

HARTS DRAW RESERVOIR - TREND STUDY NO. 14-6-09

Vegetation Type: Mixed Oak-Sagebrush

Range Type: Crucial Deer Summer, Crucial Elk Spring/Fall

NRCS Ecological Site Description: Not Available

Land Ownership: USFS

Elevation: 8,900 ft (2,713 m)

Aspect: North

Slope: 2%-4%

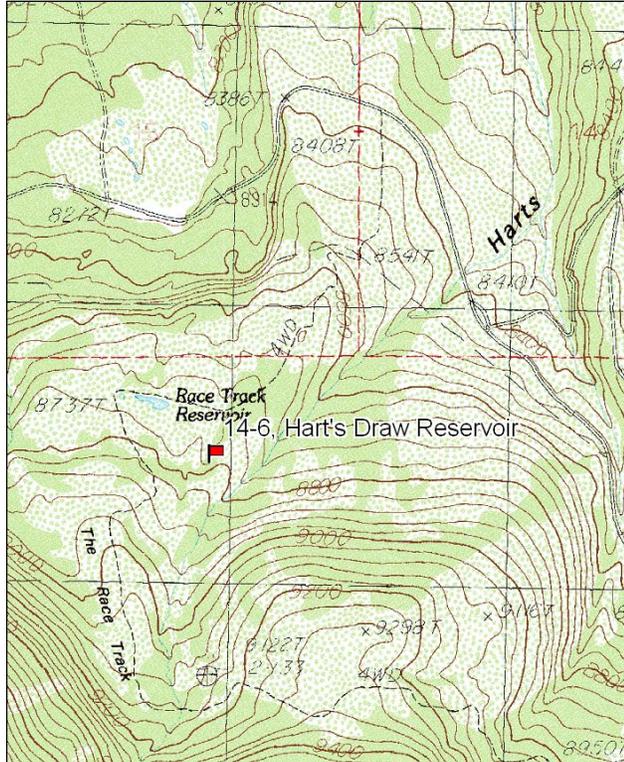
Transect bearing: 0' to 100' post - 122 degrees magnetic, 0' to 400' post - 205 degrees magnetic.

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

Directions:

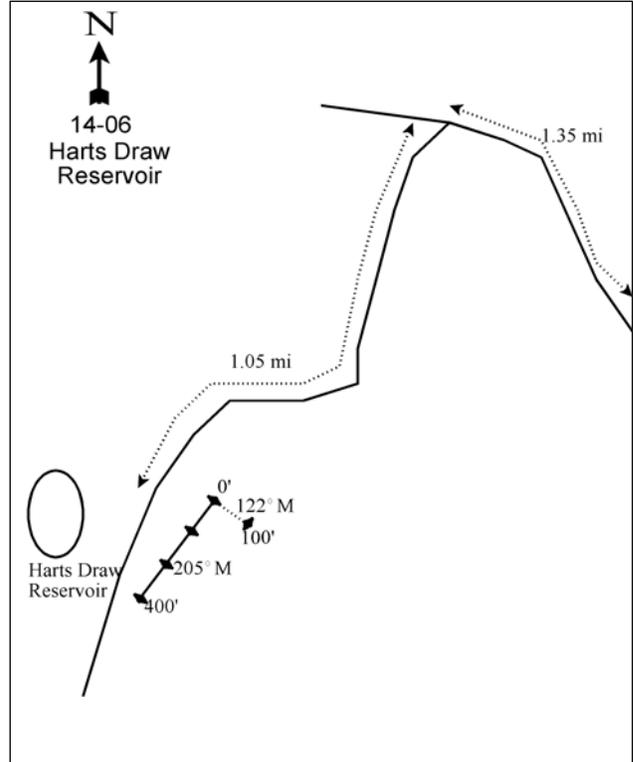
From the turnoff on the Blue Mountain Road to the Spring Creek Road by Monticello Lake (Spring Creek), proceed west on the paved road towards Foy Lake for 1.35 miles. Turn left (south) on a very rough dirt road (F.S. Rd 113) and go up 1.05 miles to a point 200 feet east of Harts Draw Reservoir (Race Track Reservoir). From here, walk south 5 paces to the transect starting point, a 12-inch high red fence post. The frequency baseline runs southeast through the sage and small oaks to another red fence post. The first hundred feet run at 122°M. The rest of the baseline is doglegged off of the 0 foot and run at 205°M.

Map Name: Monticello Lake



Township: 33S, Range: 22E, Section: 22

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 632802 E 4195835 N

HARTS DRAW RESERVOIR - TREND STUDY NO. 14-6

Site Information

Site Description: The study is on National Forest land in a Gambel oak (*Quercus gambelii*) and mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) community with aspen (*Populus tremuloides*) clones covering the surrounding hillsides. The area is part of the Harts Draw allotment (the Harts Draw unit is one of three on the allotment). The area was seeded over twenty years ago with no land treatments planned for the near future. Water is plentiful at the nearby reservoir and grazing pressure does not appear to be concentrated in the immediate area of the water. Escape cover is provided by thick clumps of oak and nearby groves of aspen. The road to the site is quite rough, so public pressure is low except during the hunting season. Pellet group data has indicated mostly light use from deer and elk since 1999 and moderately heavy use from cattle over the same period (Table - Pellet Group Data).

Browse: The sagebrush-grass vegetation sampled with this trend study is closely intermingled with oakbrush. Gambel oak was the dominant browse species in cover in 2009. Mountain big sagebrush is the dominant preferred browse species, but has steadily decreased in cover and density since 1999. Utah serviceberry (*Amelanchier utahensis*), a highly preferred browse species, has increased in cover since 1994 and now provides nearly as much cover as sagebrush (Table - Browse Trends). The sagebrush population has had high decadence in the past, but since 1994 as density has decreased so has decadence. Recruitment of young sagebrush plants has been mostly good since 1994 and utilization of sagebrush has been mostly light to moderate except in 1986 when most use was moderate or heavy. The serviceberry population consists of mostly healthy plants with low decadence. Serviceberry is especially vigorous and nearby six-foot tall shrubs provide abundant forage and seed. Recruitment of young serviceberry plants has been good over the sample years. Utilization of serviceberry has been mostly moderate with some heavy use noted in 2004, but there was mostly light use in 2009. Gambel oak on the site occur in isolated clones and vary in height from 4 to 10 feet. Use has been mostly light, vigor good and percent decadence low since 1994 (Table - Browse Characteristics).

Herbaceous Understory: Grasses are abundant in the understory, but are not very diverse. Two non-native species, smooth brome (*Bromus inermis*) and Kentucky bluegrass (*Poa pratensis*), dominate the herbaceous component. Smooth brome and Kentucky bluegrass provide nearly all of the grass cover on the site. Total grass cover declined in 2004 due to drought conditions, but smooth brome and Kentucky bluegrass still provided the majority of the vegetation cover. Other grasses are rare. Forbs are diverse but only a lupine (*Lupinus holosericeus*) is abundant. The lupine has produced over 60% of the total forb cover since 1994. Other important forbs are fewflower peavine (*Lathyrus pauciflorus*), dusty penstemon (*Penstemon comarrhenus*), redroot eriogonum (*Eriogonum racemosum*), and American vetch (*Vicia americana*).

Soil: Soil in the area is a red-brown loam with a slightly acid pH and a moderately deep effective rooting depth (Table - Soil Analysis Data). Most of the study site has a thick protective vegetation and litter cover leaving little bare ground cover (Table - Basic Cover). Gullies are found on the steeper slopes surrounding the site that are devoid of vegetation. The soil erosion condition was classified as stable in 2004 and 2009.

Trend Assessments

Browse:

- **1986 to 1994 - slightly down (-1):** Differences in density may be related to the larger sample area used in 1994; therefore, trend was determined using other parameters. Decadence of the primary browse species, mountain big sagebrush, increased from 47% to 78% and poor vigor increased from 28% to 43%. Recruitment of young sagebrush plants improved slightly.
- **1994 to 1999 - slightly down (-1):** Density of sagebrush decreased by 17% from 3,100 plants/acre to 2,580 plants/acre. Recruitment of young sagebrush plants decreased from 10% to 5% of the population. However, decadence of sagebrush decreased to 42% and poor vigor decreased to 13%.

- **1999 to 2004 - slightly down (-1):** Density of sagebrush decreased by 10% to 2,320 plants/acre and cover decreased from 8% to 5%. Recruitment of young plants improved to 10% of the population and decadence decreased to 30%.
- **2004 to 2009 - down (-2):** The density of mountain big sagebrush decreased by 37% to 1,460 plants/acre, and cover decreased to 3%. Recruitment of young sagebrush plants increased slightly and decadence decreased slightly to 27% of the population.

Grass:

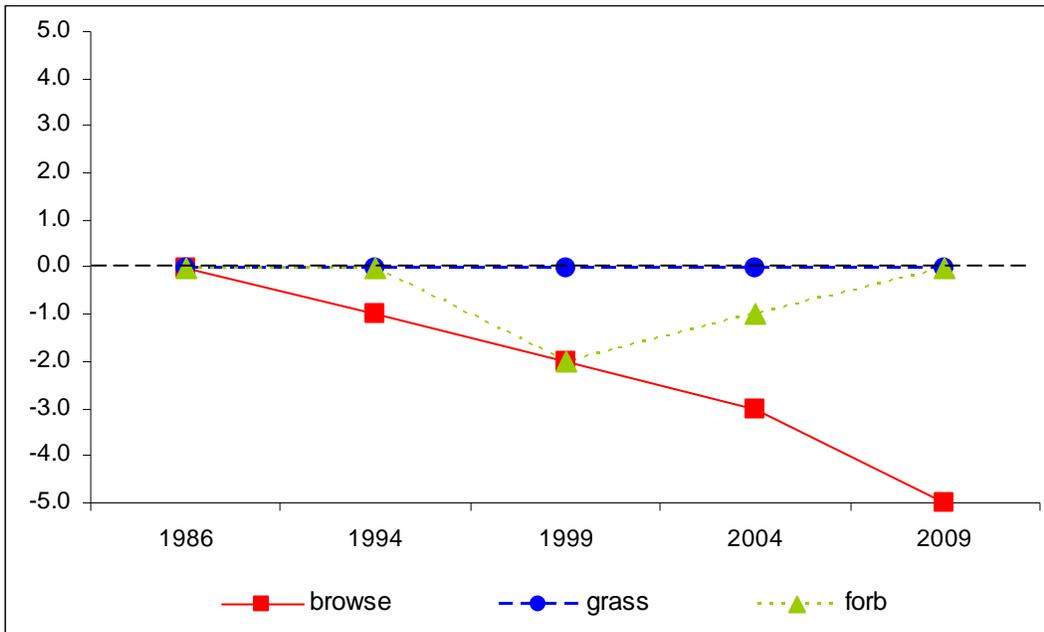
- **1986 to 1994 - stable (0):** There was little change in the sum of nested frequency of perennial grasses.
- **1994 to 1999 - stable (0):** There was a slight decrease in the sum of nested frequency of perennial grasses, though cover increased from 20% to 41%.
- **1999 to 2004 - stable (0):** There was a slight increase in the sum of nested frequency of perennial, though cover decreased to 27%.
- **2004 to 2009 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, though cover increased to 55%.

Forb:

- **1986 to 1994 - stable (0):** There was little change in the sum of nested frequency of perennial forbs.
- **1994 to 1999 - down (-2):** The sum of nested frequency of perennial forbs decreased by 22%, though cover increased from 12% to 20%.
- **1999 to 2004 - slightly up (+1):** There was a 13% increase in the sum of nested frequency of perennial forbs, though cover decreased slightly.
- **2004 to 2009 - slightly up (+1):** The sum of nested frequency of perennial forbs increased by 11% and cover increased slightly.

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
 Management unit 14, Study no: 6



HERBACEOUS TRENDS--
Management unit 14, Study no: 6

Type	Species	Nested Frequency					Average Cover %			
		'86	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron cristatum	12	2	3	-	-	.01	.03	-	-
G	Bromus inermis	a301	ab323	b336	b333	b340	8.02	20.12	17.22	27.72
G	Carex sp.	c54	b22	a-	c52	bc43	.43	-	1.17	1.01
G	Dactylis glomerata	-	-	2	-	-	-	.15	-	-
G	Koeleria cristata	-	-	-	3	3	-	-	.03	.03
G	Poa fendleriana	c130	b68	a-	b46	a9	2.01	-	.61	.12
G	Poa pratensis	a143	b270	c326	b270	c316	9.58	20.21	7.82	25.48
G	Poa secunda	-	-	-	-	3	-	-	-	.15
G	Sitanion hystrix	3	3	-	-	-	.00	-	-	-
G	Unknown grass - perennial	4	-	-	-	-	-	-	-	-
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		647	688	667	704	714	20.08	40.52	26.86	54.53
Total for Grasses		647	688	667	704	714	20.08	40.52	26.86	54.53
F	Achillea millefolium	-	-	3	-	3	-	.00	-	.03
F	Agoseris glauca	-	-	-	3	1	-	-	.00	.03
F	Androsace septentrionalis (a)	-	a7	a7	b28	b31	.63	.04	.07	.22
F	Antennaria rosea	-	-	-	-	2	-	-	-	.03
F	Antennaria sp.	b9	ab5	a1	a1	a-	.15	.15	.03	-
F	Arabis sp.	-	6	-	-	-	.01	-	-	-
F	Arenaria sp.	-	-	7	9	-	-	.30	.30	-
F	Aster sp.	-	1	-	-	-	.00	-	-	-
F	Calochortus nuttallii	-	-	2	-	-	-	.00	-	-
F	Castilleja linariaefolia	6	8	13	19	12	.05	.25	.15	.13
F	Collinsia parviflora (a)	-	ab19	a5	b36	a9	.05	.03	.14	.02
F	Crepis acuminata	-	3	-	2	3	.63	-	.01	.15
F	Erigeron flagellaris	ab29	a25	a12	a17	b49	.07	.03	.19	.98
F	Eriogonum racemosum	b76	ab52	a27	ab38	ab52	.53	.50	.72	1.01
F	Gayophytum ramosissimum(a)	-	b25	a-	a-	a-	.04	-	-	-
F	Ipomopsis aggregata	b17	a4	a-	a1	a-	.63	-	.00	-
F	Lathyrus pauciflorus	ab42	ab42	a31	ab56	b61	.79	.37	1.34	1.85
F	Lomatium parryi	a-	b26	a-	a-	a-	.87	-	-	-
F	Lupinus holosericeus	a178	c235	bc244	ab197	a173	7.76	17.11	15.04	14.18
F	Microsteris gracilis (a)	a-	a-	c51	b11	a-	-	.47	.05	-
F	Penstemon comarrhenus	c138	b64	a7	ab33	b43	.29	.07	.27	.44
F	Phlox longifolia	a16	b68	a30	b92	b93	.22	.07	.63	.91
F	Polygonum douglasii (a)	-	ab31	a7	ab20	b48	.06	.01	.04	.24
F	Senecio neomexicanus	b21	a7	a1	a5	a1	.02	.00	.04	.00
F	Taraxacum officinale	a3	a7	a9	a9	b43	.01	.07	.02	.43
F	Thlaspi sp.	b12	a-	a-	a-	a-	-	-	-	-
F	Unknown forb-perennial	-	-	-	-	7	-	-	-	.04
F	Vicia americana	a-	a-	b44	a6	a-	-	.70	.06	-
Total for Annual Forbs		0	82	70	95	88	0.78	0.56	0.31	0.49
Total for Perennial Forbs		547	553	431	488	543	12.09	19.67	18.85	20.26

Type	Species	Nestled Frequency					Average Cover %			
		'86	'94	'99	'04	'09	'94	'99	'04	'09
Total for Forbs		547	635	501	583	631	12.87	20.23	19.15	20.75

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

BROWSE TRENDS--

Management unit 14, Study no: 6

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	Amelanchier utahensis	15	16	14	14	.55	1.37	1.91	2.02
B	Artemisia tridentata vaseyana	81	60	61	46	6.02	8.42	5.24	2.83
B	Quercus gambelii	0	37	30	37	8.86	5.94	6.77	14.90
B	Symphoricarpos oreophilus	24	13	15	21	1.02	.92	1.25	2.66
Total for Browse		120	126	120	118	16.46	16.66	15.18	22.42

CANOPY COVER, LINE INTERCEPT--

Management unit 14, Study no: 6

Species	Percent Cover		
	'99	'04	'09
Amelanchier utahensis	-	2.70	2.56
Artemisia tridentata vaseyana	-	8.11	3.38
Quercus gambelii	.40	13.51	18.58
Symphoricarpos oreophilus	-	.45	2.08

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 14, Study no: 6

Species	Average leader growth (in)	
	'04	'09
Amelanchier utahensis	2.4	3.3
Artemisia tridentata vaseyana	1.5	1.6

BASIC COVER--

Management unit 14, Study no: 6

Cover Type	Average Cover %				
	'86	'94	'99	'04	'09
Vegetation	7.50	58.87	64.00	59.07	73.06
Rock	0	1.08	.04	.09	.04
Pavement	.50	.22	.12	1.09	.16
Litter	76.00	57.97	67.18	63.27	62.04
Cryptogams	.25	.11	.12	.15	.19
Bare Ground	15.75	2.75	4.34	5.81	5.00

SOIL ANALYSIS DATA --

Management unit 14, Study no: 6, Study Name: Harts Draw Reservoir

Effective rooting depth (in)	pH	loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
17.9	6.4	44	35.4	20.6	3.1	23.2	272	0.5

PELLET GROUP DATA--

Management unit 14, Study no: 6

Type	Quadrat Frequency			
	'94	'99	'04	'09
Rabbit	3	12	5	2
Elk	1	-	4	-
Deer	8	2	5	4
Cattle	2	11	13	18

Days use per acre (ha)		
'99	'04	'09
-	-	-
1 (3)	3 (7)	6 (15)
18 (44)	7 (17)	5 (12)
74 (183)	41 (102)	52 (127)

BROWSE CHARACTERISTICS--

Management unit 14, Study no: 6

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
Amelanchier utahensis									
86	999	100	0	0	-	93	7	0	-/-
94	360	28	44	28	60	11	0	22	39/55
99	380	37	63	0	-	47	0	0	31/25
04	320	6	94	0	-	56	38	0	42/38
09	440	36	64	0	-	9	5	0	60/50
Artemisia tridentata vaseyana									
86	5399	0	53	47	-	56	42	28	18/18
94	3100	7	15	78	2160	2	1	43	19/25
99	2580	5	53	42	140	12	4	13	20/23
04	2320	10	59	30	5460	32	10	18	22/29
09	1460	19	53	27	440	14	0	11	22/29
Cercocarpus montanus									
86	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	-/-
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	17/22
Quercus gambelii									
86	4065	59	23	18	1133	64	36	44	41/21
94	0	0	0	0	-	0	0	0	-/-
99	3740	29	64	7	160	17	0	1	45/29
04	4040	20	79	1	-	6	0	.49	40/25
09	5380	19	81	0	180	0	0	0	59/45
Symphoricarpos oreophilus									
86	598	33	56	11	-	78	11	78	14/7
94	600	7	93	0	-	17	0	10	15/22
99	460	13	87	0	-	13	0	0	18/19
04	500	28	72	0	20	4	0	0	16/18
09	800	10	90	0	140	0	0	0	19/23