60 feet east of the road. All transect stakes are 1- to 2-foot tall fence posts.





Map Name: Deadman Canyon

Diagrammatic Sketch

Township 13S , Range llE , Section 31

GPS: NAD 27, UTM 12S 4389026 N, 523587 E

DISCUSSION

Airport Bench - Trend Study No. 11B-2

The Airport Bench study site is located approximately two miles south of the Deadman (11B-1). This bench was also part of the 1965 chaining and seeding project. As part of the same grazing allotment, management is similar except cattle use this area at a different time each year. Vegetation composition and condition has paralleled that of the Deadman study site, with the exception of a much higher cover value for pinyon-juniper on Deadman. The pinyon and juniper on the site were selectively burned in May of 2005 and the site was read in August of that year. The site is at an elevation of 6,400 feet and is nearly level, although the bench top does slope slightly southward. As with the Deadman site (11B-1), human pressure is high because of its proximity and easy access to Price. Evidence of human activity includes wood cutting, ORV tracks, and litter. Deer pellet groups are common. Quadrat frequency of deer pellet groups was high in 1994 at 60% and steadily declined to 17% by 2005. Pellet group transect data taken on the study site baseline in 2000 provided an estimate of 54 deer use days/acre (133 ddu/ha). In 2005, estimated pellet group data was 36 deer and 5 cow days use/acre (88 ddu/ha and 13 cdu/ha).

The soil is compacted, but appears to be fairly deep with an effective rooting depth estimated at 15 inches. It has a sandy clay loam texture which had a relative rock-pavement cover of 16% in 1994, 13% in 2000, and 24% in 2005. Rocks are also common throughout the soil profile. Soil phosphorous was measured at 6.3 ppm, where values less than 6 ppm may limit normal growth and development in wildland soils (Tiedemann and Lopez 2004). Vegetation cover from crested wheatgrass combined with level terrain tends to limited erosion. The erosion condition class determined soil movement as stable in 2005.

As previously mentioned, vegetation composition is quite similar to the Deadman study (11B-1), but desirable browse forage is more limited here. Utah Juniper provided 8% cover in 2000. Trees averaged 8-10 feet in height before the 2005 burn. Point-quarter data from 2000 estimated 211 juniper and 97 pinyon trees/acre with an average diameter of 3.2 and 3.6 inches, respectively. These trees also appeared to have been released by the chaining, since only 10% of the junipers sampled were tipped over surviving chained trees. In 2005 after the fire, point-quarter data estimated 27 pinyon and juniper trees/acre, all of which were 1-4 feet tall.

True mountain mahogany was fairly abundant in 1986 at an estimated 199 plants/acre. These were moderately hedged but vigorous. With the much larger sample size used since 1992, this clumped population was estimated at only 40 plants/acre in 1994 and no plants were encountered in 2000 and 2005. There are some tall mahogany plants scattered throughout the site which appear to be heavily hedged, but much of the forage is unavailable due to height. In 2005, those mahogany which were not heavily burned were heavily hedged. Bitterbrush (seeded) and green Ephedra are uncommon. Most of the bitterbrush seen in the surrounding area were heavily hedged in 2000 and moderately hedged in 2005. Use of ephedra is consistently light to moderate. The only abundant shrub on the site before the burn was broom snakeweed, which increased from 160 plants/acre in 1994 to 3,320 in 2000. In 2005, there were only 340 plants/acre measured, this decline in numbers likely due to the burn treatment.

Crested wheatgrass dominates the herbaceous understory and provided 6% cover in 1994, then increased to 16% in 2000. Other grass species combined provided less <1% every year. After the fire in 2005, the crested wheatgrass had declined drastically to 2% cover and nested frequency was significantly lower than any previous reading. There is also some Indian ricegrass and mutton bluegrass scattered throughout the understory. Perennial forbs are not very common and do not produce significant forage, but increased after the fire from <1% cover 2000 to 3% in 2005. Annual forbs were also positively impacted by the burn. Annual forbs increased from no cover in 2000 to 11% in 2005.

1986 APPARENT TREND ASSESSMENT

Although the site is similar to the Deadman transect in may ways, overall this area appears to be in a slightly worse condition with a downward trend. There are few desirable shrubs, mainly true mountain mahogany. Juniper and pinyon appear to be rapidly increasing. The lack of shrub reproduction may indicate a declining population due to increased competition with the pinyon and juniper. Mean annual precipitation would be less at this lower site, as a result, the trees would have a greater competitive influence on understory composition. The soil trend appears stable.

1994 TREND ASSESSMENT

Comparing the data with 1986, the soil trend is slightly down, as litter cover has declined and percent bare ground has increased substantially. This basic trend has been noted throughout the state because of the prolonged drought. The browse trend is stable to declining and in poor condition because of the low numbers of useful shrubs present. When the young pinyon and juniper trees become more mature, they will have a strong negative effect on the understory browse. A treatment with a roller chopper would be timely and cost effective at this time. The herbaceous understory trend is slightly down with significant decreases in crested wheatgrass nested frequency and a very high occurrence of annual Russian thistle throughout the understory. Together they make up 85% of the total herbaceous understory cover. The Desirable Components Index score was poor due to very low browse cover and only moderate perennial grass cover.

TREND ASSESSMENT
soil - slightly down (-1)
browse - slightly down (-1)
herbaceous understory - slightly down (-1)
winter range condition (DC Index) - Poor (17) Lower Potential scale

2000 TREND ASSESSMENT

Trend for soil appears to be slightly up. The relative percent cover of bare ground declined from 31% down to 21%. Cover of litter and vegetation have both increased substantially. In addition, the dominant crested wheatgrass has increased significantly in nested frequency and cover has more than doubled. Erosion is minimal due to the level terrain combined with the abundant herbaceous cover. Trend for browse is slightly down. The browse composition is poor with few useful shrubs present. The declining trend is based upon an increase in pinyon-juniper cover. Juniper currently provides 82% of the total browse cover and juniper and pinyon have increased in size and density since 1994. Cover has increased from 2% in 1994 to 9% in 2000. Broom snakeweed has increased in density from 160 plants/acre in 1994 to 3,320 by 2000. Trend for the herbaceous understory is slightly up due to an increase in the nested frequency of crested wheatgrass which currently provides 98% of the herbaceous cover. Sum of nested frequency of perennial forbs has declined. However, perennial forbs are limited and produce little useful forage and perennial grasses are more important on this winter range. Russian thistle was also much less abundant. The DCI score increased to fair due to increases in perennial grass cover.

TREND ASSESSMENT
soil - slightly up (+1)
browse - slightly down (-1)
herbaceous understory - slightly up (+1)
winter range condition (DC Index) - Fair (31) Lower Potential scale

2005 TREND ASSESSMENT

The trend for soil is stable. Protective ground cover decreased slightly due to the burn and relative bare ground increased from 21% to 28%. The 2005 erosion condition class rated the soil as stable. The trend for browse is slightly up, due to the reduction of pinyon and juniper from the fire. The key browse species on the site since 2000 has been green ephedra. The population of green ephedra decreased 75% (60 plants/acre). However, 240 young Wyoming big sagebrush plants/acre were estimated to occur on the site. No sagebrush had previously been sampled. A very small stable population of fourwing saltbush remains on the site. The broom snakeweed population declined substantially from 3,320 plant/acre in 2000 to 340 in 2005. This decline may be due to the burn, although the population may increase again because of the lack of competition from other shrub species. The largest improvement on the browse component was the decrease in pinyon-juniper cover caused by the fire. Combined pinyon-juniper cover was 9% in 2000 and decreased to 1% in 2005. The herbaceous understory trend is down. This trend decline is due mainly to an overwhelming 11-fold increase in the nested frequency of annual forbs from 2000 to 2005 coupled with a 64% decrease in the nested frequency of perennial grasses, particularly crested wheatgrass. The annual species that increased were dominated by weedy species like annual stickseed and Russian thistle. Despite the decline in perennial grasses and the increase in annual forbs, the nested frequency of perennial forbs increased substantially. Perennial forbs on this site are of secondary importance to perennial grasses. The DCI score decreased to poor due to decreases in perennial grass cover.

TREND ASSESSMENT
soil - stable (0)
browse - slightly up (+1)
herbaceous understory - down (-2)
winter range condition (DC Index) - Poor (14) Lower Potential scale

HERBACEOUS TRENDS --
Management unit 11B, Study no: 2

Type	Species	Nested Frequency				Average Cover %		
		'86	'94	'00	'05	'94	'00	'05
G	Agropyron cristatum	$_{c}$302	$_{b}$240	$_{c}$298	$_{a}$93	6.41	16.37	2.44
G	Agropyron intermedium	-	-	-	-	-	-	.01
G	Oryzopsis hymenoides	16	42	28	19	.72	.11	.45
G	Poa fendleriana	6	-	-	-	-	-	-
G	Sitanion hystrix	-	-	-	5	-	-	.09
Total for Annual Grasses		0	0	0	0	0	0	0
Total for Perennial Grasses		324	282	326	117	7.13	16.48	3.00
Total for Grasses		324	282	326	117	7.13	16.48	3.00
F	Chenopodium fremontii (a)	-	$_{a}$-	$_{a}$-	$_{b}$13	-	-	.23
F	Chenopodium leptophyllum(a)	-	-	-	6	-	-	.04
F	Cirsium sp.	-	-	-	-	-	-	.03
F	Collinsia parviflora (a)	-	-	-	3	-	-	.00
F	Cryptantha fulvocanescens	8	17	9	6	.21	.07	.17
F	Descurainia pinnata (a)	-	$_{a}$11	$_{a}$-	$_{b}$74	.03	-	.66

Type	Species	Nested Frequency				Average Cover %		
		'86	'94	'00	'05	'94	'00	'05
F	Eriogonum cernuum (a)	-	$_{a}$-	$_{a}$1	$_{b}$185	-	.00	5.49
F	Eriogonum ovalifolium	-	8	1	4	.07	.00	.04
F	Eriogonum umbellatum	$_{b}$19	$_{ab}$17	$_{a}$-	$_{a}$-	.03	-	-
F	Euphorbia fendleri	$_{ab}$10	$_{b}$24	$_{a}$9	$_{ab}$23	.26	.04	.73
F	Gayophytum ramosissimum(a)	-	-	-	2	-	-	.03
F	Ipomopsis aggregata	-	1	-	-	.00	-	-
F	Lappula occidentalis (a)	-	$_{a}$-	$_{a}$-	$_{b}$85	-	-	.52
F	Lactuca serriola	-	-	-	6	-	-	.04
F	Lesquerella sp.	$_{a}$-	$_{ab}$6	$_{b}$14	$_{ab}$1	.03	.03	.01
F	Lithospermum incisum	2	7	4	3	.08	.03	.04
F	Linum lewisii	-	-	-	-	-	-	.00
F	Malcolmia africana	-	-	-	3	-	-	.03
F	Machaeranthera canescens	$_{a}$-	$_{ab}$4	$_{a}$3	$_{b}$15	.04	.00	.64
F	Medicago sativa	$_{b}$11	$_{ab}$9	$_{ab}$2	$_{a}$-	.02	.03	-
F	Penstemon cyanocaulis	$_{a}$2	$_{b}$50	$_{a}$2	$_{b}$38	.34	.01	1.11
F	Salsola iberica (a)	-	$_{c}$263	$_{a}$4	$_{b}$186	5.12	.00	3.72
F	Sisymbrium altissimum (a)	-	-	-	12	-	-	.73
F	Tragopogon dubius	-	-	-	8	-	-	.04
Total for Annual Forbs		0	274	5	566	5.15	0.00	11.45
Total for Perennial Forbs		52	143	44	107	1.10	0.23	2.90
Total for Forbs		52	417	49	673	6.26	0.24	14.35

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

BROWSE TRENDS --
Management unit 11B, Study no: 2

Type	Species	Strip Frequency			Average Cover %		
		'94	'00	'05	'94	'00	'05
B	Artemisia tridentata wyomingensis	0	0	3	-	-	.03
B	Atriplex canescens	0	1	2	-	.15	.88
B	Cercocarpus montanus	2	0	0	.18	-	-
B	Chrysothamnus nauseosus	0	1	0	-	-	.03
B	Chrysothamnus viscidiflorus viscidiflorus	0	1	1	-	-	-
B	Ephedra viridis	2	2	1	-	.00	.53
B	Gutierrezia sarothrae	2	31	12	-	.73	1.21
B	Juniperus osteosperma	0	11	2	1.77	8.03	1.00
B	Opuntia sp.	1	1	0	-	-	-
B	Pinus edulis	0	1	0	-	.88	-
Total for Browse		7	49	21	1.95	9.80	3.69

CANOPY COVER, LINE INTERCEPT --
Management unit 11B, Study no: 2

Species	Percent Cover	
	'00	'05
Atriplex canescens	-	1.31
Chrysothamnus viscidiflorus viscidiflorus	-	.28
Ephedra viridis	-	1.08
Gutierrezia sarothrae	-	1.14
Juniperus osteosperma	4.19	.76

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 11B, Study no: 2

Species	Average leader growth (in)
	'05
Cercocarpus montanus	4.3

POINT-QUARTER TREE DATA --
Management unit 11B, Study no: 2

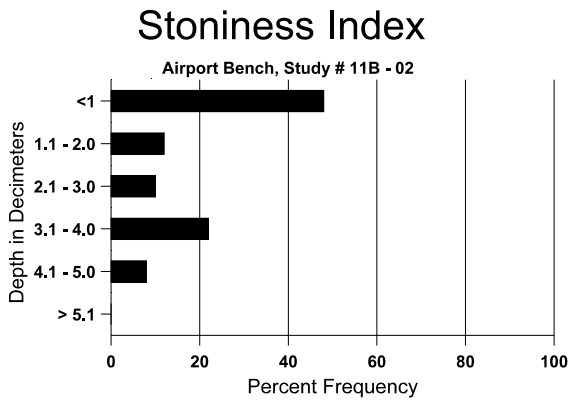
Species	Trees per Acre		Average diameter (in)	
	'00	'05	'00	'05
Juniperus osteosperma	211	27	3.2	1.8
Pinus edulis	97	-	3.6	-

BASIC COVER --
Management unit 11B, Study no: 2

Cover Type	Average Cover %			
	'86	'94	'00	'05
Vegetation	14.00	14.85	26.38	19.81
Rock	5.25	7.11	3.84	3.25
Pavement	10.25	5.91	11.58	22.76
Litter	51.25	28.81	45.04	31.90
Cryptogams	0	0	.04	0
Bare Ground	19.25	24.90	23.78	30.25

SOIL ANALYSIS DATA --
Herd Unit 11B, Study # 2, Study Name: Airport Bench

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	ppm P	ppm K	dS/m
15.0	52.4 (16.2)	7.5	54.0	22.0	24.0	3.9	6.3	147.2	0.7



PElLET GROUP DATA --
Management unit 11B, Study no: 2

Type	Quadrat Frequency		
	'94	'00	'05
Rabbit	58	30	31
Elk	3	-	1
Deer	60	42	17
Cattle	6	5	2

Days use per acre (ha)	
'00	'05
-	-
-	-
55 (134)	36 (88)
1 (2)	5 (13)

BROWSE CHARACTERISTICS --
Management unit 11B, 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 tridentata wyomingensis												
86	**0**	-	-	-	-	-	0	0	-	-	0	-/-
94	**0**	-	-	-	-	-	0	0	-	-	0	-/-
00	**0**	-	-	-	-	-	0	0	-	-	0	-/-
05	**240**	40	240	-	-	-	0	0	-	-	0	7/6
Atriplex canescens												
86	**0**	-	-	-	-	-	0	0	-	-	0	-/-
94	**0**	-	-	-	-	-	0	0	-	-	0	-/-
00	**20**	-	-	20	-	-	100	0	-	-	0	22/46
05	**40**	-	20	20	-	-	0	0	-	-	0	56/91
Cercocarpus montanus												
86	**199**	-	66	133	-	-	100	0	-	-	0	63/39
94	**40**	-	-	40	-	-	0	0	-	-	0	46/45
00	**0**	-	-	-	-	-	0	0	-	-	0	60/71
05	**0**	-	-	-	-	-	0	0	-	-	0	47/51
Chrysothamnus nauseosus												
86	**0**	-	-	-	-	-	0	0	-	-	0	-/-
94	**0**	-	-	-	-	-	0	0	-	-	0	-/-
00	**80**	40	80	-	-	20	0	0	-	-	0	22/21
05	**0**	-	-	-	-	-	0	0	-	-	0	-/-
Chrysothamnus viscidiflorus viscidiflorus												
86	**0**	-	-	-	-	-	0	0	-	-	0	-/-
94	**0**	-	-	-	-	-	0	0	-	-	0	-/-
00	**20**	-	-	20	-	-	0	0	-	-	0	5/7
05	**60**	-	60	-	-	-	0	0	-	-	0	18/15

		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)
Echinocereus sp.												
86	**0**	-	-	-	-	-	0	0	-	-	0	-/-
94	**0**	-	-	-	-	-	0	0	-	-	0	-/-
00	**0**	-	-	-	-	-	0	0	-	-	0	6/18
05	**0**	-	-	-	-	-	0	0	-	-	0	-/-
Ephedra viridis												
86	**0**	-	-	-	-	-	0	0	0	-	0	-/-
94	**100**	-	20	60	20	-	0	0	20	-	0	39/59
00	**80**	-	-	80	-	-	25	0	0	-	0	32/48
05	**20**	-	-	20	-	-	0	0	0	-	0	37/63
Gutierrezia sarothrae												
86	**0**	-	-	-	-	-	0	0	0	-	0	-/-
94	**160**	-	-	80	80	-	0	0	50	-	0	9/10
00	**3320**	200	20	3160	140	300	0	0	4	3	3	5/6
05	**340**	-	-	340	-	-	0	0	0	-	0	13/20
Juniperus osteosperma												
86	**199**	-	133	66	-	-	0	0	0	-	0	31/30
94	**0**	-	-	-	-	-	0	0	0	-	0	-/-
00	**240**	-	100	120	20	-	0	0	8	-	8	-/-
05	**40**	-	20	-	20	160	0	0	50	50	50	-/-
Opuntia sp.												
86	**0**	-	-	-	-	-	0	0	-	-	0	-/-
94	**20**	-	-	20	-	-	0	0	-	-	0	4/13
00	**40**	-	-	40	-	-	0	0	-	-	0	4/18
05	**0**	-	-	-	-	-	0	0	-	-	0	3/14
Pinus edulis												
86	**66**	-	-	66	-	-	0	0	-	-	0	87/70
94	**0**	-	-	-	-	-	0	0	-	-	0	-/-
00	**20**	-	20	-	-	-	0	0	-	-	0	-/-
05	**0**	-	-	-	-	20	0	0	-	-	0	-/-
Purshia tridentata												
86	**200**	-	-	200	-	-	33	0	-	-	0	31/45
94	**0**	-	-	-	-	-	0	0	-	-	0	26/47
00	**0**	-	-	-	-	-	0	0	-	-	0	24/69
05	**0**	-	-	-	-	-	0	0	-	-	0	52/88