Trend Study 19B-6-02

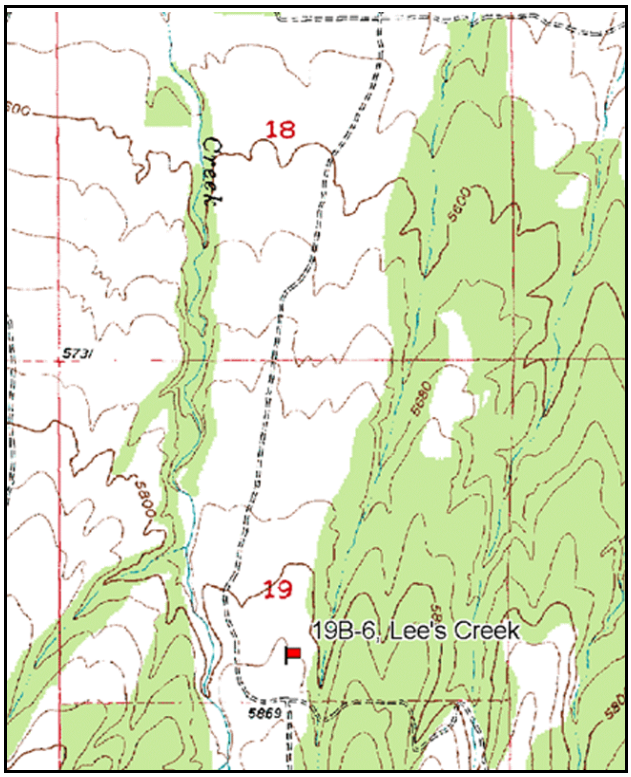
Study site name: Lee's Creek . Vegetation type: Chained, Seeded PJ .

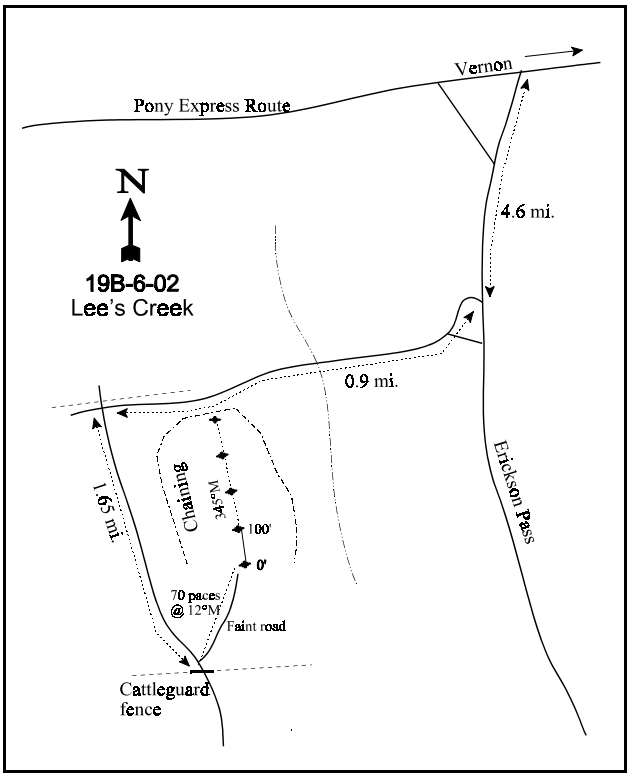
Compass bearing: frequency baseline 345 degrees magnetic.

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

LOCATION DESCRIPTION

Starting at the intersection of the Erickson Pass and Pony Express Roads, proceed south on the Erickson Pass Road for 4.60 miles to an intersection. Turn right at the intersection and proceed west for 0.9 miles to another intersection. Turn left at the intersection and proceed south for 1.65 miles to a cattle guard and gate. From the cattle guard, the 0-foot stake of the baseline, is 70 paces away at an azimuth of 12 degrees magnetic. The study runs at an azimuth of 345 degrees true. The study is located just inside the chaining that is adjacent to the burn. A red browse tag, number 3973, is attached to the 0-foot marker of the baseline.





Map Name: Indian Peaks

Diagrammatic Sketch

Township 9S , Range 7W , Section 19

GPS: NAD 27, UTM 12S 4430784 N 357071 E

DISCUSSION

Lee's Creek - Trend Study No. 19B-6

The Lee's Creek study is located in the lower portion of the Lee's Creek drainage on an old BLM juniper chaining. The study is situated on a north-south running ridge that slopes gently to the north at an elevation of 5,850 feet. It was noted in 1983 that the seeded grasses were heavily utilized by cattle causing vigor to be depressed. In 1989, observations indicated that crested wheatgrass had not grown yet from the previous grazing season due to the exceptionally hot and dry spring and summer. Vigor was depressed with very little associated litter. Observations through the years have always noted that the area has shown very little wildlife use. The area does not appear to be utilized heavily by deer, but signs of cattle and rabbit are moderate. In 1997, cattle were grazing a burned area west of the study site. The study site is now a fairly narrow corridor between burned areas of the seeded juniper chaining. A pellet group transect read on site in 2002 estimated 21 cow days use/acre (52 cdu/ha) and less than one deer day use/acre (2 ddu/ha). Rabbit pellets were also abundant in 2002. Nearly all of the cattle pats sampled in 2002 were from the previous grazing season.

Soil is alluvially deposited with minimal surface rock. However, pavement is abundant at an estimated 23% in 2002. Chemical and textural analysis indicates a loam soil with a neutral reactivity (pH of 7.0). Estimated effective rooting depth was 10 inches in 1997, and average temperature was 63°F at 13 inches in depth. Soil phosphorous was measured to be 6.3 ppm which is considered low (10 ppm is considered minimal for normal plant growth and development). Erosion is currently minimal due to minimal slope and moderate vegetation and litter cover. The erosion condition class was determined to be stable in 2002.

The key browse is Wyoming big sagebrush which had an estimated density of 3,260 plants/acre in 2002. This represents an increase from 2,260 plants/acre in 1997. Density has increased due to a very high proportion of young plants in the population in 1997 (72%), of which many entered the mature class by 2002. Recruitment continues to be good in 2002 (23%). The age structure of this Wyoming big sagebrush population has included a moderate to high proportion of young plants and a low number of decadent plants in all readings. Utilization is light and plants exhibit good vigor for the most part. During the 2002 reading, Wyoming big sagebrush showed poor annual leader growth (1.1 inches) and low seed production. Antelope bitterbrush is present in limited numbers on the site. Density was estimated at 40 plants/acre in 2002. Utilization was heavy resulting in a prostrate growth form, but this is expected with such a low density.

Point-center quarter data indicates little change in Utah juniper density. Estimated juniper density has ranged from 93-97 trees per acre since 1989. Other species scattered around the site include white-stemmed rubber rabbitbrush, pricklypear cactus, and broom snakeweed.

The herbaceous understory is dominated by crested wheatgrass, with Sandberg bluegrass being secondary. Nested frequency of crested wheatgrass slightly increased between 1983 and 1989, but has decreased the last two readings. Sandberg bluegrass increased in nested frequency with each reading between 1983 and 1997. It remained stable in 2002. Crested wheatgrass seedheads were apparent in 2002, but overall biomass production was only fair. It was noted in 2002 that crested wheatgrass plants in the adjacent burned areas had better vigor, stature, and provided more cover compared to the plants sampled by this transect. Other grasses sampled on the site in very low frequencies are bluebunch wheatgrass, bottlebrush squirreltail, and Letterman needlegrass.

The forb component is limited on this site. The most abundant species have poor forage value including Hoods phlox and rock goldenrod. Pale alyssum and bur buttercup, both annual species, were the most abundant forbs in 1997, but neither was sampled in 2002 with the drought conditions.

1983 APPARENT TREND ASSESSMENT

Although soil erosion or sedimentation are not currently serious problems, continuing livestock use is having some deleterious effects. Most notable are soil compaction from trampling, prevention of litter accumulation, and a slight but detectable reduction in vigor of the principal grass species. Overall soil trend appears stable. Browse data and visual observations indicate that the rather sparse Wyoming big sagebrush stand may be slowly increasing in density. Antelope bitterbrush, although heavily hedged, is maintaining its population. Reproduction and vigor of the herbaceous component is adequate to maintain the current stand but probably insufficient to allow any significant expansion.

1989 TREND ASSESSMENT

Although percent vegetation cover increased, percent bare ground increased and litter cover decreased. These factors, combined with an increase in rock and pavement cover, lead to a slightly downward soil trend. The browse trend is stable with a healthy Wyoming big sagebrush population. Density remained nearly identical to 1983 estimates, decadence remains low, and recruitment is good. The herbaceous understory trend is slightly upward with an increase in herbaceous understory sum of nested frequency.

TREND ASSESSMENT
soil - slightly down (2)
browse - stable (3)
herbaceous understory - slightly up (4)

1997 TREND ASSESSMENT

The soil trend is stable. Although still relatively high, percent bare ground decreased as vegetative cover increased. The levelness of the site, in conjunction with the vegetation and litter cover, help keep erosion to a minimum. The Wyoming big sagebrush population continues to be healthy with many seedling and young plants present in 1997. Utilization is light and the plants exhibit good vigor. The browse trend is up. Perennial herbaceous understory sum of nested frequency has increased since 1989, but only slightly. Crested wheatgrass is still the dominate grass, even though it significantly declined in nested frequency. Conversely, Sandberg bluegrass has significantly increased in frequency since 1989. The herbaceous understory trend is stable.

TREND ASSESSMENT
soil - stable (3)
browse - up (5)
herbaceous understory - stable (3)

2002 TREND ASSESSMENT

Trend for soil is stable. The basic cover categories are similar compared to the 1997 estimates. The erosion condition class was also determined as stable. Trend for browse is slightly up. Wyoming big sagebrush density increased, recruitment from young plants remains good, and decadence is low. Considering the drought conditions in 2002, these are very positive signs for Wyoming big sagebrush on this site. Trend for the herbaceous understory is stable, but composition and abundance are poor. Crested wheatgrass declined in nested frequency but not significantly, and Sandberg bluegrass remained stable in nested frequency.

TREND ASSESSMENT
soil - stable (3)
browse - slightly up (4)
herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 19B, Study no: 6

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
G	Agropyron cristatum	$_{b}$298	$_{b}$308	$_{a}$277	$_{a}$238	97	98	93	85	10.01	8.93
G	Agropyron spicatum	$_{b}$25	$_{a}$-	$_{a}$-	$_{a}$3	10	-	-	1	-	.03
G	Bromus tectorum (a)	-	-	$_{b}$21	$_{a}$-	-	-	8	-	.21	-
G	Oryzopsis hymenoides	1	-	-	-	1	-	-	-	.00	-
G	Poa secunda	$_{a}$94	$_{b}$165	$_{c}$215	$_{c}$213	44	71	79	81	4.44	3.03
G	Sitanion hystrix	$_{b}$28	$_{a}$8	$_{a}$2	$_{a}$4	16	4	2	2	.03	.18
G	Stipa lettermani	-	-	1	-	-	-	1	-	.03	-
Total for Annual Grasses		0	0	21	0	0	0	8	0	0.20	0
Total for Perennial Grasses		446	481	495	458	168	173	175	169	14.53	12.17
Total for Grasses		446	481	516	458	168	173	183	169	14.74	12.17
F	Alyssum alyssoides (a)	-	-	$_{b}$116	$_{a}$-	-	-	41	-	.25	-
F	Antennaria rosea	-	-	-	1	-	-	-	1	-	.00
F	Astragalus spp.	-	1	8	-	-	1	4	-	.20	-
F	Astragalus utahensis	-	-	-	-	-	-	-	-	.00	-
F	Chaenactis douglasii	1	-	5	2	1	-	2	1	.01	.00
F	Crepis acuminata	-	3	4	-	-	1	3	-	.01	-
F	Hymenoxys acaulis	-	4	-	-	-	2	-	-	-	-
F	Microsteris gracilis (a)	-	-	1	-	-	-	1	-	.00	-
F	Petradoria pumila	$_{a}$4	$_{ab}$11	$_{bc}$28	$_{c}$30	2	5	12	13	1.33	.76
F	Phlox hoodii	25	29	23	17	11	16	9	8	.31	.09
F	Phlox longifolia	-	1	2	-	-	1	2	-	.01	-
F	Ranunculus testiculatus (a)	-	-	$_{b}$98	$_{a}$-	-	-	38	-	.31	-
F	Townsendia incana	-	2	-	-	-	1	-	-	-	-
F	Zigadenus paniculatus	-	-	-	-	-	-	-	-	.03	-
Total for Annual Forbs		0	0	215	0	0	0	80	0	0.57	0
Total for Perennial Forbs		30	51	70	50	14	27	32	23	1.92	0.86
Total for Forbs		30	51	285	50	14	27	112	23	2.49	0.86

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

BROWSE TRENDS --
Herd unit 19B, Study no: 6

Type	Species	Strip Frequency		Average Cover %	
		'97	'02	'97	'02
B	Artemisia tridentata wyomingensis	42	52	4.61	5.14
B	Atriplex canescens	0	1	-	-
B	Chrysothamnus nauseosus albicaulis	5	1	.01	-
B	Gutierrezia sarothrae	4	4	.30	1.23
B	Juniperus osteosperma	6	7	9.64	9.37
B	Purshia tridentata	1	1	-	-
Total for Browse		58	66	14.57	15.75

CANOPY COVER -- LINE INTERCEPT
Herd unit 19B, Study no: 6

Species	Percent Cover	
	'97	'02
Artemisia tridentata wyomingensis	-	6.92
Chrysothamnus nauseosus albicaulis	-	.08
Gutierrezia sarothrae	-	.50
Juniperus osteosperma	6	14.42

Key Browse Annual Leader Growth
Herd unit 19B , Study no: 6

Species	Average leader growth (in)
	'02
Artemisia tridentata wyomingensis	1.1

Point-Quarter Tree Data
Herd unit 19B , Study no: 6

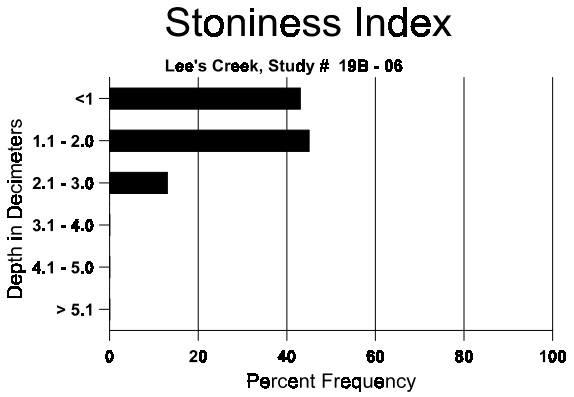
Species	Trees per Acre		Average diameter (in)	
	'97	'02	'97	'02
Juniperus osteosperma	93	97	4.3	5.1

BASIC COVER --
Herd unit 19B, Study no: 6

Cover Type	Nested Frequency		Average Cover %			
	'97	'02	'83	'89	'97	'02
Vegetation	337	309	3.25	7.75	26.29	27.71
Rock	167	194	0	5.00	1.88	2.55
Pavement	299	324	4.50	11.50	11.55	23.43
Litter	386	357	59.75	36.75	32.06	31.87
Cryptogams	213	67	0	0	5.19	.58
Bare Ground	281	291	32.50	39.00	24.19	25.08

SOIL ANALYSIS DATA --
Herd Unit 19B, Study no: 6, Lee's Creek

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
10.2	62.5 (12.7)	7.0	38.0	36.1	25.9	3.0	6.3	182.4	0.7



PELLET GROUP FREQUENCY --
Herd unit 19B, Study no: 6

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'97	'02	'02	'02
Rabbit	27	8	-	-
Deer	14	3	9	1 (2)
Cattle	22	14	252	21 (52)

BROWSE CHARACTERISTICS --
Herd unit 19B, Study no: 6

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
S	83	4	-	-	-	-	-	-	-	-	4	-	-	-	133			4
	89	-	-	-	3	-	-	-	-	-	3	-	-	-	100			3
	97	86	-	-	2	-	-	-	-	-	88	-	-	-	1760			88
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	83	10	-	-	-	-	-	-	-	-	10	-	-	-	333			10
	89	6	2	-	-	-	-	-	-	-	7	-	1	-	266			8
	97	77	4	-	-	-	-	-	-	-	81	-	-	-	1620			81
	02	38	-	-	-	-	-	-	-	-	36	-	2	-	760			38
M	83	7	1	-	-	-	-	-	-	-	8	-	-	-	266	35	36	8
	89	6	5	-	-	-	-	-	-	-	6	3	2	-	366	25	27	11
	97	27	3	1	1	-	-	-	-	-	26	-	6	-	640	25	38	32
	02	103	10	-	-	-	-	-	-	-	112	-	1	-	2260	21	30	113
D	83	3	-	-	-	-	-	-	-	-	3	-	-	-	100			3
	89	1	1	-	-	-	-	-	-	-	2	-	-	-	66			2
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	10	2	-	-	-	-	-	-	-	3	-	-	9	240			12
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	05%	00%	00%	- 0%
'89	38%	00%	14%	+69%
'97	06%	.88%	05%	+31%
'02	07%	00%	07%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:
	'83	699	14%
	'89	698	9%
	'97	2260	0%
	'02	3260	7%

Atriplex canescens																		
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	2	-	-	-	-	-	-	-	-	2	-	-	-	40	-	-	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:
	'83	0	-
	'89	0	-
	'97	0	-
	'02	40	-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus nauseosus albicaulis																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	4	1	2	-	-	-	-	-	-	6	-	1	-	140			7
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	11	16	0
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	1	-	-	-	-	-	-	1	-	-	-	20			1
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	14%	29%	14%	-86%
'02	00%	100%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	0	Dec:	0%
'89	0		0%
'97	140		0%
'02	20		100%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	10	-	-	-	-	-	-	-	-	10	-	-	-	200	7	10	10
	02	14	-	-	-	-	-	-	-	-	14	-	-	-	280	7	11	14
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	9	-	-	-	-	-	-	-	-	6	-	-	3	180			9
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	00%	00%	00%	+50%
'02	00%	00%	13%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	0	Dec:	0%
'89	0		0%
'97	240		0%
'02	480		38%

Juniperus osteosperma																		
M	83	2	-	-	-	-	-	-	-	-	2	-	-	-	66	67	41	2
	89	3	-	-	-	-	-	-	-	-	3	-	-	-	100	87	52	3
	97	4	-	-	2	-	-	-	-	-	6	-	-	-	120	-	-	6
	02	3	-	-	2	-	-	3	-	-	8	-	-	-	160	-	-	8
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+34%
'89	00%	00%	00%	+17%
'97	00%	00%	00%	+25%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'83	66	Dec:	-
'89	100		-
'97	120		-
'02	160		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Leptodactylon pungens																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	3	-	-	-	-	-	-	-	-	3	-	-	-	100	8	15	3
	89	2	-	-	-	-	-	-	-	-	2	-	-	-	66	6	7	2
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	2	-	-	-	-	-	-	-	-	-	-	-	2	66			2
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+49%
'89	00%	00%	33%	
'97	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	100	Dec:	0%
'89	198		33%
'97	0		0%
'02	0		0%

Opuntia spp.																		
M	83	1	-	-	-	-	-	-	-	-	-	1	-	-	33	6	15	1
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	33	6	15	1
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	6	21	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	5	18	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+ 0%
'89	00%	00%	00%	
'97	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'83	33	Dec:	-
'89	33		-
'97	0		-
'02	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Purshia tridentata																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	1	-	-	-	-	-	-	1	-	-	-	20			1
	02	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	83	-	-	4	-	-	-	-	-	-	4	-	-	-	133	13	31	4
	89	-	-	4	-	-	-	-	-	-	4	-	-	-	133	10	19	4
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	9	24	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	12	51	0
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	1	-	-	-	-	-	-	-	-	-	-	-	1	33			1
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	100%	00%	+20%
'89	00%	80%	20%	-88%
'97	00%	100%	00%	+50%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	133	Dec:	0%
	'89	166		20%
	'97	20		0%
	'02	40		0%