

Trend Study 25C-12-08

Study site name: Nazer Draw .

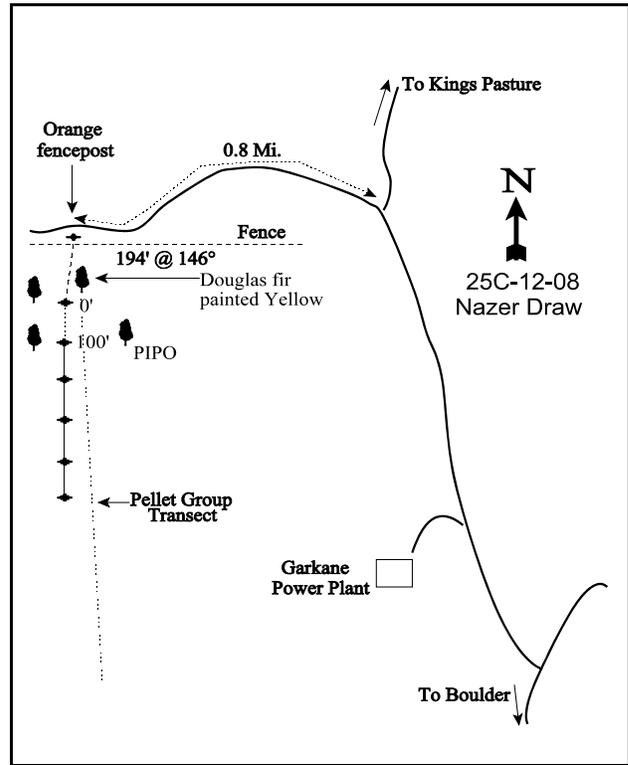
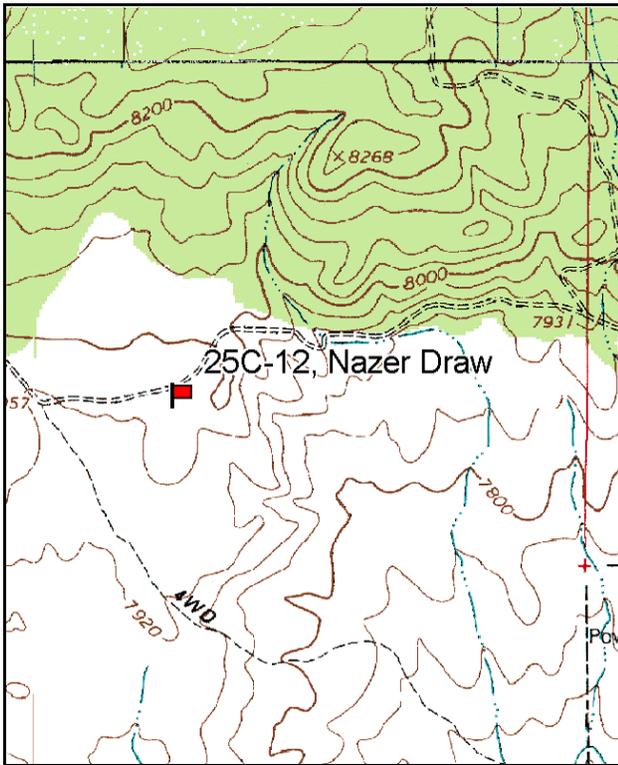
Vegetation type: Mountain Brush .

Compass bearing: frequency baseline 161 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line4 (71ft). No rebar.

LOCATION DESCRIPTION

Travel north from Boulder on SR12 for approximately 5.0 miles to the Garkane Power Plant Road. Turn left (west) onto this road. Go 0.95 miles to a cattleguard. Continue 0.2 miles to a minor fork. Bear left onto a rough road and go 0.8 miles. This road is now closed so you now have to walk the 0.8 miles to the site. Stop along the fence by an orange fence post, which serves as a witness post for the range trend study and adjacent pellet group transect. The transect starts 195 feet south of the fence. The 0-foot baseline stake is a 1 1/2-foot tall fence post marked with browse tag #7131.



Map Name: Boulder Town

Diagrammatic Sketch

Township 32S, Range 4E, Section 27

GPS: NAD 83, UTM 12S460065 E, 4204983 N

DISCUSSION

Nazer Draw - Trend Study No. 25C-12

Study Information

This study samples an open bench with a mixture of low-growing shrubs, mountain brush, and grass [elevation: 8,000 feet (2,438 m), slope: 3%-5%, aspect: southeast]. The study site is part of a 1,200 acre seeding project completed in 1955. It is surrounded by ponderosa pine (*Pinus ponderosa*), scattered clumps of Gambel oak (*Quercus gambelii*), and slopes dominated by mountain brush. The site is used by big game year-round, but less so in the winter. Data from the nearby DWR pellet group transect shows moderate deer use at 32 days use/acre from 1990-91 to 1993-94 (79 ddu/ha) (Evans et al. 1995). Deer use on the site was estimated to be moderate in 1998 and 2008 (27 ddu/acre:67 ddu/ha and 24 ddu/acre:60 ddu/ha, respectively), and heavy in 2003 (63 ddu/acre:155 ddu/ha). Elk use was estimated to be light in 1998, 2003, and 2008 (9 edu/acre:22 edu/ha, 11 edu/acre:26 edu/ha, and 15 edu/acre:36 edu/ha, respectively). Cattle use was light with approximately 6 days use/acre (15 cdu/ha) in 1998 and 2003, and minimal use in 2008 with only one cattle pat encountered. Rabbits also utilize the site in moderate numbers.

Soil

The almost level bench drains to the south to Boulder Creek and Nazer Draw. Due to the level terrain and high ground cover, erosion potential is minimal. The soil is shallow with an effective rooting depth estimated at just over 10 inches. Texture is a sandy loam which is moderately acidic (pH 5.6) and contains a high percentage of coarse fragments in the profile. Parent material is basalt. Relative combined vegetation and litter cover ranged from 68%-74% from 1994 to 1998. Relative combined rock and pavement cover has ranged from 17%-23% from 1994 to 1998. Relative bare ground cover was 12% in 1994, decreased to 7% in 1998, and increased to 9% and 8% in 2003 and 2008, respectively. The soil erosion condition class was considered to be stable in 2003 and 2008.

Browse

A variety of browse occur on the site including several preferred species. The most numerous shrub is black sagebrush (*Artemisia nova*) which had a very high density of 18,400 plants/acre in 2008. The population is dynamic with abundant young recruitment and large numbers of seedlings encountered in most years. Plants are vigorous and have displayed mostly light to moderate use from 1987 to 1998, and in 2008. Very little use was observed during the 2003 reading. Decadence steadily declined from 34% in 1987, to 22% in 1994, and 18% in 1998 and 2003, but increased to 31% in 2008.

Another key browse species is a low profile, spreading form of bitterbrush (*Purshia tridentata*). Density was estimated at 1,720 plants/acre in 2008. These plants have received continual heavy use, especially in 1987 and 2003. Vigor was normal on most plants from 1987 to 1998 and in 2008, but drought conditions combined with extremely heavy use in 2003 caused a decline in average vigor for 32% of the population. The number of decadent plants also increased from 4% in 1998 to 46% in 2003, but decreased to a normal level again in 2008. Young recruitment has been variable through the years but is currently poor. These shrubs may also reproduce by layering.

Scattered around the site but more abundant on the surrounding slopes are true mountain mahogany (*Cercocarpus montanus*) and serviceberry (*Amelanchier utahensis*). Both species have been moderately to heavily hedged. Most of the mature serviceberry on the site are small averaging less than 2 feet in height, due in part to continual heavy use. Gambel oak clones are present around the site and were picked up with the larger sample used in 1994. The population appears relatively stable and provides good escape and thermal cover. Little use of oak has been noted during any reading.

Other shrub species found on the site include dwarf rabbitbrush (*Chrysothamnus depressus*), stickyleaf low rabbitbrush (*C. viscidiflorus* ssp. *viscidiflorus*), slenderbush eriogonum (*Eriogonum microthecum*), and broom snakeweed (*Gutierrezia sarothrae*). The site also supports some pinyon pine (*Pinus edulis*) and Ponderosa

pine trees. These appear to be moving into the site. The ponderosa pine population is still young with point-quarter data estimating approximately 33 trees/acre since 1998. Pinyon pine has numbered about 20 trees/acre since 1998. Average basal diameter of ponderosa pine was estimated at 6 inches in 1998, 8 inches in 2003, and 4 inches in 2008. Pinyon basal diameter was 3.5 inches in 1998 and 2003, and 3.9 inches in 2008. Drought conditions over the past few years has contributed to several young ponderosa trees to display poor vigor in the form of brown needles in 2003.

Herbaceous Understory

Herbaceous plants are fairly abundant and diverse. Grasses provided 8% cover in 1994 while forbs produced only 3% cover. The herbaceous cover doubled in 1998 due to good precipitation. Grass cover nearly doubled to 14%, while forb cover more than doubled to 8%. Drought conditions may have been a factor in a three fold decrease in herbaceous cover in 2003 and remained relatively constant through 2008. The most common species include crested wheatgrass (*Agropyron cristatum*), intermediate wheatgrass (*Agropyron intermedium*), blue grama (*Bouteloua gracilis*), and bottlebrush squirreltail (*Sitanion hystrix*). Neither wheatgrass was on the Forest Service seed list which included smooth brome (*Bromus inermis*), orchardgrass (*Dactylis glomerata*), timothy (*Phleum* spp.), alfalfa (*Medicago sativa*), and clover (*Melilotus* spp.). Nearly 30 species of forbs were present on the study site in 1994. Many of the more common species like the buckwheats (*Eriogonum* spp.), penstemons (*Penstemon* spp.), and Indian paintbrush (*Castilleja* sp.) had shown signs of utilization by deer in 1991. Currently, the most abundant forb species include redroot eriogonum (*Eriogonum racemosum*), sulfur eriogonum (*E. umbellatum*), wing eriogonum (*E. alatum*), Lewis flax (*Linum lewisii*), and Utah deervetch (*Lotus utahensis*).

1991 TREND ASSESSMENT

The browse trend is up. The key browse species, black sagebrush, antelope bitterbrush, and serviceberry, have all increased or stayed the same since 1987. The sum of nested frequency of perennial grasses has decreased slightly. The trend for grasses is slightly down. The major decrease was with crested wheatgrass. The composition of forbs has many species, but the few species that increased since the last inventory are in such low quadrat frequencies they would not affect the overall condition very much. Except for a small handful of forbs, most declined during the extended drought. Trend for the forbs is slightly downward.

browse - up (+2)

grass - slightly down (-1)

forb - slightly down (-1)

1994 TREND ASSESSMENT

The browse trend appears stable with healthy populations of black sagebrush and antelope bitterbrush. The 1994 data shows some differences in population estimates for the browse species due to the larger sample taken in 1994. This new sample is a better representation of the actual populations than the samples taken in 1987 and 1991, so changes don't necessarily represent actual changes in population densities. The trend for grasses is slightly down. The sum of nested frequency of perennial grasses decreased slightly primarily due to a significant decrease in bottlebrush squirreltail. The warm season increaser, blue grama, increased in frequency and is now the most abundant grass. Crested and intermediate wheatgrass frequency declined slightly. Trend for forbs is slightly up. Sum nested frequencies of forbs increased slightly.

winter range condition (DCI) - good (70) Mid-level potential scale

browse - stable (0)

grass - slightly down (-1)

forb - slightly up (+1)

1998 TREND ASSESSMENT

Trend for browse is stable. Black sagebrush appears to be increasing slightly while bitterbrush density has declined. Both species display good vigor and low decadence. Bitterbrush has excellent leader growth this year. Trend for the grasses is slightly up. Sum of nested frequency of grasses increased slightly with the biggest change being the significant decline of crested wheatgrass, an increase in the frequency of intermediate wheatgrass and blue grama, and a significant increase in the frequency of bottlebrush squirreltail. Trend for forbs is slightly up. Sum of nested frequency of perennial forbs also increased.

winter range condition (DCI) - excellent (94) Mid-level potential scale
browse - stable (0) grass - slightly up (+1) forb - slightly up (+1)

2003 TREND ASSESSMENT

Trend for browse is mixed. Trend for black sagebrush is up with an increase in density, excellent young recruitment, and good vigor. Bitterbrush has remained stable in density compared to 1994 estimates and vigor is poor on 32% of the population. Hedging combined with drought conditions have caused an increase in the number of decadent plants, up to 46% of the population. Young recruitment is poor. Low numbers of serviceberry also occur on the site. These preferred shrubs also show reduced vigor. Trend for browse is considered slightly down since the most preferred shrubs, bitterbrush and serviceberry, are showing signs of decline. An increase in the already thick population of black sagebrush would be considered detrimental at this site considering the elevation is nearly 8,000 feet. Perennial grasses and forbs along with highly preferred serviceberry and bitterbrush should be the key components of this site. Trend for the grasses is slightly down. Sum of nested frequency of perennial grasses has declined slightly but not significantly. Production declined with perennial grass cover dropping by 56%. The trend for forbs is down. The sum of nested frequency for perennial forbs has declined by 58%. Eleven of the 19 forbs sampled in 2003 declined significantly in nested frequency. Forb production declined with average forb cover falling 3 fold from 8% to 3%. These trends are likely influenced by drought conditions which have effected the area for the past few years. Especially critical for herbaceous plants is spring precipitation (April to June) which has been below normal for the past 4 years.

winter range condition (DCI) - fair-good (64) Mid-level potential scale
browse - slightly down (-1) grass - slightly down (-1) forb - down (-2)

2008 TREND ASSESSMENT

Trend for browse is up. The key browse species of black sagebrush, antelope bitterbrush, and serviceberry had either stable or increasing populations. Density of black sagebrush was stable, but decadence increased to 31%. There was only light to moderate sagebrush use for the year, vigor remained good, and there was good recruitment of young plants. Density of bitterbrush increased 16% since 2003 and has more than tripled since 1998. The number of decadent plants in the population has declined from 46% in 2003 to 15%. Bitterbrush displaying poor vigor declined from 32% in 2003 to 2%. Recruitment of young bitterbrush plants continues to be low. Density of serviceberry increased by 60% from 2003. The population showed good vigor with little decadence. Recruitment was good with young plants comprising 70% of the serviceberry population. Trend for grasses is stable. There was no significant change in the frequency of any of the grasses. Trend for forbs is up. The sum of nested frequency of perennial forbs increased and cover of perennial forbs increased from 2% in 2003 to 4%.

winter range condition (DCI) - good (69) Mid-level potential scale
browse - up (+2) grass - stable (0) forb - up (+2)

HERBACEOUS TRENDS --
Management unit 25C, Study no: 12

Type	Species	Nested Frequency						Average Cover %			
		'87	'91	'94	'98	'03	'08	'94	'98	'03	'08
G	<i>Agropyron cristatum</i>	_d 190	_{bc} 114	_c 110	_a 46	_{abc} 74	_{ab} 71	1.55	.98	.86	1.58
G	<i>Agropyron intermedium</i>	24	31	18	48	27	33	.25	1.27	.42	.22
G	<i>Bouteloua gracilis</i>	_a 107	_a 104	_{ab} 152	_b 183	_b 168	_{ab} 161	5.54	9.67	4.21	4.40
G	<i>Bromus inermis</i>	10	7	4	4	-	7	.03	.15	-	.04
G	<i>Bromus tectorum</i> (a)	-	-	-	-	1	1	-	-	.03	.00
G	<i>Carex</i> sp.	_a -	_a -	_{ab} 1	_{ab} 6	_a -	_b 11	.00	.44	-	.22
G	<i>Oryzopsis hymenoides</i>	-	-	2	-	-	-	.03	-	-	-
G	<i>Sitanion hystrix</i>	_b 100	_b 90	_a 15	_b 79	_b 62	_b 68	.88	1.44	.55	.87
G	<i>Stipa comata</i>	3	4	-	-	3	5	-	-	.03	.07
Total for Annual Grasses		0	0	0	0	1	1	0	0	0.03	0.00
Total for Perennial Grasses		434	350	302	366	334	356	8.30	13.95	6.08	7.43
Total for Grasses		434	350	302	366	335	357	8.30	13.95	6.11	7.44
F	<i>Agoseris glauca</i>	-	-	-	3	-	-	-	.00	-	-
F	<i>Antennaria parvifolia</i>	6	4	-	4	-	-	-	.15	-	-
F	<i>Arabis</i> sp.	-	12	-	5	-	4	-	.01	-	.01
F	<i>Artemisia carruthii</i>	_a 17	_a 8	_{ab} 22	_b 36	_a 9	_a 14	.20	.91	.25	.08
F	<i>Arabis demissa</i>	-	5	-	-	-	-	-	-	-	-
F	<i>Astragalus newberryi</i>	6	2	-	6	-	1	-	.06	-	.00
F	<i>Castilleja chromosa</i>	_{ab} 7	_a -	_{ab} 4	_b 18	_a 1	_a 3	.01	.37	.00	.03
F	<i>Castilleja linariaefolia</i>	_c 37	_{ab} 4	_a 3	_b 14	_a -	_a -	.01	.21	-	-
F	<i>Calochortus nuttallii</i>	3	1	-	-	3	-	-	-	.03	-
F	<i>Comandra pallida</i>	_c 19	_a 5	_{ab} 8	_{bc} 21	_a -	_a 6	.04	.49	.00	.01
F	<i>Crepis acuminata</i>	9	-	1	3	5	-	.03	.09	.01	-
F	<i>Cryptantha</i> sp.	_a 5	_{ab} 13	_b 24	_a 9	_a -	_a 3	.09	.09	-	.01
F	<i>Descurainia pinnata</i> (a)	-	-	-	-	6	-	-	-	.01	-
F	<i>Draba</i> sp. (a)	-	-	-	-	1	-	-	-	.00	-
F	<i>Eriogonum alatum</i>	_{ab} 5	_{ab} 9	_{ab} 18	_b 26	_a 5	_{ab} 9	.15	.35	.06	.51
F	<i>Erigeron divergens</i>	_a 2	_a 5	_a 3	_b 38	_a -	_a -	.01	.35	-	-
F	<i>Eriogonum racemosum</i>	87	83	83	98	62	66	.72	.96	.60	.46
F	<i>Eriogonum umbellatum</i>	68	56	55	50	37	53	.82	.88	.57	.73
F	<i>Gayophytum ramosissimum</i> (a)	-	-	_b 13	_a -	_a -	_a -	.03	-	-	-
F	<i>Hymenoxys acaulis</i>	1	-	3	11	-	-	.03	.09	-	-
F	<i>Hymenoxys cooperi</i>	3	-	1	2	-	-	.00	.15	-	-
F	<i>Hymenopappus filifolius</i>	-	4	-	-	-	3	-	-	-	.00
F	<i>Lepidium densiflorum</i> (a)	_b 16	_a -	_a 3	_b 39	_a 3	_a -	.00	.10	.03	-
F	<i>Lepidium</i> sp. (a)	-	-	-	-	-	2	-	-	-	.01

T y p e	Species	Nested Frequency						Average Cover %			
		'87	'91	'94	'98	'03	'08	'94	'98	'03	'08
F	<i>Linum lewisii</i>	-	3	5	6	7	6	.06	.05	.02	.25
F	<i>Lomatium</i> sp.	3	-	-	3	5	3	-	.00	.01	.03
F	<i>Lotus utahensis</i>	_{bc} 32	_b 24	_c 57	_{bc} 30	_a -	_{bc} 36	.43	.75	-	1.02
F	<i>Lupinus kingii</i> (a)	_b 7	_a -	_{ab} 1	_b 10	_a -	_{ab} 4	.00	.31	-	.01
F	<i>Lychnis drummondii</i>	-	-	3	2	-	-	.00	.00	-	-
F	<i>Lygodesmia</i> sp.	-	-	-	-	-	6	-	-	-	.06
F	<i>Lygodesmia spinosa</i>	_a -	_a -	_b 13	_{ab} 8	_a 2	_a -	.20	.04	.03	-
F	<i>Oenothera pallida</i>	_b 16	_{ab} 5	_b 15	_{ab} 6	_a -	_{ab} 6	.05	.03	-	.15
F	<i>Orthocarpus purpureo-albus</i> (a)	7	7	-	_b 46	_b 35	_a 10	-	1.12	.52	.13
F	<i>Penstemon comarrhenus</i>	_b 73	_a 30	_a 13	_a 40	_a 6	_a 16	.08	.34	.05	.16
F	<i>Penstemon</i> sp.	4	-	15	-	6	-	.06	-	.01	-
F	<i>Phlox longifolia</i>	_{ab} 58	_b 61	_{ab} 49	_a 33	_{ab} 40	_{ab} 49	.14	.15	.24	.28
F	<i>Polygonum douglasii</i> (a)	-	-	-	8	-	1	-	.07	-	.00
F	<i>Senecio douglasii</i>	-	-	-	-	-	2	-	-	-	.03
F	<i>Sphaeralcea coccinea</i>	_b 10	_b 13	_b 10	_a -	_b 10	_{ab} 8	.19	-	.10	.18
F	<i>Taraxacum officinale</i>	-	-	4	-	-	-	.03	-	-	-
F	<i>Townsendia incana</i>	-	-	1	3	-	-	.00	.00	-	-
F	<i>Tragopogon dubius</i>	1	-	-	-	-	-	-	-	-	-
F	Unknown forb-perennial	-	3	-	-	-	-	-	-	-	-
Total for Annual Forbs		30	7	17	103	45	17	0.03	1.60	0.57	0.15
Total for Perennial Forbs		472	350	410	475	198	294	3.39	6.59	2.01	4.06
Total for Forbs		502	357	427	578	243	311	3.43	8.20	2.59	4.22

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

BROWSE TRENDS --

Management unit 25C, Study no: 12

T y p e	Species	Strip Frequency				Average Cover %			
		'94	'98	'03	'08	'94	'98	'03	'08
B	Amelanchier utahensis	2	5	4	9	.30	.45	.53	.30
B	Artemisia nova	95	90	97	95	17.12	17.40	25.88	16.39
B	Artemisia tridentata tridentata	0	0	0	0	-	-	-	.38
B	Cercocarpus montanus	1	0	0	0	.00	-	-	-
B	Chrysothamnus depressus	11	5	4	8	.06	.48	.09	.10
B	Chrysothamnus viscidiflorus viscidiflorus	13	16	13	10	.36	1.11	.72	.28
B	Eriogonum microthecum	16	26	22	19	.13	.80	.25	.16
B	Gutierrezia sarothrae	2	17	8	7	.06	.42	.21	.03
B	Opuntia sp.	2	0	0	0	.00	-	-	-
B	Pediocactus simpsonii	0	10	9	13	-	.03	.03	.06
B	Pinus edulis	0	1	0	0	-	.00	-	.15
B	Pinus ponderosa	0	4	2	2	.18	.31	.30	.30
B	Purshia tridentata	35	15	34	36	7.43	5.48	7.10	5.15
B	Quercus gambelii	0	17	13	11	2.47	5.36	3.19	3.45
B	Sclerocactus sp.	0	4	0	3	-	.00	-	.00
B	Tetradymia canescens	0	1	2	1	-	.00	.00	.00
Total for Browse		177	211	208	214	28.14	31.87	38.32	26.77

CANOPY COVER, LINE INTERCEPT --

Management unit 25C, Study no: 12

Species	Percent Cover	
	'03	'08
Amelanchier utahensis	.18	.13
Artemisia nova	25.63	19.36
Chrysothamnus viscidiflorus viscidiflorus	.68	.61
Eriogonum microthecum	.16	.05
Gutierrezia sarothrae	.15	-
Pediocactus simpsonii	.05	.05
Pinus edulis	.03	1.53
Pinus ponderosa	.55	-
Purshia tridentata	6.06	8.85
Quercus gambelii	4.08	.66

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 25C, Study no: 12

Species	Average leader growth (in)	
	'03	'08
Artemisia nova	1.2	1.2
Purshia tridentata	3.5	1.2

POINT-QUARTER TREE DATA --

Management unit 25C, Study no: 12

Species	Trees per Acre		
	'98	'03	'08
Pinus edulis	20	20	21
Pinus ponderosa	33	32	33

Average diameter (in)		
'98	'03	'08
3.5	3.5	3.9
6.0	7.9	4.0

BASIC COVER --

Management unit 25C, Study no: 12

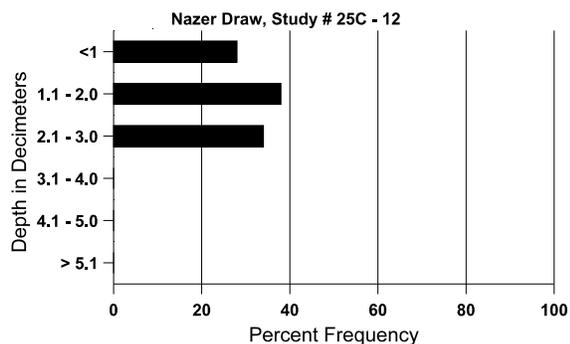
Cover Type	Average Cover %					
	'87	'91	'94	'98	'03	'08
Vegetation	10.75	7.75	33.47	49.48	42.52	37.54
Rock	7.00	8.00	14.85	15.41	14.18	14.01
Pavement	10.75	13.00	4.99	12.05	6.04	11.26
Litter	62.25	58.50	34.90	54.52	42.09	40.19
Cryptogams	0	0	.00	0	.38	0
Bare Ground	9.25	12.75	12.34	10.12	10.93	8.87

SOIL ANALYSIS DATA --

Management unit 25C, Study no: 12, Study Name: Nazer Draw

Effective rooting depth (in)	Temp °F (depth)	pH	sandy loam			%OM	PPM P	PPM K	ds/m
			% sand	% silt	% clay				
10.4	53.4 (12.1)	5.6	60.0	21.8	18.2	2.4	10.3	112.0	0.4

Stoniness Index



PELLET GROUP DATA --

Management unit 25C, Study no: 12

Type	Quadrat Frequency			
	'94	'98	'03	'08
Rabbit	23	10	12	35
Elk	5	12	6	1
Deer	35	24	38	43
Cattle	-	2	4	1

Days use per acre (ha)		
'98	'03	'08
-	-	-
9 (22)	11 (26)	15 (36)
27 (67)	63 (155)	24 (60)
6 (15)	5 (13)	1 (2)

BROWSE CHARACTERISTICS --

Management unit 25C, Study no: 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)
Amelanchier utahensis												
87	133	-	133	-	-	-	50	50	0	-	50	-/-
91	132	-	66	-	66	-	0	100	50	-	0	-/-
94	40	-	-	40	-	-	0	50	0	-	0	18/20
98	100	-	40	60	-	-	20	0	0	-	0	22/30
03	80	-	20	40	20	-	25	50	25	25	25	20/19
08	200	-	140	60	-	-	10	10	0	-	0	26/30
Artemisia nova												
87	14598	466	1133	8466	4999	-	25	4	34	.95	12	8/7
91	21864	2399	3599	12666	5599	-	44	12	26	4	15	12/14
94	8820	14640	1640	5200	1980	640	22	0	22	3	4	13/21
98	11080	2000	4640	4440	2000	820	15	.36	18	2	2	15/26
03	19540	180	4400	11720	3420	1140	0	0	18	8	9	12/18
08	18400	820	3120	9640	5640	1280	18	4	31	8	12	11/17
Cercocarpus montanus												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	20	-	-	20	-	-	0	0	-	-	0	19/16
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	20/20
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 depressus												
87	865	-	199	666	-	-	23	15	0	-	0	4/4
91	1199	-	133	933	133	-	17	39	11	-	0	7/11
94	280	-	-	260	20	-	14	0	7	-	0	4/8
98	180	-	-	180	-	-	0	0	0	-	0	3/8
03	100	-	-	60	40	-	40	60	40	-	0	4/8
08	260	-	20	180	60	-	15	46	23	8	8	4/7
Chrysothamnus viscidiflorus viscidiflorus												
87	799	-	266	533	-	-	0	0	0	-	0	4/8
91	798	-	266	466	66	-	42	33	8	-	0	4/7
94	360	-	-	360	-	-	0	0	0	-	0	7/12
98	540	-	180	340	20	-	0	0	4	4	4	26/34
03	400	-	-	340	60	-	5	0	15	10	10	8/11
08	280	20	20	200	60	20	0	7	21	7	7	12/14
Eriogonum microthecum												
87	2798	333	533	1799	466	-	24	5	17	-	7	4/2
91	3464	-	1399	1999	66	-	37	8	2	.57	2	5/5
94	640	-	120	520	-	-	6	0	0	-	0	4/5
98	800	60	280	520	-	-	3	0	0	-	0	6/7
03	840	-	60	780	-	-	43	7	0	-	0	6/6
08	680	-	20	640	20	20	3	6	3	-	0	5/7
Gutierrezia sarothrae												
87	866	-	133	733	-	-	0	0	0	-	0	8/4
91	465	-	66	399	-	-	0	0	0	-	0	8/6
94	60	-	-	40	20	-	0	0	33	-	0	8/6
98	660	100	80	580	-	40	0	0	0	-	0	9/8
03	220	-	-	220	-	-	0	0	0	-	9	8/7
08	220	-	-	220	-	-	0	0	0	-	0	8/8
Opuntia sp.												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	40	-	-	40	-	20	0	0	-	-	0	2/3
98	0	-	-	-	-	-	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)
Pediocactus simpsonii												
87	0	-	-	-	-	-	0	0	0	-	0	-/-
91	0	-	-	-	-	-	0	0	0	-	0	-/-
94	0	-	-	-	-	-	0	0	0	-	0	-/-
98	200	-	40	160	-	-	0	0	0	-	0	3/5
03	200	-	40	140	20	-	0	0	10	10	10	2/3
08	260	-	40	220	-	-	0	0	0	-	0	2/3
Pinus edulis												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
98	20	-	20	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	-/-
Pinus ponderosa												
87	66	-	66	-	-	-	0	0	0	-	0	-/-
91	66	-	-	-	66	-	0	0	100	-	0	-/-
94	0	-	-	-	-	-	0	0	0	-	0	-/-
98	80	-	80	-	-	-	0	0	0	-	0	-/-
03	40	-	40	-	-	20	0	0	0	-	0	-/-
08	40	20	40	-	-	-	0	0	0	-	0	-/-
Purshia tridentata												
87	66	266	-	66	-	-	0	100	0	-	0	22/67
91	798	599	266	466	66	-	42	42	8	3	8	7/10
94	1500	20	40	1300	160	20	60	16	11	-	0	12/37
98	540	-	120	400	20	-	19	26	4	-	0	21/52
03	1440	-	20	760	660	60	3	97	46	26	32	16/41
08	1720	-	40	1420	260	140	60	28	15	2	2	18/36
Quercus gambelii												
87	0	-	-	-	-	-	0	0	0	-	0	-/-
91	0	-	-	-	-	-	0	0	0	-	0	-/-
94	0	-	-	-	-	-	0	0	0	-	0	-/-
98	1680	520	400	1240	40	180	0	0	2	1	1	52/47
03	1500	-	420	1000	80	140	0	0	5	5	5	29/17
08	1480	100	460	880	140	200	0	0	9	-	4	52/26

		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)
Sclerocactus sp.												
87	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
98	140	-	100	40	-	-	0	0	-	-	0	3/4
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	60	-	-	60	-	-	0	0	-	-	0	2/3
Tetradymia canescens												
87	66	-	66	-	-	-	0	0	0	-	0	-/-
91	66	-	66	-	-	-	0	0	0	-	0	-/-
94	0	-	-	-	-	-	0	0	0	-	0	6/7
98	20	-	-	20	-	-	0	0	0	-	0	6/7
03	40	-	20	-	20	-	0	0	50	-	0	7/6
08	20	-	-	20	-	-	0	0	0	-	0	6/4