Trend Study 16C-7-02

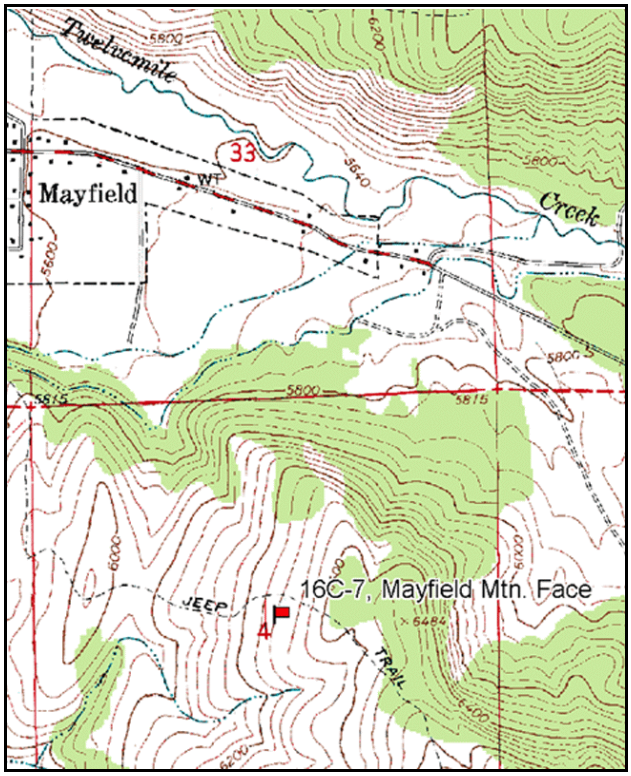
Study site name: Mayfield Mtn. Face . Vegetation type: Chained, Seeded P-J .

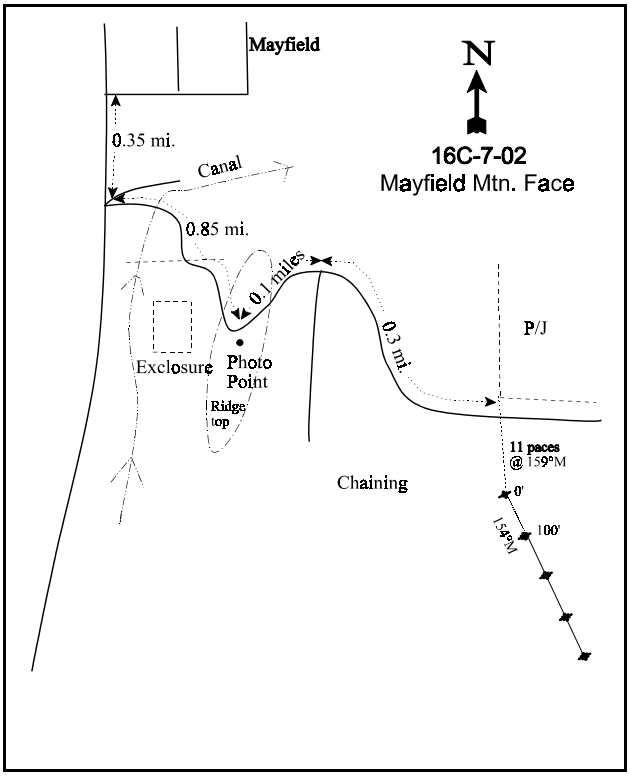
Compass bearing: frequency baseline 154 degrees magnetic.

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

LOCATION DESCRIPTION

From the intersection of the main road and Twelve Mile Canyon Road in Mayfield, go south out of town on the main road for 0.35 miles into Arapien Valley to an intersection. At the intersection, turn east up a steep four-wheel drive road that goes up the hill. Take this road 0.85 miles to an old line-intercept photo point on the ridge top (a canal and fence will be crossed 0.1 miles east of the ridge top and you will come to a fork in the road). Go straight (east) for 0.3 miles to a fence corner on the north side of the road. From the fence corner, walk 11 paces at 159 degrees magnetic to the 0-foot baseline stake.





Map Name: Mayfield

Diagrammatic Sketch

Township 20S , Range 2E ,Section 4

GPS: NAD 27, UTM 12S 4327808 N 440012 E

DISCUSSION

Mayfield Mountain Face - Trend Study No. 16C-7

The Mayfield Mountain Face study is located on a large, 30-year old chaining and seeding treatment southeast of Mayfield. The site lies on a moderately steep (15-20%), west facing slope at an elevation of 6,200 feet. The area is critical for wintering deer, but also receives some spring-fall use by big game. Quadrat frequency of deer pellets was moderately high in 1997 and 2002 at 47% and 43% respectively. Deer use was estimated at 56 days use/acre (139 ddu/ha) from pellet group transect data taken in 2002. Elk use was very light at only 3 days use/acre (7 edu/ha). A few cattle pats were also encountered.

The soil is classified as Fontreen very cobbly loam. Soils are strongly calcareous, allowing calcium carbonate precipitates to form a hardened caliche layer. Soil at the site has a clay loam texture and reactivity is neutral to slightly alkaline (pH of 7.3). There is a well developed hardpan within localized areas about 10 inches below the surface. Soils are shallow with an estimated effective rooting depth of under 9 inches. Rock and pavement cover are high and armor the surface. Percent bare soil was also moderately high at 22% in 2002, an increase from only 5% in 1997. Vegetation and litter cover are not as abundant on this site compared to most chained and seeded sites. The ratio of protective cover (vegetation, litter, and cryptogams) to bare soil declined from 5:1 in 1997 to 3:1 in 2002 with the drought conditions. However, the vegetation and litter that are present are well distributed over the site and are adequate to prevent serious erosion. An erosion condition class assessment was determined as slight in 2002.

The increase of juniper since treatment has been slow. Juniper density was estimated at 32 trees/acre using point quarter data in 2002. Pinyon density was estimated at only 8 trees/acre. Juniper density estimates from 1989 and 1997 (35 and 31 trees/acre respectively) show that juniper has remained stable since the initial reading. Older trees within the adjacent unchained stand have been highlined.

Black sagebrush is the most common shrub, and the key browse species within this chained area. Density of black sagebrush was estimated at 2,540 plants/acre in 1997, slightly increasing to 2,660 plants/acre in 2002. Percent decadence remained stable between 1997 and 2002 (12% and 13% respectively), as did vigor which is mostly normal throughout the population. Recruitment from young plants decreased from 16% in 1997 to 1% in 2002, but with drought, this is expected and has occurred in browse populations on many other sites in the area. Utilization on black sagebrush is moderate, and annual leader growth averaged less than 1 inch in 2002. The few mountain big sagebrush, bitterbrush, and four-wing saltbush that occur on site have been very heavily browsed.

Perennial grasses are the dominant vegetative component on the site, although their sum of nested frequency value declined by 29% in 2002 with the drought. Perennial grasses made up 52% of the total vegetative cover in1997, decreasing to 41% in 2002. Bluebunch wheatgrass, crested wheatgrass, and Sandberg bluegrass are the most abundant species. In 2002, nested frequency of crested wheatgrass declined but not significantly, bluebunch wheatgrass remained almost identical, and Sandberg bluegrass significantly declined. Grasses had been heavily utilized by cattle prior to sampling in July 2002, and most plants including the perennial species were already dried up. Visually, this site looked poor in 2002 due to drought and heavy use. The forb composition is dominated by bur buttercup, a species that has allelopathic properties. Perennial forbs have been nearly non-existent on the site in all readings.

1989 APPARENT TREND ASSESSMENT

Slight soil movement is detectable, but not excessive. Soil trend appears stable. Compared to the unchained areas, this treatment was successful in providing abundant grass forage. Browse production is less than optimum and the more palatable species are heavily utilized. The trend appears to be slightly declining.

1997 TREND ASSESSMENT

Trend for soil is slightly up as percent bare soil has decreased from 9% to 5%. Another important factor is that the herbaceous understory makes up almost 70% of the total plant cover. Herbaceous cover provides the best form of soil protection from erosive events that can occur during high intensity summer storms. The browse trend is stable. Black sagebrush density is estimated to be much lower than the 1989 reading. However, most of this difference can be accounted for by the significantly larger sample size that is now utilized. Use and decadence have declined since 1989, and recruitment from young plants remains good at 16% of the population. The herbaceous understory trend is stable overall because perennial grasses slightly increased in sum of nested frequency. However, the annual bur buttercup, should be closely watched for future population trends. This species provides almost 6% average cover which is excessive for an annual species with a small growth form.

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

2002 TREND ASSESSMENT

Trend for soil is down. Bare soil increased from 5% to 22%, and cover and nested frequency of herbaceous vegetation decreased. Vegetation and litter are low for a chained and seeded site. Rock and pavement are very high at nearly 30%. Erosion is only slight because of the abundance of rock and pavement on the surface and the level terrain. The ratio of protective cover (vegetation, litter, and cryptogams) to bare soil declined significantly in 2002, but remains good at nearly 3:1. Trend for browse is stable. Black sagebrush density slightly increased, decadence remains low and vigor is generally good throughout the population. Trend for the herbaceous understory is down. Sum of nested frequency of perennial grasses declined by 29% in 2002. Project personnel noted that this site looked very poor due to drought conditions and heavy use on the grasses by cattle prior to sampling. Bur buttercup remains abundant, and perennial forbs are non-existent.

TREND ASSESSMENT
soil - down (1)
browse - stable (3)
herbaceous understory - down (1)

HERBACEOUS TRENDS --
Herd unit 16C, Study no: 7

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'89	'97	'02	'89	'97	'02	'97	'02
G	Agropyron cristatum	$_{a}$94	$_{b}$147	$_{ab}$127	40	53	48	6.38	4.06
G	Agropyron intermedium	$_{a}$7	$_{b}$36	$_{a}$5	6	15	2	.89	.03
G	Agropyron spicatum	$_{b}$226	$_{a}$135	$_{a}$134	81	53	50	6.23	5.69
G	Bromus inermis	$_{b}$27	$_{b}$35	$_{a}$1	14	16	1	.40	.00
G	Bromus tectorum (a)	-	$_{b}$31	$_{a}$3	-	13	1	.40	.00
G	Elymus junceus	$_{a}$-	$_{b}$7	$_{a}$2	-	3	1	.30	.00
G	Oryzopsis hymenoides	1	7	-	1	2	-	.53	-
G	Poa pratensis	-	-	3	-	-	2	-	.03
G	Poa secunda	$_{b}$196	$_{b}$205	$_{a}$135	82	73	50	4.19	1.18

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'89	'97	'02	'89	'97	'02	'97	'02
Total for Annual Grasses		0	31	3	0	13	1	0.40	0.00
Total for Perennial Grasses		551	572	407	224	215	154	18.93	11.02
Total for Grasses		551	603	410	224	228	155	19.34	11.02
F	Antennaria rosea	1	-	-	1	-	-	-	-
F	Arabis spp.	5	1	-	3	1	-	.00	-
F	Astragalus utahensis	2	2	-	1	1	-	.03	-
F	Camelina microcarpa (a)	-	1	-	-	1	-	.00	-
F	Calochortus nuttallii	-	5	-	-	3	-	.01	-
F	Cryptantha spp.	4	-	-	2	-	-	-	-
F	Descurainia pinnata (a)	-	$_{b}$9	$_{a}$-	-	5	-	.02	-
F	Holosteum umbellatum (a)	-	1	-	-	1	-	.00	-
F	Lactuca serriola	-	4	-	-	2	-	.01	-
F	Medicago sativa	2	5	-	1	2	-	.18	-
F	Phlox hoodii	$_{b}$22	$_{a}$6	$_{a}$2	10	2	2	.06	.01
F	Ranunculus testiculatus (a)	-	$_{b}$317	$_{a}$255	-	95	79	5.05	5.85
Total for Annual Forbs		0	328	255	0	102	79	5.08	5.85
Total for Perennial Forbs		36	23	2	18	11	2	0.30	0.01
Total for Forbs		36	351	257	18	113	81	5.38	5.86

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

BROWSE TRENDS --
Herd unit 16C, Study no: 7

Type	Species	Strip Frequency		Average Cover %	
		'97	'02	'97	'02
B	Artemisia nova	51	53	8.85	8.24
B	Artemisia tridentata vaseyana	10	9	.96	.93
B	Atriplex canescens	0	1	-	-
B	Chrysothamnus nauseosus albicaulis	0	3	-	-
B	Chrysothamnus viscidiflorus stenophyllus	21	17	1.50	.28
B	Ephedra viridis	0	1	-	-
B	Gutierrezia sarothrae	19	13	.10	.04
B	Juniperus osteosperma	1	1	-	.53
Total for Browse		102	98	11.42	10.03

CANOPY COVER -- LINE INTERCEPT
Herd unit 16C, Study no: 7

Species	Percent Cover	
	'97	'02
Artemisia nova	-	7.75
Artemisia tridentata vaseyana	-	.58
Atriplex confertifolia	-	.05
Chrysothamnus viscidiflorus	-	.17
Gutierrezia sarothrae	-	.03
Juniperus osteosperma	-	.83

Key Browse Annual Leader Growth
Herd unit 16C , Study no: 7

Species	Average leader growth (in)
	'02
Artemisia nova	0.6

Point-Quarter Tree Data
Herd unit 16C , Study no: 7

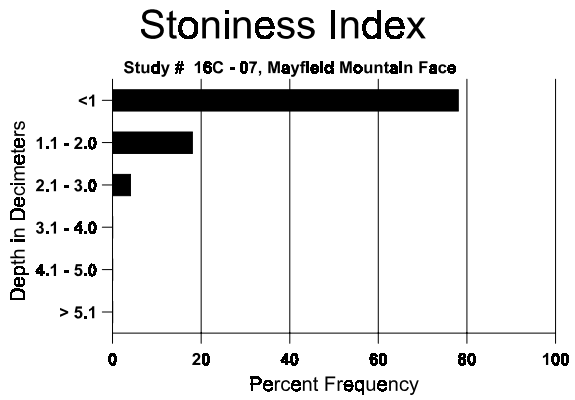
Species	Trees per Acre		Average diameter (in)	
	'97	'02	'97	'02
Juniperus osteosperma	31	32	2.5	3.0
Pinus edulis	9	8	3.5	5.2

BASIC COVER --
Herd unit 16C, Study no: 7

Cover Type	Nested Frequency		Average Cover %		
	'97	'02	'89	'97	'02
Vegetation	367	349	10.00	36.70	27.01
Rock	277	280	7.75	11.17	13.73
Pavement	295	325	46.00	12.71	15.39
Litter	377	370	27.25	25.64	29.80
Cryptogams	198	141	0	6.10	2.51
Bare Ground	189	291	9.00	5.19	22.09

SOIL ANALYSIS DATA --
Herd Unit 16C, Study no: 07, Mayfield Mountain Face

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
8.7	61.0 (10.2)	7.3	30.0	37.4	32.6	4.9	11.9	144.0	.4



PELLET GROUP FREQUENCY --
Herd unit 16C, Study no: 7

Type	Quadrat Frequency '97	Quadrat Frequency '02	Pellet Transect: Pellet Groups per Acre '02	Pellet Transect: Days Use per Acre (ha) '02
Rabbit	19	10	-	-
Elk	4	2	35	3 (7)
Deer	47	43	731	56 (139)
Cattle	-	5	44	4 (9)

BROWSE CHARACTERISTICS --
Herd unit 16C, Study no: 7

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 nova																		
S	89	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	97	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	89	6	5	-	-	-	-	-	-	-	7	-	4	-	733			11
	97	20	-	-	-	-	-	-	-	-	20	-	-	-	400			20
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	89	21	21	3	-	-	-	-	-	-	27	-	18	-	3000	14	16	45
	97	79	13	-	-	-	-	-	-	-	92	-	-	-	1840	15	28	92
	02	52	20	43	-	-	-	-	-	-	115	-	-	-	2300	13	26	115
D	89	18	7	1	-	-	-	-	-	-	21	-	5	-	1733			26
	97	15	-	-	-	-	-	-	-	-	10	-	-	5	300			15
	02	10	3	4	-	-	-	-	-	-	12	-	-	5	340			17
X	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	140			7
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	140			7

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	40%	05%	33%	-54%
'97	10%	00%	04%	+ 5%
'02	17%	35%	04%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:
	'89	5466	32%
	'97	2540	12%
	'02	2660	13%

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 vaseyana																		
Y	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	-	-	1	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	3	3	2	-	-	-	-	-	-	8	-	-	-	160	18	30	8
	02	1	4	4	-	-	-	-	-	-	9	-	-	-	180	15	30	9
D	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	2	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	-	-	3	-	-	-	-	-	-	2	-	-	1	60			3
X	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	
'97	45%	18%	09%	+ 8%
'02	33%	58%	08%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:
	'89	0	0%
	'97	220	18%
	'02	240	25%

Atriplex canescens																		
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	60	80	0
D	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	1	-	-	-	-	-	-	-	-	-	-	1	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	
'97	00%	00%	00%	
'02	100%	00%	100%	

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

Chrysothamnus nauseosus albicaulis																		
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	-	-	3	-	-	-	-	-	-	3	-	-	-	60	26	37	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	
'97	00%	00%	00%	
'02	00%	100%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:
	'89	0	-
	'97	0	-
	'02	60	-

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 viscidiflorus stenophyllus																		
Y	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	35	-	-	-	-	-	-	-	-	35	-	-	-	700	11	12	35
	02	-	-	20	-	1	-	-	-	-	21	-	-	-	420	7	16	21
D	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	10	-	-	-	-	-	-	2	-	2	6	200			10
X	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	
'97	00%	00%	00%	-18%
'02	03%	97%	26%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:
	'89	0	0%
	'97	760	3%
	'02	620	32%

Ephedra viridis																		
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	-	-	1	-	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	
'97	00%	00%	00%	
'02	00%	100%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:
	'89	0	-
	'97	0	-
	'02	20	-

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																		
S	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	22	-	-	-	-	-	-	-	-	22	-	-	-	440			22
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	89	9	-	-	-	-	-	-	-	-	9	-	-	-	600	8	5	9
	97	26	-	-	-	-	-	-	-	-	26	-	-	-	520	9	11	26
	02	18	-	-	-	-	-	-	-	-	18	-	-	-	360	5	6	18
D	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	6	-	1	-	-	-	2	-	-	6	-	-	3	180			9
X	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	180			9

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	+38%
'97	00%	00%	00%	-44%
'02	00%	04%	11%	

Total Plants/Acre (excluding Dead & Seedlings)				
'89	600	Dec:	0%
'97	960		0%
'02	540		33%

AGE	YR	1	2	3	4	5	6	7	8	9	1	2	3	4	Plants Per Acre	Ht.	Cr.	Total
Juniperus osteosperma																		
Y	89	-	-	-	1	-	-	-	-	-	1	-	-	-	66			1
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1
X	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	-70%
'97	00%	00%	00%	+ 0%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'89	66	Dec:	-
'97	20		-
'02	20		-

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																		
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	11	19	0

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

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