

NUT PINE HILLS - TREND STUDY NO. 1-16-11

Vegetation Type: Mountain Brush

Range Type: Crucial Deer Summer (Fawning habitat)

NRCS Ecological Site Description: [Upland Stony Loam \(Pinyon-Utah Juniper\), R028AY338UT](#)

Land Ownership: USFS

Elevation: 6,850 ft. (2,088 m)

Aspect: Southwest

Slope: 20-23%

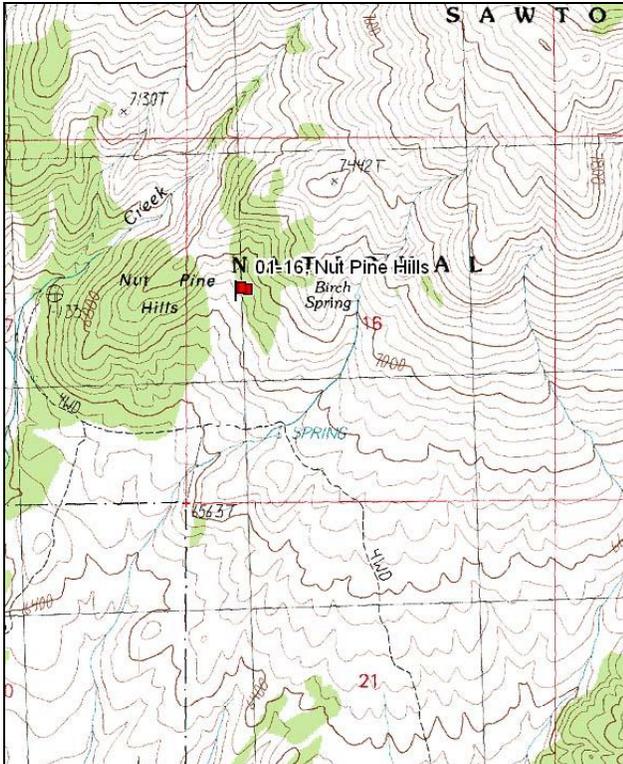
Transect bearing: 155° magnetic

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

Directions:

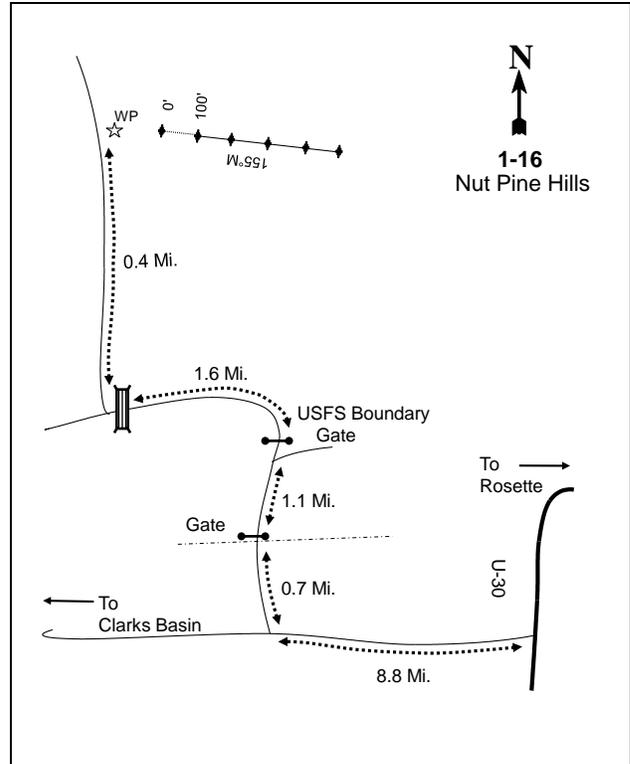
From U-30, travel the road to Clark's Basin for 8.8 miles. Turn right and travel 0.7 miles to a gate. Continue 1.1 miles to a gate marking the forest boundary. Continue 1.6 miles to another gate. Just after the cattleguard turn right and proceed 0.4 miles to a witness post. The zero foot stake is just east of the witness post.

Map Name: Dennis Hill



Township: 13N Range: 15W Section: 16

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 285907 E 4636548 N

NUT PINE HILLS - TREND STUDY NO. 1-16

Site Information

Site Description: The study monitors important deer winter range on the south slope of the Raft River Mountains. The area supports a mixed mountain brush community with scattered singleleaf pinyon (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) trees. The area is administered by the Sawtooth National Forest as part of the Nut Pines Hills pasture in the Rosette allotment. Pellet groups have been sampled at moderately heavy to heavy abundance by deer since 2001. Deer were on the site at the time of sampling in 1996 and 2011. Sampled deer pellet groups are often fresh indicating spring and early summer presence. Presence by other wildlife species appears to be minimal. Sampled cattle sign has been minimal since 2001 (Table - Pellet Group Data).

Browse: The site is dominated by browse species. Sixteen shrub or tree species have been sampled on the site over the course of the study. Key species include Utah serviceberry (*Amelanchier utahensis*), mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), and antelope bitterbrush (*Purshia tridentata*). The serviceberry is a moderately dense population comprised of mostly large, mature plants, though recruitment of young serviceberry plants is good. Vigor has been good and decadence moderate. Utilization of serviceberry has been light to moderate. Mountain big sagebrush is a moderately dense stand of lightly used plants. Utilization has been light and vigor good, though decadence has increased to moderate levels over the course of the study. Recruitment of young sagebrush plants has been mostly poor. Antelope bitterbrush is more abundant than the other preferred species, and has displayed moderate to heavy use. Vigor and decadence of bitterbrush are good, though recruitment of young plants has been somewhat poor. Mountain snowberry (*Symphoricarpos oreophilus*) is also one of the most abundant species on the site, but is not preferred and has shown light use. Other shrubs found include small numbers of black sagebrush (*Artemisia nova*), threadleaf rubber rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *consimilis*), mountain low rabbitbrush (*C. viscidiflorus* ssp. *lanceolatus*), slenderbush eriogonum (*Eriogonum microthecum*), broom snakeweed (*Gutierrezia sarothrae*), chokecherry (*Prunus virginiana*), wax currant (*Ribes cereum* ssp. *cereum*), Woods rose (*Rosa woodsii*), and gray horsebrush (*Tetradymia canescens*) (Table - Browse Characteristics). A few tree size and high-lined curlleaf mahogany (*Cercocarpus ledifolius*) are found in the area, but have not been sampled. The density of the scattered juniper and pinyon trees has remained relatively stable (Table - Point-Quarter Tree Data), but juniper canopy cover has slightly increased since 2001 (Table - Canopy Cover).

Herbaceous Understory: Grasses are diverse, but only moderately abundant on the site. The more abundant species include thickspike wheatgrass (*Agropyron dasystachyum*), bluebunch wheatgrass (*A. spicatum*), and Sandberg bluegrass (*Poa secunda*). The annual species cheatgrass (*Bromus tectorum*) is present, but in very low numbers. Forbs are also diverse, and are fairly abundant. Several useful species are present including Wyoming paint cup (*Castilleja linariaefolia*), sulfur eriogonum (*Eriogonum umbellatum*), lambstongue groundsel (*Senecio integerrimus*), and lobeleaf groundsel (*S. multilobatus*) (Table - Herbaceous Trends). These and other forbs provide useful spring forage for big game.

Soil: The soil is in the Clavicon-Rock Outcrop complex, which occurs on hillslopes. Parent material consists of colluvium and residuum derived from limestone, chert, and dolomite (Soil Survey Staff 2011). The soil texture is a sandy clay loam with a moderately alkaline soil reaction (pH 8.1) (Table - Soil Analysis Data). Vegetation and litter cover are abundant, which adequately protect the soil from serious erosion. Pavement is concentrated on the surface in isolated open interspaces (Table - Basic Cover). The soil erosion condition was classified as stable in 2001 and 2011, but slight in 2006.

Trend Assessments

Browse:

- **1996 to 2001 - stable (0):** Density of serviceberry decreased by 23% from 860 plants/acre to 660 plants/acre, but cover increased from 4% to 8%. Density of mountain big sagebrush increased by 30% from 1,140 plants/acre to 1,480 plants/acre, and cover increased from 4% to 7%. Recruitment of young sagebrush plants decreased from 12% to 5% of the population. Bitterbrush density remained similar at 1,440 plants/acre, and cover increased from 12% to 16%.
- **2001 to 2006 - stable (0):** Density of mountain big sagebrush increased by 11% to 1,640 plants/acre, but cover remained similar at 7%. Density of serviceberry and bitterbrush remained similar at 680 plants/acre and 1,320 plants/acre, respectively. However, cover of serviceberry and bitterbrush decreased to 6% to 12%, respectively.
- **2006 to 2011 - slightly up (+1):** Density of bitterbrush increased by 48% to 1,960 plants/acre, though cover remained similar. Density of serviceberry and mountain big sagebrush remained similar at 620 plants/acre and 1,600 plants/acre, respectively. Cover of serviceberry remained similar at 6%, but cover of sagebrush decreased to 5%. Many of the browse species were just breaking dormancy due to the late, cold, and wet spring.

Grass:

- **1996 to 2001 - up (+2):** The sum of nested frequency of perennial grasses increased by 19%, and cover increased from 6% to 15%. Cheatgrass decreased significantly in nested frequency, though cover remained similar at near 0%.
- **2001 to 2006 - stable (0):** The sum of nested frequency of perennial grasses remained similar, but cover decreased to 7%.
- **2006 to 2011 - down (-2):** There was a 26% decrease in the sum of nested frequency of perennial grasses, and cover decreased slightly to 6%.

Forb:

- **1996 to 2001 - down (-2):** The sum of nested frequency of perennial forbs decreased by 54%, though cover remained similar at 6%.
- **2001 to 2006 - up (+2):** There was a 50% increase in the sum of nested frequency of perennial forbs, and cover increased to 9%.
- **2006 to 2011 - slightly down (-1):** The sum of nested frequency of perennial forbs decreased by 12%, and cover decreased to 5%.

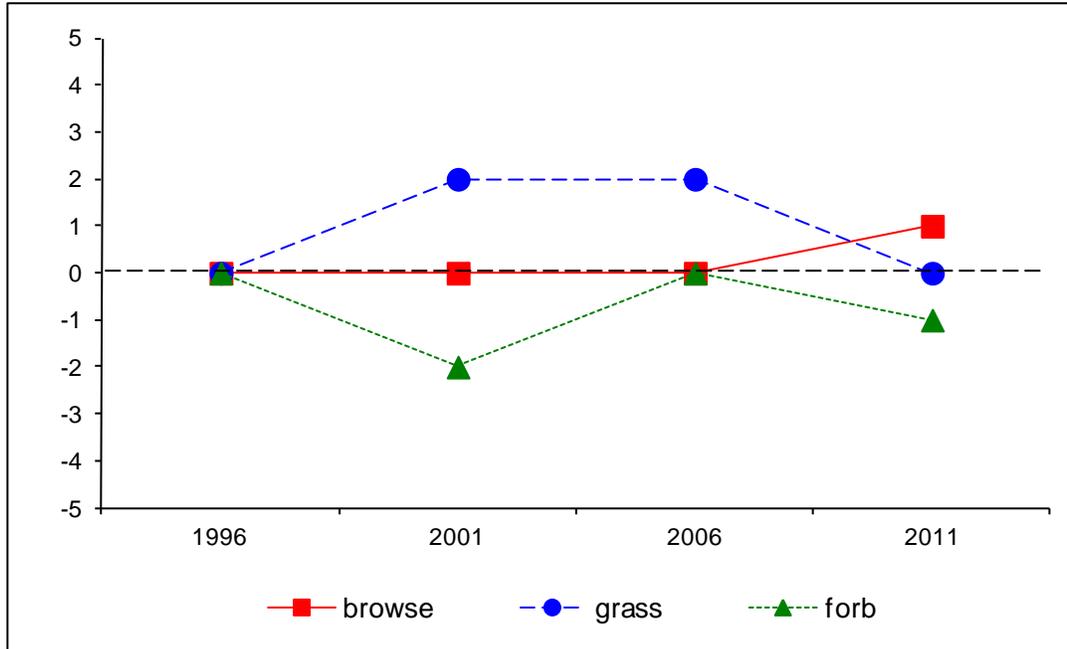
DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --

Management unit 1, study no: 16

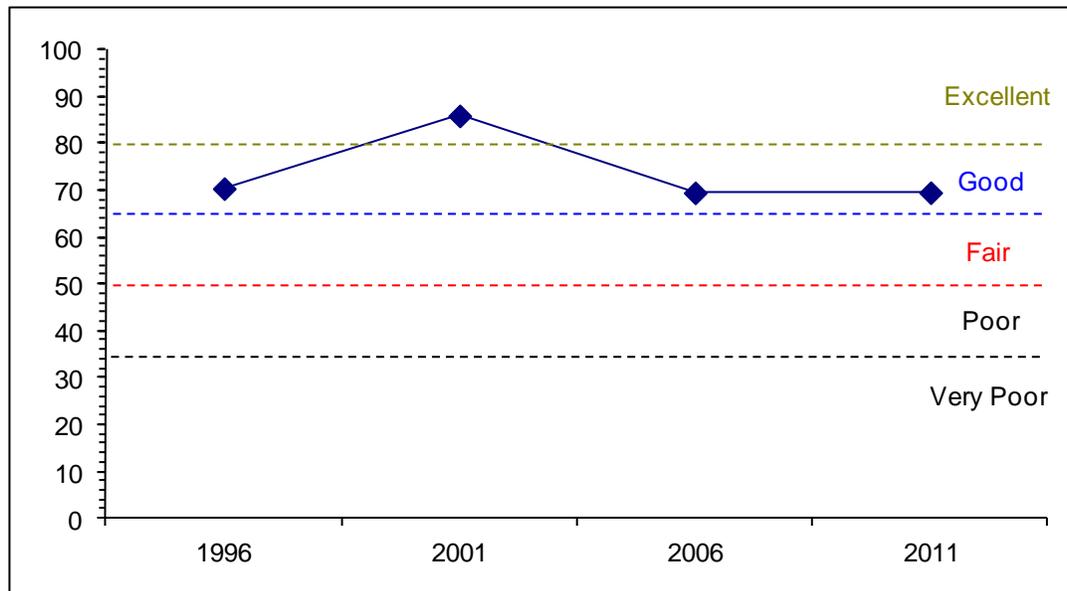
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
96	29.4	13.7	6.2	11.2	-0.1	10.0	0.0	70.4	Good
01	30.0	12.3	4.7	29.0	-0.1	10.0	0.0	85.9	Excellent
06	30.0	11.0	4.9	13.6	0.0	10.0	0.0	69.5	Good
11	30.0	12.8	4.6	12.8	0.0	9.4	0.0	69.5	Good

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
 Management unit 1 Study no: 16



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL--
 Management unit 1, Study no: 16



HERBACEOUS TRENDS--

Management unit 01, Study no: 16

T y p e	Species	Nested Frequency				Average Cover %			
		'96	'01	'06	'11	'96	'01	'06	'11
G	Agropyron dasystachyum	ab140	b186	ab181	a116	.88	3.29	1.18	.99
G	Agropyron spicatum	141	123	104	117	2.15	5.65	2.59	3.23
G	Bromus tectorum (a)	b47	a11	a2	a-	.16	.19	.00	-
G	Carex sp.	-	-	2	3	-	-	.03	.15
G	Elymus cinereus	10	-	3	1	.04	.15	.03	.03
G	Koeleria cristata	c27	b10	bc18	a-	.37	.39	.22	-
G	Oryzopsis hymenoides	1	6	12	4	.03	.18	.33	.15
G	Poa fendleriana	b97	a27	a8	a6	1.71	.76	.33	.03
G	Poa pratensis	a-	bc43	b53	b26	-	.81	.44	.17
G	Poa secunda	a21	b123	b97	b79	.40	3.27	1.62	1.62
Total for Annual Grasses		47	11	2	0	0.15	0.18	0.00	0
Total for Perennial Grasses		437	518	478	352	5.61	14.51	6.81	6.39
Total for Grasses		484	529	480	352	5.76	14.70	6.82	6.39
F	Achillea millefolium	-	6	-	3	-	.06	-	.03
F	Agoseris glauca	b68	a5	b46	b62	.15	.02	.34	.44
F	Antennaria rosea	-	-	4	-	-	-	.01	-
F	Arabis sp.	5	-	8	-	.01	-	.02	-
F	Aster sp.	a17	b38	a12	ab22	.10	.44	.02	.07
F	Astragalus beckwithii	4	3	4	-	.00	.06	.00	-
F	Astragalus newberryi	6	-	-	-	.01	-	-	-
F	Astragalus utahensis	3	-	2	2	.03	-	.00	.00
F	Calochortus nuttallii	3	-	4	4	.00	-	.00	.01
F	Castilleja linariaefolia	4	-	-	-	.03	-	-	-
F	Chaenactis douglasii	b22	a8	a1	a1	.06	.01	.00	.00
F	Cirsium sp.	8	10	13	4	.06	.22	.19	.01
F	Collinsia parviflora (a)	c131	b59	a17	c120	.43	.38	.03	.27
F	Collomia linearis (a)	b16	b22	a-	a2	.03	.03	-	.00
F	Comandra pallida	b105	a57	a58	a49	.49	.61	1.00	.19
F	Crepis acuminata	31	17	24	23	.12	.53	.56	.12
F	Cryptantha sp.	c22	b5	ab9	a-	.22	.01	.02	-
F	Delphinium nuttallianum	a9	a2	a-	b44	.04	.00	-	.18
F	Descurainia pinnata (a)	b16	a-	a-	a2	.05	-	-	.01
F	Epilobium brachycarpum (a)	-	-	2	3	-	-	.00	.00
F	Erigeron pumilus	1	-	-	-	.00	-	-	-
F	Eriogonum cernuum (a)	10	-	-	-	.02	-	-	-
F	Eriogonum umbellatum	46	27	37	43	1.25	.87	1.27	.77
F	Erysimum asperum	3	-	9	-	.01	-	.04	-
F	Hackelia patens	c69	a15	bc58	ab40	.91	.17	2.07	.54
F	Haplopappus acaulis	b16	ab12	ab17	a5	.37	.18	.14	.03
F	Ipomopsis congesta	b21	a-	b20	a-	.09	-	.18	-
F	Lesquerella sp.	5	-	-	3	.01	-	-	.00
F	Linum lewisii	-	-	3	-	-	-	.04	-
F	Lithospermum ruderae	25	20	21	12	.41	.69	1.04	.20

T y P e	Species	Nested Frequency				Average Cover %			
		'96	'01	'06	'11	'96	'01	'06	'11
F	Lomatium sp.	21	16	13	20	.41	.40	.46	.89
F	Microsteris gracilis (a)	a ⁻	b ²⁶	a ⁻	a ²	-	.05	-	.00
F	Penstemon sp.	-	-	4	-	-	-	.03	-
F	Phlox austromontana	b ⁴⁴	ab ³³	b ³³	a ¹⁵	.30	.61	.36	.16
F	Phlox longifolia	b ⁸⁶	a ³¹	a ¹⁸	a ¹⁵	.18	.07	.04	.03
F	Polygonum douglasii (a)	7	2	2	-	.01	.00	.00	-
F	Ranunculus testiculatus (a)	-	1	-	4	-	.00	-	.01
F	Senecio integerrimus	ab ²⁰	a ⁸	a ⁹	b ²⁷	.40	.36	.07	.50
F	Senecio multilobatus	b ⁵⁹	a ¹⁹	b ⁵³	a ¹¹	.29	.22	.71	.08
F	Stellaria sp.	-	-	3	-	-	-	.01	-
F	Taraxacum officinale	5	4	3	9	.00	.03	.03	.07
F	Unknown forb-annual (a)	b ⁸	a ⁻	a ⁻	a ⁻	.02	-	-	-
F	Viola sp.	ab ²¹	a ⁶	bc ²⁹	c ³⁷	.07	.02	.19	.29
F	Zigadenus paniculatus	-	2	-	-	-	.03	-	-
Total for Annual Forbs		188	110	21	133	0.56	0.47	0.04	0.30
Total for Perennial Forbs		749	344	515	451	6.09	5.67	8.94	4.68
Total for Forbs		937	454	536	584	6.65	6.14	8.98	4.99

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

BROWSE TRENDS--

Management unit 01, Study no: 16

T y P e	Species	Strip Frequency				Average Cover %			
		'96	'01	'06	'11	'96	'01	'06	'11
B	Amelanchier utahensis	32	28	24	23	3.92	7.59	5.63	6.23
B	Artemisia nova	12	6	5	3	.01	.03	.15	1.07
B	Artemisia tridentata vaseyana	41	45	45	50	4.09	6.84	7.25	4.99
B	Chrysothamnus nauseosus consimilis	5	3	4	3	.00	.38	.41	.21
B	Chrysothamnus viscidiflorus lanceolatus	45	36	39	19	1.56	1.24	1.77	.16
B	Eriogonum microthecum	23	15	15	11	.32	.24	.49	.06
B	Gutierrezia sarothrae	11	4	3	0	.12	.15	-	-
B	Juniperus osteosperma	4	2	5	5	.71	.71	1.41	2.59
B	Mahonia repens	5	4	5	1	.04	.04	.18	.00
B	Opuntia sp.	3	1	3	4	.03	-	-	.03
B	Prunus virginiana	2	0	2	1	-	-	-	-
B	Purshia tridentata	48	46	44	54	11.98	16.20	12.44	11.69
B	Ribes cereum cereum	0	0	1	1	-	-	-	-
B	Rosa woodsii	2	3	2	3	-	.30	.33	.03
B	Symphoricarpos oreophilus	72	69	70	71	13.26	16.46	12.03	9.60
B	Tetradymia canescens	34	33	26	17	.67	.60	.53	.03
Total for Browse		339	295	293	266	36.76	50.82	42.65	36.72

CANOPY COVER, LINE INTERCEPT--

Management unit 01, Study no: 16

Species	Percent Cover		
	'01	'06	'11
Amelanchier utahensis	-	6.23	7.40
Artemisia nova	-	.03	.05
Artemisia tridentata vaseyana	-	9.19	7.21
Chrysothamnus nauseosus consimilis	-	.76	1.03
Chrysothamnus viscidiflorus lanceolatus	-	2.46	-
Juniperus osteosperma	3.40	4.11	4.53
Pinus edulis	-	-	.71
Pinus monophylla	.40	.53	-
Purshia tridentata	-	18.08	17.48
Rosa woodsii	-	.05	.10
Symphoricarpos oreophilus	-	18.51	16.83
Tetradymia canescens	-	.63	.56

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 01, Study no: 16

Species	Average leader growth (in)		
	'01	'06	'11
Amelanchier utahensis	1.0	1.6	0.5
Artemisia tridentata vaseyana	1.5	1.4	0.8
Purshia tridentata	1.0	2.9	0.2

POINT-QUARTER TREE DATA--

Management unit 01, Study no: 16

Species	Trees per Acre				Average diameter (in)			
	'96	'01	'06	'11	'96	'01	'06	'11
Juniperus osteosperma	46	49	84	86	3.6	6.3	10.1	6.2
Pinus monophylla	20	78	21	25	7.9	8.5	11.7	10.6

BASIC COVER--

Management unit 01, Study no: 16

Cover Type	Average Cover %			
	'96	'01	'06	'11
Vegetation	43.29	62.09	53.11	46.44
Rock	2.98	1.24	1.80	3.09
Pavement	3.84	6.13	13.86	5.53
Litter	45.58	47.65	41.45	50.30
Cryptogams	.13	.03	.09	.13
Bare Ground	12.81	13.35	12.71	12.73

SOIL ANALYSIS DATA --

Management unit 01, Study no: 16, Study Name: Nut Pine Hills

Effective rooting depth (in)	pH	Clay-Loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
19.1	8.1	50.9	25.1	24.0	2.1	8.5	544.0	1.1

PELLET GROUP DATA--

Management unit 01, Study no: 16

Type	Quadrat Frequency			
	'96	'01	'06	'11
Rabbit	2	3	20	5
Elk	-	-	-	-
Deer	22	9	18	18
Cattle	6	2	4	3

Days use per acre (ha)		
'01	'06	'11
-	-	-
-	-	8 (20)
38 (94)	78 (193)	41 (101)
4 (9)	8 (20)	3 (7)

BROWSE CHARACTERISTICS--

Management unit 01, Study no: 16

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
Amelanchier utahensis									
96	860	26	65	9	-	40	14	0	36/42
01	660	18	64	18	20	12	24	6	38/42
06	680	26	47	26	40	9	6	3	44/46
11	620	16	81	3	-	32	6	0	47/51
Artemisia nova									
96	320	19	38	44	-	38	38	13	7/13
01	220	18	73	9	-	0	0	0	7/12
06	160	0	75	25	-	0	0	0	5/11
11	120	17	83	0	-	0	0	0	7/17
Artemisia tridentata vaseyana									
96	1140	12	84	4	20	19	4	0	19/29
01	1480	5	88	7	20	8	0	1	24/29
06	1640	5	84	11	20	16	0	6	23/34
11	1600	9	69	23	-	5	0	10	19/28
Cercocarpus ledifolius									
96	0	0	0	-	-	0	0	0	-/-
01	0	0	0	-	-	0	0	0	-/-
06	0	0	0	-	-	0	0	0	-/-
11	0	0	0	-	-	0	0	0	46/45
Chrysothamnus nauseosus consimilis									
96	120	17	33	50	-	0	0	33	26/33
01	60	0	0	100	-	0	0	67	29/49
06	120	17	50	33	-	0	0	33	31/37
11	60	0	67	33	-	0	0	33	25/32
Chrysothamnus viscidiflorus lanceolatus									
96	1480	18	78	4	80	3	0	1	16/20
01	1160	2	95	3	-	0	0	3	14/18
06	1200	3	93	3	-	0	0	2	14/22
11	460	17	57	26	-	0	4	17	13/16

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Eriogonum microthecum</i>									
96	660	15	85	0	20	0	0	0	5/8
01	440	14	77	9	-	0	0	0	5/9
06	340	0	76	24	-	6	0	6	6/11
11	400	10	90	0	-	0	0	0	4/8
<i>Gutierrezia sarothrae</i>									
96	1180	34	64	2	180	0	0	0	4/4
01	380	42	58	0	-	0	0	0	3/5
06	80	0	75	25	-	0	0	25	6/10
11	0	0	0	0	-	0	0	0	-/-
<i>Juniperus osteosperma</i>									
96	140	57	43	-	-	0	0	0	-/-
01	40	50	50	-	20	0	0	0	-/-
06	100	40	60	-	20	0	0	0	-/-
11	100	40	60	-	20	0	0	0	-/-
<i>Mahonia repens</i>									
96	440	100	0	-	-	0	0	0	3/3
01	180	44	56	-	-	0	0	0	2/2
06	260	0	100	-	-	0	0	0	2/4
11	20	0	100	-	-	0	0	0	-/-
<i>Opuntia sp.</i>									
96	100	0	80	20	-	0	0	0	5/16
01	20	0	100	0	-	0	0	0	4/10
06	60	0	100	0	-	0	0	0	4/15
11	80	0	100	0	-	0	0	0	4/11
<i>Prunus virginiana</i>									
96	40	100	0	0	-	0	0	0	-/-
01	0	0	0	0	-	0	0	0	-/-
06	60	0	33	67	-	0	0	0	-/-
11	20	0	100	0	-	0	0	0	39/20
<i>Purshia tridentata</i>									
96	1480	8	89	3	100	39	55	1	23/49
01	1440	7	88	6	40	21	35	4	25/48
06	1320	6	85	9	80	44	20	6	29/58
11	1960	5	91	4	60	33	27	4	26/45
<i>Ribes cereum cereum</i>									
96	0	0	0	-	-	0	0	0	4/62
01	0	0	0	-	-	0	0	0	-/-
06	20	0	100	-	-	0	0	0	55/61
11	20	0	100	-	-	0	0	0	43/69

		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>Rosa woodsii</i>										
96	60	33	67	-	20	0	100	0	10/4	
01	80	25	75	-	-	0	0	0	17/18	
06	80	0	100	-	-	0	0	0	29/10	
11	60	0	100	-	-	0	33	0	22/7	
<i>Symphoricarpos oreophilus</i>										
96	4840	23	77	0	80	7	0	0	18/29	
01	3980	16	82	2	-	0	0	0	19/32	
06	5700	24	73	3	-	0	3	2	19/29	
11	4540	11	89	0	-	0	0	.44	13/21	
<i>Tetradymia canescens</i>										
96	1040	27	67	6	20	0	0	0	8/11	
01	1020	8	90	2	-	0	0	0	9/10	
06	720	14	47	39	-	0	0	11	11/16	
11	460	17	70	13	-	35	9	13	9/14	