

Trend Study 2-33-06

Study site name: Brazier Canyon.

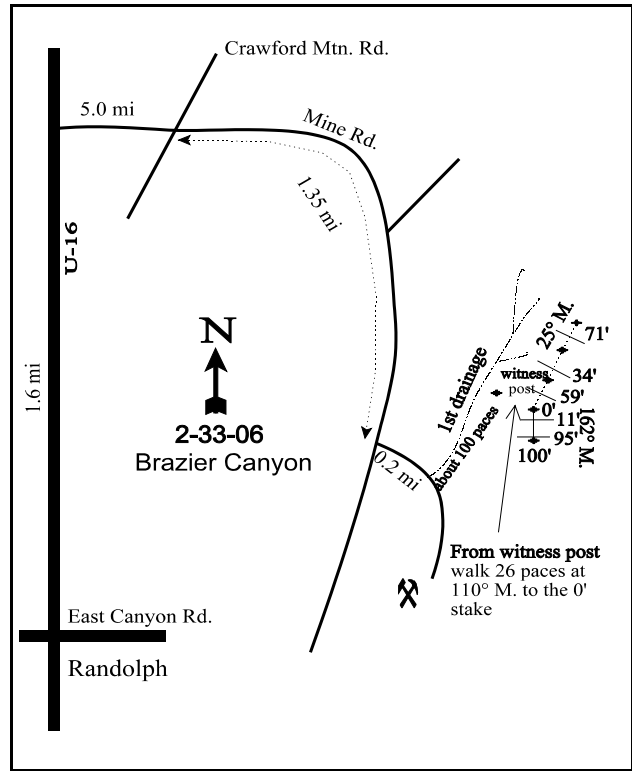
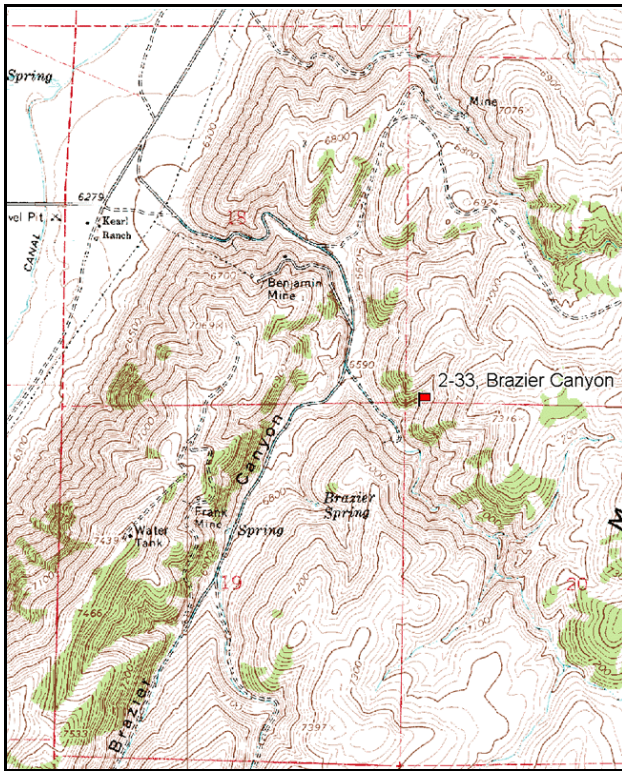
Vegetation type: Black Sagebrush.

Compass bearing: frequency baseline 162 degrees magnetic.

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

LOCATION DESCRIPTION

From North Main and East Canyon Road (100 North) in Randolph proceed north on U-16 for 1.60 miles, and turn right (east) onto Crawford Mountain Road. continue east for 5.0 miles to a two way stop. Turn right (i.e. southeast) and proceed 1.35 miles on this road to where there is a small canyon on the left with a road going up it. Turn left (i.e. east) onto this road, and proceed 0.2 miles to the first ravine on the left (i.e., north) side of the road. Walk up ravine 100 paces to a witness post. From the witness post walk 26 paces at a bearing of 110 degrees magnetic to the 0-foot baseline stake. The 0-foot stake is marked by a browse tag, #7978. The rest of the baseline runs off the 0-foot baseline stake at a bearing of 25 degrees magnetic.



Map Name: Rex Peak

Diagrammatic Sketch

Township 11N, Range 8E, Section 20

UTM NAD 27, UTM 12T 4614824 N, 494144 E

DISCUSSION

Brazier Canyon - Trend Study No. 2-33

Study Information

This study is located on the northeastern side of the Crawford Mountain and is located in a tributary of Brazier Canyon on land administered by the BLM (elevation: 6,800 feet, slope: 40-50%, aspect: west). The vegetation type is a black sagebrush-perennial grass community with scattered juniper. This area is considered winter range for deer. Cattle graze the area in the spring, but typically do not use the steep slopes. Deer use was moderately high in 1996 with a quadrat frequency of pellet groups at 33%. In addition, two deer carcasses were found on the study in 1984 and two antler sheds in 1996. A pellet group transect from 2001 estimated 48 deer, 1 elk, and 1 cow days use/acre (117 ddu/ha, 3 edu/ha, and 2 cdu/ha). Pellet group data from 2006 was estimated at 80 deer, 8 elk, and 4 cow days use/acre (198 ddu/ha, 20 edu/ha, and 11 cdu/ha).

Soil

The soil is classified in the Rexmont series, which are shallow and excessively drained gravelly loams. They are primarily residual soils derived from limestone and thus are moderately to strongly alkaline and calcareous throughout the 20 inch soil profile. Permeability is moderate, available water capacity is poor, and both runoff and erosion hazard are high (Campbell and Lacey 1982; USDA-NRCS 2006). Soil reaction is slightly alkaline (pH of 7.7) and the effective rooting depth was estimated at almost 16 inches in 1996. Rock and pavement are common on the surface. The ratio of protective cover (vegetation, litter, and cryptogams) to bare ground was fair at 2.7:1 in 2006. There is some localized soil movement, which is inevitable due to the steep slope. The study showed evidence of significant sheet erosion and somewhat less serious gully erosion in 1984. Soil pedestalling was evident, but abundant vegetation and litter cover adequately protect the soil from serious erosion. The erosion condition class was determined to be slight in 2001 and stable in 2006.

Browse

The key browse is black sagebrush, which forms a moderately dense and uniform stand. Utilization is generally light to moderate, except in 1990 when it was moderate. The larger sample taken in 1996 estimated 5,340 plants/acre of black sagebrush, which was much lower than the 1990 estimate of 11,666 plants/acre using the old method. Density slightly increased in 2001 and stayed the same in 2006. The lack of large numbers of dead plants in 1996, suggests that this new density estimate is more reflective of the actual population over the whole area. Decadence was high in 1990 at 46%, but decreased to 14% in 1996 and 2001. In 2006, decadence increased to 30% with 19% of population classified as dying. Young recruitment has averaged 3-7% of the population, which is not enough to replace those plants that are dying.

Wyoming big sagebrush is less abundant and is hybridizing with black sagebrush. Utilization on Wyoming big sagebrush is moderate. Density averaged 1,500 plants/acre in 1990 and 1996, but declined in 2001 to 1,060 plants/acre. By 2006, most of the Wyoming big sagebrush had died, leaving only 40 plants/acre. Due to the dry conditions during the summers of 1996 and 2000-2002, many of the Wyoming big sagebrush plants had dropped their leaves. This is likely a marginal site for Wyoming big sagebrush under drought conditions. Decadence increased from 30% in 1996 to 42% 2001 with 19% of the population classified as dying. Young recruitment averaged 9% from 1984 to 1996, then dropped to 2% in 2001 and was not enough to replace the plants that were dying.

Other preferred shrubs include winterfat and serviceberry, which occur in relatively small numbers. Point-quarter data from 2001 estimated 121 juniper trees/acre with an average diameter of 4 inches. In 2006, junipers were estimated at 127 trees/acre with an average diameter of 3 inches. Several are young plants about 1 to 4 feet tall.

Herbaceous Understory

Perennial grasses are the most abundant herbaceous component. Within that category, bluebunch wheatgrass

and Sandberg bluegrass are the most productive. They have produced over 90% of the grass cover and combined have averaged 15-18% cover since 1996. Forb composition is moderately diverse, but not very abundant, except hoods phlox. Total cover of perennial forbs has averaged between 5-6%, yet most are relatively unproductive and unpalatable.

1990 TREND ASSESSMENT

Allowing for difficulties in separating sagebrush species at Brazier Canyon, the total density of sagebrush declined slightly. A dense stand of sagebrush, dominated by black sagebrush, remains. While the black sagebrush decreased in density, improvements were seen in age class structure, vigor, and growth form. Sagebrush appear moderately hedged, although there is evidence of very heavy deer use. Several deer carcasses were found on the site. A density of 89 juniper/acre was calculated from the point-quarter method. Trend for grasses is stable. Perennial grass sum of nested frequency remained similar, but the frequency of bluebunch wheatgrass declined significantly. Trend for forbs is down. Forbs are diverse, but not abundant. Perennial forbs sum of nested frequency decreased by 31%, due to a significant decrease in longleaf phlox, cryptantha, low penstemon, and 2 milkvetch species.

browse - stable (0)

grasses - stable (0)

forbs - down (-2)

1996 TREND ASSESSMENT

The browse trend appears stable for black sagebrush. Population density declined 52% compared to 1990 data. However, the lack of large numbers of dead shrubs suggests that this new estimate using a much larger sample is a more accurate reflection of black sagebrush density. Utilization of black sagebrush is mostly light to moderate, vigor is good, and percent decadence has declined from 46% in 1990 to 14% in 1996. Black sagebrush makes up the majority of the browse cover (68%). Wyoming big sagebrush has a similar density compared to 1990. Utilization is less heavy, yet vigor is poor on 11% of the population, and decadence has increased from 22% in 1990 to 30% in 1996. There is one dead plant for every two living ones. Trend for Wyoming big sagebrush appears slightly down, but it only contributes 13% of the browse cover. The browse trend is considered stable overall. Trend for grasses is slightly up. Perennial grass sum of nested frequency increased by 17% due to an increase in bluebunch wheatgrass and mutton bluegrass. Cheatgrass was sampled, but is not abundant. Trend for forbs is stable. Forbs are not abundant and did not change much overall from 1990. The Desirable Components Index rated this study as excellent due to good browse cover, low decadence, and good perennial grass cover.

winter range condition (DC Index) - excellent (69) Low Potential scale

browse - stable (0)

grasses - slightly up (+1)

forbs - stable (0)

2001 TREND ASSESSMENT

Trend for the key browse species, black sagebrush, is stable. Utilization continues to be light to moderate, vigor normal on most plants, and percent decadence low at 13%. Young plants are abundant and adequate to maintain the stand. Wyoming big sagebrush is of secondary importance. It has declined slightly in density. It displays moderate to heavy use, poor vigor on 19% of the population, and high percent decadence at 42%. Recruitment is poor and there are not currently enough young plants to replace the plants classified as dying (200 plants/acre). This is probably a marginal site for Wyoming big sagebrush, especially during drought. The density of young juniper trees increased from 20 plants/acre in 1996 to 100 plants/acre in 2001. Over time, the increase in juniper cover could negatively effect the sagebrush understory. Trend for grasses is slightly up. Perennial grass sum of nested frequency did not change much, but bluebunch wheatgrass increased significantly, while Sandberg bluegrass decreased significantly. Trend for forbs is stable. Perennial forb sum of nested frequency increased by 13%, although forbs remain a minor component of the herbaceous understory. The Desirable Components Index rated this study as excellent due to good browse cover, low decadence, and good perennial grass cover.

winter range condition (DC Index) - excellent (75) Low Potential scale
 browse - stable (0) grasses - slightly up (+1) forbs - stable (0)

2006 TREND ASSESSMENT

Trend for key browse is slightly down. Black sagebrush density has remained similar to 2001 and young recruitment is still good at 5% of population. Decadence increased from 13% to 30%. The Wyoming big sagebrush is down and practically has been eliminated from the study area. Density decreased from 1,060 plants/acre in 2001 to 40 plants/acre in 2006. Cover has only averaged about 1%, but typically Wyoming big sagebrush has been much more utilized than black sagebrush. This area is probably marginal for Wyoming big sagebrush and appears it will no longer be a part of this community. Junipers continue to expand their population. Trend for grasses is stable. Perennial grass sum of nested frequency remained similar to 2001 and cheatgrass has continued to be a minor component. Trend for forbs is stable. Perennial forb nested frequency changed very little. The Desirable Components Index rated this study as good-excellent due to decreased browse cover, moderate decadence, and good perennial grass cover.

winter range condition (DC Index) - good-excellent (64) Low Potential scale
 browse - slightly down (-1) grasses - stable (0) forbs - stable (0)

HERBACEOUS TRENDS --
 Management unit 02 , Study no: 33

Type	Species	Nested Frequency					Average Cover %		
		'84	'90	'96	'01	'06	'96	'01	'06
G	Agropyron spicatum	c208	a119	ab166	c212	bc207	6.76	10.46	12.07
G	Bromus tectorum (a)	-	-	a19	ab43	b54	.21	.66	.59
G	Koeleria cristata	b23	ab11	a1	a6	a-	.00	.09	-
G	Poa fendleriana	a8	a-	b27	ab14	a3	.28	.27	.03
G	Poa secunda	a190	c302	c308	b252	b265	8.95	4.30	5.39
G	Sitanion hystrix	-	-	3	-	-	.15	-	-
G	Stipa comata	-	-	-	-	2	-	-	.03
Total for Annual Grasses		0	0	19	43	54	0.21	0.66	0.59
Total for Perennial Grasses		429	432	505	484	477	16.16	15.13	17.54
Total for Grasses		429	432	524	527	531	16.38	15.79	18.13
F	Agoseris glauca	-	-	-	-	4	-	-	.03
F	Alyssum alyssoides (a)	-	-	a-	a-	b14	-	-	.03
F	Antennaria rosea	10	6	5	5	-	.06	.06	-
F	Arenaria fendleri	46	44	35	21	29	1.61	.37	.61
F	Arabis holboellii	a1	a-	b10	ab6	ab3	.03	.06	.01
F	Aster chilensis	-	-	-	-	1	-	-	.04
F	Astragalus convallarius	c43	a4	bc25	c43	ab18	.51	.90	.37
F	Astragalus sp.	c115	a13	a8	a4	b37	.09	.01	.48
F	Astragalus utahensis	1	3	-	2	4	-	.00	.03
F	Balsamorhiza sagittata	8	5	2	14	7	.15	.31	.24

Type	Species	Nested Frequency					Average Cover %		
		'84	'90	'96	'01	'06	'96	'01	'06
F	Castilleja linariaefolia	-	-	-	4	-	-	.06	-
F	Camelina microcarpa (a)	-	-	-	-	-	-	.00	-
F	Calochortus nuttallii	1	4	-	-	-	-	-	-
F	Chaenactis douglasii	3	-	-	-	-	-	-	-
F	Comandra pallida	-	-	-	8	8	-	.09	.04
F	Collinsia parviflora (a)	-	-	6	-	3	.01	-	.00
F	Cordylanthus ramosus (a)	-	-	7	1	1	.07	.00	.01
F	Crepis acuminata	28	23	24	43	29	.49	.57	.38
F	Cryptantha sp.	_b 39	_a -	_a -	_a -	_a 1	-	-	.00
F	Cymopterus sp.	-	-	-	8	3	-	.05	.03
F	Descurainia pinnata (a)	-	-	3	4	12	.03	.03	.02
F	Draba sp. (a)	-	-	-	-	3	-	-	.00
F	Erigeron divergens	_a -	_b 34	_a 4	_a 6	_a 2	.06	.06	.03
F	Haplopappus acaulis	_{ab} 4	_a -	_b 14	_{ab} 2	_b 11	.21	.03	.33
F	Hackelia patens	-	9	-	3	3	-	.03	.03
F	Holosteum umbellatum (a)	-	-	-	-	6	-	-	.01
F	Lupinus sp.	-	-	-	2	-	-	.00	-
F	Machaeranthera canescens	-	-	-	2	-	-	.00	-
F	Melilotus officinalis	-	-	-	-	1	-	-	.00
F	Penstemon humilis	_b 10	_a 2	_{ab} 3	_a 1	_a -	.01	.00	-
F	Phacelia sp.	6	-	-	-	-	-	-	-
F	Phlox hoodii	_a 32	_a 34	_b 74	_b 80	_b 68	.93	2.57	2.37
F	Phlox longifolia	_a 29	_b 83	_{ab} 60	_a 38	_b 85	.52	.21	.68
F	Physaria sp.	-	-	-	-	5	-	-	.01
F	Polygonum douglasii (a)	-	-	-	-	4	-	-	.01
F	Senecio multilobatus	3	-	-	1	-	-	.03	-
F	Solidago sp.	3	-	-	-	-	-	-	-
F	Trifolium sp.	_a -	_a -	_{ab} 6	_b 13	_{ab} 5	.02	.08	.04
Total for Annual Forbs		0	0	16	5	43	0.11	0.04	0.10
Total for Perennial Forbs		382	264	270	306	324	4.73	5.54	5.78
Total for Forbs		382	264	286	311	367	4.85	5.59	5.88

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

BROWSE TRENDS --

Management unit 02 , Study no: 33

Type	Species	Strip Frequency			Average Cover %		
		'96	'01	'06	'96	'01	'06
B	<i>Amelanchier alnifolia</i>	4	1	0	-	.00	-
B	<i>Artemisia nova</i>	82	80	87	10.04	13.06	9.27
B	<i>Artemisia tridentata wyomingensis</i>	42	30	2	1.89	.98	.15
B	<i>Ceratoides lanata</i>	15	15	13	.07	.30	.51
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	29	34	33	1.03	3.69	2.57
B	<i>Eriogonum microthecum</i>	37	36	46	.87	1.05	1.46
B	<i>Juniperus osteosperma</i>	4	7	8	.56	1.23	2.14
B	<i>Leptodactylon pungens</i>	0	0	1	-	-	-
B	<i>Opuntia sp.</i>	2	2	2	-	-	-
B	<i>Symphoricarpos oreophilus</i>	5	4	6	.38	.21	.06
B	<i>Tetradymia canescens</i>	0	0	1	-	.03	-
Total for Browse		220	209	199	14.85	20.59	16.18

CANOPY COVER, LINE INTERCEPT --

Management unit 02 , Study no: 33

Species	Percent Cover	
	'01	'06
<i>Artemisia nova</i>	-	10.76
<i>Artemisia tridentata wyomingensis</i>	-	.21
<i>Ceratoides lanata</i>	-	.45
<i>Chrysothamnus viscidiflorus viscidiflorus</i>	-	3.48
<i>Eriogonum microthecum</i>	-	2.00
<i>Juniperus osteosperma</i>	1.00	6.34
<i>Opuntia sp.</i>	-	.05
<i>Symphoricarpos oreophilus</i>	-	.26

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 02 , Study no: 33

Species	Average leader growth (in)	
	'01	'06
<i>Amelanchier alnifolia</i>	-	3.1
<i>Artemisia nova</i>	0.2	0.5

POINT-QUARTER TREE DATA --
Management unit 02 , Study no: 33

Species	Trees per Acre		Average diameter (in)	
	'01	'06	'01	'06
Juniperus osteosperma	121	127	3.7	2.8

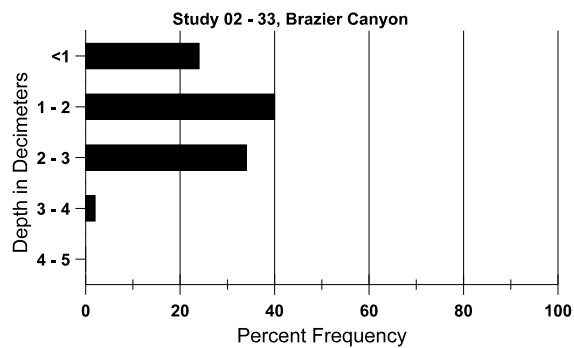
BASIC COVER --
Management unit 02 , Study no: 33

Cover Type	Average Cover %				
	'84	'90	'96	'01	'06
Vegetation	3.00	14.75	35.12	42.21	39.31
Rock	15.50	6.00	13.34	5.89	13.22
Pavement	16.00	24.50	16.43	13.54	16.69
Litter	49.25	32.50	26.29	33.81	24.45
Cryptogams	6.75	4.75	5.01	2.72	2.19
Bare Ground	9.50	17.50	11.36	19.00	24.33

SOIL ANALYSIS DATA --
Herd Unit 02, Study no: 33, Brazier Canyon

Effective rooting depth (in)	Temp °F (depth)	PH	Loam			%OM	PPM P	PPM K	dS/m
			%sand	%silt	%clay				
15.5	53.2 (16.8)	7.7	36.7	39.0	24.3	4.0	14.4	105.6	0.7

Stoniness Index



PELLET GROUP DATA --
 Management unit 02 , Study no: 33

Type	Quadrat Frequency		
	'96	'01	'06
Rabbit	7	5	9
Elk	-	2	7
Deer	33	25	27
Cattle	1	1	3

Days use per acre (ha)	
'01	'06
-	-
1 (3)	8 (20)
48 (117)	80 (198)
1 (2)	4 (11)

BROWSE CHARACTERISTICS --
 Management unit 02 , Study no: 33

		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>Amelanchier alnifolia</i>												
84	66	-	66	-	-	-	0	0	0	-	0	-/-
90	133	-	133	-	-	-	0	0	0	-	0	-/-
96	80	-	40	-	40	20	0	0	50	50	50	14/13
01	20	-	-	-	20	-	0	100	100	100	100	19/20
06	0	-	-	-	-	-	0	0	0	-	0	22/32
<i>Artemisia nova</i>												
84	14132	333	600	5466	8066	-	25	.47	57	-	2	7/13
90	11666	200	1000	5333	5333	-	63	2	46	.51	4	10/11
96	5340	180	160	4440	740	880	28	.37	14	2	2	12/21
01	5760	560	420	4620	720	900	17	1	13	6	6	12/20
06	5680	1080	260	3740	1680	1240	.70	0	30	19	20	13/21
<i>Artemisia tridentata wyomingensis</i>												
84	865	-	66	533	266	-	54	15	31	-	0	12/12
90	1532	66	133	1066	333	-	22	26	22	-	9	33/26
96	1460	-	100	920	440	620	52	5	30	8	11	14/24
01	1060	20	20	600	440	300	40	17	42	19	19	12/21
06	40	40	20	-	20	640	50	0	50	50	50	-/-
<i>Ceratoides lanata</i>												
84	399	-	66	333	-	-	67	0	0	-	0	6/7
90	465	-	266	133	66	-	29	14	14	-	0	6/5
96	580	-	40	540	-	-	38	10	0	-	0	8/10
01	680	-	-	680	-	-	6	0	0	-	0	8/15
06	580	-	-	580	-	-	0	21	0	-	0	10/10

		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)
Chrysothamnus nauseosus consimilis												
84	0	-	-	-	-	-	0	0	-	-	0	-/-
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	0	-	-	-	-	-	0	0	-	-	0	-/-
01	0	-	-	-	-	-	0	0	-	-	0	28/65
06	0	-	-	-	-	-	0	0	-	-	0	-/-
Chrysothamnus viscidiflorus viscidiflorus												
84	2399	-	200	1266	933	-	0	0	39	-	0	15/12
90	2732	66	666	1600	466	-	0	2	17	-	0	13/11
96	840	-	20	700	120	-	2	0	14	-	0	13/19
01	1020	-	-	940	80	-	0	0	8	-	0	12/20
06	1160	-	40	1040	80	20	2	0	7	-	10	11/15
Eriogonum microthecum												
84	1400	400	400	1000	-	-	0	0	-	-	0	9/8
90	1466	66	800	666	-	-	5	0	-	-	0	5/7
96	1300	-	20	1280	-	-	0	0	-	-	0	7/9
01	1380	-	-	1380	-	-	0	1	-	-	0	6/8
06	1740	20	60	1680	-	-	1	0	-	-	0	8/12
Juniperus osteosperma												
84	66	-	66	-	-	-	0	0	-	-	0	-/-
90	66	66	66	-	-	-	0	0	-	-	0	-/-
96	80	20	20	60	-	20	0	0	-	-	0	-/-
01	140	-	100	40	-	-	0	0	-	-	0	-/-
06	180	100	80	100	-	-	0	0	-	-	0	49/59
Leptodactylon pungens												
84	0	-	-	-	-	-	0	0	0	-	0	-/-
90	0	-	-	-	-	-	0	0	0	-	0	-/-
96	0	-	-	-	-	-	0	0	0	-	0	-/-
01	0	-	-	-	-	-	0	0	0	-	0	-/-
06	20	-	-	-	20	-	0	0	100	-	100	-/-
Opuntia sp.												
84	0	-	-	-	-	-	0	0	-	-	0	-/-
90	0	-	-	-	-	-	0	0	-	-	0	-/-
96	40	-	-	40	-	-	0	0	-	-	0	3/10
01	40	-	-	40	-	-	0	0	-	-	0	6/12
06	80	-	20	60	-	-	0	0	-	-	0	3/3

		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)	
Rosa woodsii													
84	0	-	-	-	-	-	0	0	-	-	0	-/-	
90	0	-	-	-	-	-	0	0	-	-	0	-/-	
96	0	-	-	-	-	-	0	0	-	-	0	-/-	
01	0	-	-	-	-	-	0	0	-	-	0	-/-	
06	0	-	-	-	-	-	0	0	-	-	0	20/41	
Symphoricarpos oreophilus													
84	599	-	266	333	-	-	0	0	-	-	0	16/6	
90	1799	-	66	1733	-	-	19	4	-	-	15	22/12	
96	140	-	20	120	-	-	0	0	-	-	14	16/32	
01	120	-	-	120	-	100	0	0	-	-	0	18/32	
06	200	-	20	180	-	-	0	0	-	-	0	16/33	
Tetradymia canescens													
84	0	-	-	-	-	-	0	0	-	-	0	-/-	
90	0	-	-	-	-	-	0	0	-	-	0	-/-	
96	0	-	-	-	-	-	0	0	-	-	0	-/-	
01	0	-	-	-	-	-	0	0	-	-	0	12/30	
06	20	-	20	-	-	-	0	0	-	-	0	12/25	