

WEST GOSLIN - TREND STUDY NO. 8B-9-10

Vegetation Type: Mountain Big Sagebrush-Grass

Range Type: Crucial Deer Summer (Fawning habitat), Crucial Elk Summer (Calving habitat)

NRCS Ecological Site Description: [Mountain Loam \(Mountain Big Sagebrush\), R047XA430UT](#)

Land Ownership: BLM

Elevation: 7986 ft. (2435 m)

Aspect: Southeast

Slope: 2%-4%

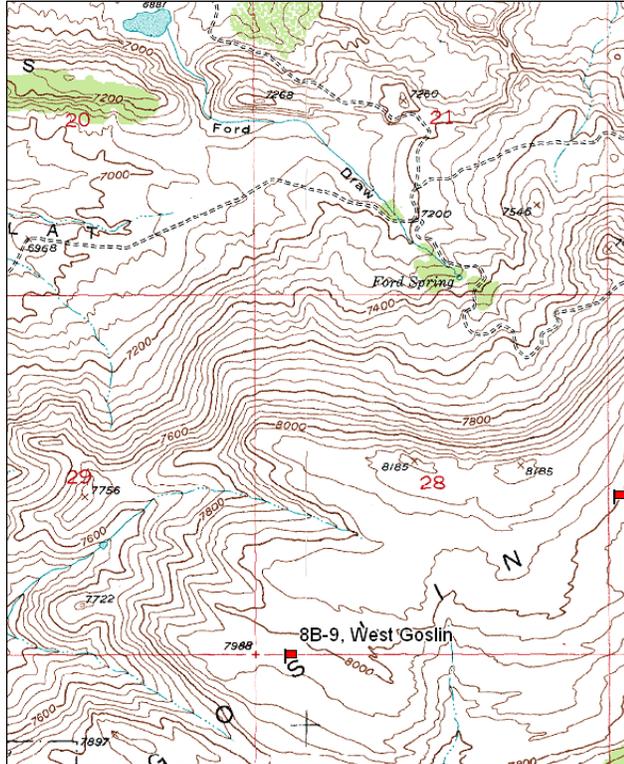
Transect bearing: 264° magnetic

Belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

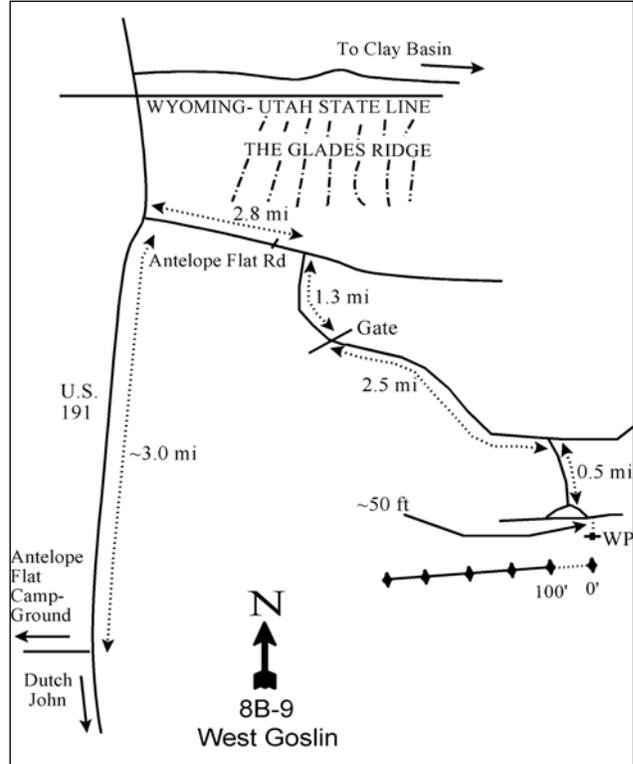
Directions:

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191 for approximately 8 miles. Before reaching the Wyoming-Utah border, turn east on the Antelope Flat Road toward Goslin Mountain. Go 2.8 miles and turn right toward Goslin Mountain. Turn right and drive 1.3 miles to a gate. Go through the gate and continue 2.5 miles to a fork. Go right 0.5 miles to a intersection . The witness post is located on the east side of the Y shaped intersection about 50' south of the road. Full size posts are used to mark the site. The 0-foot post is marked with a browse tag # 34.

Map Name: Goslin Mountain



Diagrammatic Sketch:



Township: 3N Range: 23E Section: 28

GPS: NAD 83, UTM 12T 640111 E 4535748 N

WEST GOSLIN - TREND STUDY NO. 8B-9

Site Information

Site Description: The study is located within a mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and grass community on a ridge top on the west side of Goslin Mountain. The site was burned in 2002 as part of the Mustang fire which burned the west face of Goslin Mountain, but did not extend to the east side of the mountain where the Goslin Mountain (8B-2) site is located. Grazing in the area is managed by the Bureau of Land Management (BLM) as part of the Goslin Mountain allotment. Deer, elk and antelope use the area, and elk and antelope have been seen using the site during multiple readings. Due to difficulties in differentiating between species, deer and antelope pellets were all classified as deer. Pellet group transect data estimated moderate use by elk in 2000, heavy use in 2005 and light use in 2010. Estimated deer/antelope use was light in 2000 and 2010, with more moderate use in 2005. Estimated use by cattle has been light since 2000. Grouse pellets were also sampled on the site since 2005 (Table - Pellet Group Data).

Browse: The key browse species on the site historically consisted of a fairly dense stand of mountain big sagebrush, but sagebrush density decreased substantially following the wildfire in 2002. Prior to the burn, the sagebrush consisted of a population of large, mature plants with moderate decadence and light use. Following the burn, the population has rebounded quickly in density, but is now comprised of much smaller plants. Utilization of sagebrush has increased and was mostly moderate in 2010. Recruitment of young sagebrush plants was high in 2005, immediately following the fire, but has been poor in all other sample years. Other browse sampled on the site includes Wyeth eriogonum (*Eriogonum heracleoides*), snowberry (*Symphoricarpos oreophilus*) and stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*). Low rabbitbrush has increased substantially in density since the fire. A few small serviceberry (*Amelanchier utahensis*) and true mountain mahogany (*Cercocarpus montanus*) are also scattered over the site (Table - Browse Characteristics).

Herbaceous Understory: Due to the high elevation of this site (8,000 feet) and the apparent spring use by big game, the herbaceous understory is the key component on this site. Grasses on the site are diverse and abundant. Prior to the fire, letterman needlegrass (*Stipa lettermani*), mutton bluegrass (*Poa fendleriana*) and onion grass (*Melica bulbosa*) were the most abundant grasses, but since the fire many species have become more prevalent including thickspike wheatgrass (*Agropyron dasystachyum*), alpine fescue (*Festuca ovina*) and needle-and-thread (*Stipa comata*). Cheatgrass (*Bromus tectorum*) was sampled for the first time in 2010 at moderate frequency and cover. Forbs are also diverse and fairly abundant. Silvery lupine (*Lupinus argenteus*) is the dominant forb providing a large portion of the perennial forb cover. Other common forbs include: sulfur eriogonum (*Eriogonum umbellatum*), longleaf phlox (*Phlox longifolia*) and hollyleaf clover (*Trifolium gymnocarpon*). Preferred forbs include arrowleaf balsamorhiza (*Balsamorhiza sagittata*), yellow Indian paintbrush (*Castilleja flava*), low penstemon (*Penstemon humilus*), lambstongue groundsel (*Senecio integerrimus*) and spindleroot bluebell (*Mertensia fusiformis*). Annual forbs increased substantially in 2005, following the fire, but have been less prevalent in other sample years (Table - Herbaceous Trends).

Soil: The soil texture is a sandy loam with a slightly acidic reaction (pH 6.1). Phosphorus may have limited availability for plant growth and development at 4.7 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Due to the abundant vegetation and litter cover, there was little bare ground exposed previous to 2005. Vegetation and litter cover was very well dispersed (as indicated by the very high nested frequency values) further protecting the soil from erosion. There are also a few large boulders on the soil surface. Bare ground cover increased substantially in 2005, but returned to pre-fire levels in 2010 (Table - Basic Cover). The soil erosion condition was classified as stable in 2005 and 2010.

Trend Assessments

Browse:

- **1995 to 2000 - stable (0):** There was little change in the mountain big sagebrush population.

- **2000 to 2005 - down (-2):** The wildfire in 2002 removed many of the shrubs from the site. Density of mountain big sagebrush decreased by 48% from 3,600 plants/acre to 1,880 plants/acre, and cover decreased from 24% to 1%. Recruitment of young sagebrush plants was high at 69% of the population, indicating the sagebrush population may rebound quickly.
- **2005 to 2010 - up (+2):** Though still well below pre-fire levels, the density of mountain big sagebrush increased by 34% and cover increased to 8%. Most of the mature plants are considerably smaller than prior to the fire. Recruitment of young sagebrush plants was again poor decreasing to 4%.

Grass:

- **1995 to 2000 - slightly down (-1):** The perennial grass sum of nested frequency decreased by 11%, though cover increased from 13% to 17%.
- **2000 to 2005 - down (-2):** The sum of nested frequency of perennial grasses decreased by 31% despite cover increasing slightly to 18%.
- **2005 to 2010 - up (+2):** There was a 62% increase in the sum of nested frequency of perennial grasses and cover increased to 35%. Unfortunately, cheatgrass was sampled for the first time on the site at moderate frequency and cover.

Forb:

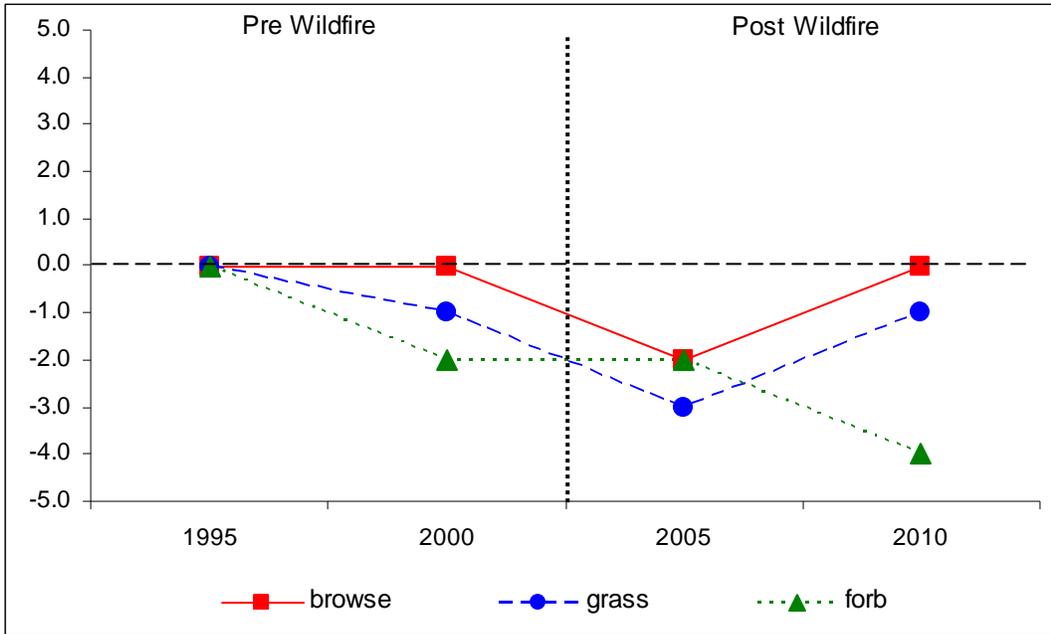
- **1995 to 2000 - down (-2):** The sum of nested frequency of perennial forbs decreased by 46%, though cover decreased only slightly from 14% to 13%.
- **2000 to 2005 - stable (0):** There was little change in the sum of nested frequency or cover of perennial forbs, but several important forbs including sulfur eriogonum and silvery lupine decreased significantly in nested frequency. Annual forbs also increased substantially in nested frequency and cover.
- **2005 to 2010 - down (-2):** The perennial forb sum of nested frequency decreased by 36% and cover decreased to 6%. Annual forbs also decreased markedly in frequency and cover.

DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --
Management unit 8B, study no: 9

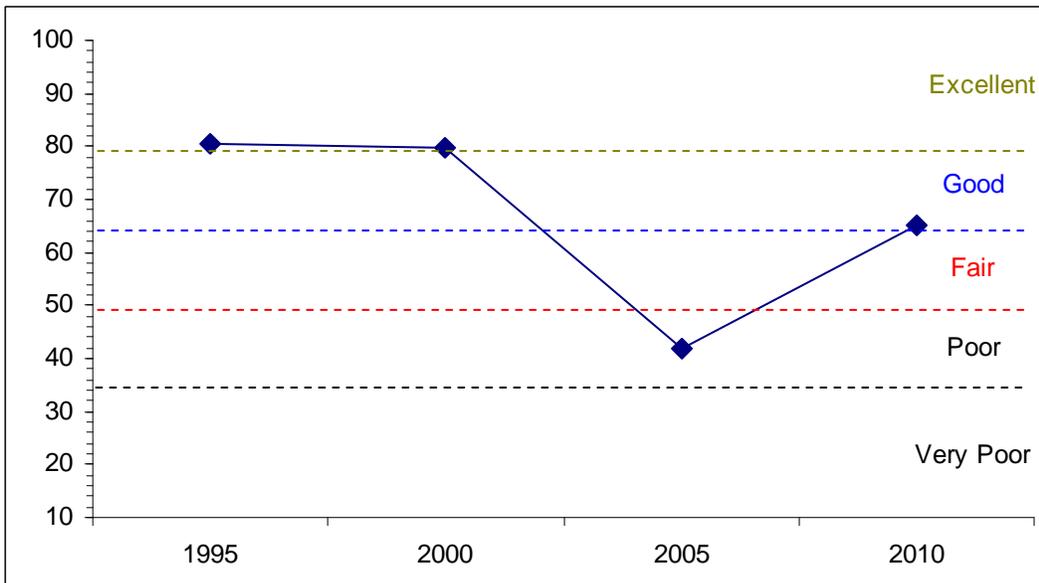
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
95	30.0	10.8	3.6	26.1	0.0	10.0	0.0	80.5	Good-Excellent
00	29.9	6.4	3.5	30.0	0.0	10.0	0.0	79.8	Good-Excellent
05	1.8	0.0	0.0	30.0	0.0	10.0	0.0	41.8	Poor
10	9.9	15.0	2.1	30.0	-2.0	10.0	0.0	65.0	Fair-Good

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
 Management unit 8B, Study no: 9



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL--
 Management unit 8B, Study no: 9



HERBACEOUS TRENDS--
Management unit 08B, Study no: 9

Type	Species	Nested Frequency				Average Cover %			
		'95	'00	'05	'10	'95	'00	'05	'10
G	Agropyron dasystachyum	a180	a116	b232	c308	.80	.96	7.42	9.48
G	Agropyron spicatum	a-	a-	b16	a4	-	-	.50	.38
G	Bromus tectorum (a)	a-	a-	a-	b96	-	-	-	2.67
G	Carex sp.	39	33	19	40	.56	.99	.34	1.41
G	Dactylis glomerata	b49	a-	a-	a-	.31	-	-	-
G	Festuca ovina	b26	b17	a-	c88	.35	.28	-	3.46
G	Koeleria cristata	-	-	3	4	-	-	.00	.30
G	Melica bulbosa	c213	b80	a6	a18	4.51	1.95	.04	.11
G	Poa fendleriana	a43	b188	a58	b185	.86	3.37	2.43	6.53
G	Poa pratensis	a13	b50	ab35	ab29	.06	1.43	1.74	2.42
G	Poa secunda	b15	a-	ab13	b30	.13	-	.15	.35
G	Sitanion hystrix	28	34	11	22	.16	.61	.30	.49
G	Stipa columbiana	96	72	51	55	1.70	1.35	2.54	2.95
G	Stipa comata	a16	b66	ab50	b83	.13	1.90	1.51	5.48
G	Stipa lettermani	b174	b141	a57	a25	3.47	4.26	1.06	1.17
Total for Annual Grasses		0	0	0	96	0	0	0	2.67
Total for Perennial Grasses		892	797	551	891	13.07	17.13	18.09	34.56
Total for Grasses		892	797	551	987	13.07	17.13	18.09	37.23
F	Agoseris glauca	c151	a9	b59	b47	.90	.19	.46	.41
F	Allium sp.	c86	ab13	b29	a7	.42	.02	.10	.04
F	Antennaria rosea	4	-	-	-	.03	-	-	-
F	Arabis drummondii	9	6	-	5	.02	.01	-	.00
F	Arenaria sp.	ab16	b16	a1	a3	.51	.11	.00	.00
F	Astragalus convallarius	4	8	11	10	.18	.24	.33	.19
F	Astragalus sp.	8	4	-	-	.01	.15	-	-
F	Balsamorhiza sagittata	4	3	-	-	.01	.04	-	-
F	Castilleja flava	4	8	-	-	.03	.04	-	-
F	Chenopodium leptophyllum(a)	-	-	2	-	-	-	.00	-
F	Collinsia parviflora (a)	c154	a5	b78	bc110	.99	.01	.36	.44
F	Collomia linearis (a)	c169	a3	b73	b62	1.07	.00	.22	.19
F	Crepis acuminata	b36	a8	a4	a3	.34	.07	.18	.03
F	Cryptantha sp.	-	-	-	4	-	-	-	.02
F	Cymopterus longipes	11	16	7	-	.07	.06	.04	-
F	Delphinium nuttallianum	18	-	6	-	.04	-	.02	-
F	Descurainia pinnata (a)	-	-	12	-	-	-	.19	-
F	Draba sp. (a)	2	-	-	-	.03	-	-	-
F	Erigeron eatonii	11	5	-	3	.02	.04	-	.03
F	Eriogonum umbellatum	c52	c59	a-	b13	1.31	1.56	-	.20
F	Gayophytum ramosissimum(a)	a-	a-	b120	a-	-	-	1.88	-
F	Heterotheca villosa	a3	ab9	ab13	b22	.00	.21	.62	.95
F	Hymenoxys sp.	2	-	-	-	.03	-	-	-
F	Lappula occidentalis (a)	a-	a-	b44	a2	-	-	.99	.00
F	Lepidium sp. (a)	a-	a-	b44	a4	-	-	.76	.01

T y p e	Species	Nested Frequency				Average Cover %			
		'95	'00	'05	'10	'95	'00	'05	'10
F	Lomatium triternatum	9	-	3	-	.01	-	.04	-
F	Lupinus argenteus	_b 197	_b 184	_a 115	_a 111	6.85	6.93	7.41	2.81
F	Mertensia fusiformis	3	-	2	-	.00	-	.03	-
F	Microsteris gracilis (a)	-	-	10	1	-	-	.07	.00
F	Penstemon humilis	9	-	8	-	.04	-	.06	-
F	Phlox hoodii	_b 27	_b 36	_a 7	_a 2	.56	1.34	.33	.03
F	Phlox longifolia	_b 129	_a 47	_c 163	_a 48	1.36	.41	2.54	.64
F	Polygonum douglasii (a)	_b 69	_a 27	_d 294	_c 137	.19	.26	4.40	.68
F	Ranunculus testiculatus (a)	-	-	10	-	-	-	.01	-
F	Salsola iberica (a)	-	-	1	-	-	-	.00	-
F	Schoenocrambe linifolia	-	-	7	-	-	-	.01	-
F	Sedum lanceolatum	9	11	-	-	.06	.09	-	-
F	Senecio integerrimus	_b 16	_b 13	_{ab} 5	_a -	.09	.06	.04	-
F	Sphaeralcea coccinea	-	-	3	3	-	-	.03	.38
F	Taraxacum officinale	_b 58	_a 3	_a 9	_a 3	.21	.03	.20	.00
F	Trifolium gymnocarpon	75	59	69	54	.73	.96	.62	.49
F	Unknown forb-annual (a)	3	-	-	-	.00	-	-	-
F	Zigadenus paniculatus	-	-	2	-	-	-	.00	-
Total for Annual Forbs		397	35	688	316	2.29	0.28	8.94	1.33
Total for Perennial Forbs		951	517	523	338	13.90	12.60	13.11	6.26
Total for Forbs		1348	552	1211	654	16.19	12.88	22.05	7.60

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

BROWSE TRENDS--

Management unit 08B, Study no: 9

T y p e	Species	Strip Frequency				Average Cover %			
		'95	'00	'05	'10	'95	'00	'05	'10
B	Amelanchier utahensis	7	4	3	5	.21	.18	.03	.03
B	Artemisia nova	4	0	1	0	.00	-	-	-
B	Artemisia tridentata vaseyana	82	87	46	65	24.90	23.68	1.22	7.84
B	Chrysothamnus viscidiflorus viscidiflorus	7	8	6	43	.53	.21	.53	2.20
B	Eriogonum heracleoides	67	65	26	44	7.47	7.94	1.88	2.34
B	Gutierrezia sarothrae	2	0	0	3	.15	-	-	.00
B	Mahonia repens	0	0	0	2	-	-	-	-
B	Purshia tridentata	1	1	1	1	-	.03	.15	.03
B	Symphoricarpos oreophilus	9	10	7	9	.96	1.19	1.81	1.60
Total for Browse		179	175	90	172	34.23	33.23	5.63	14.06

CANOPY COVER, LINE INTERCEPT--

Management unit 08B, Study no: 9

Species	Percent Cover	
	'05	'10
Amelanchier utahensis	.33	.40
Artemisia tridentata vaseyana	1.73	11.16
Chrysothamnus viscidiflorus viscidiflorus	.40	2.09
Eriogonum heracleoides	2.31	2.78
Purshia tridentata	.06	-
Symphoricarpos oreophilus	1.08	1.13

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 08B, Study no: 9

Species	Average leader growth (in)	
	'05	'10
Artemisia tridentata vaseyana	-	1.9

BASIC COVER--

Management unit 08B, Study no: 9

Cover Type	Average Cover %			
	'95	'00	'05	'10
Vegetation	55.49	61.42	44.98	62.28
Rock	1.75	1.41	2.09	1.63
Pavement	.12	1.22	2.40	1.00
Litter	61.50	70.24	21.14	57.08
Cryptogams	.07	.00	.01	0
Bare Ground	8.76	6.59	36.85	6.59

SOIL ANALYSIS DATA --

Management unit 8B, Study no: 9, Study Name: West Goslin

Effective rooting depth (in)	pH	sandy loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
13.4	6.1	64.0	21.4	14.6	3.0	4.7	134.4	0.6

PELLET GROUP DATA--

Management unit 08B, Study no: 9

Type	Quadrat Frequency				Days use per acre (ha)		
	'95	'00	'05	'10	'00	'05	'10
Rabbit	-	3	20	4	-	-	-
Grouse	-	-	1	-	-	52/acre	-
Elk	7	7	9	4	30 (74)	80 (197)	14 (35)
Deer/Antelope	3	4	8	21	7 (17)	34 (84)	8 (20)
Cattle	-	5	3	5	4 (11)	15 (36)	20 (48)

BROWSE CHARACTERISTICS--
Management unit 08B, Study no: 9

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<i>Amelanchier utahensis</i>									
95	260	23	69	8	-	23	8	0	27/41
00	80	0	100	0	-	25	50	0	27/33
05	80	50	50	0	-	0	75	0	11/17
10	120	67	33	0	-	17	33	17	11/21
<i>Artemisia nova</i>									
95	80	0	75	25	-	50	50	25	6/9
00	0	0	0	0	-	0	0	0	-/-
05	20	100	0	0	-	0	0	0	-/-
10	0	0	0	0	-	0	0	0	-/-
<i>Artemisia tridentata vaseyana</i>									
95	3380	7	80	14	20	25	2	4	30/43
00	3600	7	64	29	200	7	1	9	28/43
05	1880	69	31	0	40	3	3	1	7/11
10	2520	4	96	0	-	46	17	0	16/26
<i>Cercocarpus montanus</i>									
95	0	0	0	-	-	0	0	0	68/84
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	15/23
10	0	0	0	-	-	0	0	0	19/24
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
95	200	10	90	0	-	0	0	0	8/12
00	260	23	69	8	-	0	0	0	9/14
05	240	8	92	0	20	0	0	0	12/20
10	2020	14	86	0	-	0	0	2	8/12
<i>Eriogonum heracleoides</i>									
95	5440	1	99	-	-	0	0	0	11/14
00	6360	18	82	-	-	0	0	0	4/10
05	1260	0	100	-	-	0	0	0	7/14
10	1740	2	98	-	-	13	0	0	5/18
<i>Gutierrezia sarothrae</i>									
95	40	0	100	-	-	0	0	0	6/7
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	-/-
10	80	0	100	-	-	0	0	0	10/9
<i>Mahonia repens</i>									
95	0	0	0	-	-	0	0	0	-/-
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	3/9
10	80	0	100	-	-	0	0	0	3/10

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Purshia tridentata</i>										
95	20	0	100	-	-	0	100	0	15/42	
00	60	0	100	-	-	0	0	0	16/28	
05	20	0	100	-	-	0	100	0	7/24	
10	20	0	100	-	-	0	100	0	10/48	
<i>Symphoricarpos oreophilus</i>										
95	340	0	100	-	-	41	0	0	24/47	
00	320	6	94	-	-	0	0	0	25/53	
05	220	9	91	-	-	0	0	0	14/45	
10	400	5	95	-	-	5	0	0	16/42	
<i>Tetradymia canescens</i>										
95	0	0	0	-	-	0	0	0	-/-	
00	0	0	0	-	-	0	0	0	-/-	
05	0	0	0	-	-	0	0	0	10/25	
10	0	0	0	-	-	0	0	0	12/28	