

Trend Study 25A-4-04

Study site name: Durfee Homestead .

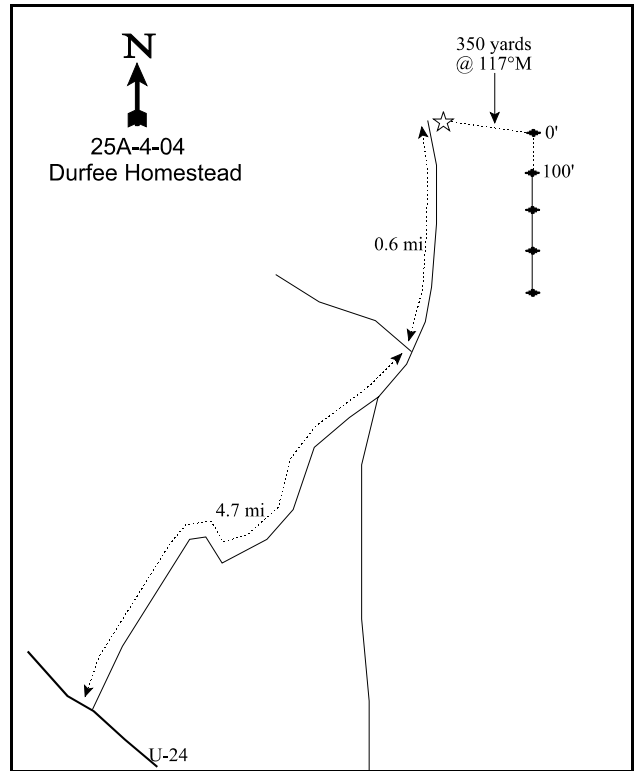
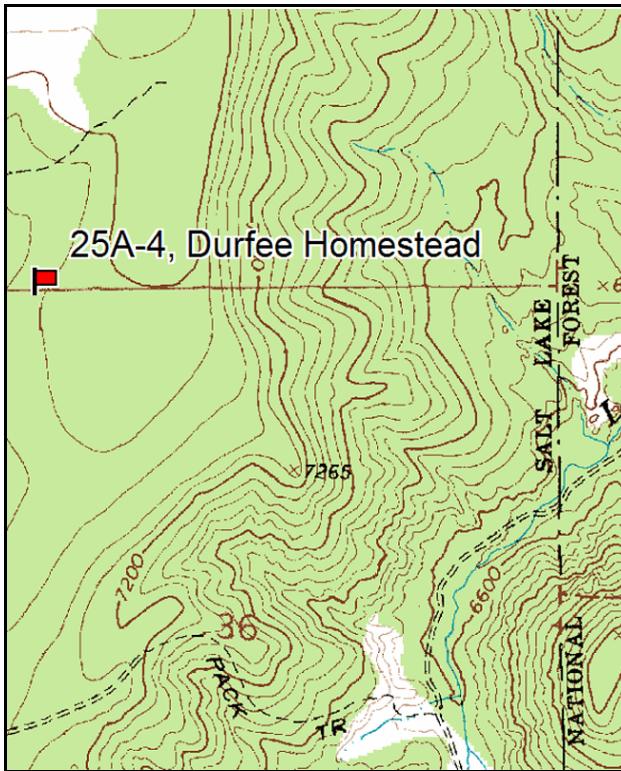
Vegetation type: Chained, Seeded P-J .

Compass bearing: frequency baseline 180 degrees magnetic.

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

LOCATION DESCRIPTION

From Sigurd, drive east on U-24 to mile marker 21. Turn left (north) on the Sand Ledge Road and drive northeast for 1.6 miles. Turn left at the intersection and proceed north 3.1 miles to an intersection with a trough and pond. Continue 0.1 miles to a road that goes up the draw bottom. Drive up this road for 0.5 miles. Stop at the witness post (1/2" red rebar 2' tall on east side of road) and walk out 350 yards at a bearing of 117 degrees magnetic. The baseline starts out in the chaining about 100 feet from the edge of the PJ. The 0-foot baseline stake has a red browse tag #7194 attached.



Map Name: Rex Reservoir, Utah

Diagrammatic Sketch

Township 23S , Range 1W , Section 36

GPS: NAD 27, UTM 12S 4290868 N, 425073 E

DISCUSSION

Durfee Homestead - Trend Study No. 25A-4

The Durfee Homestead trend study lies on BLM administered land, in an area that was chained and seeded in 1983. The transect is on a west aspect with a 10% slope at an elevation of 7,400 feet. Scattered patches of pinyon-juniper were left as protective cover. The transect is located within 100 feet of a dense pinyon-juniper border of unchained, mature trees. The area is used in the late spring by cattle as part of the Sand Ledge allotment which is administered by the BLM. Pellet group transect data indicates use by wildlife and livestock is moderate. In 1999, pellet group data estimated 15 deer (38 ddu/ha), 33 elk (82 edu/ha), and 16 cow days use/acre (40 cdu/ha). Pellet group data from 2004 estimated 15 deer (36 ddu/ha), 7 elk (17 edu/ha), and 4 cow days use/acre (9 cdu/ha).

The soil is a loam to clay loam in texture and has a slightly alkaline pH (7.5). Soil organic matter is moderately high at 4.3%. Rock is prevalent on the surface and throughout the profile, resulting in an estimated effective rooting depth of just under 12 inches. Rock and pavement together provided nearly 40% of the surface cover in 1999 and increased to nearly 60% in 2004. Bare ground was relatively low at about 20% in 1999 and decreased to 9% in 2004, mostly likely due to increase in rock and pavement. Litter and slash from the chaining made up 72% of the ground cover in 1985, dropping to only 21% by 1991. It appears that litter was greatly overestimated in 1985. Litter was estimated at 15% in 2004. Erosion is minimal due to the heavily armored surface from pavement and rock. The erosion condition class determined soil movement as stable in 2004.

The chaining was very effective in removing the overstory of juniper and pinyon. However, preferred browse species are almost non-existent following the chaining and seeding. The key browse species are Wyoming big sagebrush, antelope bitterbrush, and a very sparse Utah serviceberry. Together, these preferred species provide only about 6% of the browse cover. Wyoming big sagebrush density was 20 plants/acre in 1999 and increased to 100 in 2004, but was greatly reduced following a fire previous to the 1991 reading. Bitterbrush (also not tolerant of fire) density was estimated at 20 plants/acre in 2004, 40 in 1999, which was down from an estimated 532 plants/acre when the site was first read in 1985. Slenderbush eriogonum was moderately utilized in 1999, but this species is small and does not produce much forage. It was estimated at 1,732 plants/acre in 1985 and due to fire is only estimated at 120 plants/acre in 2004.

The increaser, stickyleaf low rabbitbrush, currently dominates the browse component. This species has increased during each sampling period, especially since the fire, and was estimated at 3,640 plant/acre in 2004. The population was all young plants in 1991. In 2004, it was mostly mature and appeared to have a stable population with low recruitment (6%). The average height and crown measurements for low rabbitbrush have more than doubled since 1985. Broom snakeweed was the second most abundant browse in 2004 with an estimated density of 3,200 plants/acre, which was up from 1,700 in 1999. Small clumps of Gambel oak clones occur on the site.

Herbaceous vegetation is diverse, moderately dense, and composed mainly of native species. Several seeded grasses are present, but occur infrequently. These species include: smooth brome, crested wheatgrass, and intermediate wheatgrass. Native grasses are the most abundant with bluebunch wheatgrass, Sandberg bluegrass, mutton bluegrass, and bottlebrush squirreltail all present. Cheatgrass is present at the site and has increased from 10% of the grass cover in 1999 to 21% in 2004. Forbs are sparse, but fairly diverse and include a few valuable species such as sulfur and redroot eriogonum, tapertip hawksbeard, and hoary aster.

The area was to have been rested from livestock grazing since the chaining, however the pellet group transect has noted cattle trespass since 1999.

1985 APPARENT TREND ASSESSMENT

Current soil condition is fairly good and appears stable. Vegetative trend appears up as the browse recovers from the chaining.

1991 TREND ASSESSMENT

A fire occurred on the area since the 1985 survey. The data showed a loss of almost all the bitterbrush, slenderbush eriogonum, and dwarf rabbitbrush, while low rabbitbrush increased by 63%, and Wyoming big sagebrush decreased by almost 95%. These spectacular changes can all be attributed to the effect of a fire on two species that are especially not tolerant of fire. Almost all grasses have decreased values for both sum of nested and quadrat frequency. Most forbs did have increased sum of nested and quadrat frequency values, but the ones with the highest quadrat frequencies are increasers (fire related), e.g. pale agoseris, thistle, prickly lettuce, and hoary aster. Percent rock cover increased by 68% and percent pavement increased by 56%. Litter cover decreased by 71%. Percent bare ground increased from 9% to 26%. All these findings indicate a downward trend. This trend was surely aggravated by the drought, slope, and west aspect.

TREND ASSESSMENT

soil - down (1)

browse - down (1)

herbaceous understory - down (1)

1999 TREND ASSESSMENT

Trend for soil is considered stable to improving. Rock and pavement provide nearly 40% of the surface cover at the present time which armors the surface from heavy erosion. Bare ground and litter cover both decreased in 1999, with vegetative cover increasing. Trend for browse is down. The preferred species, Wyoming big sagebrush and bitterbrush, provide less than 5% of the browse cover, and have not recovered from the fire prior to the 1991 reading. These species have very low densities and young and seedling recruitment are currently nonexistent. Stickyleaf low rabbitbrush is the dominant species in the chaining. It continues to increase in density and stature. Average height crown measurements have more than doubled since 1985. Broom snakeweed, another increaser, is the second most abundant browse species. Trend for the herbaceous understory is slightly up. Perennial grasses are the dominate group in the understory providing the great majority of the herbaceous cover. Sum of nested frequency for perennial grasses and forbs combined increased in 1999. The Desirable Components Index rated this site as fair with a score of 27 due to low shrub cover, few young shrubs, and good perennial grass and forb cover.

TREND ASSESSMENT

soil - stable (3)

browse - down (1)

herbaceous understory - slightly up (4)

winter range condition (DC Index) - 27 (fair) Wyoming big sagebrush type

2004 TREND ASSESSMENT

Trend for soils is stable. Bare ground has decreased in percent cover, but rock and pavement combined increased from 40% relative cover to 60%, which may suggest some soil loss. Overall the high rock and pavement provide good armoring against erosion. Trend for key browse Wyoming big sagebrush and antelope bitterbrush is stable. Sagebrush increased from 20 plant/acre in 1999 to 100 in 2004 and shows good seed production this year. Bitterbrush decreased from 40 plants/acre in 1999 to 20 in 2004 and shows repeated heavy use, although vigor appears normal. Broom snakeweed doubled its density and stickleaf low

rabbitbrush remains at fairly high densities. Trend for herbaceous understory is slightly down. Seeded perennial grasses remained similar to previous readings, but native species (sandberg bluegrass and bottlebrush squirreltail) decreased. Overall, the sum of nested frequency for perennial grasses decreased and it also decreased for the perennial forbs. This may have been due to an increase in cheatgrass nested frequency and cover since 1999. The Desirable Components Index rated this site as fair with a score of 27 due to low shrub cover, few young shrubs, increase cheatgrass cover, and good perennial grass and forb cover.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly down (2)

winter range condition (DC Index) - 27 (fair) Wyoming big sagebrush type

HERBACEOUS TRENDS --

Management unit 25A, Study no: 4

Type	Species	Nested Frequency				Average Cover %	
		'85	'91	'99	'04	'99	'04
G	Agropyron cristatum	b ₂₂	b ₂₀	a ₃	a ₇	.03	.06
G	Agropyron intermedium	b ₄₆	a ₁₀	a ₂₀	a ₁₅	.43	.60
G	Agropyron spicatum	a ₆₈	a ₄₈	b ₁₂₄	b ₁₂₃	3.56	5.56
G	Bromus inermis	a ₁₈	a ₁₂	b ₈₀	b ₈₃	2.65	2.41
G	Bromus tectorum (a)	-	-	110	92	.90	2.57
G	Carex spp.	b ₁₂	a ₋	ab ₂	a ₋	.03	-
G	Oryzopsis hymenoides	-	-	-	-	.00	-
G	Poa fendleriana	b ₅₈	b ₄₆	ab ₃₃	a ₁₆	.28	.46
G	Poa secunda	a ₉	ab ₂₀	c ₇₉	b ₃₈	1.32	.40
G	Sitanion hystrix	c ₇₆	b ₄₂	ab ₂₅	a ₉	.20	.09
Total for Annual Grasses		0	0	110	92	0.90	2.57
Total for Perennial Grasses		309	198	366	291	8.53	9.61
Total for Grasses		309	198	476	383	9.44	12.18
F	Agoseris glauca	a ₇	b ₂₉	ab ₁₈	a ₄	.17	.01
F	Allium spp.	4	5	-	-	-	-
F	Arabis spp.	-	5	3	4	.01	.01
F	Astragalus beckwithii	6	10	3	3	.00	.03
F	Chaenactis douglasii	ab ₄	ab ₁	b ₁₁	a ₋	.03	-
F	Cirsium spp.	a ₋	b ₂₁	b ₄₀	b ₃₇	1.23	1.27
F	Collomia linearis (a)	-	-	a ₁	b ₅₈	.00	.17
F	Comandra pallida	ab ₃	c ₁₃	b ₁	b ₋	.00	-
F	Collinsia parviflora (a)	-	-	a ₉	b ₁₉₀	.01	.52
F	Crepis acuminata	2	4	-	2	-	.00
F	Cymopterus longipes	3	2	-	-	-	-

T y p e	Species	Nested Frequency				Average Cover %	
		'85	'91	'99	'04	'99	'04
F	<i>Draba</i> spp. (a)	-	-	6	3	.04	.00
F	<i>Epilobium brachycarpum</i> (a)	-	-	_b 39	_a 4	.13	.01
F	<i>Erodium cicutarium</i> (a)	-	3	-	-	-	-
F	<i>Erigeron eatonii</i>	-	2	6	2	.04	.01
F	<i>Erigeron pumilus</i>	_a 8	_{ab} 9	_b 21	_a 5	.42	.04
F	<i>Eriogonum racemosum</i>	9	15	6	6	.04	.23
F	<i>Eriogonum umbellatum</i>	_b 19	_a 1	_a 4	_a 2	.01	.03
F	<i>Gayophytum ramosissimum</i> (a)	-	-	21	25	.17	.10
F	<i>Lactuca serriola</i>	_a -	_b 64	_a -	_a -	-	-
F	<i>Lepidium</i> spp. (a)	-	-	-	7	-	.02
F	<i>Machaeranthera canescens</i>	_b 50	_b 46	_a 16	_a 3	.12	.03
F	<i>Microsteris gracilis</i> (a)	-	-	_a 24	_b 66	.06	.16
F	<i>Petrorhiza pumila</i>	_a -	_a -	_{ab} 6	_b 17	.60	.84
F	<i>Phlox longifolia</i>	_a -	_b 35	_a 3	_b 27	.00	.12
F	<i>Polygonum douglasii</i> (a)	-	-	_a 7	_b 31	.02	.09
F	<i>Ranunculus testiculatus</i> (a)	-	-	_a 8	_b 63	.01	.16
F	<i>Sphaeralcea coccinea</i>	-	-	3	-	.03	-
F	<i>Tragopogon dubius</i>	_{ab} 4	_b 18	_c 61	_a -	.67	.00
F	<i>Trifolium</i> spp.	_a 4	_b 21	_a -	_a -	-	-
F	Unknown forb-perennial	-	3	-	-	-	-
Total for Annual Forbs		0	3	115	447	0.46	1.25
Total for Perennial Forbs		123	304	202	112	3.40	2.66
Total for Forbs		123	307	317	559	3.87	3.92

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

BROWSE TRENDS --

Management unit 25A, Study no: 4

Type	Species	Strip Frequency		Average Cover %	
		'99	'04	'99	'04
B	Amelanchier utahensis	0	1	.00	.03
B	Artemisia tridentata wyomingensis	1	5	.15	.38
B	Chrysothamnus depressus	3	4	.03	.30
B	Chrysothamnus nauseosus hololeucus	3	1	.18	.03
B	Chrysothamnus viscidiflorus viscidiflorus	55	53	6.44	5.06
B	Eriogonum microthecum	2	2	-	-
B	Gutierrezia sarothrae	33	57	1.37	2.36
B	Purshia tridentata	2	1	.30	.38
B	Quercus gambelii	1	3	2.03	2.24
B	Sambucus cerulea	1	1	.38	.63
B	Tetradymia canescens	4	2	.03	-
Total for Browse		105	130	10.92	11.43

CANOPY COVER, LINE INTERCEPT --

Management unit 25A, Study no: 4

Species	Percent Cover	
	'99	'04
Amelanchier utahensis	-	.08
Artemisia tridentata wyomingensis	-	.91
Chrysothamnus depressus	-	.28
Chrysothamnus nauseosus hololeucus	-	.11
Chrysothamnus viscidiflorus viscidiflorus	-	6.90
Gutierrezia sarothrae	-	5.84
Juniperus osteosperma	-	1.00
Purshia tridentata	-	.60
Quercus gambelii	1.39	2.48
Sambucus cerulea	-	.36

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 25A, Study no: 4

Species	Average leader growth (in)
	'04
Artemisia tridentata wyomingensis	2.3
Purshia tridentata	5.2

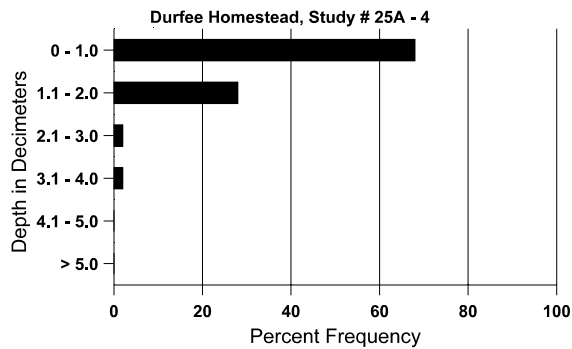
BASIC COVER --
Management unit 25A, Study no: 4

Cover Type	Average Cover %			
	'85	'91	'99	'04
Vegetation	2.75	6.00	23.77	27.43
Rock	12.25	38.00	22.90	29.98
Pavement	3.75	9.00	15.65	29.29
Litter	72.00	21.00	18.27	14.93
Cryptogams	.25	0	.01	.00
Bare Ground	9.00	26.00	19.98	8.79

SOIL ANALYSIS DATA --
Management unit 25A, Study no: 4, Study Name: Durfee Homestead

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
11.9	60.3 (8.1)	7.5	34.0	38.7	27.3	4.3	38.1	214.4	0.7

Stoniness Index



PELLET GROUP DATA --
 Management unit 25A, Study no: 4

Type	Quadrat Frequency		Days use per acre (ha)	
	'99	'04	'99	'04
Rabbit	8	56	-	-
Elk	9	7	33 (82)	7 (17)
Deer	7	11	15 (38)	15 (36)
Cattle	9	1	16 (40)	4 (9)

BROWSE CHARACTERISTICS --
 Management unit 25A, Study no: 4

		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)
Amelanchier utahensis												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
99	0	20	-	-	-	-	0	0	-	-	0	20/28
04	20	-	-	20	-	-	0	100	-	-	0	14/17
Artemisia tridentata wyomingensis												
85	1198	133	66	266	866	-	44	6	72	-	28	13/14
91	66	-	-	66	-	-	0	0	0	-	0	11/7
99	20	-	-	20	-	20	0	0	0	-	0	35/53
04	100	-	20	80	-	-	40	0	0	-	0	16/22
Atriplex canescens												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
99	0	-	-	-	-	-	0	0	-	-	0	19/27
04	0	-	-	-	-	-	0	0	-	-	0	-/-
Chrysothamnus depressus												
85	932	66	133	666	133	-	0	0	14	-	0	5/8
91	0	-	-	-	-	-	0	0	0	-	0	-/-
99	140	-	-	140	-	-	29	0	0	-	0	5/7
04	260	-	-	200	60	-	31	69	23	8	8	5/8
Chrysothamnus nauseosus hololeucus												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
99	60	-	-	60	-	-	0	0	-	-	0	22/32
04	40	20	-	40	-	-	0	100	-	-	0	21/28

		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)
Chrysothamnus viscidiflorus viscidiflorus												
85	866	66	266	600	-	-	0	0	0	-	0	6/7
91	2333	200	2333	-	-	-	6	9	0	-	0	-/-
99	3660	-	200	2840	620	40	1	0	17	7	8	15/22
04	3640	-	220	2440	980	-	4	5	27	7	31	13/24
Echinocereus triglochidatus												
85	66	-	66	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
99	0	-	-	-	-	-	0	0	-	-	0	-/-
04	0	-	-	-	-	-	0	0	-	-	0	-/-
Eriogonum microthecum												
85	1732	-	600	1066	66	-	8	4	4	-	0	7/7
91	0	-	-	-	-	-	0	0	0	-	0	-/-
99	60	-	-	60	-	-	100	0	0	-	0	3/13
04	120	-	-	120	-	-	0	0	0	-	0	7/14
Gutierrezia sarothrae												
85	0	-	-	-	-	-	0	0	0	-	0	-/-
91	0	-	-	-	-	-	0	0	0	-	0	-/-
99	1700	20	100	1600	-	20	0	1	0	-	0	8/11
04	3200	20	300	2860	40	-	0	0	1	1	1	9/12
Pinus edulis												
85	132	-	66	-	66	-	0	0	50	-	100	-/-
91	0	-	-	-	-	-	0	0	0	-	0	-/-
99	0	-	-	-	-	-	0	0	0	-	0	-/-
04	0	-	-	-	-	-	0	0	0	-	0	-/-
Purshia tridentata												
85	532	-	133	333	66	-	50	13	12	-	0	15/25
91	0	-	-	-	-	-	0	0	0	-	0	-/-
99	40	-	-	40	-	-	0	100	0	-	0	20/48
04	20	-	-	20	-	-	0	100	0	-	0	21/57
Quercus gambelii												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
99	260	-	-	260	-	-	0	0	-	-	0	69/69
04	280	-	60	220	-	-	0	0	-	-	0	51/37

		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)
Sambucus cerulea												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
99	20	-	-	20	-	-	0	0	-	-	0	43/52
04	20	-	-	20	-	-	0	100	-	-	0	55/57
Tetradymia canescens												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
99	100	-	-	100	-	-	20	0	-	-	0	6/14
04	40	-	-	40	-	-	50	0	-	-	0	10/20