

Trend Study 14-6-04

Study site name: Harts Draw Reservoir .

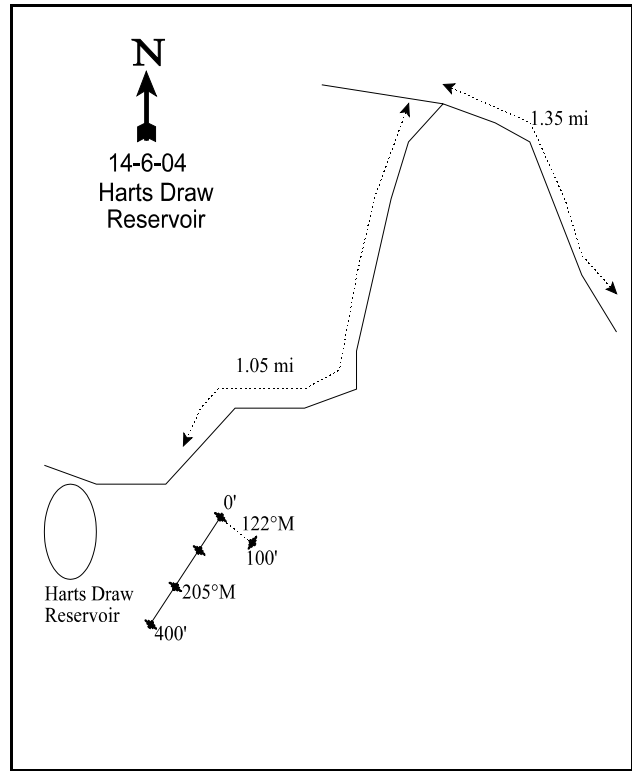
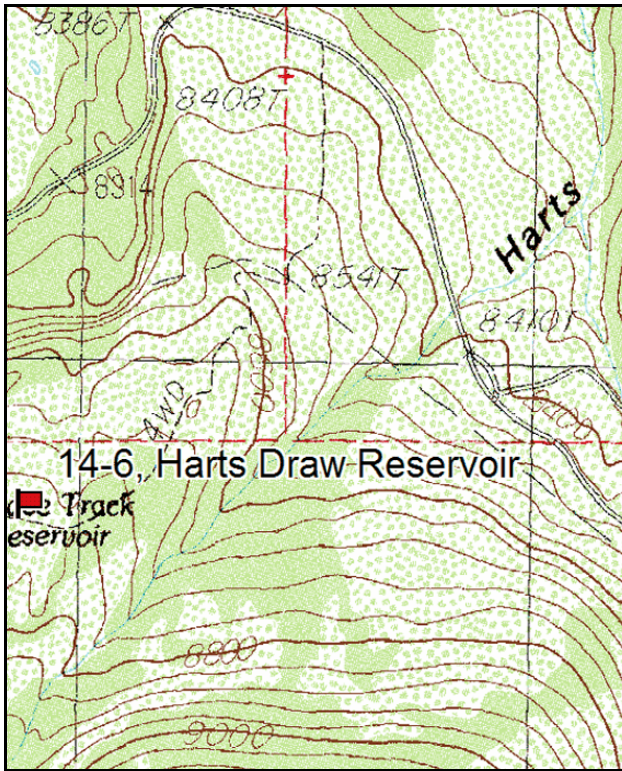
Vegetation type: Mixed Oak-Sagebrush .

Compass bearing: frequency baseline 122 degrees magnetic.

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

LOCATION DESCRIPTION

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

Diagrammatic Sketch

Township 33S , Range 22E , Section 22

GPS: NAD 27, UTM 12S 4195632 N, 632865 E

## DISCUSSION

### Harts Draw Reservoir - Trend Study No. 14-6

The Harts Draw Reservoir study is on National Forest land and located on summer range for deer and elk. Aspen groves with oakbrush and sagebrush openings are the predominant vegetation types. This trend study samples one of these sagebrush openings. The elevation is 8,800 feet with a north-northwest aspect and a slope of less than 5%. The area is part of the Harts Draw allotment (the Harts Draw unit is one of three on the allotment). The grazing system is rest-rotation; this unit is grazed for two months of the season for two years and rested the third year. Season of use is June 16 to Sept 15. The current agreement is for 361 head. The area was seeded over twenty years ago with no land treatments planned for the near future.

Considering its proximity to a water source, the area has received only moderate utilization of the grasses by cattle. Water is plentiful and grazing pressure does not appear to be concentrated in the immediate area of the water. Although access is easy, public pressure is low except during the hunting season. Deer pellet groups are frequent and deer have been observed on the site. Escape cover is provided by thick clumps of oak and nearby groves of aspen. Pellet group data from 1999 estimated 18 deer days use/acre (44 ddu/ha), 1 elk days use/acre (3 edu/ha), and 74 cow days use/acre (183 cdu/ha). Nearly all of the cattle pats appeared to be from the previous grazing season. About half of the deer pellet groups were recent with the other half from last year. Pellet group data from 2004 estimated low deer and elk use at 7 and 3 days use/acre respectively (17 ddu/ha and 7 edu/ha). Cattle use was moderate estimated at 41 days use/acre (102 cdu/ha). Cattle pats encountered in 2004 appeared to be from the previous grazing season (2003).

Soil in the area is a moderately deep red-brown loam with an estimated effective rooting depth of nearly 18 inches. It has a slightly acid pH of 6.4. The soil on the site is extremely compacted and difficult to dig in. As a result, stoniness measurements rarely hit rock and are more a measure of soil compaction. As evidenced by the very rocky, rough road leading to the site, the soil is susceptible to erosion. Once started by the removal of vegetation, erosion is rapid and severe. Gullies are found on the steeper slopes that are devoid of vegetation. Most of the study site has a thick protective vegetative and litter cover leaving little unprotected soil.

The sagebrush-grass type, sampled with this trend study, is closely intermingled with oakbrush. It is a productive and highly utilized as summer range. Mountain big sagebrush is the dominant preferred browse species which provided about one-third of the total browse cover in 2004 with a cover value of 5%. Density was estimated at 3,100 plants/acre in 1994. Nearly 80% of the population was classified as decadent but utilization was mostly light. By 2004, the population had declined to 2,320 plants/acre and the number of decadent plants dropped to 30% of the population. Utilization was more moderate with some heavy use on selected plants. Seedlings were abundant and about 10% of the population consisted of young plants.

Oak on the site occur in isolated clones and vary in height from 4 to 10 feet. Density has remained rather constant since 1986 at around 4,000 stems/acre. Oak was mistakenly not included in the shrub density strips in 1994, so there are no density data. Utilization was moderate in 1986, especially on the abundant young sprouts around the edges of the clones. These showed some evidence of poor vigor and insect damage that year. Use has been mostly light, vigor normal, and percent decadence low during all other readings. Total line intercept canopy cover was estimated at just under 14% in 2004.

Two other shrubs, serviceberry and snowberry, are found in scattered populations. Both shrubs were moderately utilized in 1986. The snowberry had already started to lose its leaves in early September of 1986 when the site was first read. Use of snowberry has been mostly light and vigor normal since 1994. Serviceberry is especially vigorous and nearby six-foot tall shrubs provide abundant forage and seed. Serviceberry sampled on the site showed moderate to heavy use in 2004 and vigor was good.

Grasses and forbs are abundant in the understory, however two increaser grasses, smooth brome and Kentucky bluegrass, dominate the herbaceous component. Smooth brome and Kentucky bluegrass each provides a cover value of 20% and account for 100% of the grass cover and 66% of the total herbaceous cover in 1999. Total grass cover declined 34% in 2004 due to drought conditions, but smooth brome and Kentucky bluegrass still account for 93% of the total grass cover. Other grasses are rare. Forbs are diverse but only lupine is abundant. It produced 85% of the total forb cover in 1999 and 79% in 2004. Dusty penstemon was quite common in the past and was heavily grazed, as was redroot eriogonum. Both species have decreased in abundance. Other important forbs are few flower peavine, paintbrush, wooly groundsel, and American vetch.

1986 TREND ASSESSMENT

Looking at data from both the older line intercept studies (LI) and the newer Interagency trend study (IA), these observations seem in order.

1. The oak and aspen-dominated areas are similar on all parameters between years. Diversity in species composition and forage production are high. The overall trend is stable.
2. The sagebrush-grass type, intensively surveyed with both methods, appears to be a more dynamic community. No severe fluctuations in the type were apparent, but there have been some changes.

	1981	1986
Browse production	188 lbs/acre	272 lbs/acre
Browse density	8,400 plants/acre	12,200 plants/acre
% of production from ARTRV	94%	85%
oak density	2500 plants/acre LI - 5600 plants/acre	IA - 5200 plants/acre
grass production	247 lbs/acre	360 lbs/acre

3. The soil is very erodible and where erosion has started, there is serious soil loss. However, most of the area has adequate cover in the form of a dense herbaceous understory and abundant litter. Soil trend is stable.

These data point to a trend of increasing oak, a possible decrease in big sagebrush and possible decrease in grass density. Comparison of photo point photographs also support these conclusions. Oak is vigorously sprouting, while very little recruitment is found for the sagebrush, which also has a fairly high amount of decadence.

This area provides an excellent mosaic of big game habitat types, with cover, water, and forage all available. It is important to maintain the limited sagebrush-grass type for it is highly productive and heavily used by both big game and livestock. The increasing oak threatens the stability of this vegetation type. Therefore, trend is considered stable to declining.

1994 TREND ASSESSMENT

The trend for soil is up, because percent bare ground has decreased substantially and percent litter is still quite high with vegetative cover also being high. The browse trend is slightly down for the key species, which is mountain big sagebrush. The density estimate has gone down somewhat, but that is more reflective of the

much larger sample size. What is of more importance is that the population has a much higher percent decadence (78%) and those showing poor vigor has increased to 43%. The one parameter that can turn this trend around is the large number of seedlings (2,160 seedlings/acre). The herbaceous understory trend is stable.

#### TREND ASSESSMENT

soil - up (5)

browse - slightly down (2)

herbaceous understory - stable (3)

#### 1999 TREND ASSESSMENT

Trend for soil is stable with excellent protective ground cover. Trend for browse appears to be in a state of decline for mountain big sagebrush. Although vigor has improved and percent decadence has gone down from 78% to 42%, the population density has gone down slightly, recruitment is poor, and the proportion of the population which are dead has doubled since 1994. Currently there are not enough young plants to replace decadent and dying plants. Gambel oak has remained at similar densities since 1986 (4,066 to 3,740 stems/acre) while increasing in size. Serviceberry and snowberry appear to have stable but small populations. Trend for the herbaceous understory is slightly down. Smooth brome and Kentucky bluegrass continue to dominate the herbaceous understory. The increase in Kentucky bluegrass since 1994 may be due to identification problems with mutton bluegrass. The nested frequencies of grasses slightly decreased, while cover of the two dominant grasses doubled since 1994. This would be due to wetter conditions in 1999. Sum of nested frequency for forbs overall declined substantially, but the dominant forb, lupine an increaser, remained stable. Cover of forbs also nearly doubled compared to 1994 estimates.

#### TREND ASSESSMENT

soil - stable (3)

browse - slightly down (2)

herbaceous understory - slightly down (2)

#### 2004 TREND ASSESSMENT

Trend for soil remains stable with abundant protective ground cover and little exposed bare ground. Trend for the key browse species, mountain big sagebrush, is stable. Density is similar to 1999 estimates while percent decadence has declined from 42% to 30%. Young recruitment is good with 10% of the population consisting of young plants. Seedlings are also abundant. Gambel oak density appears stable and total canopy cover was estimated at 13.5%. Most oak is unutilized. Serviceberry and snowberry have small but stable populations. Trend for the herbaceous understory is stable with similar sum of nested frequency values for perennial grasses and forbs between years. Smooth brome and Kentucky bluegrass still dominate the herbaceous understory by providing 93% of the total grass cover. Perennial grass production is down however due to the dry conditions of the past few years. Average cover of perennial grasses declined 35%. Most of the change is due to a significant decline in cover of Kentucky bluegrass, down nearly three-fold (20% to 8%). Sum of nested frequency for perennial forbs increased slightly in 2004 and average cover remained similar. Silky lupine totally dominates the forb component by providing 79% of the total forb cover. Nested frequency of lupine did decline significantly since 1999 but average cover remained similar (17% vs 15%). Peavine and longleaf phlox increased significantly in frequency. Most other forbs occur rarely.

#### TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

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

T y p e	Species	Nested Frequency				Average Cover %		
		'86	'94	'99	'04	'94	'99	'04
G	<i>Agropyron cristatum</i>	12	2	3	-	.01	.03	-
G	<i>Bromus inermis</i>	<sub>a</sub> 301	<sub>ab</sub> 323	<sub>b</sub> 336	<sub>b</sub> 333	8.02	20.12	17.22
G	<i>Carex</i> spp.	<sub>c</sub> 54	<sub>b</sub> 22	<sub>a</sub> -	<sub>c</sub> 52	.43	-	1.17
G	<i>Dactylis glomerata</i>	-	-	2	-	-	.15	-
G	<i>Koeleria cristata</i>	-	-	-	3	-	-	.03
G	<i>Poa fendleriana</i>	<sub>c</sub> 130	<sub>b</sub> 68	<sub>a</sub> -	<sub>b</sub> 46	2.01	-	.61
G	<i>Poa pratensis</i>	<sub>a</sub> 143	<sub>b</sub> 270	<sub>c</sub> 326	<sub>b</sub> 270	9.58	20.21	7.82
G	<i>Sitanion hystrix</i>	3	3	-	-	.00	-	-
G	Unknown grass - perennial	4	-	-	-	-	-	-
Total for Annual Grasses		0	0	0	0	0	0	0
Total for Perennial Grasses		647	688	667	704	20.08	40.52	26.86
Total for Grasses		647	688	667	704	20.08	40.52	26.86
F	<i>Achillea millefolium</i>	-	-	3	-	-	.00	-
F	<i>Agoseris glauca</i>	-	-	-	3	-	-	.00
F	<i>Androsace septentrionalis</i> (a)	-	<sub>a</sub> 7	<sub>a</sub> 7	<sub>b</sub> 28	.63	.04	.07
F	<i>Antennaria</i> spp.	<sub>b</sub> 9	<sub>ab</sub> 5	<sub>a</sub> 1	<sub>a</sub> 1	.15	.15	.03
F	<i>Arabis</i> spp.	-	6	-	-	.01	-	-
F	<i>Arenaria</i> spp.	-	-	7	9	-	.30	.30
F	<i>Aster</i> spp.	-	1	-	-	.00	-	-
F	<i>Castilleja linariaefolia</i>	6	8	13	19	.05	.25	.15
F	<i>Calochortus nuttallii</i>	-	-	2	-	-	.00	-
F	<i>Collinsia parviflora</i> (a)	-	<sub>b</sub> 19	<sub>a</sub> 5	<sub>b</sub> 36	.05	.03	.14
F	<i>Crepis acuminata</i>	-	3	-	2	.63	-	.01
F	<i>Erigeron flagellaris</i>	29	25	12	17	.07	.03	.19
F	<i>Eriogonum racemosum</i>	<sub>b</sub> 76	<sub>ab</sub> 52	<sub>a</sub> 27	<sub>b</sub> 38	.53	.50	.72
F	<i>Gayophytum ramosissimum</i> (a)	-	<sub>b</sub> 25	<sub>a</sub> -	<sub>a</sub> -	.04	-	-
F	<i>Ipomopsis aggregata</i>	<sub>b</sub> 17	<sub>a</sub> 4	<sub>a</sub> -	<sub>a</sub> 1	.63	-	.00
F	<i>Lathyrus pauciflorus</i>	<sub>ab</sub> 42	<sub>ab</sub> 42	<sub>a</sub> 31	<sub>b</sub> 56	.79	.37	1.34
F	<i>Lomatium parryi</i>	<sub>a</sub> -	<sub>b</sub> 26	<sub>a</sub> -	<sub>a</sub> -	.87	-	-
F	<i>Lupinus holosericeus</i>	<sub>a</sub> 178	<sub>b</sub> 235	<sub>b</sub> 244	<sub>a</sub> 197	7.76	17.11	15.04
F	<i>Microsteris gracilis</i> (a)	-	<sub>a</sub> -	<sub>c</sub> 51	<sub>b</sub> 11	-	.47	.05
F	<i>Penstemon comarrhenus</i>	<sub>c</sub> 138	<sub>b</sub> 64	<sub>a</sub> 7	<sub>ab</sub> 33	.29	.07	.27
F	<i>Phlox longifolia</i>	<sub>a</sub> 16	<sub>b</sub> 68	<sub>a</sub> 30	<sub>b</sub> 92	.22	.07	.63
F	<i>Polygonum douglasii</i> (a)	-	<sub>b</sub> 31	<sub>a</sub> 7	<sub>ab</sub> 20	.06	.01	.04
F	<i>Senecio neomexicanus</i>	<sub>b</sub> 21	<sub>a</sub> 7	<sub>a</sub> 1	<sub>a</sub> 5	.02	.00	.04

Type	Species	Nested Frequency				Average Cover %		
		'86	'94	'99	'04	'94	'99	'04
F	Taraxacum officinale	3	7	9	9	.01	.07	.02
F	Thlaspi spp.	12	-	-	-	-	-	-
F	Vicia americana	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 44	<sub>a</sub> 6	-	.70	.06
Total for Annual Forbs		0	82	70	95	0.78	0.56	0.31
Total for Perennial Forbs		547	553	431	488	12.09	19.67	18.85
Total for Forbs		547	635	501	583	12.87	20.23	19.15

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	'94	'99	'04
B	Amelanchier utahensis	15	16	14	.55	1.37	1.91
B	Artemisia tridentata vaseyana	81	60	61	6.02	8.42	5.24
B	Quercus gambelii	0	37	30	8.86	5.94	6.77
B	Symphoricarpos oreophilus	24	13	15	1.02	.92	1.25
Total for Browse		120	126	120	16.46	16.66	15.18

#### CANOPY COVER, LINE INTERCEPT --

Management unit 14 , Study no: 6

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

#### KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 14 , Study no: 6

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

BASIC COVER --

Management unit 14 , Study no: 6

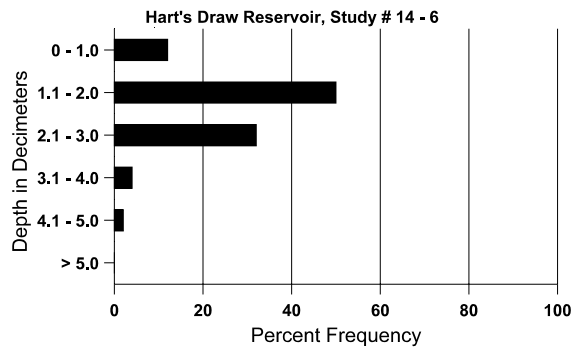
Cover Type	Average Cover %			
	'86	'94	'99	'04
Vegetation	7.50	58.87	64.00	59.07
Rock	0	1.08	.04	.09
Pavement	.50	.22	.12	1.09
Litter	76.00	57.97	67.18	63.27
Cryptogams	.25	.11	.12	.15
Bare Ground	15.75	2.75	4.34	5.81

SOIL ANALYSIS DATA --

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

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
17.9	62.7 (11.6)	6.4	44.0	35.4	20.6	3.1	23.2	272.0	0.5

Stoniness Index



PELLET GROUP DATA --

Management unit 14 , Study no: 6

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

Days use per acre (ha)	
'99	'04
-	-
1 (3)	3 (7)
18 (44)	7 (17)
74 (183)	41 (102)

BROWSE CHARACTERISTICS --  
Management unit 14 , Study no: 6

		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)
<b>Amelanchier utahensis</b>												
86	<b>1000</b>	-	1000	-	-	-	93	7	0	-	0	-/-
94	<b>360</b>	60	100	160	100	-	11	0	28	22	22	39/55
99	<b>380</b>	-	140	240	-	-	47	0	0	-	0	31/25
04	<b>320</b>	-	20	300	-	-	56	38	0	-	0	42/38
<b>Artemisia tridentata vaseyana</b>												
86	<b>5399</b>	-	-	2866	2533	-	56	42	47	1	28	18/18
94	<b>3100</b>	2160	220	460	2420	800	2	1	78	42	43	19/25
99	<b>2580</b>	140	120	1380	1080	1480	12	4	42	12	13	20/23
04	<b>2320</b>	5460	240	1380	700	1100	32	10	30	18	18	22/29
<b>Quercus gambelii</b>												
86	<b>4066</b>	1133	2400	933	733	-	64	36	18	2	44	41/21
94	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
99	<b>3740</b>	160	1080	2400	260	800	17	0	7	1	1	45/29
04	<b>4040</b>	-	800	3200	40	220	6	0	1	-	.49	40/25
<b>Symphoricarpos oreophilus</b>												
86	<b>599</b>	-	200	333	66	-	78	11	11	3	78	14/7
94	<b>600</b>	-	40	560	-	-	17	0	0	-	10	15/22
99	<b>460</b>	-	60	400	-	-	13	0	0	-	0	18/19
04	<b>500</b>	20	140	360	-	-	4	0	0	-	0	16/18