

EAST TIDWELL - TREND STUDY NO. 25A-12-09

Vegetation Type: Alpine-Mixed

Range Type: Crucial Deer Summer, Crucial Elk Summer

NRCS Ecological Site Description: Not Available

Land Ownership: USFS

Elevation: 10,000 ft (3,048 m)

Aspect: Southwest

Slope: 7%-12%

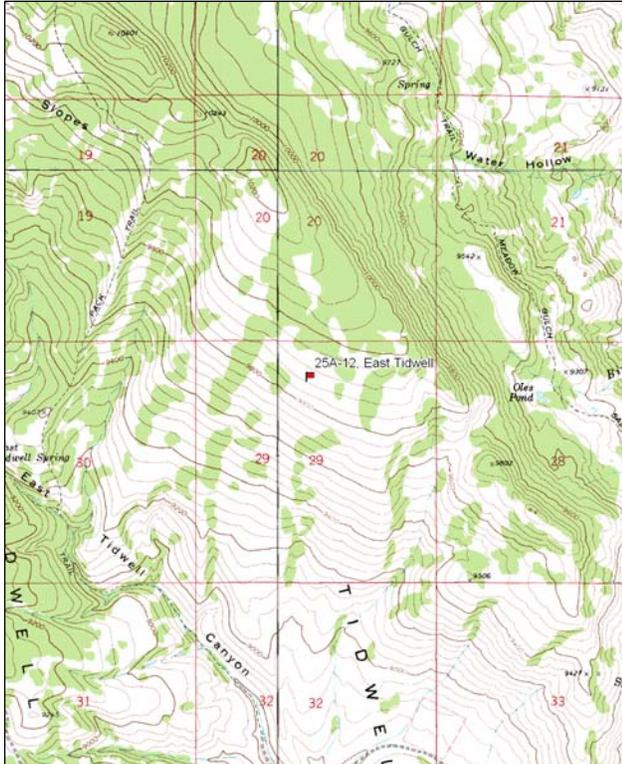
Transect bearing: 173 degrees magnetic

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

Directions:

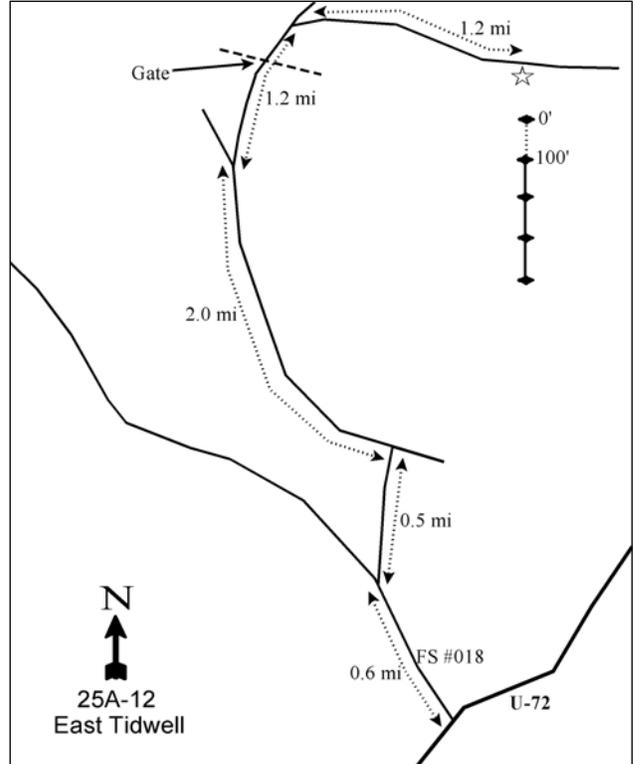
Traveling north on U-72 from Fremont, turn west on Forest Service road #018 (between the cattleguard and mile marker #16). Go 0.6 miles (crossing a cattleguard) to a fork in the road, go right. One-half mile later you'll come to a "T" in the road, stay to the left. Go 2.0 miles and turn right at a fork that goes up a steep hill. After 0.1 miles there is a faint intersection. Stay on the main road heading north for 0.9 miles to a gate. Go through the gate and go 0.2 miles to a fork in the road. Stay to the right and go through a grove of trees, up a steep and rocky road. Here the road becomes very faint, but travel 1.2 miles to a witness post. The 0 foot baseline stake is easy to see, and has browse tag #9078 attached.

Map Name: Geyser Peak



Township: 25S, Range: 4E, Section: 20

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 456537 E 4274079 N

EAST TIDWELL - TREND STUDY NO. 25A-12

Site Information

Site Description: The study is located on high elevation summer range east of East Tidwell Canyon. The study is in a community that consists entirely of low growing shrubs, forbs, and grasses. Large aspen (*Populus tremuloides*) groves grow to the north and west of the site and provide good cover. The area is managed by the Forest Service as part of the Solomon allotment. Pellet group data estimated heavy elk use in 1999 and 2009, with more moderate use in 2004. Estimated deer use has been light since 1999 and estimated cattle use has been light since 2004 (Table - Pellet Group Data). There is a water trough about 600 feet south of the site which is fed by a pipe that goes to a fenced spring about half mile to the north. There was no water in the trough in any sample year since 1999 and it appeared that the pipeline is not functioning.

Browse: The dominant browse species on the site is Parry rabbitbrush (*Chrysothamnus parryi*), which has fluctuated in cover since 1999 (Table - Browse Trends). The population of Parry rabbitbrush is mostly mature and healthy with low decadence, good vigor, and good recruitment of young plants over the sample years. Utilization of rabbitbrush has been mostly light since 1991. There is a small population of black sagebrush (*Artemisia nova*) that has been steadily increasing in density since 1999. There is also a small population of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) that has displayed moderate use over the sample years. Several other shrubs occur in relatively small numbers including: fringed sagebrush (*Artemisia frigida*), stickleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*), and gray horsebrush (*Tetradymia canescens*). It appears that the stickleaf low rabbitbrush was identified as Parry rabbitbrush in 1991 (Table - Browse Characteristics).

Herbaceous Understory: Due to the high elevation of this site, the herbaceous understory is the key forage source for big game and livestock. Grasses are diverse and moderately abundant. Prairie junegrass (*Koeleria cristata*), slender wheatgrass (*Agropyron trachycaulum*), mutton bluegrass (*Poa fendleriana*), bottlebrush squirreltail (*Sitanion hystrix*), and letterman needlegrass (*Stipa lettermani*) are the most common grasses. Forbs are also diverse and are abundant on the site. There are several useful species on the site, although many of the common forbs are low growing less desirable types such as rose pussytoes (*Antennaria rosea*), low fleabane (*Erigeron pumilus*), Eaton fleabane (*E. eatonii*), trailing fleabane (*E. flagellaris*), pingue hymenoxys (*Hymenoxys richardsonii*), and elegant cinquefoil (*Potentilla concinna*) (Table - Herbaceous Trends).

Soil: The soil is a loam with a slightly alkaline pH (Table - Soil Analysis Data). Parent material is basalt. Bare ground cover is low due to the well armored nature of the soil surface with high amounts of rock and pavement cover (Table - Basic Cover). The soil erosion condition was classified as stable in 2004 and 2009.

Trend Assessments

Browse:

- **1991 to 1999 - stable (0):** Differences in density may be related to the larger sample area used in 1999; therefore, trend was determined using other parameters. There was little change in the browse component on the site.
- **1999 to 2004 - stable (0):** Density of the primary browse species, Parry rabbitbrush decreased by 44%, but cover increased substantially. The more preferred browse species, black sagebrush and mountain big sagebrush, both increased slightly in density.
- **2004 to 2009 - slightly up (+1):** The density of Parry rabbitbrush increased by nearly three-fold, but cover decreased to 1999 levels. Black sagebrush and mountain big sagebrush density both increased markedly due to the high recruitment of young plants.

Grass:

- **1991 to 1999 - stable (0):** There was a slight decrease in the sum of nested frequency of perennial grasses.
- **1999 to 2004 - stable (0):** Perennial grass sum of nested frequency and cover remained similar.
- **2004 to 2009 - down (-2):** The sum of nested frequency of perennial grasses decreased by 23% and cover decreased from 9% to 6%. Prairie junegrass decreased significantly in nested frequency.

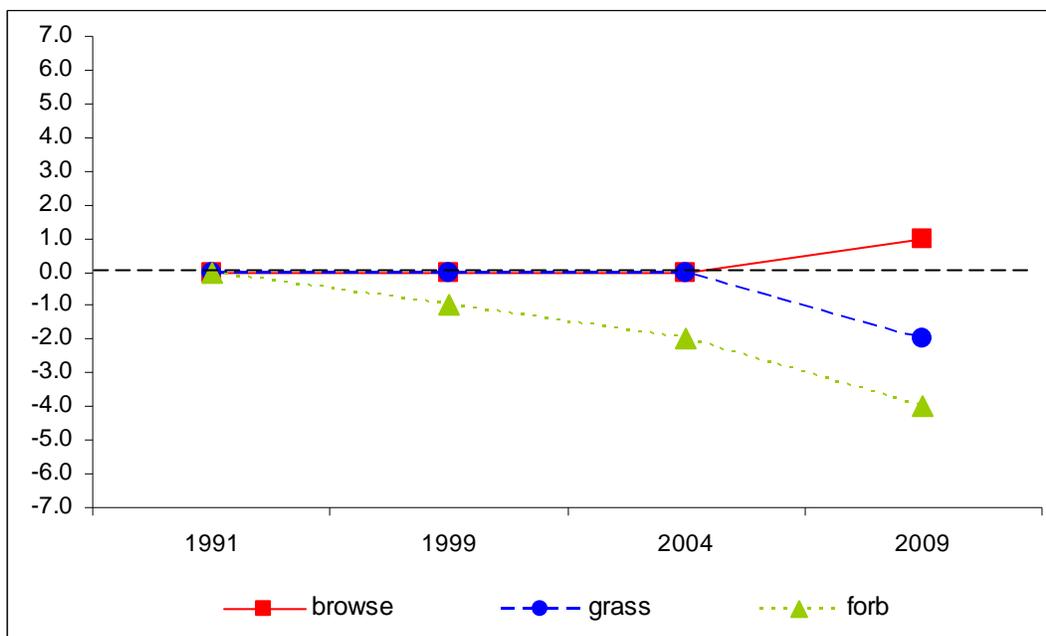
Forb:

- **1991 to 1999 - slightly down (-1):** Perennial forb sum of nested frequency decreased by 19%.
- **1999 to 2004 - slightly down (-1):** The sum of nested frequency of perennial forbs continued to decrease by a further 19%, but cover remained similar.
- **2004 to 2009 - down (-2):** There was a 19% decrease in the sum of nested frequency of perennial forbs and cover decreased from 13% to 6%.

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--

Management unit 25A Study no: 12



HERBACEOUS TRENDS--

Management unit 25A, Study no: 12

Type	Species	Nested Frequency				Average Cover %		
		'91	'99	'04	'09	'99	'04	'09
G	Agropyron trachycaulum	a-	b24	c79	c56	.32	1.04	.52
G	Bouteloua gracilis	ab24	ab14	a2	b30	.03	.00	.52
G	Carex sp.	b49	a9	a15	ab27	.10	.16	.13
G	Festuca ovina	b59	b77	a19	a2	.70	.10	.00
G	Koeleria cristata	b132	b159	b165	a71	2.15	3.16	.72
G	Poa fendleriana	a89	c170	ab103	bc141	2.92	1.53	2.28
G	Sitanion hystrix	c128	b84	ab66	a40	1.22	.98	.48

Type	Species	Nested Frequency				Average Cover %		
		'91	'99	'04	'09	'99	'04	'09
G	<i>Stipa comata</i>	a ⁻	b ¹⁰	a ¹	a ⁻	.06	.04	-
G	<i>Stipa lettermani</i>	c ¹⁸⁴	a ⁶⁸	b ¹²⁶	a ⁶⁶	1.35	2.29	1.22
G	<i>Stipa pinetorum</i>	-	-	-	11	-	-	.09
G	<i>Vulpia octoflora</i> (a)	-	-	-	4	-	-	.01
Total for Annual Grasses		0	0	0	4	0	0	0.01
Total for Perennial Grasses		665	615	576	444	8.88	9.32	5.98
Total for Grasses		665	615	576	448	8.88	9.32	6.00
F	<i>Agoseris glauca</i>	b ⁴⁶	ab ²⁰	ab ⁴	a ⁻	.15	.09	-
F	<i>Androsace septentrionalis</i> (a)	-	b ³¹	a ¹	a ⁻	.11	.00	-
F	<i>Antennaria rosea</i>	70	62	67	63	1.21	2.53	1.40
F	<i>Aster</i> sp.	b ³⁸	a ⁷	a ¹	a ⁵	.01	.00	.01
F	<i>Astragalus</i> sp.	76	55	61	59	1.55	.76	.24
F	<i>Chaenactis douglasii</i>	5	7	10	13	.01	.17	.10
F	<i>Comandra pallida</i>	-	9	7	-	.10	.04	-
F	<i>Delphinium</i> sp.	2	-	-	-	-	-	-
F	<i>Erigeron eatonii</i>	a ⁷	a ¹⁴	a ¹²	b ⁴⁴	.32	.08	.66
F	<i>Erigeron flagellaris</i>	a ⁻	a ⁵	a ⁷	b ²⁶	.01	.18	.10
F	<i>Erigeron pumilus</i>	a ⁵	b ⁵⁶	c ⁷⁹	b ⁴¹	1.10	1.79	.27
F	<i>Eriogonum alatum</i>	-	5	10	11	.06	.09	.07
F	<i>Eriogonum umbellatum</i>	19	29	32	14	.52	.46	.23
F	<i>Gayophytum ramosissimum</i> (a)	-	-	-	4	-	-	.00
F	<i>Gentiana calycosa</i>	b ³⁴	b ¹⁸	a ⁻	a ⁻	.25	-	-
F	<i>Geranium caespitosum</i>	c ¹⁷⁴	ab ¹⁰³	b ¹¹⁴	a ⁶⁶	1.65	1.73	.38
F	<i>Hymenoxys richardsonii</i>	b ⁸²	b ⁶⁸	a ⁴⁶	a ³⁶	1.59	1.08	.85
F	<i>Ivesia gordonii</i>	b ²⁹	a ⁶	a ⁻	a ⁻	.04	-	-
F	<i>Lesquerella wardii</i>	b ⁵⁸	a ¹³	a ⁴	a ⁻	.05	.01	-
F	<i>Linum lewisii</i>	a ²²	b ⁵⁶	ab ²⁹	a ¹⁰	.86	.57	.14
F	<i>Lupinus argenteus</i>	4	7	6	11	.39	.40	.06
F	<i>Lychnis drummondii</i>	a ⁻	b ¹³	a ⁻	a ⁻	.06	-	-
F	<i>Lygodesmia</i> sp.	-	-	-	-	-	.00	-
F	<i>Machaeranthera canescens</i>	b ⁹⁰	a ⁷	a ¹⁴	a ³³	.07	.24	.39
F	<i>Oxytropis lambertii</i>	ab ¹⁴	b ⁴⁵	a ⁴	a ⁻	.49	.30	-
F	<i>Penstemon</i> sp.	b ⁹⁵	b ⁸⁰	a ³⁹	ab ⁶³	.43	.33	.28
F	<i>Phlox longifolia</i>	b ¹²¹	a ⁴⁹	a ⁶⁶	a ⁵⁹	.17	.29	.26
F	<i>Polygonum douglasii</i> (a)	-	2	-	-	.00	-	-
F	<i>Potentilla concinna</i>	b ¹³⁴	a ³⁹	a ²⁶	a ²⁶	.75	.83	.14
F	<i>Potentilla gracilis</i>	a ⁻	b ²⁶	c ⁶¹	b ¹⁶	.06	.72	.10
F	<i>Senecio multilobatus</i>	a ⁴¹	c ¹⁵⁸	b ⁷⁸	a ³⁷	1.60	.64	.11
F	<i>Taraxacum officinale</i>	b ²⁶	ab ¹⁴	a ⁸	a ⁻	.10	.02	-
F	Unknown forb-perennial	2	-	-	-	-	-	-
Total for Annual Forbs		0	33	1	4	0.11	0.00	0.00
Total for Perennial Forbs		1194	971	785	633	13.69	13.43	5.87
Total for Forbs		1194	1004	786	637	13.80	13.44	5.87

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

BROWSE TRENDS--

Management unit 25A, Study no: 12

Type	Species	Strip Frequency			Average Cover %		
		'99	'04	'09	'99	'04	'09
B	Artemisia frigida	40	33	27	.37	.79	.54
B	Artemisia nova	5	11	22	.53	.78	.80
B	Artemisia tridentata vaseyana	2	9	22	.15	.19	.90
B	Chrysothamnus parryi	81	97	89	5.82	10.76	5.35
B	Chrysothamnus viscidiflorus viscidiflorus	47	44	50	.71	1.06	.50
B	Gutierrezia sarothrae	27	71	11	.06	1.82	.07
B	Symphoricarpos oreophilus	1	0	3	.00	-	.00
B	Tetradymia canescens	43	54	45	.95	1.93	.59
Total for Browse		246	319	269	8.61	17.35	8.77

CANOPY COVER, LINE INTERCEPT--

Management unit 25A, Study no: 12

Species	Percent Cover	
	'04	'09
Artemisia frigida	.83	.51
Artemisia nova	.33	.66
Artemisia tridentata vaseyana	.56	1.11
Chrysothamnus parryi	16.39	5.08
Chrysothamnus viscidiflorus viscidiflorus	3.25	.71
Gutierrezia sarothrae	2.50	.01
Tetradymia canescens	2.29	1.04

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 25A, Study no: 12

Species	Average leader growth (in)	
	'04	'09
Artemisia nova	1.3	0.8
Artemisia tridentata vaseyana	2.7	1.4

BASIC COVER--

Management unit 25A, Study no: 12

Cover Type	Average Cover %			
	'91	'99	'04	'09
Vegetation	10.50	30.06	34.51	24.17
Rock	13.25	10.85	9.94	8.51
Pavement	44.25	43.96	54.81	42.78
Litter	22.25	6.19	8.01	11.38
Cryptogams	.25	.18	.24	.01
Bare Ground	9.50	4.02	8.05	11.56

SOIL ANALYSIS DATA --

Management unit 25A, Study no: 12, Study Name: East Tidwell

Effective rooting depth (in)	pH	loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
16	7.5	47.3	29.4	23.3	3.1	21	166.4	0.6

PELLET GROUP DATA--

Management unit 25A, Study no: 12

Type	Quadrat Frequency			Days use per acre (ha)		
	'99	'04	'09	'99	'04	'09
Rabbit	12	34	33	-	-	-
Grouse	-	-	1	-	-	-
Elk	37	25	40	68 (168)	35 (86)	52 (129)
Deer	17	15	14	15 (37)	16 (40)	20 (50)
Cattle	2	1	1	1 (2)	5 (13)	7 (18)

BROWSE CHARACTERISTICS--

Management unit 25A, Study no: 12

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Artemisia frigida										
91	1132	82	18	-	66	18	6	0	2/5	
99	4520	14	86	-	80	1	0	0	5/7	
04	1240	5	95	-	-	8	2	0	8/11	
09	1100	0	100	-	-	5	0	0	4/9	
Artemisia nova										
91	0	0	0	-	-	0	0	0	-/-	
99	140	29	71	-	-	0	0	0	10/28	
04	380	32	68	-	80	0	0	0	10/20	
09	2280	60	40	-	1160	0	0	0	6/16	
Artemisia tridentata vaseyana										
91	399	0	83	17	-	17	67	0	4/5	
99	40	0	100	0	-	50	0	0	8/20	
04	240	8	92	0	120	42	8	0	13/28	
09	1320	56	36	8	280	8	0	5	9/16	
Chrysothamnus parryi										
91	38865	28	44	28	4333	36	22	5	4/6	
99	13140	9	87	4	120	.76	0	1	5/8	
04	7420	5	93	1	120	2	.53	.26	5/9	
09	19960	15	85	0	460	0	0	0	4/8	
Chrysothamnus viscidiflorus viscidiflorus										
91	0	0	0	0	-	0	0	0	-/-	
99	2220	10	86	5	-	0	.90	4	5/9	
04	2480	4	91	5	-	0	0	4	7/12	
09	2520	6	93	1	-	0	0	0	4/8	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Gutierrezia sarothrae</i>										
91	599	44	56	-	-	11	0	0	3/3	
99	960	10	90	-	20	0	0	0	4/6	
04	3860	0	100	-	-	0	0	0	5/8	
09	280	0	100	-	-	0	0	0	4/6	
<i>Symphoricarpos oreophilus</i>										
91	0	0	0	-	-	0	0	0	-/-	
99	20	0	100	-	-	100	0	0	8/30	
04	0	0	0	-	-	0	0	0	10/31	
09	60	0	100	-	-	0	0	0	10/24	
<i>Tetradymia canescens</i>										
91	1331	15	50	35	66	40	25	5	4/5	
99	2280	27	68	4	80	9	0	.87	6/9	
04	3120	9	90	1	-	7	2	3	6/11	
09	2320	19	80	1	140	0	0	3	5/8	