

Trend Study 17-5-07

Study site name: Deer Creek Dam .

Vegetation type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 180 degrees magnetic (line 2-4 @ 108°M).

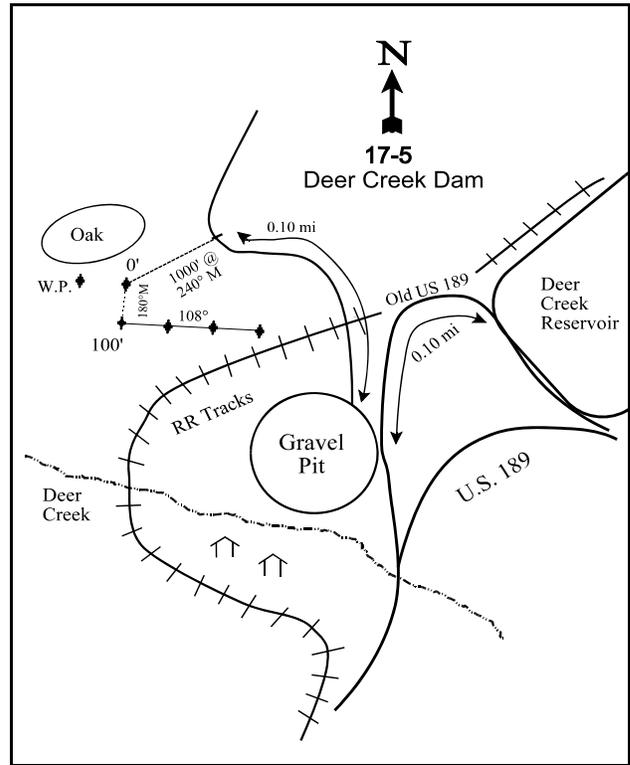
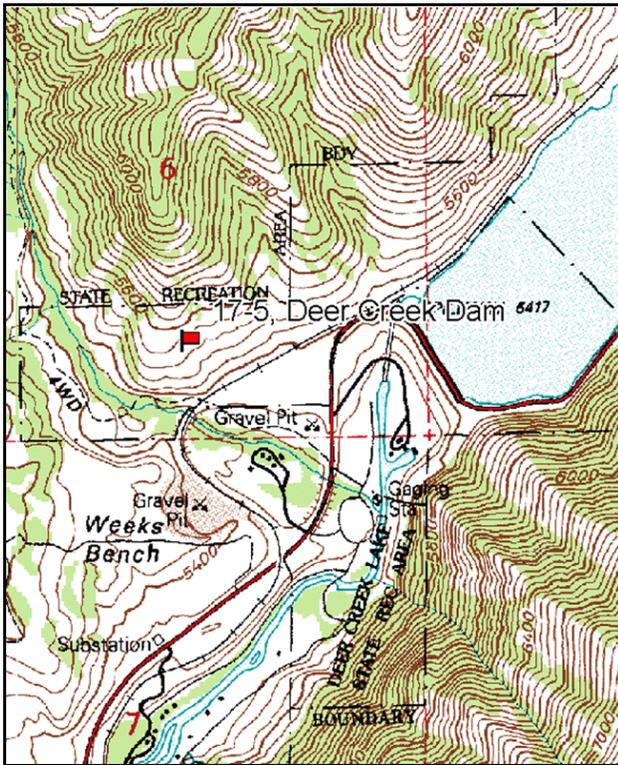
Frequency belt placement: line 1 (11 & 95ft), line 2 [belt 4] (71ft), line 3 (34ft), line 4 [belt 3] (71ft).

Rebar: In 2007 rebar was found on belts 1 & 5 but not on belts 2, 3 & 4

LOCATION DESCRIPTION

***When the study was sampled in 2007, U.S. 189 was under construction and was being realigned. Once construction is completed, these directions may no longer be valid.

From the dam at the south end of Deer Creek Reservoir, proceed south on U.S. 189 for 0.10 miles to an intersection to the west that enters a gravel pit. Turn right toward Deer Creek and proceed northwesterly to the intersection of the Denver and Rio-Grande railroad tracks. Continue for 0.1 miles to where the road bends to the north. Walk 1000 feet at heading of 240 degrees to a full high witness post. The 0-foot baseline stake is 20 feet from the witness post. A red browse tag, number 3914, is attached to the 0-foot baseline stake. Line 4 belt 3 was mistakenly put at 71 feet, and in order to be consistent, belt 3 has not been moved to 59 feet.



Map Name: Aspen Grove

Diagrammatic Sketch

Township 5S, Range 4E, Section 6

GPS: NAD 83, UTM 12S 454470 E 4473073 N

DISCUSSION

Deer Creek Dam - Trend Study No. 17-5

Study Information

This study is located within deer winter range on a moderately sloping bench at the mouth of Deer Creek [elevation: 5,540 feet (1,689 m), slope (12%-20%), aspect: south-southeast]. The study is on land administered by the Utah Division of Parks and Recreation about 0.5 miles (2.6 km) west of Deer Creek dam. Power line construction previous to site establishment in 1989 disturbed the ground along the end of the frequency lines. This resulted in a decrease many of the mature sagebrush being eliminated and a proliferation of sagebrush and annual weeds. The study is approximately 1000 feet (305 m) to the west of a staging area and gravel pit that were actively being used in 2007 as a part of the realignment project on US-189. Winter and spring deer use has been moderate. From the pellet group transect, there were an estimated 32 deer days use/acre (79 ddu/ha) in 2002 and 30 deer days use/acre (74 ddu/ha) in 2007. Elk use was estimated at 6 days use/acre (15 edu/ha) in 2002 and 17 days use/acre (41 edu/ha) in 2007. The deer and elk pellets sampled in 2007 appeared to be one year old. The lack of more recent big game use may be related to the construction work being done on US-189.

Soil

The soil is classified in the Burgi-Agassiz association. Soils in this series are well-drained, moderately permeable, and formed in alluvium and colluvium derived from mixed sedimentary rocks, mainly sandstone, quartzite, and limestone (USDA-NRCS 2007). Specifically at the study, the soil has a clay loam texture, and the profile is very rocky. A calcium carbonate layer is present 9 inches (22.9 cm) below the surface. Vegetation and litter have accounted for at least 77% of the ground cover since 1996. The erosion condition was classified as stable in 2002 and 2007.

Browse

Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) is the dominant preferred browse species. Sagebrush canopy cover was 25% in 2002 and decreased to 16% in 2007. Density has fluctuated between years, and some of the change in density is likely the result of the increased sample area used beginning in 1996, which is more accurate at determining shrub densities. The density increased from 4,120 plants/acre (10,198 plants/ha) in 1996 to 5,320 plants/acre (13,168 plants/ha) in 2002, and decreased to 2,800 plants/acre (6,931 plants/ha) in 2007. Seedling density has decreased dramatically from 21,000 seedlings/acre (51,980 seedlings/ha) in 1989 to 2,020 seedlings/acre (5,000 seedlings/ha) in 1996, and 0 seedlings/acre in 2002 and 2007. Young plants increased from 5% of the population in 1983 to 38% in 1996, then decreased to 4% by 2007. Conversely, decadence decreased from 24% of the population in 1983 to 8% in 1996, then increased to 34% by 2007. The density of dead plants has increased from 440 plants/acre (1,089 plants/ha) in 1996 to 920 plants/acre (2,277 plants/ha) in 2007. The proportion of plants exhibiting poor vigor was 53% of the population in 1983, but has been low since 1989. The average annual leader growth was 3.3 inches (8.4 cm) in 2002 and 1.4 inches (3.6 cm) in 2007. Browse use on sagebrush has been light to light-moderate.

Stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) was first sampled in 1996 and had an estimated density of 2,060 plants/acre (5,099 plants/ha). In 2007, the density had decreased to 1,300 plants/acre (3,218 plants/ha). Very few plants showed browse use in any reading. Broom snakeweed (*Gutierrezia sarothrae*) density was estimated at 1,140 plants/acre in 1996, increased to 2,940 plants/acre in 2002, and decreased to 600 plants/acre (1,485 plants/ha) in 2007. Other species present in low densities include chokecherry (*Prunus virginiana*), antelope bitterbrush (*Purshia tridentata*), snowberry (*Symphoricarpos oreophilus*), serviceberry (*Amelanchier alnifolia*), and white rubber rabbitbrush (*Chrysothamnus nauseosus* ssp. *albicaulis*).

Herbaceous Understory

The herbaceous understory is weedy in composition. Since they were initially measured in 1996, annual grasses have had higher nested and quadrat frequencies than perennial grasses. Annual grass cover was 19% in 1996, 2% in 2002, and 9% in 2007. In 1996 and 2007, cheatgrass (*Bromus tectorum*) was the dominant understory species. Japanese brome (*Bromus japonicus*) and jointed goatgrass (*Aegilops cylindrica*), a noxious weed, were first sampled in 2002. Perennial grass cover has been 3%-4% since 1996, and the most abundant species are bluebunch wheatgrass (*Agropyron spicatum*) and Kentucky bluegrass (*Poa pratensis*). The cover of bluebunch wheatgrass has increased with every reading, while that of Kentucky bluegrass has decreased.

Perennial forb cover has averaged 10% since 1996. Many of the forbs sampled are increasers and weeds, including both annuals and perennials. The most abundant forbs are pale alyssum (*Alyssum alyssoides*), longleaf phlox (*Phlox longifolia*), bur buttercup (*Ranunculus testiculatus*), and yellow salsify (*Tragopogon dubius*). Bur buttercup is an allelopathic annual (Buchanan et al. 1978), and buttercup quadrat frequency has increased from 7% in 1996 to 38% in 2007. Dalmatian toadflax (*Linaria dalmatica*) and houndstongue (*Cynoglossum officinale*), both noxious weed species, have also been sampled and cover has averaged 2% since 1996.

1989 TREND ASSESSMENT

The browse trend is down. The density of mountain big sagebrush decreased 53%, though most of the decrease is due to the construction of a power line through the study. Although the population density decreased, the density of seedling plants increased from 0 plants/acre to 21,000 plants/acre (51,980 plants/ha). Decadence decreased from 24% to 11% of the population, and plants exhibiting poor vigor decreased from 53% to 0%. Browse use shifted from light-moderate to exclusively light. Chokecherry was sampled for the first time, and there were 266 plants/acre (658 plants/ha). The grass trend is up. The sum of nested frequency of perennial grasses increased two-fold. The nested frequencies of bluebunch wheatgrass and Kentucky bluegrass increased significantly. The forb trend is down. Excluding noxious weeds, the sum of nested frequency of perennial forbs decreased 41%, including a significant decrease in the nested frequency of northern sweetvetch (*Hedysarum boreale*). Houndstongue was sampled for the first time, though it was only in one quadrat.

browse - down (-2)

grass - up (+2)

forb - down (-2)

1996 TREND ASSESSMENT

The browse trend is up. The density of sagebrush increased more than three-fold. This increase was due to the higher density of young and mature plants. Decadency remained stable, though the density of dead plants increased from 0 plants/acre to 440 plants/acre (1,089 plants/ha). The proportion of plants exhibiting poor vigor also increased from 0% to 14% of the population. The grass trend is down. The sum of nested frequency of perennial grasses decreased 21%, including a significant decrease in the nested frequency of Kentucky bluegrass. Cheatgrass had a quadrat frequency of 96% and accounted for 19% of the total ground cover. The forb trend is slightly down. Excluding noxious weeds, the sum of nested frequency of perennial forbs increased more than four-fold. However, much of the increase was attributed to species with little forage value. Dalmatian toadflax was sampled for the first time and had a quadrat frequency of 23%, and the quadrat frequency of houndstongue increased to 16%. There were significant increases in the nested frequency of wavyleaf thistle (*Cirsium undulatum*), houndstongue, and longleaf phlox. The Desirable Components Index (DCI) score was fair due to high browse cover with low decadence and high recruitment, and high perennial forb cover. The score was lowered because of high annual grass cover and the presence of two noxious weed species.

winter range condition (DCI) - fair (54) Mid-level potential scale

browse - up (+2)

grass - down (-2)

forb - slightly down (-1)

2002 TREND ASSESSMENT

The browse trend is slightly up. The density of sagebrush increased 29%. There were no seedlings sampled, and the density of young plants decreased nearly 50%. Young and decadent plants each accounted for 15% of the population, and the density of dead plants increased two-fold. The change in the sagebrush age class distribution, and the decrease in sagebrush height and crown measurements, suggest that the sagebrush stand may be experiencing intraspecific competition. Poor vigor was exhibited by 5% of the plants. The grass trend is slightly down. The sum of nested frequency of perennial forbs decreased 10%, including a significant decrease in the nested frequency of Kentucky bluegrass. Cheatgrass nested frequency also decreased significantly, and cover decreased from 19% to 2%. However, the trend was lowered due to the presence of Japanese brome and jointed goatgrass. Japanese brome was fairly abundant and had a quadrat frequency of 69%, but goatgrass had a quadrat frequency of only 2%. The forb trend is stable. Excluding noxious weeds, the sum of nested frequency of perennial forbs decreased 14%. The two perennial species that decreased significantly in nested frequency, wavyleaf thistle and bedstraw (*Galium* sp.), have little forage value. Houndstongue was not sampled, and there were significant increases in the nested frequencies of wild onion (*Allium* sp.) and yellow salsify. The DCI remained fair because the decrease in browse recruitment was offset by a decrease in annual grass cover.

winter range condition (DCI) - fair (57) Mid-level potential scale
browse - slightly up (+1) grass - slightly down (-1) forb - stable (0)

2007 TREND ASSESSMENT

The browse trend is down. The density of sagebrush decreased 47%, and sagebrush canopy cover decreased from 25% to 16%. There were no seedlings sampled, and young plants comprised 4% of the population. Decadence increased to 34%, and plants with poor vigor increased to 11% of the population. All plants with poor vigor were classified as dying. Despite the decrease in density and the increase in decadence, the average height and crown measurements increased 5 inches (13 cm) and 11 inches (28 cm), respectively. Browse use shifted from light to light-moderate. The grass trend is down. The sum of nested frequency of perennial grasses decreased 35%, while the sum of nested frequency of annual grasses increased 30%. There was a significant increase in the nested frequency of cheatgrass and a significant decrease in that of Japanese brome. Cheatgrass cover increased to 9% and it was sampled in 84% of the quadrats. The forb trend is slightly down. The sum of nested frequency of perennial forbs increased 7%. Houndstongue was sampled again and the nested frequency of dalmatian toadflax increased significantly. Additionally, there were significant increases in the nested frequencies of two allelopathic annuals, bur buttercup (Buchanan et al. 1978) and storksbill (*Erodium cicutarium*) (Kimball and Schiffman 2003). The DCI score decreased to very poor-poor due to the decrease in preferred browse cover, increased browse decadence and decreased young, increased annual grass cover, and presence of three noxious species.

winter range condition (DCI) - very poor-poor (35) Mid-level potential scale
browse - down (-2) grass - down (-2) forb - slightly down (-1)

HERBACEOUS TRENDS --
 Management unit 17 , Study no: 5

T y p e	Species	Nested Frequency					Average Cover %		
		'83	'89	'96	'02	'07	'96	'02	'07
G	<i>Aegilops cylindrica</i> (a)	-	-	-	_a 3	_a 2	-	.03	.03
G	<i>Agropyron cristatum</i>	-	-	-	_a 3	_a 2	-	.03	.06
G	<i>Agropyron spicatum</i>	_a 5	_b 37	_{bc} 70	_c 93	_{bc} 63	2.07	2.19	2.90

Type	Species	Nested Frequency					Average Cover %		
		'83	'89	'96	'02	'07	'96	'02	'07
G	<i>Bromus japonicus</i> (a)	-	-	-	b171	a111	-	1.43	.99
G	<i>Bromus tectorum</i> (a)	-	-	c356	a125	b276	19.20	1.63	8.72
G	<i>Elymus cinereus</i>	-	-	a5	a-	a4	.18	.00	.78
G	<i>Melica bulbosa</i>	-	-	a3	a7	a3	.00	.21	.18
G	<i>Oryzopsis hymenoides</i>	-	-	-	3	-	-	.15	-
G	<i>Poa fendleriana</i>	a3	a10	-	-	a1	-	-	.03
G	<i>Poa pratensis</i>	b96	c164	b92	a43	a26	1.24	.52	.35
G	<i>Poa secunda</i>	a1	a3	-	a1	-	-	.00	-
G	<i>Sitanion hystrix</i>	-	-	-	3	-	-	.03	-
Total for Annual Grasses		0	0	356	299	389	19.20	3.11	9.75
Total for Perennial Grasses		105	214	170	153	99	3.50	3.15	4.30
Total for Grasses		105	214	526	452	488	22.70	6.26	14.05
F	<i>Agoseris glauca</i>	-	-	-	-	3	-	-	.00
F	<i>Alyssum alyssoides</i> (a)	-	-	a96	b157	c229	.36	.81	1.75
F	<i>Allium</i> sp.	ab31	a9	a16	b46	ab21	.06	.44	.10
F	<i>Artemisia ludoviciana</i>	a3	-	a6	a6	a5	.06	.21	.16
F	<i>Astragalus beckwithii</i>	-	-	-	b24	a11	-	.78	.39
F	<i>Astragalus convallarius</i>	a13	a5	ab24	ab25	b45	.24	.50	1.67
F	<i>Astragalus utahensis</i>	-	-	-	1	-	-	.00	-
F	<i>Camelina microcarpa</i> (a)	-	-	-	a3	b47	-	.03	.21
F	<i>Calochortus nuttallii</i>	a14	a3	-	a7	a2	-	.02	.00
F	<i>Cirsium undulatum</i>	a21	a12	b47	a20	a12	.82	.35	.21
F	<i>Collomia linearis</i> (a)	-	-	-	a9	a6	-	.02	.01
F	<i>Comandra pallida</i>	-	-	a2	a3	b24	.00	.01	.11
F	<i>Collinsia parviflora</i> (a)	-	-	-	a2	a2	-	.00	.01
F	<i>Cynoglossum officinale</i>	-	a2	b37	-	a9	2.34	-	.39
F	<i>Epilobium brachycarpum</i> (a)	-	-	-	-	3	-	-	.00
F	<i>Eriogonum brevicaulis</i>	-	a7	a6	a1	a2	.18	.00	.00
F	<i>Erodium cicutarium</i> (a)	-	-	-	a11	b28	-	.09	.59
F	<i>Galium</i> sp.	-	-	c147	b60	a27	1.05	1.14	1.54
F	<i>Gayophytum ramosissimum</i> (a)	-	-	b20	a3	-	.04	.00	-
F	<i>Hackelia patens</i>	-	a3	-	-	a1	-	-	.03
F	<i>Helianthus annuus</i> (a)	-	a1	-	a5	-	-	.03	-
F	<i>Hedysarum boreale</i>	c69	ab13	b28	-	a8	.63	-	.04
F	<i>Lactuca serriola</i>	-	a20	a17	a3	a12	.04	.01	.11
F	<i>Linaria dalmatia</i>	-	-	a52	a41	b71	.85	1.37	2.01

Type	Species	Nested Frequency					Average Cover %		
		'83	'89	'96	'02	'07	'96	'02	'07
F	<i>Lithospermum ruderales</i>	_a 1	_a 3	_a 6	_a 6	_a 8	.44	.18	.53
F	<i>Lupinus argenteus</i>	_a 8	_a 1	_a 2	_a -	_a 1	.15	.16	.06
F	<i>Machaeranthera canescens</i>	_a 2	_a 5	_a 1	_a -	_a 6	.00	.03	.01
F	<i>Melilotus officinalis</i>	-	-	9	-	-	.04	-	-
F	<i>Microsteris gracilis</i> (a)	-	-	-	_a 4	_a 8	-	.01	.02
F	<i>Oenothera</i> sp.	_a 4	_b 10	_a 3	-	_a 1	.00	-	.03
F	<i>Phlox longifolia</i>	_a 26	_a 15	_b 109	_b 123	_b 115	2.21	2.59	1.79
F	<i>Ranunculus testiculatus</i> (a)	-	-	_a 12	_a 30	_b 125	.06	.13	1.33
F	<i>Solidago</i> sp.	3	-	-	-	-	-	-	-
F	<i>Tragopogon dubius</i>	-	_a 10	_b 61	_c 92	_d 141	.39	1.08	1.78
Total for Annual Forbs		0	1	128	224	448	0.45	1.13	3.96
Total for Perennial Forbs		195	118	573	458	525	9.56	8.91	11.02
Total for Forbs		195	119	701	682	973	10.02	10.05	14.98

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

BROWSE TRENDS --

Management unit 17 , Study no: 5

Type	Species	Strip Frequency			Average Cover %		
		'96	'02	'07	'96	'02	'07
B	<i>Acer grandidentatum</i>	0	1	0	-	-	-
B	<i>Amelanchier alnifolia</i>	2	3	3	-	.53	.15
B	<i>Artemisia tridentata vaseyana</i>	78	82	74	20.79	23.60	14.10
B	<i>Chrysothamnus nauseosus albicaulis</i>	18	16	13	.90	.58	.96
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	39	31	33	3.54	1.55	1.34
B	<i>Crataegus douglasii</i>	0	1	0	-	-	-
B	<i>Gutierrezia sarothrae</i>	26	40	15	.32	1.21	.42
B	<i>Mahonia repens</i>	0	10	0	-	.36	-
B	<i>Prunus virginiana</i>	3	11	4	.36	.63	.91
B	<i>Purshia tridentata</i>	2	1	1	.15	-	.03
B	<i>Quercus gambelii</i>	0	0	1	-	-	-
B	<i>Rosa woodsii</i>	0	2	0	-	-	-
B	<i>Symphoricarpos oreophilus</i>	19	17	11	3.25	3.36	1.25
Total for Browse		187	215	155	29.33	31.84	19.17

CANOPY COVER, LINE INTERCEPT --

Management unit 17 , Study no: 5

Species	Percent Cover	
	'02	'07
<i>Amelanchier alnifolia</i>	.20	.96
<i>Artemisia tridentata vaseyana</i>	24.79	15.64
<i>Chrysothamnus nauseosus albicaulis</i>	1.31	1.54
<i>Chrysothamnus viscidiflorus viscidiflorus</i>	1.50	2.91
<i>Gutierrezia sarothrae</i>	2.54	.25
<i>Mahonia repens</i>	.63	-
<i>Prunus virginiana</i>	.93	.61
<i>Symphoricarpos oreophilus</i>	4.93	1.66

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 17 , Study no: 5

Species	Average leader growth (in)	
	'02	'07
<i>Artemisia tridentata vaseyana</i>	3.4	1.4

BASIC COVER --

Management unit 17 , Study no: 5

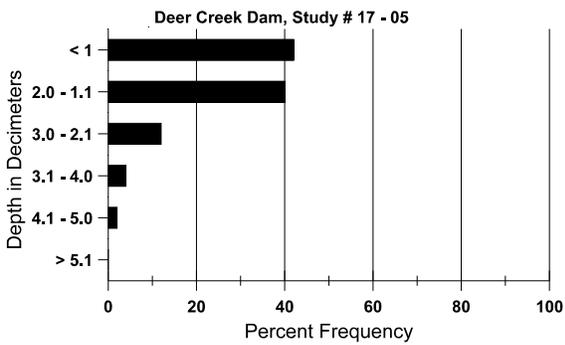
Cover Type	Average Cover %				
	'83	'89	'96	'02	'07
Vegetation	4.25	9.25	56.32	46.84	51.81
Rock	1.25	1.75	5.36	3.31	3.42
Pavement	5.50	15.25	5.72	6.73	5.44
Litter	82.75	68.50	57.25	45.51	46.59
Cryptogams	.25	0	0	0	0
Bare Ground	6.00	5.25	6.69	17.03	9.81

SOIL ANALYSIS DATA --

Herd Unit 17, Study no: 05, Deer Creek Dam

Effective rooting depth (in)	Temp °F (depth)	pH	Clay loam			%OM	ppm P	ppm K	dS/m
			%sand	%silt	%clay				
13.8	66.2 (14.0)	7.3	29.3	42.7	28.0	3.3	12.9	150.4	.7

Stoniness Index



PELLET GROUP DATA --

Management unit 17 , Study no: 5

Type	Quadrat Frequency		
	'96	'02	'07
Rabbit	-	-	2
Elk	1	3	-
Deer	15	11	5

Days use per acre (ha)	
'02	'07
-	-
6 (15)	17 (41)
32 (79)	30 (74)

BROWSE CHARACTERISTICS --

Management unit 17 , Study no: 5

		Age class distribution (plants per acre)					Utilization					
Y	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Acer grandidentatum												
83	0	-	-	-	-	-	0	0	-	-	0	-/-
89	0	-	-	-	-	-	0	0	-	-	0	-/-
96	0	-	-	-	-	-	0	0	-	-	0	-/-
02	40	-	-	40	-	-	0	0	-	-	0	15/6
07	0	-	-	-	-	-	0	0	-	-	0	-/-
Amelanchier alnifolia												
83	0	-	-	-	-	-	0	0	0	-	0	-/-
89	66	-	-	-	66	-	0	100	100	-	100	-/-
96	40	-	-	20	20	-	0	100	50	-	50	25/26
02	60	-	-	40	20	-	0	33	33	-	0	52/46
07	60	-	-	20	40	-	33	67	67	33	33	33/34

		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)
<i>Artemisia tridentata vaseyana</i>												
83	2533	-	133	1800	600	-	32	18	24	-	53	23/33
89	1199	21000	200	866	133	-	0	0	11	-	0	27/41
96	4120	2020	1560	2220	340	440	18	2	8	5	14	24/39
02	5320	-	800	3700	820	880	17	2	15	5	5	24/28
07	2800	-	100	1760	940	920	27	16	34	11	11	29/39
<i>Chrysothamnus nauseosus albicaulis</i>												
83	0	-	-	-	-	-	0	0	0	-	0	-/-
89	66	-	-	66	-	-	0	0	0	-	0	21/27
96	580	-	80	400	100	20	3	21	17	10	24	23/26
02	520	-	-	360	160	60	0	0	31	19	23	17/20
07	320	-	-	180	140	60	0	0	44	6	19	26/26
<i>Chrysothamnus viscidiflorus viscidiflorus</i>												
83	0	-	-	-	-	-	0	0	0	-	0	-/-
89	0	-	-	-	-	-	0	0	0	-	0	-/-
96	2060	120	280	1780	-	-	11	0	0	-	0	12/21
02	1760	-	-	1720	40	20	0	0	2	1	1	12/17
07	1300	-	120	1040	140	20	0	0	11	3	8	12/20
<i>Crataegus douglasii</i>												
83	0	-	-	-	-	-	0	0	-	-	0	-/-
89	0	-	-	-	-	-	0	0	-	-	0	-/-
96	0	-	-	-	-	-	0	0	-	-	0	-/-
02	40	-	-	40	-	-	0	100	-	-	0	28/40
07	0	-	-	-	-	-	0	0	-	-	0	31/33
<i>Gutierrezia sarothrae</i>												
83	0	-	-	-	-	-	0	0	0	-	0	-/-
89	66	133	-	66	-	-	0	0	0	-	0	19/20
96	1140	600	340	760	40	-	2	2	4	4	5	6/9
02	2940	-	80	2640	220	320	0	0	7	3	3	10/13
07	600	20	40	560	-	-	0	0	0	-	0	10/9
<i>Mahonia repens</i>												
83	0	-	-	-	-	-	0	0	-	-	0	-/-
89	0	-	-	-	-	-	0	0	-	-	0	-/-
96	0	-	-	-	-	-	0	0	-	-	0	-/-
02	5180	-	-	5180	-	-	0	0	-	-	0	4/5
07	0	-	-	-	-	-	0	0	-	-	0	-/-

		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)
Prunus virginiana												
83	0	-	-	-	-	-	0	0	0	-	0	-/-
89	266	-	266	-	-	-	0	0	0	-	0	-/-
96	320	420	280	40	-	-	13	0	0	-	0	46/23
02	680	-	20	640	20	-	12	68	3	-	0	11/8
07	700	-	700	-	-	-	0	0	0	-	0	-/-
Purshia tridentata												
83	0	-	-	-	-	-	0	0	-	-	0	-/-
89	0	-	-	-	-	-	0	0	-	-	0	-/-
96	100	20	20	80	-	-	80	0	-	-	0	14/42
02	20	-	-	20	-	-	100	0	-	-	0	19/33
07	20	-	-	20	-	-	0	100	-	-	0	12/42
Quercus gambelii												
83	0	-	-	-	-	-	0	0	-	-	0	-/-
89	0	-	-	-	-	-	0	0	-	-	0	-/-
96	0	-	-	-	-	-	0	0	-	-	0	-/-
02	0	-	-	-	-	-	0	0	-	-	0	37/27
07	20	-	-	20	-	-	0	0	-	-	100	19/32
Rosa woodsii												
83	0	-	-	-	-	-	0	0	-	-	0	-/-
89	0	-	-	-	-	-	0	0	-	-	0	-/-
96	0	-	-	-	-	-	0	0	-	-	0	-/-
02	40	-	40	-	-	-	0	0	-	-	0	-/-
07	0	-	-	-	-	-	0	0	-	-	0	-/-
Symphoricarpos oreophilus												
83	0	-	-	-	-	-	0	0	0	-	0	-/-
89	66	-	-	-	66	-	100	0	100	-	0	-/-
96	540	-	60	480	-	-	7	11	0	-	0	25/33
02	480	-	20	380	80	40	8	8	17	-	0	25/31
07	300	-	20	240	40	40	27	7	13	-	7	19/32