

GOSLIN MOUNTAIN - TREND STUDY NO. 8B-2-10

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: UDWR

Elevation: 8030 ft. (2448 m)

Aspect: Southeast

Slope: 12%

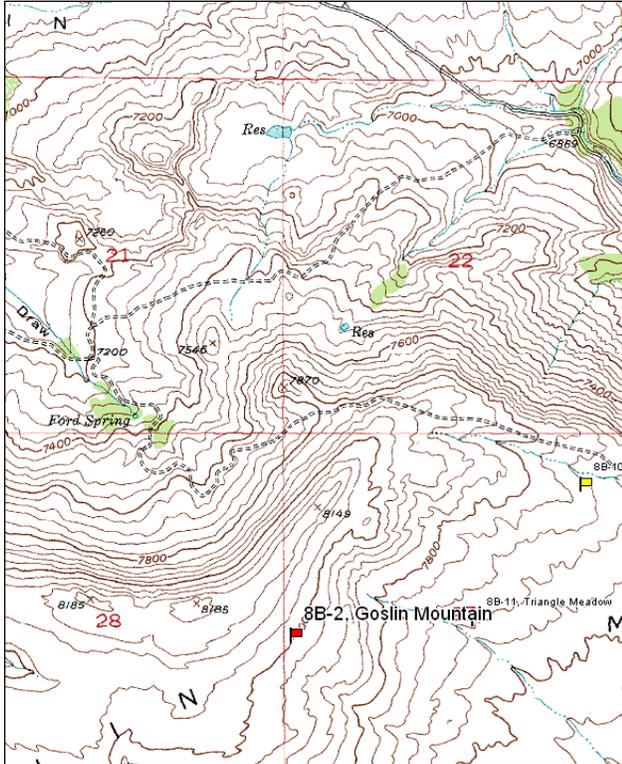
Transect bearing: 18° magnetic

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

Directions:

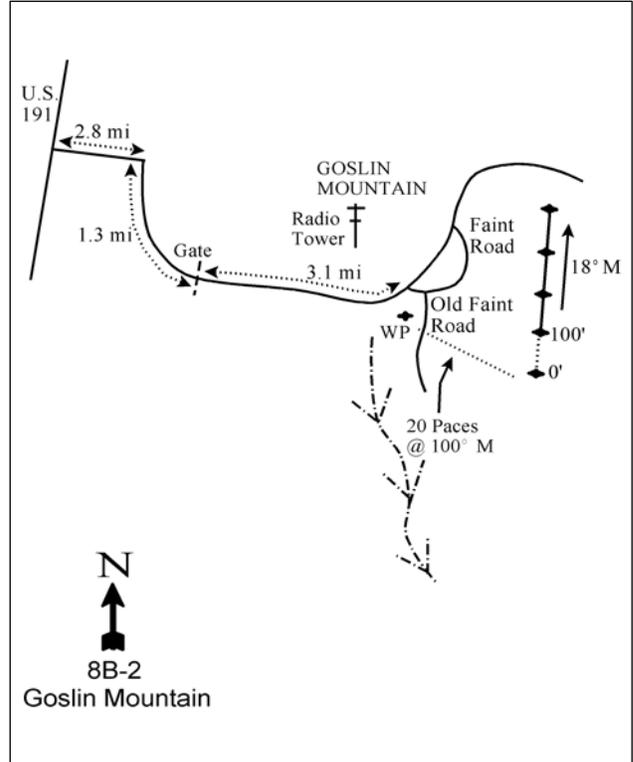
From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191 for approximately 8 miles. Before the Wyoming border, turn east on the Antelope Flat Road towards Goslin Mountain. Go 2.8 miles and turn right towards Goslin Mountain. Proceed 1.3 miles to a gate. Continue up the mountain 3.1 miles to a turnoff to the left which goes to a radio tower. A little further down the main road there is a road to the right with the witness post located off of it. Stop here and walk 20 paces at 100° to the 0-foot baseline stake.

Map Name: Goslin Mountain



Township: 3N Range: 23E Section: 27

Diagrammatic Sketch:



GPS: NAD 83, UTM 12T 641583 E 4536489 N

GOSLIN MOUNTAIN - TREND STUDY NO. 8B-2

Site Information

Site Description: The study samples a mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and grass community near the summit of Goslin Mountain. Much of the surrounding area was treated with a lop and scatter in the spring of 2008 as part of the Goslin Mountain Phase 2 Lop and Scatter ([WRI Project #691](#)). Several large juniper (*Juniperus osteosperma*) trees that were scattered over the site were cut down, likely as part of the treatment. Deer, elk and antelope utilize the site year-round with less use occurring during severe winters. The area is administered by the Utah Division of Wildlife Resources (UDWR), but cattle grazing is permitted in the area as part of the Goslin Mountain allotment managed by the Bureau of Land Management (BLM). The area is also considered important habitat for sage grouse. Pellet group transect data estimated light use by deer in 2001, but heavier use since 2005. Estimated elk and cattle use has been light since 2001. Grouse pellets were sampled on the site in 2005 (Table - Pellet Group Data).

Browse: The key browse species consists of a moderately dense stand of mountain big sagebrush which has provided the majority of the browse cover since 1995 (Table - Browse Trends). The sagebrush population is comprised of mostly mature plants with moderate to high amounts of decadence and poor vigor. Recruitment of young sagebrush plants has fluctuated from poor to good over the sample years. Utilization of sagebrush has been mostly light to moderate, though use was heavier in 1995 and 2010. Other important browse species consist of serviceberry (*Amelanchier utahensis*), bitterbrush (*Purshia tridentata*) and snowberry (*Symphoricarpos oreophilus*). The bitterbrush population has a prostrate growth form with an average height of less than 2 feet. Utilization estimates have been moderate to heavy, but vigor has remained good. The small number of serviceberry plants scattered throughout the site have displayed moderate to heavy hedging (Table - Browse Characteristics).

Herbaceous Understory: Grasses are diverse and abundant on the site. The dominant grasses consist of needle-and-thread (*Stipa comata*), Letterman needlegrass (*S. lettermani*), oniongrass (*Melica bulbosa*), thickspike wheatgrass (*Agropyron dasystachyum*), mutton bluegrass (*Poa fendleriana*) and Kentucky bluegrass (*P. pratensis*). It was reported in 1988 that the *Poa* spp. were identified to genus only because of the difficulty identifying grasses that year. Forbs are also very diverse and fairly abundant. Important species include silver lupine (*Lupinus argenteus*), low penstemon (*Penstemon humilus*) and sulfur eriogonum (*Eriogonum umbellatum*) (Table - Herbaceous Trends).

Soil: The soil texture is sandy loam which has a slightly acidic soil reaction (pH 6.2). Phosphorus may have limited availability for plant growth and development at 4.6 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Protective ground cover is abundant and well dispersed leaving little bare ground cover (Table - Basic Cover). However, there are some signs of past erosion in the form of soil pedestals around shrubs and the bare areas. The soil erosion condition was classified as stable in 2005 and 2010.

Trend Assessments

Browse:

- **1982 to 1988 - stable (0):** The density of the primary browse species, mountain big sagebrush, increased by two-fold, but decadence increased from 3% to 52%.
- **1988 to 1995 - stable (0):** Differences in density may be related to the larger sample area used in 1995; therefore, trend was determined using other parameters. Decadence of mountain big sagebrush decreased to 33%, but poor vigor increased from 4% to 15% and there was no new recruitment of young sagebrush plants.
- **1995 to 2000 - stable (0):** Mountain big sagebrush density, cover, decadence and poor vigor remained similar.

- **2000 to 2005 - slightly down (-1):** The density of mountain big sagebrush decreased by 14% from 2,500 plants/acre to 2,160 plants/acre, though cover increased from 13% to 15%. Decadence of sagebrush decrease to 26%, but is still considered moderately high.
- **2005 to 2010 - slightly up (+1):** There was an 11% increase in the density of mountain big sagebrush to 2,400 plants/acre. Recruitment of young sagebrush plants increased from 6% to 15% of the population.

Grass:

- **1982 to 1988 - no trend (NT):** Only quadrat frequency data for grasses are available from 1982, so no trend was given.
- **1988 to 1995 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 11%.
- **1995 to 2000 - up (+2):** The perennial grass sum of nested frequency increased by 21% and cover increased from 13% to 24%.
- **2000 to 2005 - stable (0):** There was little change in the sum of nested frequency of perennial grasses with a slight decrease in cover to 20%.
- **2005 to 2010 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 15%, though cover increased to 24%.

Forb:

- **1982 to 1988 - no trend (NT):** Only quadrat frequency data for forbs are available from 1982, so no trend was given.
- **1988 to 1995 - up (+2):** The sum of nested frequency of perennial forbs increased by 26%.
- **1995 to 2000 - slightly down (-1):** The perennial forb sum of nested frequency decreased by 16%, but cover increased slightly from 3% to 5%
- **2000 to 2005 - stable (0):** There was little change in the perennial forb sum of nested frequency or cover.
- **2005 to 2010 - slightly down (-1):** The perennial forb sum of nested frequency decreased by 19%, but cover increased to 6%.

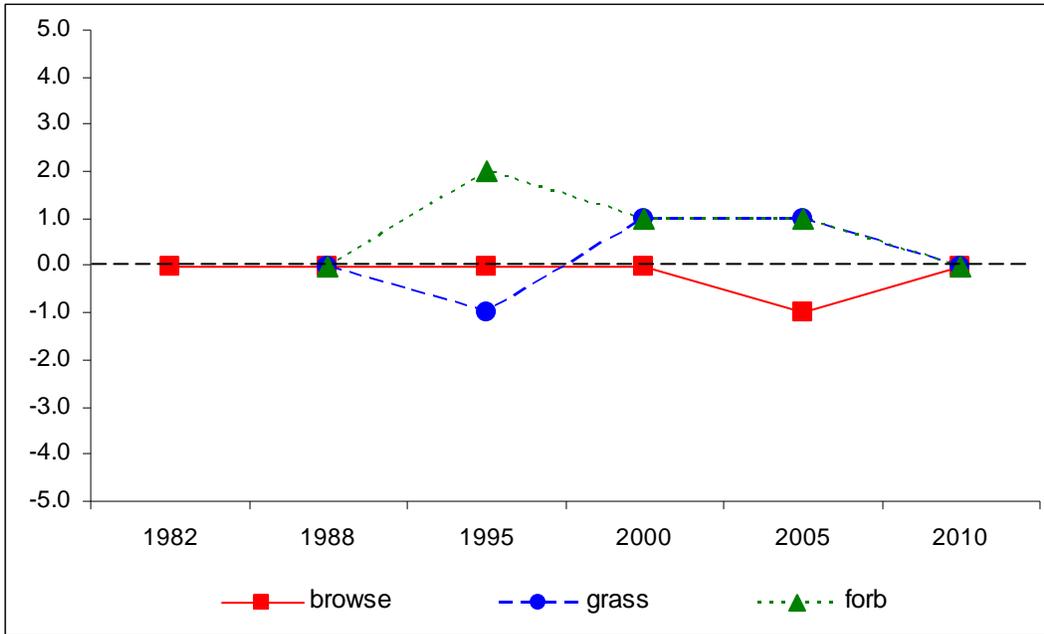
DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --

Management unit 8B, study no: 2

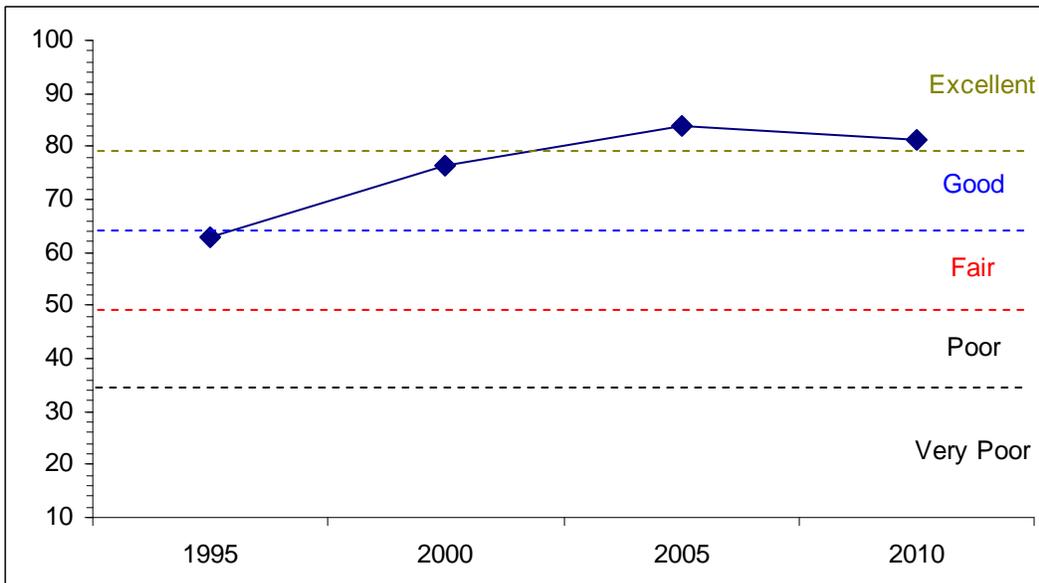
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
95	22.1	7.0	1.4	26.2	0.0	6.4	0.0	63.0	Fair
00	25.8	7.1	3.6	30.0	0.0	10.0	0.0	76.5	Good
05	29.9	9.9	4.5	30.0	0.0	9.4	0.0	83.7	Excellent
10	25.2	10.2	5.8	30.0	0.0	10.0	0.0	81.2	Good-Excellent

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 8B, Study no: 2



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL--
Management unit 8B, Study no: 2



HERBACEOUS TRENDS--
Management unit 08B, Study no: 2

Type	Species	Nested Frequency					Average Cover %			
		'88	'95	'00	'05	'10	'95	'00	'05	'10
G	Agropyron dasystachyum	136	144	150	183	150	1.06	2.82	2.24	3.08
G	Agropyron spicatum	a-	b37	b14	b25	b20	.42	.63	.26	.60
G	Agropyron trachycaulum	a-	a-	ab6	a-	b19	-	.30	-	.15
G	Bromus carinatus	a-	a-	a6	a-	b20	-	.18	-	.47
G	Bromus tectorum (a)	-	2	-	5	-	.00	-	.01	-
G	Carex sp.	22	32	31	43	35	.88	.75	1.12	.81
G	Dactylis glomerata	-	1	-	-	-	.00	-	.00	-
G	Danthonia unispicata	14	4	3	2	3	1.01	.00	.03	.15
G	Koeleria cristata	11	-	2	-	12	-	.03	-	.39
G	Leucopoa kingii	-	3	7	7	2	.06	.44	.44	.06
G	Melica bulbosa	ab86	b102	c156	bc121	a58	2.94	3.74	1.61	1.58
G	Poa bulbosa	a-	ab3	b22	b15	b15	.03	.17	.69	.30
G	Poa fendleriana	a-	b38	b87	c128	c122	.45	2.25	3.28	3.99
G	Poa pratensis	a-	a5	b43	b53	b47	.06	1.37	1.06	2.87
G	Poa secunda	a-	b25	bc38	c56	bc32	.09	.36	1.33	.62
G	Poa sp.	b171	a-	a-	a-	a-	-	-	-	-
G	Sitanion hystrix	b63	a-	a-	a1	a-	-	-	.00	-
G	Stipa columbiana	b89	a7	b86	a22	a43	.07	2.58	1.06	1.75
G	Stipa comata	a118	b190	ab139	ab137	a112	4.46	7.60	5.60	5.39
G	Stipa lettermani	abc54	c89	a34	bc64	ab40	1.57	.68	1.50	1.50
Total for Annual Grasses		0	2	0	5	0	0.00	0	0.00	0
Total for Perennial Grasses		764	680	824	857	730	13.11	23.96	20.29	23.76
Total for Grasses		764	682	824	862	730	13.12	23.96	20.30	23.76
F	Achillea millefolium	b15	a-	a-	a4	b9	-	-	.15	.09
F	Agoseris glauca	a-	a53	b64	c89	a3	.28	1.06	.54	.03
F	Allium sp.	a21	b139	a35	a41	a13	.81	.12	.11	.05
F	Alyssum alyssoides (a)	-	-	-	-	6	-	-	-	.01
F	Androsace septentrionalis (a)	-	-	-	-	1	-	-	-	.00
F	Antennaria rosea	b14	a3	ab9	ab5	a-	.00	.07	.03	-
F	Arabis sp.	3	3	2	2	3	.00	.00	.01	.00
F	Arenaria sp.	a1	b20	b31	ab16	ab13	.20	.33	.12	.07
F	Aster chilensis	b16	b16	ab7	a-	a-	.06	.07	-	-
F	Astragalus argophyllus	a3	ab5	b15	ab6	ab7	.01	.13	.06	.04
F	Calochortus nuttallii	-	-	-	-	1	-	-	-	.00
F	Chaenactis douglasii	-	3	-	3	2	.00	-	.03	.00
F	Collinsia parviflora (a)	-	c234	a22	b92	a52	1.48	.09	.41	.26
F	Collomia linearis (a)	-	a151	b37	b37	b48	.75	.25	.14	.20
F	Comandra pallida	-	-	1	-	-	-	.00	-	-
F	Crepis acuminata	a3	ab5	ab3	ab7	b17	.04	.03	.07	.11
F	Cymopterus longipes	a-	b19	ab12	ab8	ab9	.05	.10	.09	.05
F	Delphinium nuttallianum	-	1	2	1	-	.00	.00	.00	-
F	Descurainia pinnata (a)	-	5	6	-	2	.01	.01	-	.00
F	Erigeron eatonii	a-	a7	b28	a3	ab18	.04	.11	.06	.06

Type	Species	Nested Frequency					Average Cover %			
		'88	'95	'00	'05	'10	'95	'00	'05	'10
F	<i>Erigeron flagellaris</i>	b ₉₄	a ₁₁	a ₅	a ₇	a ₅	.06	.06	.07	.06
F	<i>Eriogonum umbellatum</i>	b ₄₆	a ₃	a ₁₄	a ₈	b ₅₄	.02	.25	.30	2.85
F	<i>Gilia inconspicua</i> (a)	-	4	-	-	-	.00	-	-	-
F	<i>Heterotheca villosa</i>	-	-	8	3	-	.03	.06	.18	.00
F	<i>Lactuca serriola</i>	-	-	-	-	3	-	-	-	.00
F	<i>Lomatium</i> sp.	-	4	-	-	3	.01	-	-	.03
F	<i>Lupinus argenteus</i>	35	44	37	28	34	.51	.80	1.21	1.18
F	<i>Lychnis drummondii</i>	-	-	-	8	5	-	-	.02	.06
F	<i>Mertensia</i> sp.	a ⁻	a ⁻	a ⁻	b ₁₇	a ⁻	-	-	.18	-
F	<i>Microsteris gracilis</i> (a)	-	b ₃₁	b ₂₉	b ₂₄	a ⁻	.15	.07	.07	-
F	<i>Penstemon humilis</i>	a ⁻	ab ₇	ab ₅	ab ₇	b ₁₅	.16	.06	.07	.54
F	<i>Petrorhiza pumila</i>	-	-	1	2	3	-	.03	.15	.06
F	<i>Phlox longifolia</i>	c ₁₁₇	b ₇₃	ab ₇₀	b ₇₇	a ₃₉	.36	.40	.71	.17
F	<i>Polygonum douglasii</i> (a)	-	b ₇₁	a ₃₃	a ₂₅	a ₁₆	.17	.06	.07	.03
F	<i>Schoenocrambe linifolia</i>	-	-	-	3	-	-	-	.00	-
F	<i>Senecio integerrimus</i>	a ⁻	ab ₁₃	a ₂	b ₂₄	a ₁₀	.09	.00	.12	.05
F	<i>Senecio multilobatus</i>	-	4	-	4	3	.03	-	.03	.03
F	<i>Taraxacum officinale</i>	ab ₄	b ₃₆	ab ₁₃	a ⁻	ab ₇	.25	.22	.00	.04
F	<i>Tragopogon dubius</i>	-	3	5	2	6	.00	.06	.01	.04
F	<i>Trifolium gymnocarpon</i>	a ₈	bc ₅₇	c ₆₃	ab ₃₂	bc ₄₈	.15	.80	.32	.45
F	Unknown forb-perennial	b ₃₃	a ⁻	a ⁻	a ⁻	a ⁻	-	-	-	-
F	<i>Viola</i> sp.	a ⁻	a ⁻	b ₁₂	a ⁻	a ⁻	-	.24	-	-
F	<i>Zigadenus paniculatus</i>	8	2	-	1	1	.00	-	.00	.00
Total for Annual Forbs		0	496	127	178	125	2.57	0.50	0.69	0.52
Total for Perennial Forbs		421	531	444	408	331	3.21	5.09	4.71	6.13
Total for Forbs		421	1027	571	586	456	5.78	5.59	5.41	6.66

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

BROWSE TRENDS--

Management unit 08B, Study no: 2

Type	Species	Strip Frequency				Average Cover %			
		'95	'00	'05	'10	'95	'00	'05	'10
B	<i>Amelanchier utahensis</i>	3	4	3	4	.30	1.54	1.54	1.11
B	<i>Artemisia tridentata vaseyana</i>	72	72	64	70	13.53	12.76	14.56	13.56
B	<i>Chrysothamnus viscidiflorus lanceolatus</i>	7	7	4	5	.42	.18	.41	.15
B	<i>Eriogonum heracleoides</i>	51	54	60	20	3.26	1.81	4.44	1.97
B	<i>Gutierrezia sarothrae</i>	3	0	3	1	.15	-	.03	.03
B	<i>Mahonia repens</i>	12	5	4	5	.48	.15	.30	.30
B	<i>Purshia tridentata</i>	15	20	19	21	3.13	5.00	6.25	4.42
B	<i>Ribes</i> sp.	0	0	0	1	-	-	-	-
B	<i>Symphoricarpos oreophilus</i>	10	8	8	11	.72	2.87	3.29	2.59
Total for Browse		173	170	165	138	22.01	24.33	30.83	24.16

CANOPY COVER, LINE INTERCEPT--

Management unit 08B, Study no: 2

Species	Percent Cover		
	'00	'05	'10
<i>Amelanchier utahensis</i>	-	1.68	2.06
<i>Artemisia tridentata vaseyana</i>	-	17.98	17.71
<i>Chrysothamnus viscidiflorus lanceolatus</i>	-	.13	-
<i>Eriogonum heracleoides</i>	-	4.93	1.21
<i>Gutierrezia sarothrae</i>	-	-	.06
<i>Juniperus scopulorum</i>	1.60	1.20	-
<i>Mahonia repens</i>	-	.23	.45
<i>Purshia tridentata</i>	-	5.56	7.91
<i>Symphoricarpos oreophilus</i>	-	3.01	3.66

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 08B, Study no: 2

Species	Average leader growth (in)	
	'05	'10
<i>Artemisia tridentata vaseyana</i>	1.3	1.3
<i>Purshia tridentata</i>	2.2	1.6

BASIC COVER--

Management unit 08B, Study no: 2

Cover Type	Average Cover %					
	'82	'88	'95	'00	'05	'10
Vegetation	8.50	12.00	41.94	57.47	55.04	53.77
Rock	2.75	2.00	3.28	5.05	4.00	3.60
Pavement	0	3.00	.84	2.42	.80	.71
Litter	60.25	57.50	50.97	58.79	34.59	55.33
Cryptogams	1.00	.25	.10	.38	.07	.03
Bare Ground	27.50	25.25	16.86	12.69	17.82	16.77

SOIL ANALYSIS DATA --

Management unit 8B, Study no: 2, Study Name: Goslin Mountain

Effective rooting depth (in)	pH	sandy loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
12.4	6.2	69.3	16.2	14.6	2.6	4.6	121.6	0.5

PELLET GROUP DATA--

Management unit 08B, Study no: 2

Type	Quadrat Frequency				Days use per acre (ha)		
	'95	'00	'05	'10	'00	'05	'10
Rabbit	-	1	5	5	-	-	-
Grouse	-	-	3	-	-	61/acre	-
Elk	3	1	4	2	3 (8)	4 (10)	10 (25)
Deer	7	4	8	12	15 (36)	56 (139)	58 (144)
Cattle	5	3	6	3	-	9 (22)	7 (16)

BROWSE CHARACTERISTICS--
Management unit 08B, Study no: 2

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>									
82	0	0	0	0	-	0	0	0	-/-
88	0	0	0	0	-	0	0	0	-/-
95	80	0	75	25	-	50	25	0	17/37
00	80	0	100	0	-	0	0	0	30/50
05	80	0	100	0	-	0	100	0	35/56
10	100	0	80	20	-	20	80	20	30/51
<i>Artemisia tridentata vaseyana</i>									
82	2332	6	91	3	-	0	0	0	27/33
88	4865	21	27	52	733	38	1	4	27/39
95	2480	0	67	33	-	52	27	15	51/59
00	2500	7	57	36	220	12	2	18	23/36
05	2160	6	68	26	760	28	4	17	24/38
10	2400	15	64	21	20	37	23	22	25/43
<i>Chrysothamnus viscidiflorus lanceolatus</i>									
82	199	0	100	0	-	0	0	0	9/7
88	199	0	67	33	-	0	0	0	15/7
95	200	0	100	0	-	0	0	0	12/21
00	220	0	100	0	-	0	0	0	9/13
05	120	17	83	0	-	0	0	0	10/17
10	120	17	83	0	-	17	0	0	11/16
<i>Eriogonum heracleoides</i>									
82	0	0	0	0	-	0	0	0	-/-
88	0	0	0	0	-	0	0	0	-/-
95	3000	16	83	1	-	0	.66	.66	7/18
00	2620	5	95	0	-	0	0	0	5/15
05	2660	4	91	5	-	8	0	.75	7/20
10	1520	30	70	0	-	0	0	0	5/14
<i>Gutierrezia sarothrae</i>									
82	0	0	0	-	-	0	0	0	-/-
88	0	0	0	-	-	0	0	0	-/-
95	180	0	100	-	-	0	0	0	4/7
00	0	0	0	-	-	0	0	0	-/-
05	100	0	100	-	-	0	0	0	8/12
10	80	0	100	-	-	0	0	0	6/8

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
Mahonia repens									
82	599	0	100	-	-	0	0	0	5/4
88	1933	100	0	-	-	14	0	0	-/-
95	2900	34	66	-	-	0	0	0	4/6
00	560	43	57	-	-	0	0	0	4/4
05	400	40	60	-	-	0	0	0	4/6
10	1080	15	85	-	-	0	0	0	4/5
Purshia tridentata									
82	532	25	75	0	-	25	63	0	11/21
88	799	33	67	0	-	42	50	25	14/22
95	400	15	85	0	-	45	45	0	13/45
00	420	10	81	10	-	67	0	5	20/63
05	440	18	82	0	-	14	73	0	20/60
10	480	4	96	0	-	29	54	4	21/59
Ribes sp.									
82	0	0	0	-	-	0	0	0	-/-
88	0	0	0	-	-	0	0	0	-/-
95	0	0	0	-	-	0	0	0	-/-
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	31/37
10	20	0	100	-	-	100	0	0	-/-
Symphoricarpos oreophilus									
82	0	0	0	-	-	0	0	0	-/-
88	0	0	0	-	-	0	0	0	-/-
95	400	35	65	-	20	0	0	0	15/41
00	160	0	100	-	-	0	0	13	24/63
05	320	6	94	-	-	0	0	0	18/41
10	340	6	94	-	-	35	24	0	19/60