

NASTY FLAT - TREND STUDY NO. 15-2-09

Vegetation Type: Quaking Aspen

Range Type: Crucial Deer Summer, Crucial Bison Year-Long

NRCS Ecological Site Description: [Mountain Shallow Loam \(Black Sagebrush\), R048AY433UT](#)

Land Ownership: BLM

Elevation: 9,500 ft (2,896 m)

Aspect: west

Slope: 33%

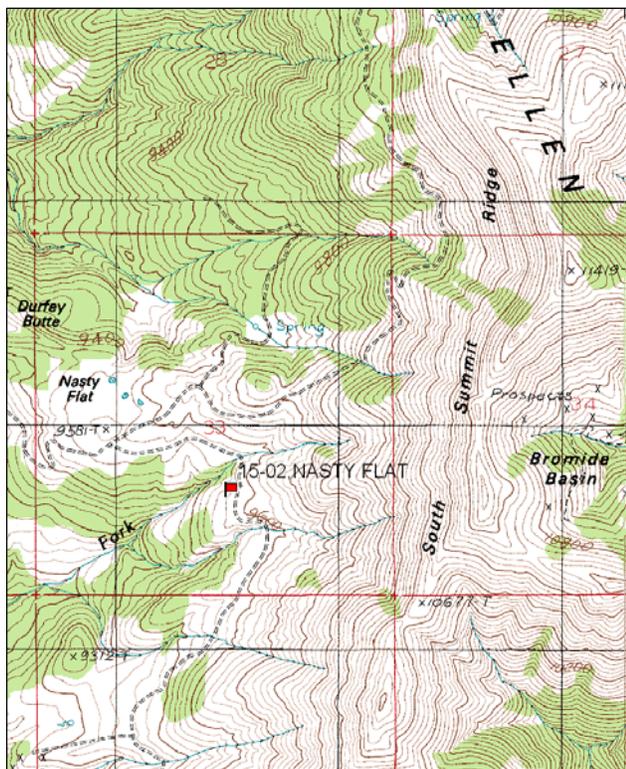
Transect bearing: 213 degrees magnetic.

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

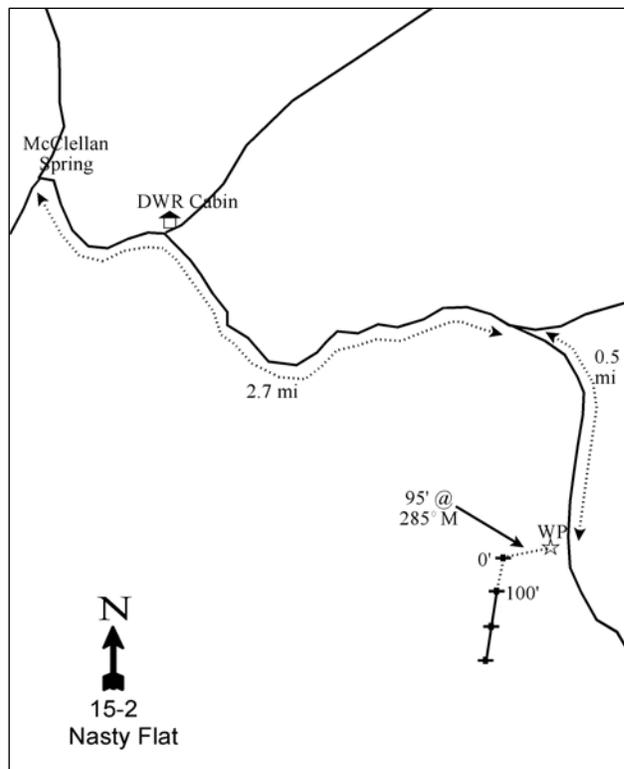
Directions:

From the McMillan (McClellan) Spring Campground (BLM), proceed east on the road past Willow Spring and the DWR cabin for 2.7 miles to a fork. Stay right and continue 0.5 miles. The transect is located in the patch of aspens below the road. A witness post is located on the right side of the road. From this fence post, walk 95 feet bearing 285° to the start of the baseline. The first stake is under the aspens, and tagged with a red browse tag, #7852.

Map Name: Mount Ellen



Diagrammatic Sketch:



Township: 31S, Range: 10E, Section: 33

GPS: NAD 83, UTM 12S 516430 E 4212885 N

NASTY FLAT - TREND STUDY NO. 15-2

Site Information

Site Description: The study samples an aspen (*Populus tremuloides*) stand in the Henry Mountains west of Kimble and Turner Peak. The aspen type is not very extensive and does not occur often within this management unit. This is a mature aspen stand with a considerable number of young aspen in the understory as well as a few conifers. In 1999, the baseline was realigned to better sample aspen regeneration and animal use near the edge of the aspen clone. Pellet group data for bison and cattle were combined due to the difficulty in differentiating between these species. Pellet group data has indicated increasing deer use from light in 1999 to moderately heavy in 2009. Estimated bison/cattle use was light to moderate in 1999 and 2004, with no sign encountered in 2009 (Table - Pellet Group Data).

Browse: Aspen is the key browse species on this site. Quadrat cover of aspen has remained fairly similar since 1999 (Table - Browse Trends), and canopy cover has been high since 1999 (Table - Canopy Cover). Strip density estimates of aspen have remained similar since 1999 (Table - Browse Characteristics) and point-quarter density estimates decreased from 1999 to 2004, but have been similar since 2004 (Table - Point-Quarter Tree Data). Decadence and vigor of aspen has mostly good over the sample years with an increase in both decadence and poor vigor during the drought year of 2004. Recruitment of young aspen has been good over the sample years. Utilization of aspen was moderate to high at the outset of the study in 1987, but has been light to moderate since 1999 (Table - Browse Characteristics). Other tree species that occur on the site in moderate cover and density are the coniferous species Douglas fir (*Pseudotsuga menziesii*) and limber pine (*Pinus flexilis*).

Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) was sampled more accurately in 1999 after the baseline was relocated closer to the edge of the aspen clone, but this species is not considered a key species as this site is a summer range. Cover of sagebrush has increased steadily since 1999 (Table - Browse Trends), though density decreased between 1999 and 2004. Decadence of sagebrush has also increased steadily since 1999. The sagebrush population has a high proportion of young plants and utilization has been mostly light since the outset of the study (Table - Browse Characteristics). Less abundant shrubs that were sampled on the site include snowberry (*Symphoricarpos oreophilus*) and mountain juniper (*Juniperus communis*).

Herbaceous Understory: The herbaceous understory is dominated by perennial species. The dominant grasses are mutton bluegrass (*Poa fendleriana*) and slender wheatgrass (*Agropyron trachycaulum*) which provide the majority of the total grass and herbaceous cover. Other grasses that occur in low cover and frequency include elk sedge (*Carex geyeri*), bottlebrush squirreltail (*Sitanion hystrix*), and Letterman needlegrass (*Stipa lettermani*). Forbs are fairly diverse, but not overly abundant. The forb component is dominated by the perennial species tuber starwort (*Stellaria jamesiana*) and dandelion (*Taraxacum officinale*) (Table - Herbaceous Trends).

Soil: The soil is a loam with substantial amounts of organic matter in the surface horizon, is moderately acidic, and has a moderately deep estimated effective rooting depth (Table - Soil Analysis Data). Erosion is not a problem on the site due to the high litter cover (Table - Basic Cover). Erosion control efforts have been undertaken by the BLM to limit erosion in nearby drainages with fabric check dams. Most of these have been effective in holding soil on the steep, eroded slopes of the area. The soil erosion condition was classified as stable in 2004 and slight in 2009 due primarily to surface litter movement.

Trend Assessments

Browse:

- **1987 to 1994 - stable (0):** Browse is not an important component of this summer range site. Aspen is the primary browse species on the site. No form and vigor class data was collected for this species in 1994, so comparisons cannot be made.
- **1994 to 1999 - stable (0):** The baseline was relocated in 1999, so direct comparison of browse species cannot be made. Aspen had good vigor, decadence, and recruitment of young plants. Mountain big sagebrush density increased markedly.
- **1999 to 2004 - down (-2):** Strip density estimates of both aspen and mountain big sagebrush decreased, but cover estimates remained similar. Decadence also increased in both aspen and mountain big sagebrush to 22% and 19%, respectively. Recruitment of young aspen and young sagebrush plants decreased markedly.
- **2004 to 2009 - stable (0):** Density and cover estimates remained similar for both aspen and mountain big sagebrush. Decadence of sagebrush increased to 29%.

Grass:

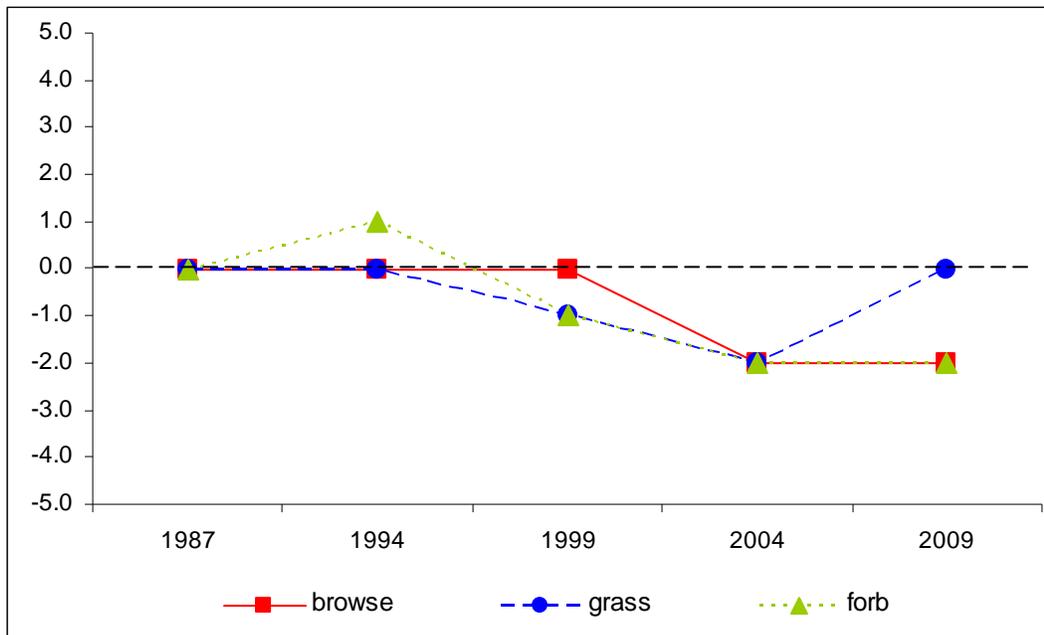
- **1987 to 1994 - stable (0):** There was a slight decrease in the sum of nested frequency of perennial grasses. There was a significant decrease in the nested frequency of smooth brome (*Bromus inermis*) and a significant increase in the nested frequency of Letterman needlegrass.
- **1994 to 1999 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 9% and cover decreased from 7% to 4%. There was a significant decrease in the nested frequency of mutton bluegrass.
- **1999 to 2004 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 11%, though cover increased to 7%. There was a significant decrease in the nested frequency of elk sedge and Letterman needlegrass, and a significant increase in nested frequency of mutton bluegrass and bottlebrush squirreltail.
- **2004 to 2009 - up (+2):** The sum of nested frequency of perennial grasses increased by 22% and cover increased to 10%. There was a significant increase in the nested frequency of slender wheatgrass and a significant decrease in the nested frequency of bottlebrush squirreltail.

Forb:

- **1987 to 1994 - slightly up (+1):** The sum of nested frequency of perennial forbs increased by 10%.
- **1994 to 1999 - down (-2):** the sum of nested frequency of perennial forbs decreased by 27% and cover decreased from 12% to 5%. There was a significant decrease in the nested frequency of tuber starwort.
- **1999 to 2004 - slightly down (-1):** The sum of nested frequency of perennial forbs decreased by 10%, though cover increased to 7%.
- **2004 to 2009 - stable (0):** There was little change in the sum of nested frequency or cover of perennial forbs.

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 15, Study no: 2



HERBACEOUS TRENDS--

Management unit 15, Study no: 2

Type	Species	Nested Frequency					Average Cover %			
		'87	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron trachycaulum	ab111	a88	ab110	a76	b141	.41	1.14	.96	3.11
G	Bromus carinatus	-	-	-	2	-	-	-	.03	-
G	Bromus inermis	b51	a4	a4	a-	a-	.03	.03	-	-
G	Carex geyseri	a4	a13	b70	a24	a27	.26	1.02	.25	.58
G	Festuca ovina	5	-	2	-	-	-	.00	-	-
G	Poa fendleriana	b259	b236	a125	b183	b216	4.14	1.50	5.57	6.29
G	Sitanion hystrix	a10	a-	a10	b40	a4	-	.02	.55	.06
G	Stipa lettermani	a1	b66	b49	a5	a14	1.86	.42	.07	.20
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		441	407	370	330	402	6.71	4.15	7.44	10.25
Total for Grasses		441	407	370	330	402	6.71	4.15	7.44	10.25
F	Achillea millefolium	-	-	3	2	-	-	.00	.00	-
F	Agoseris glauca	-	6	3	11	-	.01	.00	.05	-
F	Allium sp.	a-	a-	ab4	a2	b12	-	.06	.00	.07
F	Androsace septentrionalis (a)	-	3	7	3	2	.00	.01	.00	.00
F	Arabis drummondii	13	16	19	4	-	.09	.09	.01	-
F	Astragalus sp.	a-	b69	a-	a-	a-	1.47	-	-	-
F	Calochortus nuttallii	4	-	4	-	-	-	.01	-	-
F	Castilleja linariaefolia	-	-	-	-	1	-	-	-	.00
F	Chenopodium fremontii (a)	-	5	-	7	2	.01	-	.02	.00

T y p e	Species	Nested Frequency					Average Cover %			
		'87	'94	'99	'04	'09	'94	'99	'04	'09
F	Cymopterus lemmonii	3	-	4	4	4	-	.01	.04	.03
F	Descurainia pinnata (a)	4	-	-	-	-	-	-	-	-
F	Erigeron eatonii	a15	ab27	b66	b62	b67	.09	.54	.50	.61
F	Erigeron sp.	4	-	-	-	-	-	-	-	-
F	Fritillaria atropurpurea	-	-	4	-	-	-	.01	-	-
F	Lychnis drummondii	a-	a-	a-	b14	a-	-	-	.03	-
F	Penstemon watsonii	b41	ab21	b39	ab20	a12	.17	.34	.52	.25
F	Phlox longifolia	22	16	25	22	23	.09	.11	.07	.09
F	Physalis sp.	-	3	-	-	-	.00	-	-	-
F	Polygonum douglasii (a)	-	a-	a-	b49	b32	-	-	.09	.09
F	Sedum lanceolatum	1	-	6	3	3	-	.06	.01	.00
F	Senecio multilobatus	b13	a-	a-	a-	a3	-	-	-	.02
F	Stellaria jamesiana	b282	b277	a172	a184	a204	2.97	1.07	3.04	2.14
F	Taraxacum officinale	b187	b187	ab141	a110	a111	5.84	2.45	2.48	2.20
F	Unknown forb-perennial	b23	a-	a-	a3	a4	-	-	.00	.01
F	Unknown forb-perennial 2	-	-	-	-	6	-	-	-	.03
F	Vicia sp.	3	-	-	-	-	-	-	-	-
F	Viola sp.	a-	b52	a-	a-	a-	1.12	-	-	-
Total for Annual Forbs		4	8	7	59	36	0.01	0.00	0.11	0.09
Total for Perennial Forbs		611	674	490	441	450	11.88	4.78	6.78	5.50
Total for Forbs		615	682	497	500	486	11.90	4.79	6.90	5.59

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

BROWSE TRENDS--

Management unit 15, Study no: 2

T y p e	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	Artemisia tridentata vaseyana	12	37	27	22	.16	1.01	1.26	1.56
B	Juniperus communis	1	0	3	1	1.00	-	-	.03
B	Mahonia repens	0	1	0	0	-	-	-	-
B	Pinus flexilis	0	3	3	8	.46	.56	.41	1.11
B	Populus tremuloides	0	66	62	53	2.21	1.58	1.45	1.74
B	Pseudotsuga menziesii	0	18	20	18	.85	3.06	6.50	5.56
B	Ribes velutinum velutinum	1	0	0	0	.21	-	-	-
B	Symphoricarpos oreophilus	4	4	6	6	.30	.15	.30	.33
Total for Browse		18	129	121	108	5.21	6.38	9.93	10.34

CANOPY COVER, LINE INTERCEPT--

Management unit 15, Study no: 2

Species	Percent Cover		
	'99	'04	'09
Artemisia tridentata vaseyana	-	1.66	1.06
Juniperus communis	-	.18	.25
Pinus flexilis	2.00	.53	3.43
Populus tremuloides	61.40	67.84	47.78
Pseudotsuga menziesii	9.39	10.28	9.93
Symphoricarpos oreophilus	-	.86	.18

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 15, Study no: 2

Species	Average leader growth (in)	
	'04	'09
Artemisia tridentata vaseyana	-	2.9

POINT-QUARTER TREE DATA--

Management unit 15, Study no: 2

Species	Trees per Acre			Average diameter (in)		
	'99	'04	'09	'99	'04	'09
Pinus flexilis	76	80	121	2	2.1	2.3
Populus tremuloides	4797	1512	1594	1.3	3.8	4.7
Pseudotsuga menziesii	105	137	148	2.9	4	2.9

BASIC COVER--

Management unit 15, Study no: 2

Cover Type	Average Cover %				
	'87	'94	'99	'04	'09
Vegetation	4.50	24.53	15.80	24.68	28.63
Rock	1.00	.66	6.27	5.71	7.52
Pavement	0	.03	.02	.46	.09
Litter	93.75	77.49	82.88	75.55	72.00
Cryptogams	0	0	.03	0	0
Bare Ground	.75	1.26	1.17	4.59	5.50

SOIL ANALYSIS DATA --

Management unit 15, Study no: 2, Study Name: Nasty Flat

Effective rooting depth (in)	pH	loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
19.2	5.9	49.3	30.2	20.6	5.4	31.3	204.8	0.5

PELLET GROUP DATA--

Management unit 15, Study no: 2

Type	Quadrat Frequency			
	'94	'99	'04	'09
Rabbit	-	-	-	1
Grouse	-	-	1	-
Elk	2	-	-	-
Deer	3	5	11	16
Bison/Cattle	-	1	4	-

Days use per acre (ha)		
'99	'04	'09
-	-	-
-	-	-
-	-	2 (5)
13 (32)	22 (5)	39 (96)
15 (37)	18 (44)	-

BROWSE CHARACTERISTICS--

Management unit 15, Study no: 2

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Artemisia tridentata vaseyana</i>									
87	0	0	0	0	-	0	0	0	-/-
94	300	47	47	7	-	0	0	7	8/11
99	1460	25	70	5	60	0	0	5	12/20
04	1080	4	78	19	-	17	4	9	11/19
09	1100	38	33	29	120	24	9	7	12/19
<i>Juniperus communis</i>									
87	0	0	0	0	-	0	0	0	-/-
94	20	0	100	0	-	0	0	0	14/73
99	0	0	0	0	-	0	0	0	-/-
04	60	0	67	33	-	0	0	0	-/-
09	20	0	100	0	-	0	0	0	-/-
<i>Mahonia repens</i>									
87	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	-/-
99	100	0	100	-	-	0	0	0	3/17
04	0	0	0	-	-	0	0	0	7/8
09	0	0	0	-	-	0	0	0	-/-
<i>Pinus flexilis</i>									
87	66	100	0	-	66	0	0	0	-/-
94	0	0	0	-	-	0	0	0	-/-
99	60	67	33	-	20	0	0	0	-/-
04	60	67	33	-	-	0	0	0	-/-
09	200	60	40	-	-	0	0	10	-/-
<i>Populus tremuloides</i>									
87	5131	94	5	1	599	39	22	0	393/157
94	0	0	0	0	-	0	0	0	-/-
99	2840	75	22	3	-	0	0	3	-/-
04	2540	36	42	22	-	24	6	19	-/-
09	2520	52	40	8	120	18	12	3	-/-

		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>Pseudotsuga menziesii</i>										
87	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	500	88	12	-	60	0	0	0	-/-	
04	460	61	39	-	60	0	0	0	-/-	
09	500	48	52	-	120	0	0	0	-/-	
<i>Ribes velutinum velutinum</i>										
87	66	100	0	-	-	100	0	0	-/-	
94	20	0	100	-	-	0	0	0	15/48	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	20	0	0	0	-/-	
<i>Symphoricarpos oreophilus</i>										
87	133	0	100	-	-	0	100	0	14/16	
94	80	25	75	-	-	0	0	0	19/28	
99	220	82	18	-	-	0	0	0	20/30	
04	220	9	91	-	-	0	0	0	19/25	
09	320	63	38	-	-	0	0	0	20/33	