

Trend Study 25C-20-08

Study site name: Baldys .

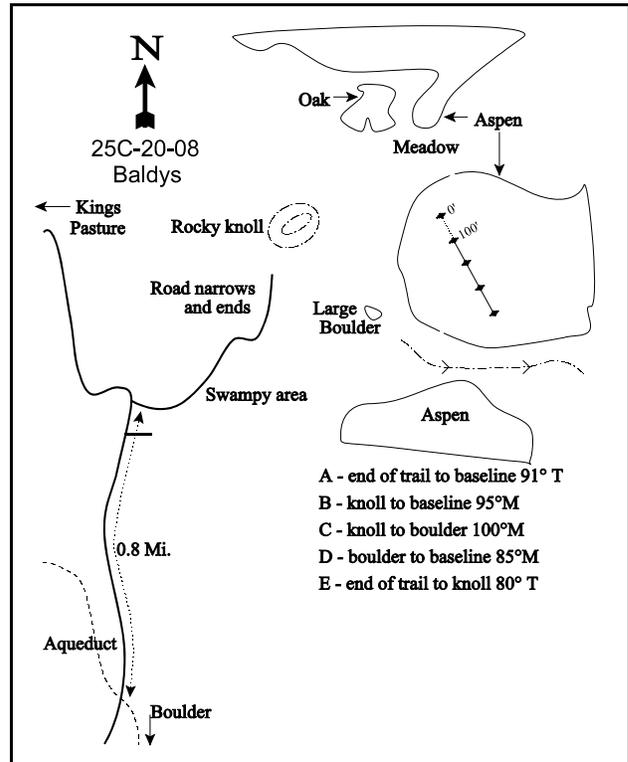
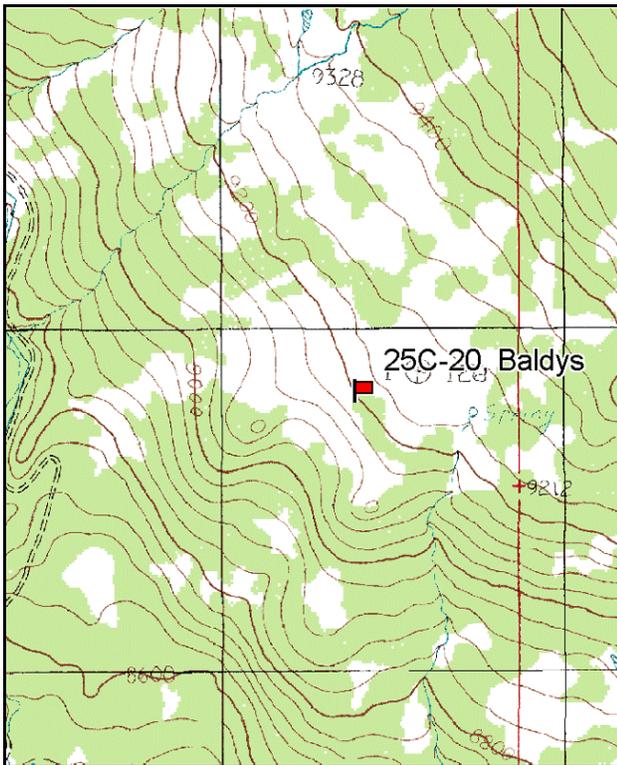
Vegetation type: Quaking Aspen .

Compass bearing: frequency baseline 120 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line4 (71ft). No rebar.

LOCATION DESCRIPTION

From SR12 north of Boulder, turn onto the Garkane Power Plant road. Travel 1.8 miles to a fork, and go right toward Kings Pasture. Proceed 1.2 miles to a cattleguard and pipeline crossing. Continue 0.8 miles to a fork at a sharp curve in the road. Be sure to take the second fork, just 150-200 feet before the correct fork is another minor fork. Go 0.2 miles up a rocky road. Park at the creek, then walk across the creek and marshy area and follow the old road up the hill to the northeast. At the end of the road/trail where it tops out on the hill, take bearings to the clump of aspens where the study is located. The rocky knoll, shown on the map, is a small knoll. The aspen stand contains a spruce along line 2 and there are no other conifers around. From the knoll to the site is approximately 600 feet. It is marked by short fenceposts. The 0-foot baseline stake is marked by browse tag #7172.



Map Name: Grover

Diagrammatic Sketch

Township 32S , Range 4E , Section Unsurveyed

GPS: NAD 83, UTM 12S 462325 E, 4207990 N

DISCUSSION

Baldys - Trend Study No. 25C-20

Study Information

This study samples a small aspen (*Populus tremuloides*) grove on deer and elk summer range in the Baldys area below the rim of Boulder Mountain [elevation: 9,200 feet (2,804 m), slope: 10%-20%, aspect: southwest]. It is separated from nearby aspen groves by rolling meadows dominated by low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *lanceolatus*) and grasses. The area receives use by both elk and cattle and is considered a key area for elk during the summer. Deer use was estimated to be light in 1998 and 2003 (7 ddu/acre:17 ddu/ha and 12 ddu/acre:30 ddu/ha, respectively), and increased to lightly moderate in 2008 (20 ddu/acre:50 ddu/ha). Elk use was estimated to be moderate with 32 days use/acre (79 edu/ha) in 1998 and 2003, and moderately heavy with 45 days use/acre (111 edu/ha) in 2008. About 12 elk were also seen near the site during the 1998 reading. Cattle use was very heavy in 1998 (114 cdu/acre:282 cdu/ha), decreased to light use in 2003 (7 cdu/acre:16 cdu/ha), and increased to moderate use in 2008 (25 cdu/acre:63 cdu/ha). Cattle were in the area during the 1998 and 2003 reading. This area is in a deferred rotation grazing system with use occurring from mid-June to mid-October.

Soil

Soil at the site is moderately deep with an effective rooting depth of almost 14 inches. Rocks of volcanic origin are common on soil surface, with some large rocks scattered throughout the soil profile. Parent material is basalt. Soil texture is a sandy loam which is slightly acidic in reaction (pH 6.1). Soil organic matter is the highest on the unit at 6.1%. An organic matter rich "A" horizon is detectable to a depth of about 6 inches. Although the terrain has a slope of about 10% to 20%, erosion is not a problem due to excellent ground cover. Relative combined vegetation and litter cover averaged nearly 90% from 1994 to 2008. Relative bare ground cover has been under 5% since 1994. Historically erosion is evidenced by the gullies which are common in the meadow areas, but the few observed in the aspen are no longer active. The soil erosion condition class was considered to be stable in 2003 and 2008.

Browse

Since this is summer range, browse species are not considered a critical component, however, the aspen overstory that characterizes the site is considered to be important to the health of the site. About half of the aspen were considered mature in 1987 and 1991. Line-intercept data from 1998, 2003, and 2008 estimated average aspen canopy cover at 74%. There were an estimated 866 trees/acre in 1987, 799 trees/acre in 1991, 700 trees/acre in 1998, and increased to approximately 1,100 trees/acre in 2003 and 2008. The young trees, averaging two feet in height, were moderately utilized in 1991. Aspen density data on the shrub density strips was mistakenly not collected in 1994. Decadent aspen sampled were young trees which appeared to have been hedged in the past. Point-quarter data from 1998 estimated 428 mature trees/acre with an average trunk diameter of 9.2 inches. In 2008, 45% of the aspen sampled were in the 1 to 4 foot height category, and the remaining 55% were greater than 12 feet tall. The average basal diameter was 6.2 inches in 2008.

The shrub understory is dominated by snowberry (*Symphoricarpos oreophilus*). The density of snowberry has increased from 2,399 plants/acre in 1987 to 7,720 plants/acre in 2008. The majority of the population is mature, although young plants remain abundant. Utilization of snowberry was moderate to heavy in 1987 and 1991, but mostly light from 1994 to 2008. Wood's rose (*Rosa woodsii*) is the second most abundant understory species with an estimated density of 1,540 plants/acre in 1998, 2,440 plants/acre in 2003, and 2,020 plant/acre in 2008. Utilization of Wood's rose was light in all three years. A small population of serviceberry were found on the site in 2003 and 2008. These plants averaged only 19 inches in height in 2003 and 13 inches in 2008. Serviceberry showed moderate to heavy use in 2003 and moderate use in 2008.

Herbaceous Understory

The herbaceous understory is the most important component of this summer range. Tree and shrub cover have a limiting effect on grass cover and frequency. Although grasses are diverse, only 4 species occur more than

occasionally. Kentucky bluegrass (*Poa pratensis*), an increaser with heavy grazing, is the most abundant and it provided 57% of the grass cover in 1998, 45% in 2003, and 43% in 2008. Mutton bluegrass (*Poa fendleriana*), obtuse sedge (*Carex obtusata*), and sheep fescue (*Festuca ovina*) are also fairly common. Diversity of forbs is also good, with at least 19 perennial species sampled each year. Composition is poor, however, with low growing increasers including western yarrow (*Achillea millefolium*) and dandelion (*Taraxacum officinale*) providing 38% of the forb cover in 2008. Other undesirable increaser forbs found on the site include the poisonous orange sneezeweed (*Helenium hoopesii*) and Rocky Mountain iris (*Iris missouriensis*). More common preferred forbs include thistle (*Lathyrus lanszwertii*), silvery lupine (*Lupinus argenteus*), and American vetch (*Vicia americana*).

1991 TREND ASSESSMENT

Trend for browse is up. There are not many browse species in very high frequencies on this site. Snowberry and aspen would be considered the most important. Aspen has decreased in numbers by 8%, while snowberry has increased by 62%. Decadence for both species is still low. The trend for both grasses and forbs is stable. The nested frequency of perennial grasses and forbs has remained constant

browse - up (+2)

grass - stable (0)

forb - stable (0)

1994 TREND ASSESSMENT

Trend for browse is stable. Aspen was mistakenly not sampled in the shrub belt inventories in 1994, so no comparisons can be made. However, snowberry and Wood's rose show stable trends. The herbaceous understory is diverse and abundant with nearly equal amounts of grasses and forbs. Composition could be better however. The increaser, Kentucky bluegrass, dominates the grass component while the most numerous forbs consist of the increasers yarrow, orange sneezeweed, and dandelion. Sum of nested frequencies for grasses and forbs have remained similar to 1991 estimates indicating a stable trend.

browse - stable (0)

grass - stable (0)

forb - stable (0)

1998 TREND ASSESSMENT

Trend for browse is stable for snowberry and Wood's rose. The aspen component on this site is overly mature with poor reproduction. Density of mature trees is currently stable but the proportion of young plants has steadily declined since 1987. Aspen does not provide an important forage source on this site due to the lack of available forage, but the health of the site depends on the aspen overstory. Trend for the grasses is slightly down. Sum of nested frequency of grasses declined slightly and production has increased slightly. Kentucky bluegrass is still the most abundant grass and it increased slightly in nested frequency. The trend for forbs is slightly up, although the composition is poor. The sum of nested frequency of perennial forbs increased. Weedy increaser forbs including western yarrow, trailing fleabane, orange sneezeweed, and dandelion, currently produce 59% of the forb cover. There are few of the late successional aspen community forbs present like sweetanise (*Osmorhiza occidentalis*), meadowrue (*Thalictrum fendleri*), and wild carrot (*Ligusticum filicinum*), but forb cover increased from 8% to 26%.

browse - stable (0)

grass - slightly down (-1)

forb - slightly up (+1)

2003 TREND ASSESSMENT

Trend for browse is up, but shrubs are not a critical aspect of this summer range. However, aspen has increased in density due primarily to an increase in young plants (180 to 620 plants/acre). Wood's rose and snowberry also increased in density although both are more increasers and not utilized as forage on this site. Serviceberry also increased in density and is moderately to heavily browsed. Trend for the grasses is stable. Sum of nested frequency of perennial grasses remained similar to 1998 and production of perennial grasses remained relatively stable. The trend for forbs is slightly down. The sum of nested frequency of perennial forbs declined 22%, while cover declined 49% (26% to 13%). Forb composition is still poor.

browse - up (+2)

grass - stable (0)

forb - slightly down (-1)

2008 TREND ASSESSMENT

The trend for browse is stable. The density of the primary browse species, snowberry and Woods rose, have remained relatively constant. Vigor and decadence are good for both species. Aspen density has remained stable and recruitment of young plants is good. The trend for the grasses is slightly up. The sum of nested frequency of perennial grasses and production is relatively constant. There was a slight change in composition with a significant increase in obtuse sedge frequency and production. Kentucky bluegrass continues to be the dominant grass species on the site. The trend for forbs is slightly up. The sum of nested frequency of perennial forbs increased slightly, as did production. Composition remains poor.

browse - stable (0)

grass - slightly up (+1)

forb - slightly up (+1)

HERBACEOUS TRENDS --

Management unit 25C, Study no: 20

Type	Species	Nested Frequency						Average Cover %			
		'87	'91	'94	'98	'03	'08	'94	'98	'03	'08
G	Agropyron trachycaulum	a13	a7	b34	a8	a7	a13	.19	.19	.07	.16
G	Bouteloua gracilis	-	-	1	-	1	3	.00	-	.00	.03
G	Bromus anomalus	ab8	b18	ab15	a3	a2	a-	.63	.00	.03	-
G	Bromus carinatus	a-	b9	a-	a-	ab3	ab1	-	.03	.18	.01
G	Carex obtusata	a66	b126	ab110	ab76	a53	b121	.98	1.42	1.04	3.08
G	Dactylis glomerata	b16	a-	a1	a-	a-	a1	.00	-	-	.00
G	Festuca ovina	c101	bc86	a40	a45	a40	ab52	.37	1.31	.53	.52
G	Festuca thurberi	-	-	4	-	-	4	.07	-	-	.16
G	Juncus balticus	bc38	c47	abc37	a-	a6	ab21	.59	-	.04	.14
G	Koeleria cristata	-	-	4	-	-	1	.00	-	-	.00
G	Muhlenbergia richardsonis	a-	b10	a-	b13	ab1	ab5	-	.48	.00	.09
G	Poa fendleriana	a32	a1	b98	b80	b67	b71	3.08	2.12	2.50	1.45
G	Poa pratensis	a134	c193	ab142	ab143	bc161	bc147	2.33	7.86	5.70	5.46
G	Sitanion hystrix	ab12	bc40	cd45	a6	d70	cd49	.61	.12	2.34	1.06
G	Stipa columbiana	a-	a-	a-	b16	ab5	b15	-	.13	.03	.35
G	Stipa comata	1	1	-	-	-	3	-	-	-	.03
G	Stipa lettermani	ab59	ab24	b45	a14	a9	a-	.76	.12	.16	-
Total for Annual Grasses		0	0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		480	562	576	404	425	507	9.65	13.81	12.65	12.59
Total for Grasses		480	562	576	404	425	507	9.65	13.81	12.65	12.59
F	Achillea millefolium	154	140	92	126	91	79	1.79	3.59	1.49	1.18
F	Agoseris glauca	-	-	-	4	18	-	-	.03	.72	-
F	Allium cernuum	62	28	20	14	11	24	.20	.10	.33	.07
F	Antennaria parvifolia	13	14	19	30	22	18	.11	.58	.29	.34
F	Androsace septentrionalis (a)	-	-	3	9	-	3	.01	.16	-	.01
F	Artemisia dracunculus	-	-	-	5	5	-	-	.01	.04	-
F	Arabis drummondii	3	24	-	-	-	13	-	-	-	.05

Type	Species	Nested Frequency					Average Cover %				
		'87	'91	'94	'98	'03	'08	'94	'98	'03	'08
F	<i>Artemisia ludoviciana</i>	2	-	-	-	-	5	-	-	-	.04
F	<i>Aster chilensis</i>	-	23	5	19	13	10	.04	.06	.08	.19
F	<i>Astragalus convallarius</i>	-	-	-	5	-	-	-	.18	-	-
F	<i>Castilleja linariaefolia</i>	-	-	-	-	3	1	-	-	.03	.06
F	<i>Chenopodium album</i> (a)	-	-	4	12	1	-	.01	.07	.00	-
F	<i>Cirsium vulgare</i>	5	-	3	3	3	1	.06	.03	.04	.03
F	<i>Collomia linearis</i> (a)	-	-	-	2	-	-	-	.00	-	-
F	<i>Cymopterus lemmonii</i>	33	40	14	1	25	23	.09	.01	.39	.28
F	<i>Descurainia sp.</i> (a)	-	-	-	5	-	-	-	.03	-	-
F	<i>Erigeron eatonii</i>	-	-	-	-	2	4	-	-	.00	.01
F	<i>Erigeron flagellaris</i>	25	12	27	27	32	17	.21	1.06	.26	.12
F	<i>Erigeron sp.</i>	18	4	-	3	4	-	-	.00	.03	-
F	<i>Eriogonum racemosum</i>	-	3	-	-	-	3	-	-	-	.00
F	<i>Gentiana amarella heterosepala</i>	-	2	-	-	-	-	-	-	-	-
F	<i>Geranium richardsonii</i>	36	26	45	29	17	19	.57	.28	.29	.30
F	<i>Helenium hoopesii</i>	34	33	38	41	37	40	.85	2.51	1.20	1.13
F	<i>Ipomopsis aggregata</i>	-	-	-	-	4	4	-	-	.03	.03
F	<i>Iris missouriensis</i>	21	17	16	24	5	4	.42	.42	.15	.03
F	<i>Lathyrus lanszwertii</i>	-	-	20	58	28	81	1.14	3.83	1.40	4.13
F	<i>Lomatium sp.</i>	-	-	-	4	-	-	-	.15	-	-
F	<i>Lupinus argenteus</i>	7	12	33	39	19	28	1.66	2.32	.85	2.96
F	<i>Lychnis drummondii</i>	-	-	-	2	-	5	-	.00	-	.02
F	<i>Osmorhiza occidentalis</i>	-	-	-	7	-	-	-	.01	-	-
F	<i>Penstemon sp.</i>	1	-	10	-	3	3	.03	-	.00	.00
F	<i>Phacelia sp.</i>	-	2	-	-	2	-	-	-	.03	.03
F	<i>Phlox austromontana</i>	-	3	34	15	28	40	.76	.60	.93	.80
F	<i>Phlox longifolia</i>	-	-	-	-	-	1	-	-	-	.00
F	<i>Potentilla concinna</i>	-	-	5	1	3	1	.03	.03	.06	.00
F	<i>Polygonum douglasii</i> (a)	-	-	8	13	6	28	.02	.16	.02	.08
F	<i>Potentilla gracilis</i>	-	1	12	4	-	1	.48	.06	-	.01
F	<i>Senecio multilobatus</i>	8	-	13	12	11	-	.08	.07	.14	-
F	<i>Senecio serra</i>	-	-	-	-	-	14	-	-	-	.13
F	<i>Taraxacum officinale</i>	224	221	157	199	151	200	1.29	8.17	3.08	6.14
F	<i>Tragopogon dubius</i>	-	-	-	-	2	5	-	-	.03	.09
F	<i>Trifolium repens</i>	1	-	-	-	-	-	-	-	-	-
F	Unknown forb-perennial	4	-	-	-	5	-	-	-	.07	-

Type	Species	Nested Frequency						Average Cover %			
		'87	'91	'94	'98	'03	'08	'94	'98	'03	'08
F	Vicia americana	68	73	55	97	51	21	.32	1.62	.91	.53
F	Viola sp.	-	3	-	4	7	1	-	.03	.24	.03
Total for Annual Forbs		0	0	15	41	7	31	0.04	0.43	0.02	0.09
Total for Perennial Forbs		719	681	618	773	602	666	10.18	25.84	13.20	18.82
Total for Forbs		719	681	633	814	609	697	10.23	26.28	13.23	18.91

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

BROWSE TRENDS --

Management unit 25C, Study no: 20

Type	Species	Strip Frequency				Average Cover %			
		'94	'98	'03	'08	'94	'98	'03	'08
B	Amelanchier alnifolia	0	0	9	10	-	-	.33	.33
B	Amelanchier utahensis	8	0	0	0	.44	-	-	-
B	Chrysothamnus nauseosus hololeucus	0	0	0	1	-	-	-	.00
B	Populus tremuloides	0	32	35	42	.91	1.82	11.03	3.24
B	Ribes montigenum	1	0	0	2	.00	-	-	.00
B	Rosa woodsii	19	29	25	22	.71	1.15	1.20	.61
B	Symphoricarpos oreophilus	61	75	76	83	11.68	13.44	13.38	10.16
Total for Browse		89	136	145	160	13.75	16.42	25.96	14.35

CANOPY COVER, LINE INTERCEPT --

Management unit 25C, Study no: 20

Species	Percent Cover		
	'98	'03	'08
Amelanchier alnifolia	-	.71	.43
Populus tremuloides	76.00	72.19	73.56
Ribes montigenum	-	.43	.06
Rosa woodsii	-	.65	1.36
Symphoricarpos oreophilus	-	12.35	21.35

POINT-QUARTER TREE DATA --

Management unit 25C, Study no: 20

Species	Trees per Acre		
	'98	'03	'08
Populus tremuloides	428	-	1122

Average diameter (in)		
'98	'03	'08
9.2	-	6.2

BASIC COVER --

Management unit 25C, Study no: 20

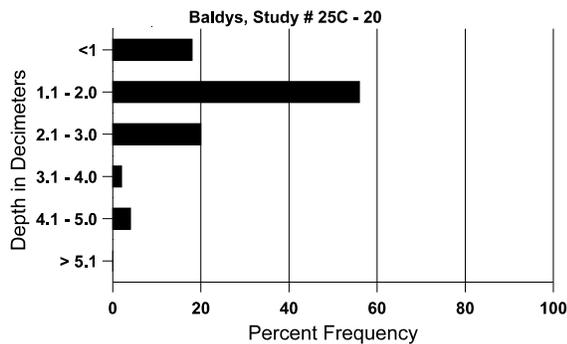
Cover Type	Average Cover %					
	'87	'91	'94	'98	'03	'08
Vegetation	4.00	3.50	29.06	49.69	42.97	47.62
Rock	8.25	6.25	9.58	5.89	7.71	8.56
Pavement	0	0	.45	1.04	.57	.83
Litter	85.75	85.25	60.19	81.25	65.61	52.88
Cryptogams	0	.25	0	.03	.15	.01
Bare Ground	2.00	4.75	4.38	4.92	1.15	4.02

SOIL ANALYSIS DATA --

Management unit 25C, Study no: 20, Study Name: Baldys

Effective rooting depth (in)	Temp °F (depth)	pH	sandy clay loam			%0M	PPM P	PPM K	ds/m
			% sand	% silt	% clay				
13.5	43.2 (14.5)	6.1	62.7	16.7	20.6	6.1	28.4	329.6	0.6

Stoniness Index



PELLET GROUP DATA --

Management unit 25C, Study no: 20

Type	Quadrat Frequency			
	'94	'98	'03	'08
Rabbit	1	-	1	3
Elk	3	12	18	18
Deer	1	5	2	5
Cattle	4	5	4	4

Days use per acre (ha)		
'98	'03	'08
-	-	-
32 (79)	32 (79)	45 (111)
7 (17)	12 (30)	20 (50)
14 (35)	7 (16)	25 (63)

BROWSE CHARACTERISTICS --
Management unit 25C, Study no: 20

		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)
Amelanchier alnifolia												
87	0	-	-	-	-	-	0	0	0	-	0	-/-
91	0	-	-	-	-	-	0	0	0	-	0	-/-
94	0	-	-	-	-	-	0	0	0	-	0	-/-
98	0	-	-	-	-	-	0	0	0	-	0	-/-
03	740	-	460	140	140	-	22	16	19	5	5	19/9
08	640	60	160	320	160	-	13	0	25	9	9	13/9
Amelanchier utahensis												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	420	-	-	420	-	-	71	0	-	-	0	10/6
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	-/-
Chrysothamnus nauseosus												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	66	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	-/-
Chrysothamnus nauseosus hololeucus												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	20	-	20	-	-	-	0	0	-	-	0	10/9
Chrysothamnus viscidiflorus lanceolatus												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	17/28
08	0	-	-	-	-	-	0	0	-	-	0	14/20

		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)
Populus tremuloides												
87	998	-	533	399	66	-	20	20	7	-	7	341/144
91	932	-	466	466	-	-	36	0	0	-	14	355/124
94	0	-	-	-	-	-	0	0	0	-	0	-/-
98	1000	-	480	480	40	120	10	0	4	4	4	-/-
03	1180	-	620	540	20	80	15	0	2	-	0	-/-
08	1100	140	480	560	60	80	15	13	5	5	16	-/-
Ribes montigenum												
87	66	-	-	66	-	-	0	0	-	-	0	30/39
91	66	-	-	66	-	-	0	0	-	-	0	35/55
94	60	-	-	60	-	-	0	0	-	-	0	19/63
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	100	-	40	60	-	-	0	0	-	-	0	21/34
Rosa woodsii												
87	132	-	66	-	66	-	0	50	50	-	0	-/-
91	66	-	66	-	-	-	0	0	0	-	0	-/-
94	1340	20	400	920	20	20	0	0	1	-	0	14/11
98	1540	240	560	940	40	20	1	0	3	-	0	20/15
03	2440	-	-	2400	40	100	0	0	2	.81	.81	13/8
08	2020	-	420	1580	20	-	0	0	1	.99	.99	16/8
Symphoricarpos oreophilus												
87	2399	66	733	1666	-	-	61	25	0	-	0	18/27
91	6265	66	1933	3533	799	-	29	7	13	.31	4	16/24
94	5780	20	400	5380	-	-	3	0	0	-	0	16/24
98	5080	120	1240	3820	20	20	2	.39	0	-	0	20/29
03	6600	-	1080	5420	100	-	0	0	2	-	0	16/27
08	7720	120	860	6420	440	40	4	2	6	1	3	17/26