Trend Study 27-7-08

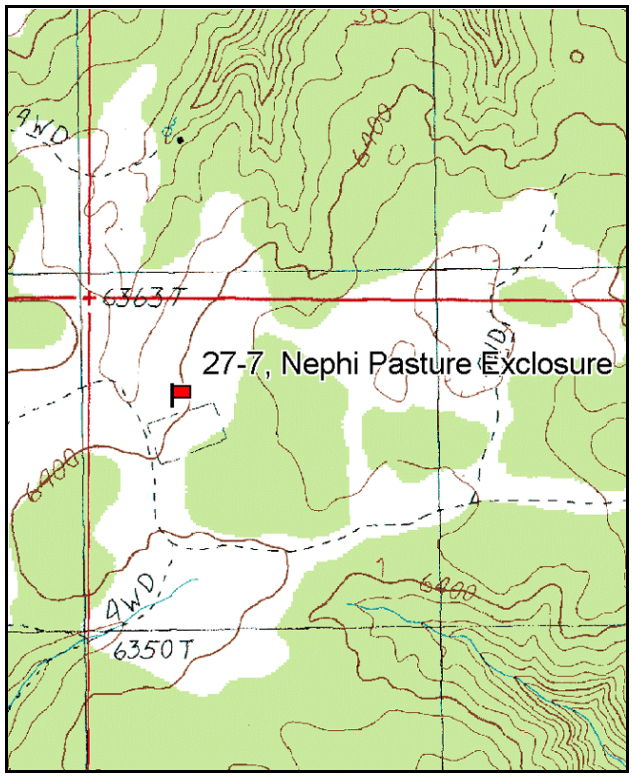
Study site name: Nephi Pasture Exclosure Outside . Vegetation type: Mountain Brush .

Compass bearing: frequency baseline 4 degrees magnetic.

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

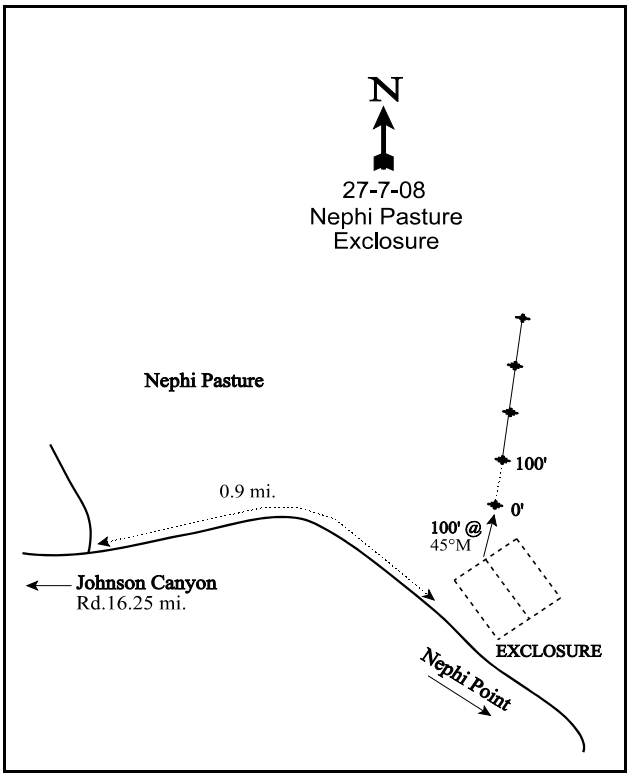
LOCATION DESCRIPTION

From Kanab, take US 89 east for 9.4 miles to Johnson Canyon. Travel north up Johnson Canyon 9.75 miles to the Lock Ridge-Nephi Pasture road. Turn right. Go 16.25 miles (see 27-6-03 for more detail) on the main road to a major intersection in Nephi Pasture. Continue straight towards Nephi Point, going 0.9 miles to an exclosure. Walk east along the fence on the north side of the exclosure to the inner fence. From the northeast corner of the tallest fence, walk 100 feet northeast to the 0-foot baseline stake, a cut fencepost tagged #7808.



Map Name: Buckskin Mountain

Township 42S , Range 4W , Section 1



Diagrammatic Sketch

GPS: NAD 83, UTM 12S 394192 E, 4116823 N

DISCUSSION

Nephi Pasture Exclosure Outside - Trend Study No. 27-7

Study Information

The Nephi Pasture exclosure complex was built in the 1960's and is found approximately 20 miles northeast of Kanab [elevation: 6,400 feet (1,950 m), slope: 5%, aspect: west]. This transect samples the outside of the exclosure which is a basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) community type with a significant bitterbrush (*Purshia tridentata*), and serviceberry (*Amelanchier utahensis*) component. Two other studies were established inside the total exclosure (27R-4) and the livestock exlcosure (27R-5) in 1998 as part of a three-way comparison between the different exclosure grazing treatments. For further details on these studies refer to their discussion sections and to the Nephi Pasture Exclosure comparison summary. The area was identified by the BLM as an Upland Sand site (11-13 inches precipitation) and a mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*)/Indian ricegrass (*Oryzopsis hymenoides*) habitat type. On this study, the sagebrush was identified during the readings as basin big sagebrush, not mountain big sagebrush, because of size and growth form. The area is within the Vermillion-Nephi Pasture allotment which is grazed by cattle during the winter. Deer use this area during mild winters, but utilize areas south of US-89 during severe winters. Pellet group data estimated heavy deer use in 1998 and 2003 (64 ddu/acre:158 ddu/ha and 70 ddu/acre:174 ddu/ha, respectively), and lower, but still moderately heavy use in 2008 (38 ddu/acre:93 ddu/ha). Cattle use was estimated to be lightly moderate in 1998 and 2003 (16 cdu/acre:40 cdu/ha and 23 cdu/acre:57 cdu/ha, respectively), and no cattle use detected in 2008. Elk use was estimated to be minimal in 1998 with 1 elk days use/acre (3 edu/ha), and no sign of elk detected in 2003 or 2008.

Soil

Typical of all of the Nephi Pasture area, the soil is composed largely of fine sand, formed by aeolian derived sandstone parent materials. It has a loamy sand texture with a moderately acidic reaction (pH 5.9). The soil is deep with an effective rooting depth estimated at nearly 21 inches. There are no rock fragments apparent in the profile or on the surface. Organic matter is low at only 0.7%. Potassium may be limiting to plant growth and development at just 38.4 ppm (Tiedemann and Lopez 2004). There is evidence of wind and surface water erosion on the site with the soil erosion condition classified as slight in 2003 and 2008.

Browse

Serviceberry, basin big sagebrush, and antelope bitterbrush dominate the shrub component. These key species produced 71% of the vegetative cover on the site in 1997, 48% in 1998, 89% in 2003, and 84% in 2008. Mature serviceberry plants were very large, averaging about six feet in height by six feet in width. Available parts of these shrubs had been moderately to heavily hedged during all readings, with the heaviest use reported in 1987 (100% heavy use). The increased density reported in 1992 (265 to 980 plants/acre) appears to have been caused by observer differences in counting stems. Clumps of several stems in the same area were considered one plant in 1997, 1998, 2003, and 2008. Vigor has been good on most plants from 1992 to 2003, but plants displaying poor vigor increased to 22% in 2008. Decadence was fairly low from 1992 to 2003, ranging from 10% to 20% of the plants, but also increased to 33% in 2008. Reproduction has been good in all surveys with young plants comprising 17% to 45% of the population. Annual leader growth of serviceberry averagedfiveinches in 2003 and 3.5 inches in 2008.

The basin big sagebrush population density remained relatively constant at around 1,800 plants/acre from 1987-1998. Big sagebrush density declined in 2003 to 1,240 plants/acre and was similar in 2008. Reproduction was good from 1987 to 1998 with young plants comprising from 13% to 29% of the population, but decreased to 0% and 3% in 2003 and 2008, respectively. Since 1992, sagebrush has exhibited generally light to moderate use, but vigor has been poor on a large proportion of the population and decadence has been moderately high ranging from 33% to 63%. Basin big sagebrush annual leaders averaged 3.4 inches of growth in 2003 and 2.1 inches in 2008.

Bitterbrush density has steadily declined from 1,700 plants/acre in 1992, to about 1,200 plants/acre in 1997 and 1998, to 960 plants/acre in 2003, and to 880 plants/acre in 2008. Bitterbrush received consistent moderate to heavy use from 1987 to 2003, but mostly light with some moderate to heavy use in 2008. Despite the heavy use, bitterbrush has maintained generally good vigor and low to moderate decadence. The highest decadence estimates for bitterbrush occurred in the 1992, 2003, and 2008 surveys which followed periods of drought in southern Utah. As this is a winter grazing allotment for livestock, bitterbrush likely receives dual use from big game and cattle in at least some years. Many plants are partly unavailable for use due to the extensive hedging over the years. It was noted in 2003 that all of the available forage on bitterbrush came from the current year leaders. Annual leader growth on bitterbrush averaged 7.5 inches in 2003, and 4.0 inches in 2008.

Herbaceous Understory

The herbaceous understory had good diversity and fair production from 1987 to 1998. With drought conditions in 2003, very few grasses or forbs were sampled on the site. Grasses decreased further and forbs increased slightly in 2008. The increase in forbs was mostly due to an increase in the frequency of annual forbs. The most abundant perennial grasses prior to the 2003 survey were bottlebrush squirreltail (*Sitanion hystrix*), western wheatgrass (*Agropyron smithii*), sand dropseed (*Sporobolus cryptandrus*), Indian ricegrass, needle-and-thread (*Stipa comata*), and Sandberg bluegrass (*Poa secunda*). Two annual species, cheatgrass (*Bromus tectorum*) and sixweeks fescue (*Vulpia octoflora*), were both moderately abundant in 1997 and 1998, but neither was encountered in 2003, and cheatgrass was only sampled rarely in 2008. Forbs have been nearly as abundant on this site as the grasses. Toadflax (*Comandra pallida*) has been the most abundant perennial forb in all surveys, with all other perennial species being rare. Annual forbs had moderate abundance from 1992 to 1998 and in 2008, with wooly plantain (*Plantago patagonica*) being the most common. There was light grazing on the palatable grasses in 1998, mainly sand dropseed and western wheatgrass.

1992 TREND ASSESSMENT

Because the sample area was increased in 1992, many of the estimates for browse density have increased from the 1987 survey. Therefore, percent decadence, form class, and vigor should be the parameters most important for trend evaluation. The key species for the site in order of dominance (percent of total plant cover) are: serviceberry (33%), basin big sagebrush (32%) and bitterbrush (18%). Basin big sagebrush has the highest decadence, but is not higher than expected with the site potential and condition, along with the length of the current drought. The key species also all have some evidence of reproduction and a good percent young age class of plants. The trend for browse would be considered stable. For the herbaceous understory, annuals in the past were ignored in the surveys. The trend for perennial grasses and forbs is stable. The nested frequency of perennial grasses and perennial forbs has remained similar.

winter range condition (DCI) - fair (59) Mid-level potential scale
browse - stable (0) grass - stable (0) forb - stable (0)

1997 TREND ASSESSMENT

Trend for the key browse species is mixed. Bitterbrush and serviceberry appear to be stable with good vigor and low decadence. The increase in density of both species between 1992 and 1997 appear to be observer differences. These rhizomatous shrubs can be difficult to count when in dense clusters. Several stems coming from the same general area were considered one plant in 1997. Basin big sagebrush appears to have a declining trend with a reduced population density, reduced vigor, and increasing decadence. In addition, the large number of dead plants counted in 1997 indicate a die-off. A decline in density can also be seen in all age classes. Since sagebrush accounts for one third of the shrub cover, the browse trend is considered slightly down. The trend for both grasses and forbs is stable but still depleted. Sum of nested frequency for grasses increased, although this was due to a significant increase in the nested frequencies of cheatgrass and sixweeks fescue. The most common native grass, bottlebrush squirreltail, increased slightly. Sum of nested frequency for forbs also increased slightly, due mainly to a significant increase in the nested frequency of toadflax.

winter range condition (DCI) - fair (54) Mid-level potential scale
browse - slightly down (-1) grass - stable (0) forb - stable (0)

1998 TREND ASSESSMENT

Trend for the key browse species are similar to 1997 estimates. Utah serviceberry and antelope bitterbrush trends appear stable. Bitterbrush vigor is good, reproduction adequate, and decadence low at only 13%. The sagebrush population has remained at a similar density since 1987, but the population has become increasingly decadent (46%), and 43% of the sagebrush are dead (1,440 plants/acre). This combined with poor reproduction in 1997 and 1998 point to a decline. This decline does not appear to be caused by utilization because the livestock exclosure and total exclosure also show similar trends. Overall browse trend is considered stable since conditions for sagebrush are similar to 1997. However, the sagebrush population should be watched closely. Trend for the grasses and forbs is stable, although in poor condition. Sum of nested frequency for perennial grasses and forbs are similar to 1997 estimates. One negative factor is the significant increase in nested frequency for the annuals; cheatgrass, sixweeks fescue, and wooly plantain.

winter range condition (DCI) - poor (41) Mid-level pontential scale
browse - stable (0) grass - stable (0) forb - stable (0)

2003 TREND ASSESSMENT

Trend for browse is slightly down. The three key species, serviceberry, bitterbrush, and basin big sagebrush all have lower population densities since 1998, and bitterbrush and basin big sagebrush have much lower young recruitment. Decadence increased for all three species in 2003, although sagebrush is the only species of the three that would be considered as having high decadence. One-third of the basin big sagebrush population showed poor vigor in 2003. Because basin big sagebrush is the least preferred of the key species, the deteriorating condition of this population is not as alarming as it may be on other sites without a good bitterbrush and/or serviceberry component. Trend for the grasses is down and is slightly down for the forbs. Most perennial grass and forb species showed lower individual nested frequency values in 2003 compared to 1998. The sum of nested frequency of perennial grasses declined 76%, though a positive trend was that cheatgrass and sixweeks fescue, both annuals, were not encountered. The sum of nested frequency of all forbs declined by 66%, but again this was largely due to a decrease in annual species. The sum of nested frequency of perennial forbs remained relatively similar to 1998. The decreases in both the browse and herbaceous components is likely an effect of drought.

winter range condition (DCI) - poor (38) Mid-level potential scale
browse - slightly down (-1) grass - down (-2) forb - slightly down (-1)

2008 TREND ASSESSMENT

Trend for the key browse species is stable. The population density of all three species remained relatively constant from 2003. Serviceberry plants displaying poor vigor increased from 7% in 2003 to 22%, decadence was moderate at 33%, and recruitment of young plants remained good in 2008. Bitterbrush plants vigor remained good, decadence remained similar to 2003, though recruitment of young plants remained low. Basin big sagebrush plants displaying poor vigor increased from 37% of the population in 2003 to 51%. Decadence of sagebrush remained similar to 2003, but high at 63%, and recruitment of young plants remained low. The trend for grasses is down. The sum of nested frequency of perennial grasses decreased by 80% from 2003, and cover of perennial grasses was less than 0.05%. The trend for forbs is stable. The sum of nested frequency of all forbs increased by 85% from 2003, primarily due to an increase in annual forb frequency.

winter range condition (DCI) - poor (39) Mid-level potential scale
browse - stable (0) grass - down (-2) forb - stable (0)

HERBACEOUS TRENDS --
Management unit 27 , Study no: 7

Type	Species	Nested Frequency						Average Cover %				
		'87	'92	'97	'98	'03	'08	'92	'97	'98	'03	'08
G	Agropyron smithii	$_{ab}$24	$_{a}$4	$_{bc}$48	$_{c}$71	$_{a}$10	$_{a}$2	.03	.29	.50	.07	.01
G	Bromus tectorum (a)	-	$_{a}$3	$_{b}$112	$_{c}$144	$_{a}$-	$_{a}$6	.00	2.35	3.21	-	.01
G	Oryzopsis hymenoides	11	25	21	14	16	2	.34	.10	.25	.21	.01
G	Poa secunda	8	12	16	15	3	-	.10	.39	.10	.01	-
G	Sitanion hystrix	$_{b}$54	$_{b}$58	$_{b}$62	$_{b}$39	$_{a}$-	$_{a}$-	.51	.83	.62	-	-
G	Sporobolus cryptandrus	$_{ab}$24	$_{b}$33	$_{ab}$14	$_{b}$31	$_{a}$9	$_{a}$5	.63	.06	.33	.07	.01
G	Stipa comata	$_{b}$22	$_{b}$24	$_{b}$25	$_{b}$21	$_{ab}$7	$_{a}$-	.32	.14	.16	.03	.00
G	Vulpia octoflora (a)	-	$_{b}$27	$_{c}$73	$_{d}$144	$_{a}$-	$_{a}$-	.11	.33	1.92	-	-
Total for Annual Grasses		0	30	185	288	0	6	0.11	2.69	5.13	0	0.00
Total for Perennial Grasses		143	156	186	191	45	9	1.94	1.82	1.97	0.40	0.03
Total for Grasses		143	186	371	479	45	15	2.06	4.51	7.10	0.40	0.04
F	Arabis sp.	-	-	5	3	-	-	-	.04	.01	-	-
F	Astragalus sp.	8	2	1	1	3	-	.00	.00	.00	.00	-
F	Calochortus nuttallii	-	-	1	-	4	-	-	.01	-	.01	-
F	Chaenactis douglasii	-	2	1	10	-	-	.01	.00	.19	-	-
F	Collomia linearis (a)	-	-	3	-	-	-	-	.00	-	-	-
F	Comandra pallida	$_{ab}$72	$_{a}$58	$_{b}$117	$_{b}$98	$_{ab}$88	$_{b}$107	.50	1.79	1.04	1.42	2.87
F	Collinsia parviflora (a)	-	-	1	-	2	1	-	.15	-	.03	.00
F	Delphinium nuttallianum	-	-	3	-	-	-	-	.00	-	-	-
F	Descurainia sp. (a)	-	$_{b}$16	$_{bc}$30	$_{bc}$26	$_{a}$-	$_{c}$42	.40	.12	.13	-	.23
F	Draba sp. (a)	-	16	-	8	-	-	.03	-	.04	-	-
F	Eriogonum cernuum (a)	-	$_{b}$33	$_{a}$10	$_{a}$1	$_{a}$2	$_{b}$52	.24	.05	.00	.03	.15
F	Erigeron sp.	-	-	1	3	-	-	-	.00	.00	-	-
F	Eriogonum racemosum	1	-	7	4	-	1	-	.04	.01	-	.00
F	Euphorbia glyptosperma (a)	$_{b}$17	$_{ab}$8	$_{a}$-	$_{a}$-	$_{a}$-	$_{a}$-	.04	-	-	-	-
F	Frasera speciosa	-	-	2	-	-	3	-	.00	-	-	.03
F	Gilia sp. (a)	-	-	$_{b}$24	$_{a}$-	$_{b}$11	$_{a}$-	-	.12	-	.28	-
F	Lappula occidentalis (a)	-	-	4	-	-	-	-	.04	-	-	-
F	Lupinus argenteus	-	-	1	-	-	-	.03	.03	-	-	-
F	Microsteris gracilis (a)	-	$_{b}$21	$_{b}$31	$_{a}$-	$_{a}$-	$_{a}$-	.04	.15	-	-	-
F	Oenothera pallida	-	3	-	3	3	-	.03	-	.03	.00	-
F	Penstemon sp.	$_{a}$-	$_{b}$10	$_{a}$-	$_{ab}$8	$_{a}$-	$_{ab}$1	.22	-	.04	-	.03
F	Phlox austromontana	$_{a}$-	$_{ab}$14	$_{b}$22	$_{ab}$14	$_{ab}$9	$_{a}$2	.30	.20	.35	.09	.03
F	Plantago patagonica (a)	-	$_{c}$88	$_{b}$46	$_{d}$195	$_{a}$2	$_{ab}$23	.40	.18	5.36	.03	.07

Type	Species	Nested Frequency						Average Cover %				
		'87	'92	'97	'98	'03	'08	'92	'97	'98	'03	'08
F	Polygonum douglasii (a)	-	$_{ab}$15	$_{b}$26	$_{a}$-	$_{a}$-	$_{a}$3	.03	.04	-	-	.00
F	Senecio multilobatus	4	-	1	-	-	-	-	.00	-	-	-
F	Sphaeralcea parvifolia	$_{b}$12	$_{ab}$3	$_{a}$1	$_{a}$1	$_{ab}$3	-	.01	.00	.00	.03	-
F	Unknown forb-annual (a)	-	3	-	-	-	-	.01	-	-	-	-
Total for Annual Forbs		17	200	175	230	17	121	1.21	0.88	5.54	0.37	0.47
Total for Perennial Forbs		97	92	163	145	110	114	1.11	2.15	1.69	1.56	2.98
Total for Forbs		114	292	338	375	127	235	2.32	3.04	7.24	1.93	3.45

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

BROWSE TRENDS --
Management unit 27 , Study no: 7

Type	Species	Strip Frequency					Average Cover %				
		'92	'97	'98	'03	'08	'92	'97	'98	'03	'08
B	Amelanchier utahensis	23	13	13	11	13	12.05	8.44	3.32	5.71	7.00
B	Artemisia filifolia	0	0	3	0	0	-	-	.18	-	-
B	Artemisia tridentata tridentata	58	58	55	46	44	11.92	5.20	3.20	5.41	4.81
B	Chrysothamnus nauseosus	0	0	0	1	0	-	-	-	.00	-
B	Chrysothamnus viscidiflorus	0	1	1	0	0	-	.00	.00	-	-
B	Eriogonum microthecum	0	0	1	0	0	-	-	.00	-	-
B	Gutierrezia sarothrae	34	32	27	4	2	1.53	.26	.68	.03	.00
B	Juniperus osteosperma	0	0	0	0	0	-	-	-	-	.03
B	Leptodactylon pungens	3	5	0	4	2	.06	.06	-	.06	.01
B	Opuntia sp.	1	0	0	1	1	.00	-	-	.00	.00
B	Purshia tridentata	36	34	37	34	31	6.50	6.59	7.64	7.50	6.03
Total for Browse		155	143	137	101	93	32.08	20.58	15.03	18.73	17.90

CANOPY COVER, LINE INTERCEPT --
Management unit 27 , Study no: 7

Species	Percent Cover	
	'03	'08
Amelanchier utahensis	8.19	10.78
Artemisia tridentata tridentata	8.03	5.13
Chrysothamnus nauseosus	.05	-
Juniperus osteosperma	-	2.83
Purshia tridentata	7.71	10.06

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 27 , Study no: 7

Species	Average leader growth (in)	
	'03	'08
Amelanchier utahensis	3.9	3.5
Artemisia tridentata tridentata	2.2	2.1
Purshia tridentata	6.1	4.0

POINT-QUARTER TREE DATA --
Management unit 27 , Study no: 7

Species	Trees per Acre		
	'98	'03	'08
Juniperus osteosperma	6	<18	22

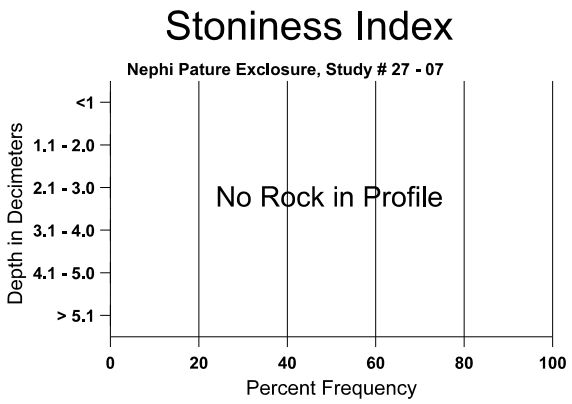
Average diameter (in)		
'98	'03	'08
8.5	-	3.8

BASIC COVER --
Management unit 27 , Study no: 7

Cover Type	Average Cover %					
	'87	'92	'97	'98	'03	'08
Vegetation	.75	34.50	27.35	34.91	20.50	22.11
Rock	0	.04	.05	0	.03	.02
Pavement	0	0	.02	.04	.01	.11
Litter	59.75	54.40	47.79	48.41	47.10	54.87
Cryptogams	1.00	2.00	1.93	8.56	.67	.26
Bare Ground	38.50	26.89	35.68	30.71	45.26	34.79

SOIL ANALYSIS DATA --
Management unit 27, Study no: 7, Study Name: Nephi Pasture Exclosure

Effective rooting depth (in)	Temp °F (depth)	pH	loamy sand			%0M	PPM P	PPM K	dS/m
			%sand	%silt	%clay				
20.8	65.0 (18.1)	5.9	87.0	7.4	5.6	0.7	11.9	38.4	0.2



PELLET GROUP DATA --
Management unit 27 , Study no: 7

Type	Quadrat Frequency				
	'92	'97	'98	'03	'08
Rabbit	49	20	25	8	77
Elk	-	-	-	-	-
Deer	26	32	27	23	9
Cattle	3	5	5	5	4

Days use per acre (ha)		
'98	'03	'08
-	-	-
1 (2)	-	-
64 (158)	70 (174)	38 (93)
16 (40)	23 (57)	-

BROWSE CHARACTERISTICS --
Management unit 27 , Study no: 7

		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	**265**	66	66	133	66	-	0	100	25	8	25	60/56
92	**980**	120	440	440	100	-	18	18	10	6	10	-/-
97	**340**	-	100	200	40	20	47	18	12	12	12	83/86
98	**380**	20	120	220	40	-	26	21	11	-	0	66/73
03	**300**	-	80	160	60	20	60	7	20	7	7	70/72
08	**360**	-	60	180	120	-	33	17	33	6	22	78/75
Artemisia filifolia												
87	**0**	-	-	-	-	-	0	0	-	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	-	0	-/-
97	**0**	-	-	-	-	-	0	0	-	-	0	-/-
98	**260**	60	140	120	-	-	0	0	-	-	0	9/15
03	**0**	-	-	-	-	-	0	0	-	-	0	-/-
08	**0**	-	-	-	-	-	0	0	-	-	0	-/-
Artemisia tridentata tridentata												
87	**1865**	66	466	1266	133	-	54	21	7	-	0	34/35
92	**2720**	200	800	1020	900	-	15	1	33	22	24	-/-
97	**1700**	20	320	600	780	1200	53	11	46	41	46	36/45
98	**1880**	100	240	780	860	1440	40	9	46	22	23	31/37
03	**1240**	-	-	460	780	1500	15	0	63	37	37	31/34
08	**1260**	-	40	420	800	1360	17	10	63	49	51	39/40
Chrysothamnus nauseosus												
87	**0**	-	-	-	-	-	0	0	-	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	-	0	-/-
97	**0**	-	-	-	-	-	0	0	-	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	-	0	-/-
03	**20**	-	-	20	-	-	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)
Chrysothamnus viscidiflorus												
87	**133**	66	133	-	-	-	0	0	-	-	50	-/-
92	**0**	-	-	-	-	-	0	0	-	-	0	-/-
97	**20**	-	-	20	-	-	0	0	-	-	0	7/7
98	**20**	-	-	20	-	-	0	0	-	-	0	18/13
03	**0**	-	-	-	-	-	0	0	-	-	0	-/-
08	**0**	-	-	-	-	-	0	0	-	-	0	-/-
Eriogonum microthecum												
87	**0**	-	-	-	-	-	0	0	-	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	-	0	-/-
97	**0**	-	-	-	-	-	0	0	-	-	0	-/-
98	**20**	-	-	20	-	-	0	100	-	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	-	0	-/-
08	**0**	-	-	-	-	-	0	0	-	-	0	-/-
Gutierrezia sarothrae												
87	**3932**	66	-	3866	66	-	0	0	2	-	0	9/12
92	**1180**	200	120	1040	20	-	0	0	2	-	0	-/-
97	**1280**	20	180	1060	40	60	0	0	3	-	0	11/12
98	**1280**	20	40	1240	-	-	0	0	0	-	0	11/13
03	**120**	-	40	80	-	-	0	0	0	-	0	11/14
08	**40**	40	-	40	-	20	0	0	0	-	0	6/5
Leptodactylon pungens												
87	**598**	533	133	399	66	-	0	0	11	-	0	5/6
92	**340**	-	20	320	-	-	0	0	0	-	0	-/-
97	**280**	-	-	280	-	20	0	0	0	-	7	18/20
98	**0**	-	-	-	-	-	0	0	0	-	0	-/-
03	**180**	-	-	180	-	20	0	0	0	-	0	5/7
08	**80**	-	-	20	60	40	0	75	75	25	25	2/3
Opuntia sp.												
87	**0**	-	-	-	-	-	0	0	0	-	0	-/-
92	**40**	-	20	-	20	-	0	0	50	-	50	-/-
97	**0**	-	-	-	-	-	0	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	0	-	0	4/13
03	**20**	-	-	20	-	-	0	0	0	-	0	2/3
08	**20**	-	20	-	-	-	0	0	0	-	0	4/12

		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	**1464**	-	399	999	66	-	0	100	5	-	0	12/41
92	**1700**	40	420	840	440	-	13	80	26	13	16	-/-
97	**1240**	-	80	1060	100	40	35	55	8	5	8	21/43
98	**1220**	-	120	940	160	40	18	75	13	2	2	20/43
03	**960**	-	-	640	320	60	29	71	33	8	8	20/38
08	**880**	-	20	620	240	220	18	23	27	7	7	25/45
Ribes sp.												
87	**0**	-	-	-	-	-	0	0	-	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	-	0	-/-
97	**0**	-	-	-	-	-	0	0	-	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	-	0	30/25
03	**0**	-	-	-	-	-	0	0	-	-	0	-/-
08	**0**	-	-	-	-	-	0	0	-	-	0	-/-
Tetradymia canescens												
87	**0**	-	-	-	-	-	0	0	-	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	-	0	-/-
97	**0**	-	-	-	-	-	0	0	-	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	-	0	19/7
08	**0**	-	-	-	-	-	0	0	-	-	0	-/-