Trend Study 27-1-08

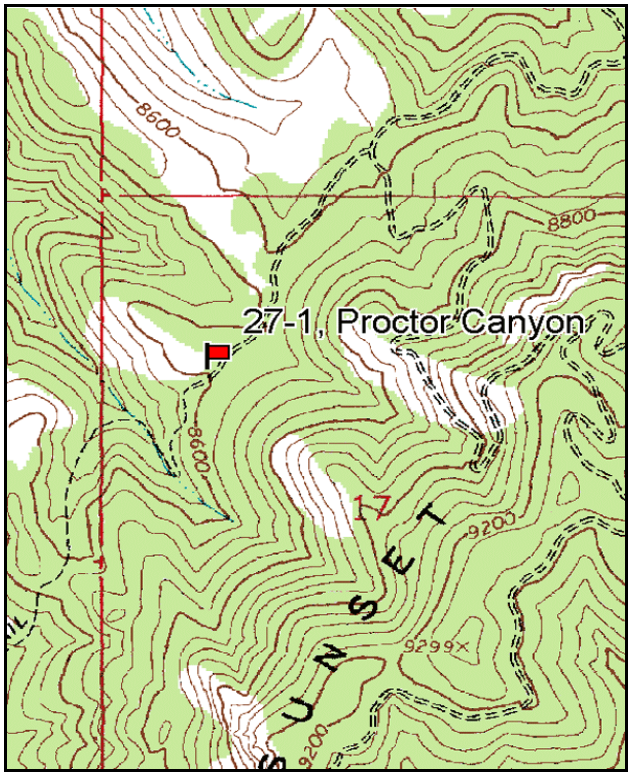
Study site name: Proctor Canyon . Vegetation type: Mountain Brush .

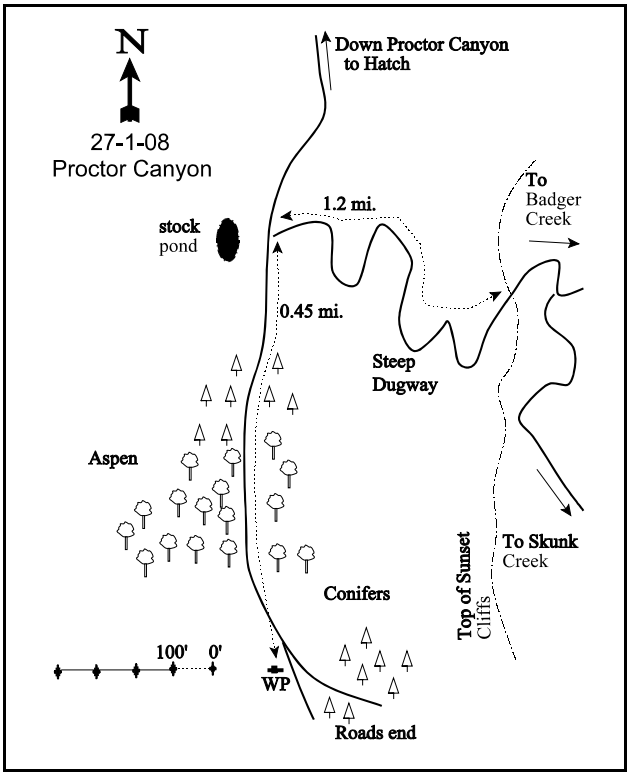
Compass bearing: frequency baseline 297 degrees magnetic.

Frequency belt placement: line 1 (11 & 71ft), line 2 (95ft), line 3 (59ft), line 4 (34ft; only 50 ft long). No rebar.

LOCATION DESCRIPTION

At the south end of Tropic Reservoir, turn west off the East Fork Sevier Road and proceed up Badger Creek 2.45 miles. Keep left at the fork and continue towards Proctor Canyon 3.5 miles to a fork at the top of the mountain. Go right towards Hatch for 1.2 miles, down a narrow, rocky dugway, to a fork in the aspens. Turn hard left towards Big Hollow/Camp Eli, and go 0.45 miles to a clearing and the witness post. The frequency baseline starts near the top of the hill and runs west-northwest. The trend study is marked by 2 foot tall green fence posts. The 0-foot baseline stake is 50 west of the witness post and is marked with a red browse tag #7161.





Map Name: Tropic Reservoir Diagrammatic Sketch

Township 37S , Range 4 1/2W , Section 17 GPS: NAD 83, UTM 12S 380077 E, 4161288 N

DISCUSSION

Proctor Canyon - Trend Study No. 27-1

Study Information

This study is located on big game summer range on the west side of the Paunsaugunt Plateau below the Sunset Cliffs [elevation: 8,600 feet (2,621 m), slope: 1%-7%, aspect: northwest]. The small open ridge top where the study is located is a mixed mountain brush community surrounded by dense conifer forest and aspen (*Populus tremuloides*) stands. It is representative of larger, but more inaccessible, open, sagebrush ridges to the northwest. One-half mile to the north, in the same cattle allotment, is a seeded area and stock pond. Deer sign, consisting of pellet groups and antler drops, was noted in 1992, along with a few elk pellet groups. Quadrat frequency of deer pellet groups increased by nearly two-fold in 1997, while elk pellet group frequency remained at similar but low levels. Recent livestock use was also noted in 1997. Pellet group transect data estimated deer use to be heavy in 2003 (49 ddu/acre:121 ddu/ha) and very heavy in 2008 (78 ddu/acre:193 ddu/ha). Elk use was estimated to be minimal in both 2003 and 2008 (2 edu/acre:5 edu/ha). Cattle use was estimated to be light in 2003 (8 cdu/acre:20 cdu/ha) and no cattle patties were encountered in 2008.

Soil

The soil on the ridge is fairly deep with an effective rooting depth estimated at 14 inches. It is a light colored loamy sand with a neutral pH (7.1). Phosphorus is low at 8 ppm, when values between 6-11 ppm may have marginal availability for plant growth and development (Tiedemann and Lopez 2004). Organic matter is also relatively low at 1.5%. Relative combined vegetation and litter cover was high at 81%-86% from 1992 to 2008. Relative bare ground cover has been moderate at 12%-18% from 1992 to 2008. The road and steeper side hills show evidence of gullying and other surface erosion features. The erosion condition rating was classified as stable in 2003 and 2008.

Browse

The browse composition is diverse with 14 shrub species being sampled on the site. The most abundant key browse species are bitterbrush (*Purshia tridentata*) and black sagebrush (*Artemisia nova*) which account for over half of the total browse cover. Serviceberry (*Amelanchier utahensis*) and squaw currant (*Ribes cereum* ssp. *inebrians*) are also prominent due to their larger size. At the edge of the aspen and conifer stands, young ponderosa pine (*Pinus ponderosa*) and Rocky Mountain juniper (*Juniperus scopulorum*) are abundant. Of the 14 browse species encountered on the transect, serviceberry and bitterbrush provide the bulk of the forage utilized by big game, with black sagebrush also providing some. Both bitterbrush and serviceberry have been moderately to heavily hedged in all readings, and black sagebrush showed moderate to heavy use in 1987 and moderate use in 2008. In 1987 and 1992, the serviceberry population consisted of a high proportion of plants having poor vigor at 43% and 94%, respectively. The shrubs were apparently suffering from Cedar-apple rust. During the 1997, 2003, and 2008 surveys, serviceberry vigor was normal on most plants. Bitterbrush and black sagebrush have maintained normal vigor in all readings. Serviceberry and black sagebrush have had moderate to high recruitment by young plants in all surveys. Bitterbrush recruitment was moderately high in 1987 and 1992, fair in 1997, low in 2003, and there was no new recruitment in 2008. All three of these key species have had low decadence rates in all surveys, except for black sagebrush in 1987 when decadence was estimated at 36%. Serviceberry and bitterbrush leaders averaged around 3.5 and 2.5 inches of annual growth, respectively, for both the 2003 and 2008 readings.

It appears that during the 1987 reading there was trouble identifying the different rabbitbrush species. In 1992, the majority of the rabbitbrush was classified as stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) and dwarf rabbitbrush (*Chrysothamnus depressus),* with lesser amounts of Parry rabbitbrush (*Chrysothamnus parryi* ssp. *attenuatus*). These three species combined for an estimated density of 8,520 plants/acre in 1992, 59% of which was stickyleaf low rabbitbrush. In 1997, all of the rabbitbrush species showed population declines. In 2003, dwarf rabbitbrush had a 64% density increase with Parry and low

rabbitbrushes slightly increased in density. In 2008, the density of dwarf and Parry rabbitbrushes decreased slightly, and low rabbitbrush density stayed relatively constant.

Herbaceous Understory

Complementing the diverse shrub overstory is a wide variety of herbaceous species. Eleven perennial grass species have been sampled on the transect with the most common being Kentucky bluegrass (*Poa pratensis*), mutton bluegrass (*Poa fendleriana*), prairie junegrass (*Koeleria cristata*), Letterman needlegrass (*Stipa lettermani*), needle-and-thread grass (*Stipa comata*), and slender wheatgrass (*Agropyron trachycaulum*). Total grass production was poor in 1997, 2003, and 2008 with average cover values between 8%-10%. Total grass cover was much higher in 1992 at nearly 19%. Forty-six species of forbs have been sampled at least once on the transect. Redroot eriogonum (*Eriogonum racemosum*), dusty penstemon (*Penstemon comarrhenus*), Pacific aster (*Aster chilensis*), and silverweed cinquefoil (*Potentilla concinna*) seem to be the preferred forb species. Although highly diverse, most of the forb species are infrequent. Grasses accounted for 30% of the total vegetation cover on the site in 1992, but only about 15% in 1997, 2003, and 2008. Average forb cover has declined as well.

1992 TREND ASSESSMENT

Trend for browse is stable. Density differences may be related to the larger sample area used in 1992, therefore, trend for browse was determined using other parameters. Vigor is good on all species except serviceberry which is suffering from Cedar-apple rust. Decadence of black sagebrush has declined from 36% in 1987 to 11%. Age class analysis indicates that the key species serviceberry, black sagebrush, and bitterbrush have healthy populations. The abundance of the less desirable dwarf, Parry, and stickyleaf low rabbitbrush is a concern on this site. Continued increases in these shrubs could come at the expense of the more desirable shrub species. Trend for the grasses is slightly up with a slight increase in the sum of nested frequency of perennial grasses. Trend for forbs is slightly down with a slight decrease in the sum of nested frequency of perennial forbs.

browse - stable (0) grass - slightly up (+1) forb - slightly down (-1)

1997 TREND ASSESSMENT

Trend for the key browse species, serviceberry, black sagebrush and bitterbrush is slightly down. Density of serviceberry has declined by 52% since 1992 to 480 plants/acre. The number of mature serviceberry plants increased slightly while the proportion of young plants declined from 62% in 1992 to 17%. Black sagebrush declined 16% in population density since 1992 with a similar decline in young plants and an increase in decadence. Bitterbrush density has declined 51% since 1992 and young plants dropped from 740 plants/acre to 140 plants/acre. Decadence in bitterbrush is still low, however, and the current number of seedlings and young appear to be adequate to maintain the population. On the beneficial side, the combined density of the less desirable dwarf, Parry and stickyleaf low rabbitbrush declined from 8,520 plants/acre in 1992 to 4,720 plants/acre. Rabbitbrush populations are mostly mature with few seedlings or young. Trend for the grasses is down. Sum of nested frequency of perennial grasses declined and production of perennial grasses decreased from nearly 19% of total cover in 1992 to just over 8%. Composition of the grasses is also changing on the site. Needle-and-thread grass along with Kentucky bluegrass have increased significantly in nested frequency since 1992. Currently, these two species account for 65% of the total grass cover. Slender wheatgrass, Prairie Junegrass, and Letterman needlegrass have all declined significantly. The trend for forbs is down, as well. Sum of nested frequency of perennial forbs decreased and production of perennial forbs decreased from 11% of total cover in 1992 to just over 5%. Some of the common forb species on the site, Arizona thistle (*Cirsium arizonicum*), Pacific aster, redroot eriogonum, longleaf phlox (*Phlox longifolia*), and silverweed cinquefoil, are all weedy increasers.

browse - slightly down (-1) grass - down (-2) forb - down (-2)

2003 TREND ASSESSMENT

Trend for browse is stable. The key species have low decadence, generally good vigor, and consistent (serviceberry) or increasing (black sagebrush and bitterbrush) population densities. Recruitment of young plants was consistent from 1997 for serviceberry and increased in the black sagebrush population. Bitterbrush had lower recruitment of young plants compared to 1997. Dwarf rabbitbrush increased by nearly three-fold in total density, but the other two rabbitbrush species remained stable. Trend for the grasses is slightly down. Sum of nested frequency values of perennial grasses had a large decline, but cover of perennial grasses increased slightly. The trend for forbs is down. Sum of nested frequency for perennial forbs declined 45% since 1997.

browse - stable (0) grass - slightly down (-1) forb - down (-2)

2008 TREND ASSESSMENT

Trend for browse is stable. The density of the primary browse species, serviceberry, black sagebrush, and bitterbrush, were relatively consistent. Recruitment of young plants was good for serviceberry and black sagebrush, but there were no young bitterbrush plants sampled. Vigor and decadence remain good in all three species populations. The trend for grasses is stable. The sum of nested frequency of perennial grasses and production of perennial grasses remained relatively constant. Composition of grasses shifted slightly with a significant decrease in frequency of needle-and-thread grass and a significant increase in Kentucky bluegrass and bluebunch wheatgrass (*Agropyron spicatum*) frequency. The trend for forbs is up. Sum of nested frequency of perennial forbs greatly increased and production increased to nearly 6% of total cover.

browse - stable (0) grass - stable (0) forb - up (+2)

HERBACEOUS TRENDS --
Management unit 27 , Study no: 1

Type	Species	Nested Frequency					Average Cover %			
		'87	'92	'97	'03	'08	'92	'97	'03	'08
G	Agropyron spicatum	$_{ab}$6	$_{b}$25	$_{b}$27	$_{a}$-	$_{b}$22	.16	.07	-	.34
G	Agropyron trachycaulum	$_{c}$185	$_{b}$112	$_{a}$40	$_{a}$49	$_{a}$64	1.71	.13	.62	.81
G	Bouteloua gracilis	$_{b}$34	$_{a}$15	$_{ab}$13	$_{a}$3	$_{a}$4	.36	.15	.03	.03
G	Bromus anomalus	$_{a}$8	$_{b}$39	$_{a}$1	$_{a}$-	$_{a}$3	.75	.00	.00	.03
G	Carex sp.	$_{b}$64	$_{a}$24	$_{a}$11	$_{a}$6	$_{a}$10	.87	.10	.09	.19
G	Koeleria cristata	$_{a}$54	$_{c}$144	$_{ab}$78	$_{ab}$72	$_{bc}$109	2.99	.61	1.11	1.67
G	Poa fendleriana	$_{a}$88	$_{b}$78	$_{ab}$45	$_{b}$72	$_{b}$72	2.52	.54	1.14	1.52
G	Poa pratensis	$_{a}$-	$_{b}$39	$_{c}$101	$_{b}$39	$_{c}$83	2.99	2.25	1.68	1.83
G	Stipa columbiana	$_{a}$-	$_{a}$1	$_{b}$14	$_{ab}$8	$_{a}$1	.03	.08	.04	.00
G	Stipa comata	$_{a}$17	$_{b}$96	$_{b}$124	$_{b}$97	$_{a}$42	3.22	3.13	3.26	1.04
G	Stipa lettermani	$_{b}$133	$_{ab}$115	$_{a}$83	$_{a}$91	$_{a}$75	2.85	1.20	1.12	2.04
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		589	688	537	437	485	18.50	8.28	9.11	9.55
Total for Grasses		589	688	537	437	485	18.50	8.28	9.11	9.55
F	Achillea millefolium	$_{b}$74	$_{ab}$40	$_{b}$55	$_{a}$20	$_{ab}$41	.82	.58	.07	.46

Type	Species	Nested Frequency					Average Cover %			
		'87	'92	'97	'03	'08	'92	'97	'03	'08
F	Agoseris glauca	$_{a}$-	$_{a}$-	$_{a}$-	$_{ab}$5	$_{b}$11	-	-	.04	.08
F	Alyssum alyssoides (a)	-	-	-	6	3	-	-	.01	.00
F	Antennaria rosea	-	3	3	-	5	.15	.15	-	.03
F	Androsace septentrionalis (a)	-	8	2	5	7	.02	.00	.03	.01
F	Arabis sp.	-	1	2	-	1	.00	.00	-	.00
F	Artemisia dracunculus	$_{b}$40	$_{b}$33	$_{ab}$23	$_{a}$4	$_{a}$-	1.12	.66	.09	-
F	Artemisia ludoviciana	$_{b}$15	$_{ab}$7	$_{ab}$6	$_{a}$-	$_{a}$-	.06	.06	-	-
F	Aster chilensis	$_{c}$95	$_{bc}$64	$_{b}$43	$_{a}$13	$_{a}$6	.67	.21	.04	.03
F	Astragalus humistratus	$_{ab}$16	$_{b}$29	$_{b}$28	$_{a}$1	$_{ab}$15	.42	.22	.00	.33
F	Astragalus tenellus	$_{b}$27	$_{a}$5	$_{a}$8	$_{a}$3	$_{a}$-	.06	.01	.04	-
F	Aster sp.	-	-	-	3	-	-	-	.03	-
F	Castilleja linariaefolia	-	2	11	3	7	.00	.05	.01	.04
F	Calochortus nuttallii	$_{a}$-	$_{ab}$7	$_{a}$4	$_{ab}$8	$_{b}$20	.01	.01	.04	.04
F	Chaenactis douglasii	7	1	-	-	-	.00	-	-	-
F	Chenopodium fremontii (a)	-	-	1	-	-	-	.00	-	-
F	Chenopodium leptophyllum(a)	-	-	3	1	-	-	.00	.00	-
F	Cirsium arizonicum	$_{b}$37	$_{b}$40	$_{ab}$35	$_{a}$11	$_{a}$15	1.17	.43	.08	.42
F	Collinsia parviflora (a)	-	-	$_{a}$-	$_{b}$11	$_{a}$-	-	-	.02	-
F	Crepis acuminata	-	-	2	3	1	-	.00	.06	.00
F	Cruciferae	5	-	-	-	-	-	-	-	-
F	Erigeron eatonii	$_{a}$-	$_{a}$-	$_{b}$11	$_{ab}$1	$_{b}$6	-	.12	.00	.03
F	Erigeron flagellaris	$_{c}$148	$_{b}$63	$_{a}$6	$_{a}$10	$_{a}$5	.52	.01	.05	.18
F	Erigeron pumilus	1	5	10	12	10	.15	.03	.13	.10
F	Eriogonum racemosum	36	44	48	34	48	1.02	.34	.37	.64
F	Eriogonum umbellatum	23	44	28	28	27	1.06	1.16	.57	.62
F	Fritillaria atropurpurea	-	-	4	-	-	-	.01	-	-
F	Gayophytum ramosissimum(a)	-	-	3	11	8	-	.00	.05	.04
F	Hymenoxys richardsonii	13	21	-	10	13	.23	-	.22	.42
F	Ipomopsis aggregata	$_{ab}$6	$_{b}$15	$_{a}$6	$_{a}$-	$_{a}$-	.08	.01	-	-
F	Linum lewisii	$_{a}$4	$_{b}$20	$_{b}$18	$_{a}$-	$_{ab}$7	.26	.05	-	.10
F	Lotus utahensis	4	-	-	-	-	-	-	-	-
F	Lychnis drummondii	-	10	1	6	-	.02	.00	.01	-
F	Machaeranthera canescens	12	16	13	22	17	.06	.12	.28	.77
F	Microsteris gracilis (a)	-	-	-	8	-	-	-	.04	-
F	Oenothera caespitosa	-	2	-	-	-	.03	-	-	-
F	Oenothera pallida	-	3	-	11	12	.00	-	.19	.10

Type	Species	Nested Frequency					Average Cover %			
		'87	'92	'97	'03	'08	'92	'97	'03	'08
F	Orthocarpus luteus (a)	6	$_{b}$56	$_{a}$13	$_{b}$45	$_{b}$49	1.53	.16	.41	.82
F	Penstemon comarrhenus	$_{b}$50	$_{ab}$41	$_{a}$37	$_{ab}$24	$_{ab}$36	.15	.21	.13	.26
F	Penstemon humilis	-	-	-	3	7	-	-	.00	.21
F	Phlox longifolia	$_{ab}$37	$_{c}$65	$_{bc}$56	$_{a}$17	$_{c}$69	.45	.27	.04	.24
F	Potentilla concinna	$_{b}$65	$_{a}$23	$_{a}$30	$_{a}$24	$_{a}$30	.87	.65	.46	.58
F	Polygonum douglasii (a)	-	$_{b}$78	$_{b}$58	$_{a}$2	$_{a}$13	.28	.12	.01	.03
F	Senecio douglasii	6	-	-	-	2	-	-	-	.03
F	Taraxacum officinale	$_{b}$42	$_{a}$1	$_{a}$4	$_{a}$-	$_{a}$7	.00	.01	-	.02
F	Tragopogon dubius	$_{b}$31	$_{ab}$15	$_{a}$9	$_{a}$-	$_{a}$6	.08	.02	-	.03
Total for Annual Forbs		6	142	80	89	80	1.84	0.30	0.60	0.91
Total for Perennial Forbs		794	620	501	276	424	9.54	5.46	3.00	5.86
Total for Forbs		800	762	581	365	504	11.38	5.77	3.60	6.78

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

BROWSE TRENDS --
Management unit 27 , Study no: 1

Type	Species	Strip Frequency				Average Cover %			
		'92	'97	'03	'08	'92	'97	'03	'08
B	Amelanchier utahensis	22	21	16	21	3.45	2.30	4.71	4.21
B	Artemisia nova	33	28	44	44	4.94	5.62	7.39	8.25
B	Chrysothamnus depressus	22	14	26	26	1.22	1.36	1.04	2.03
B	Chrysothamnus parryi attenuatus	11	8	6	3	.24	.01	.04	.00
B	Chrysothamnus viscidiflorus viscidiflorus	73	60	67	65	4.99	4.16	5.74	6.05
B	Gutierrezia sarothrae	10	3	2	4	.33	.03	.03	.21
B	Juniperus scopulorum	0	0	0	1	4.28	3.40	2.78	2.91
B	Mahonia repens	1	1	0	0	.00	.00	-	-
B	Opuntia sp.	3	0	0	1	.00	-	-	.00
B	Pinus ponderosa	1	1	0	0	.00	.00	-	-
B	Purshia tridentata	60	52	53	51	22.88	22.12	19.85	14.46
B	Ribes cereum inebrians	6	3	4	1	1.74	1.78	1.86	.53
B	Rosa woodsii	14	10	11	14	.85	.78	.45	1.94
B	Symphoricarpos oreophilus	21	18	27	22	2.37	3.02	3.40	2.99
B	Tetradymia canescens	26	17	25	22	1.06	.21	.69	.73
Total for Browse		303	236	281	275	48.40	44.83	48.04	44.32

CANOPY COVER, LINE INTERCEPT --
Management unit 27 , Study no: 1

Species	Percent Cover	
	'03	'08
Amelanchier utahensis	3.84	2.95
Artemisia nova	6.15	8.91
Chrysothamnus depressus	1.61	2.61
Chrysothamnus parryi attenuatus	.23	.20
Chrysothamnus viscidiflorus viscidiflorus	5.26	11.41
Juniperus scopulorum	7.59	8.03
Pinus ponderosa	-	.55
Purshia tridentata	25.61	28.88
Ribes cereum inebrians	1.39	1.60
Rosa woodsii	.66	2.54
Symphoricarpos oreophilus	4.25	5.88
Tetradymia canescens	1.16	2.01

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 27 , Study no: 1

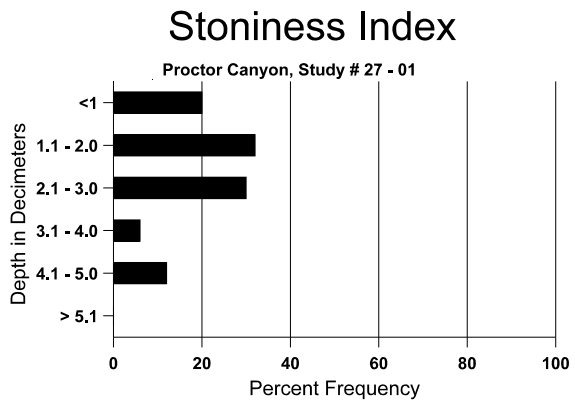
Species	Average leader growth (in)	
	'03	'08
Amelanchier utahensis	3.6	3.5
Purshia tridentata	2.5	2.4

BASIC COVER --
Management unit 27 , Study no: 1

Cover Type	Average Cover %				
	'87	'92	'97	'03	'08
Vegetation	11.00	63.12	53.09	57.47	63.29
Rock	2.25	2.82	.37	.77	.79
Pavement	5.25	0	1.62	.67	1.89
Litter	64.50	40.95	50.03	48.00	41.97
Cryptogams	0	.16	.83	.42	.07
Bare Ground	17.00	20.06	21.83	23.27	14.78

SOIL ANALYSIS DATA --
Management unit 27, Study no: 1, Study Name: Proctor Canyon

Effective rooting depth (in)	Temp °F (depth)	pH	sandy loam			%0M	PPM P	PPM K	dS/m
			%sand	%silt	%clay				
14.4	63.0 (14.3)	7.1	80.0	7.1	12.9	1.5	8.0	54.4	0.4



PELLET GROUP DATA --
Management unit 27 , Study no: 1

Type	Quadrat Frequency			
	'92	'97	'03	'08
Rabbit	6	1	6	17
Elk	3	2	5	1
Deer	12	22	19	16
Cattle	-	2	4	3

Days use per acre (ha)	
'03	'08
-	-
2 (5)	2 (5)
49 (121)	78 (193)
8 (20)	-

BROWSE CHARACTERISTICS --
Management unit 27 , Study no: 1

		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 utahensis												
87	**465**	66	266	199	-	-	0	86	0	-	43	52/49
92	**1000**	-	620	280	100	-	66	8	10	6	94	-/-
97	**480**	-	80	400	-	-	58	8	0	-	0	44/41
03	**440**	-	60	320	60	-	23	32	14	-	5	42/40
08	**460**	-	60	320	80	-	30	4	17	13	17	45/49
Artemisia nova												
87	**3531**	-	466	1799	1266	-	38	45	36	1	4	14/19
92	**1840**	60	500	1140	200	-	12	3	11	-	0	-/-
97	**1540**	20	180	1020	340	140	10	0	22	6	6	14/27
03	**2720**	-	520	1940	260	60	10	0	10	.73	.73	19/27
08	**3100**	960	380	1860	860	140	38	0	28	7	7	18/30
Cercocarpus ledifolius												
87	**0**	-	-	-	-	-	0	0	-	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	-	0	-/-
97	**0**	-	-	-	-	-	0	0	-	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	-	0	-/-
08	**0**	-	-	-	-	-	0	0	-	-	0	60/47
Chrysothamnus depressus												
87	**133**	-	-	133	-	-	50	50	0	-	0	4/7
92	**2880**	-	440	2440	-	-	0	0	0	-	1	-/-
97	**900**	-	100	780	20	-	0	7	2	2	2	4/12
03	**2480**	-	-	2480	-	-	6	15	0	-	0	4/9
08	**1940**	-	-	1940	-	-	45	30	0	-	0	4/10
Chrysothamnus parryi attenuatus												
87	**3732**	199	533	2666	533	-	14	2	14	-	0	17/16
92	**580**	-	180	400	-	-	0	3	0	-	0	-/-
97	**320**	-	140	180	-	-	0	0	0	-	0	12/7
03	**420**	-	-	420	-	-	0	0	0	-	0	6/8
08	**100**	100	-	100	-	-	0	0	0	-	0	7/11

		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 viscidiflorus viscidiflorus												
87	**0**	-	-	-	-	-	0	0	0	-	0	-/-
92	**5060**	80	1760	2900	400	-	2	0	8	.39	2	-/-
97	**3500**	-	100	3380	20	-	0	0	1	-	0	16/21
03	**3640**	-	-	3420	220	-	0	1	6	.54	.54	14/17
08	**3960**	80	80	3440	440	-	0	0	11	4	4	19/26
Gutierrezia sarothrae												
87	**333**	-	-	333	-	-	0	0	-	-	0	7/6
92	**580**	-	60	520	-	-	0	0	-	-	0	-/-
97	**200**	-	-	200	-	-	0	0	-	-	0	7/3
03	**100**	-	80	20	-	-	0	0	-	-	0	9/5
08	**80**	-	-	80	-	-	25	0	-	-	0	7/10
Juniperus scopulorum												
87	**0**	-	-	-	-	-	0	0	-	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	-	0	-/-
97	**0**	-	-	-	-	-	0	0	-	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	-	0	-/-
08	**20**	-	-	20	-	-	0	0	-	-	0	-/-
Mahonia repens												
87	**0**	-	-	-	-	-	0	0	-	-	0	-/-
92	**20**	-	20	-	-	-	0	0	-	-	0	-/-
97	**20**	-	-	20	-	-	0	0	-	-	0	3/5
03	**0**	-	-	-	-	-	0	0	-	-	0	3/5
08	**0**	-	-	-	-	-	0	0	-	-	0	-/-
Opuntia sp.												
87	**0**	-	-	-	-	-	0	0	-	-	0	-/-
92	**60**	-	60	-	-	-	0	0	-	-	0	-/-
97	**0**	-	-	-	-	-	0	0	-	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	-	0	-/-
08	**20**	-	-	20	-	-	0	0	-	-	0	3/17
Pinus ponderosa												
87	**0**	-	-	-	-	-	0	0	-	-	0	-/-
92	**20**	-	20	-	-	-	100	0	-	-	0	-/-
97	**20**	-	20	-	-	-	0	0	-	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	-	0	-/-
08	**0**	-	-	-	-	-	0	0	-	-	0	-/-

		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)
Purshia tridentata												
87	**2732**	333	533	2133	66	-	24	68	2	-	0	22/35
92	**3460**	180	740	2600	120	-	50	31	3	-	0	-/-
97	**1680**	140	140	1460	80	20	54	33	5	1	1	27/56
03	**2340**	-	80	2160	100	20	9	80	4	-	0	24/48
08	**1960**	60	-	1880	80	-	58	18	4	2	3	25/54
Ribes cereum inebrians												
87	**0**	-	-	-	-	-	0	0	0	-	0	-/-
92	**280**	40	160	100	20	-	0	0	7	7	7	-/-
97	**80**	-	-	80	-	-	0	0	0	-	0	61/72
03	**80**	-	-	60	20	-	0	0	25	-	0	54/48
08	**20**	-	-	20	-	-	100	0	0	-	0	47/68
Rosa woodsii												
87	**0**	-	-	-	-	-	0	0	-	-	0	-/-
92	**1880**	-	1820	60	-	-	0	0	-	-	0	-/-
97	**1200**	60	580	620	-	-	0	0	-	-	0	14/15
03	**1140**	120	800	340	-	-	0	0	-	-	0	8/8
08	**1140**	20	240	900	-	-	0	0	-	-	0	11/9
Symphoricarpos oreophilus												
87	**0**	-	-	-	-	-	0	0	0	-	0	-/-
92	**1260**	-	740	500	20	-	2	0	2	-	2	-/-
97	**480**	-	80	380	20	-	8	0	4	4	4	17/42
03	**1200**	-	40	1140	20	-	2	10	2	2	2	14/20
08	**900**	-	160	740	-	-	2	0	0	-	0	28/40
Tetradymia canescens												
87	**1265**	199	399	866	-	-	37	16	0	-	0	9/10
92	**820**	-	460	300	60	-	0	0	7	-	0	-/-
97	**400**	-	40	300	60	-	0	0	15	-	0	15/14
03	**940**	-	160	720	60	-	0	0	6	-	0	12/12
08	**640**	60	40	380	220	-	0	0	34	3	6	9/12