

Trend Study 14-14-04

Study site name: Texas Flat .

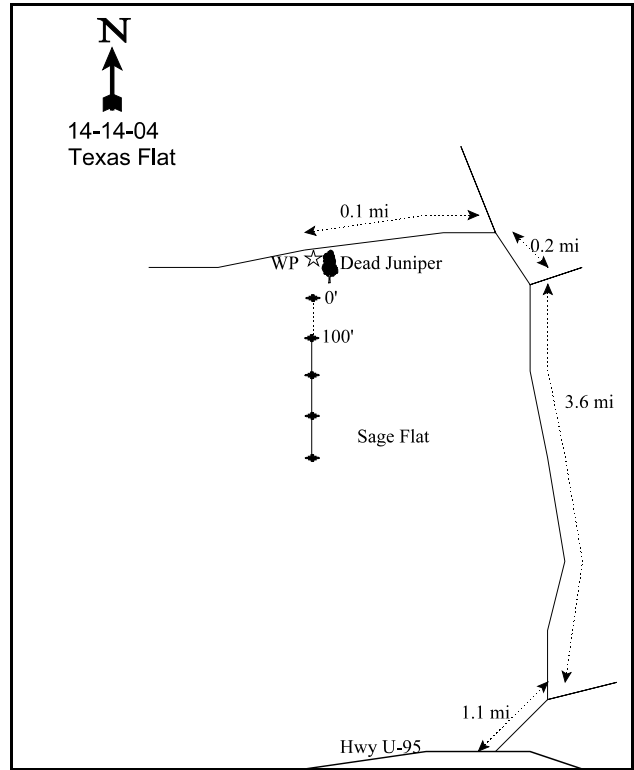
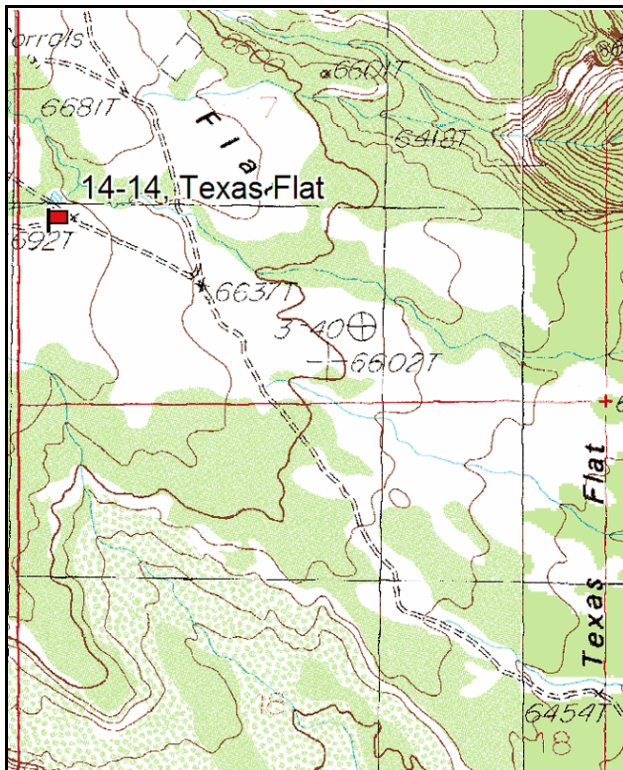
Vegetation type: Basin Big Sagebrush .

Compass bearing: frequency baseline 164 degrees magnetic.

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

LOCATION DESCRIPTION

Turn north off of Highway U-95 onto San Juan County Road #263 at a point 0.3 miles east of mile marker 102. Proceed north 1.1 miles to a fork. Take the left fork. Go another 3.6 miles and turn left. Go down this road 0.2 miles. Turn left onto a faint two-track road and go 0.1 miles to a witness post located just west of an old dead juniper. The witness post is a 3 1/2 foot tall green fence post on the south (left) side of the road. The 0-foot baseline stake is 100 feet south and is a fence post tagged #7868.



Map Name: Hotel Rock

Diagrammatic Sketch

Township 37S , Range 20E , Section 7

GPS: NAD 27, UTM 12S 4159915 N, 609096 E

DISCUSSION

Texas Flat - Trend Study No. 14-14

Texas Flat is a large flat south of Elk Ridge surrounded by deep slickrock canyons. Dense juniper-pinyon stands are intermixed with large sagebrush parks. The area is managed by the BLM. In 1955, the sagebrush was railed and drill-seeded with crested wheatgrass. In October 1986, the area was treated with the herbicide tebuthiuron, a soil activated herbicide that defoliates and eventually kills broad leafed plants. Sagebrush survival on the study site depends on treatment boundaries and application rates. The area is grazed by 300 cattle in the fall or spring. Crested wheatgrass was heavily utilized in 1986. Deer use is light on the site. The Texas Flat pellet group trend transect showed an average of 9 deer days use/acre (22 ddu/ha) from 1982 to 1986 (Jense et al. 1986). The average deer days use/acre declined to 7 (18 ddu/ha) between 1987 to 1992 (Jense et al. 1992). Average deer days use/acre increased to 13 (33 ddu/ha) between 1993 and 1997 (DWR 1998). Pellet group data from the site in 1999 estimated 19 deer days use/acre (47 ddu/ha) and 46 cow days use/acre (114 cdu/ha). In 2004, pellet group data estimated 17 deer days use/acre (41 ddu/ha), 2 elk days use/acre (5 edu/ha), and 30 cow days use/acre (73 cdu/ha).

Soil on the site has a sandy loam texture. The soil on the site should be moderately deep, but it was very compacted which made soil penetrometer measurements difficult. Effective rooting depth was estimated at only about 8 inches, because the soil is very compact. This is probably an underestimation considering that basin big sagebrush, a species which only occurs on deep soils, is present on the site. The parent material is sandstone. There is no rock on the surface or within the profile. Average soil temperature was high at 71°F (12 inches) in 1999 and 75 °F (11 inches) in 2004. Erosion is not a problem due to the high infiltration capacity of the soil and the lack of significant slope. Relative bare soil doubled to almost 50% in 2004 and the ratio bare soil to protective ground cover (vegetation, litter, and cryptogams) declined from 1:2.8 to 1:1.9.

The herbicide treatment was planned to leave edges and drainages for wildlife. The study site is close to the edge of the pinyon-juniper, so it is unknown at this point how much herbicide was actually applied. Since the Basin big sagebrush present is not a preferred subspecies and not fully utilized, the treatment will provide more spring forage as long as the grass is not over grazed by livestock. With the elimination of sagebrush in surrounding areas, the remaining sagebrush along the edges could receive more use. Tebuthiuron is also detrimental to forbs.

Pretreatment density of basin big sagebrush was estimated at 5,466 plants/acre in 1986. Young plants were abundant, accounting for 83% of the population. Utilization was light in 1986, vigor normal and percent decadence low at only 4%. In 1992, after the treatment, density of sagebrush dropped to only 180 plants/acre, which is a 97% decline. Density rose in 1994 to 500 plants/acre and has remained at that level. Density was 540 plants/acre in 2004. Use was light between 1986 and 1999, but increased to moderate in 2004. Vigor has been generally good and decadence low, although decadence did increase to 30% in 2004. Recruitment has been poor since 1986. Young plants have made up 4-7% of the population between 1994 and 2004. Seedlings were very abundant in 2004 with nearly 2000/acre sampled. Hopefully precipitation patterns will be favorable enough to recruit some of these seedlings into the population.

Other browse species sampled include stickyleaf low rabbitbrush, slenderbush eriogonum, and broom snakeweed. Slenderbush eriogonum occurs in low densities and receives moderate to heavy use. Use was very heavy in 2004. Broom snakeweed, an increaser subshrub, is common, but density and cover has declined each reading since 1992.

Grass species present in 1986, prior to the treatment, were mainly crested wheatgrass, sand dropseed, and needle-and-thread grass. Use was very heavy in 1986 on the available grasses, but vigor was still good and the plants appeared to be recovering from the early spring use. After the treatment, nested frequency of crested wheatgrass steadily increased and peaked in 1999. It decreased to its lowest point in 2004. Since 1994 crested

wheatgrass has made up at least 75% of the total grass cover. It had over 15% cover from 1992-1999 and declined to about 9% in 2004. Sand dropseed nested frequency was highest in 1992 and 1994, but declined in 1999 and was stable in 2004. Cheatgrass has never been found in significant numbers on this site. Forbs were scarce before the treatment, however they increased dramatically by 1992. Common species included, low fleabane, thistle, peavine, prickly lettuce, and scarlet globemallow. Sum of nested frequency for perennial forbs declined dramatically by 1994 and have remained at a low level since.

1986 APPARENT TREND ASSESSMENT

It will be interesting to follow the effects of the treatment on this area. Not knowing the exact treatment of the study site, it is impossible to assign a trend to this disturbed area. Even if not directly impacted by the herbicide, the site will be effected. An increase in spring forage would be beneficial to the deer that winter here, as long as browse forage and cover is left by the treatment. The soil trend will probably remain stable.

1992 TREND ASSESSMENT

Soil trend appears to be stable after the herbicide treatment and great increases in grass and forb frequencies. The browse trend for the key species would be down because the sagebrush population has decreased by 97%, down to only 180 plants/acre. It should also be noted that snakeweed has increased numbers to 3,080 plants/acre, a 20% increase. Pricklypear cactus has noted a 88% decrease in it's population since 1986. The herbaceous understory has seen great changes in the nested frequencies for grasses, especially the forbs. Trend for herbaceous understory is up. The Desirable Components Index (see methods) rating is fair at 40. The shrub component is lacking, but the herbaceous understory is healthy.

TREND ASSESSMENT

soil - stable (3)

browse - down (1)

herbaceous understory - up (5)

winter range condition (DC Index) - 40 (fair) Basin big sagebrush type (Wyoming sagebrush scale)

1994 TREND ASSESSMENT

Trend for soil would be considered stable. Total vegetative cover declined from 53% to 34%, but litter cover increased and percent relative cover of bare ground declined from 26% to 20%. Trend for browse is up slightly. Density has increased from 180 to 500 plants/acre. Use is light and percent decadence low at 8%. Recruitment is currently poor with low numbers of seedlings and young. Another positive aspect of the browse trend is a decline in the density of broom snakeweed from 3,080 to 2,340 plants/acre. Trend for the herbaceous understory is mixed. Sum of nested frequency of perennial grasses has increased slightly, while frequency of perennial forbs has declined dramatically. Combined sum of nested frequency of perennial grasses and forbs has declined from 1,194 to 665. Perennial forb cover declined from 28% in 1992 to less than 2% in 1994. Some of this decline is expected after a flush of growth following treatment. With this in mind, trend for the herbaceous understory is considered down, but this decline is expected after a flush of growth following the treatment. The DCI score improved to good as sagebrush cover increased to over 2%.

TREND ASSESSMENT

soil - slightly up (4)

browse - slightly up (4)

herbaceous understory - down (1)

winter range condition (DC Index) - 52 (good) Basin big sagebrush type (Wyoming sagebrush scale)

1999 TREND ASSESSMENT

Trend for soil is stable. Percent cover of vegetation has increased, but this is off set by a decline in percent cover of litter and a slight increase in bare ground. Trend for browse is stable due to a stable population density, light use, good vigor, and low percent decadence for basin big sagebrush. Broom snakeweed has also remained stable. Trend for the herbaceous understory is stable with similar sum of nested frequency values for perennial grasses and forbs compared to 1994. The dominant grass, crested wheatgrass, increased slightly in nested frequency and provides 89% of the grass cover. The DCI rating dropped to fair (41), because sagebrush cover declined to less than 1% cover.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

winter range condition (DC Index) - 41 (fair) Wyoming big sagebrush type

2004 TREND ASSESSMENT

The soil trend is down. Relative cover values for bare ground increased from 23% to 48% in 2004. Vegetation cover declined 37% and the ratio of protective ground cover (vegetation, litter, and cryptogams) to bare ground declined from 1:2.8 to 1:1.9. The trend for browse is stable. Basin big sagebrush density has remained stable. Recruitment is relatively low with only 7% of this small population being considered young. A very high number of seedlings were sampled in 2004. If precipitation is favorable many of these plants could be recruited into the population. Use increased to a moderate level and percent decadence has increased to 30% from only 12% in 1999. The trend for the herbaceous understory is slightly down. Crested wheatgrass nested frequency is the lowest it has ever been, but it is still abundant and contributes to over 9% cover. Sand dropseed has remained stable. Nested frequency for perennial forbs is stable, while annual forbs have declined. The DCI rating dropped to 32 due to declines in perennial grasses and forbs.

TREND ASSESSMENT

soil - down (1)

browse - stable (3)

herbaceous understory - slightly down (2)

winter range condition (DC Index) - 32 (fair) Wyoming big sagebrush type

HERBACEOUS TRENDS --

Management unit 14 , Study no: 14

Type	Species	Nested Frequency					Average Cover %			
		'86	'92	'94	'99	'04	'92	'94	'99	'04
G	Agropyron cristatum	ab ₂₅₂	a ₂₃₅	bc ₂₈₀	c ₃₀₆	a ₂₀₆	15.33	17.76	15.43	9.51
G	Bromus tectorum (a)	-	-	-	2	-	-	-	.00	-
G	Sporobolus cryptandrus	a ₃₀	c ₂₄₁	c ₂₀₆	b ₁₂₄	b ₁₄₂	17.44	4.88	1.80	2.91
G	Stipa comata	b ₂₉	a ₂	a ₄	ab ₁₁	a ₁₁	.03	.06	.08	.09
G	Vulpia octoflora (a)	-	-	4	3	-	-	.01	.00	-
Total for Annual Grasses		0	0	4	5	0	0	0.00	0.00	0
Total for Perennial Grasses		311	478	490	441	359	32.81	22.71	17.31	12.52

Type	Species	Nested Frequency					Average Cover %			
		'86	'92	'94	'99	'04	'92	'94	'99	'04
	Total for Grasses	311	478	494	446	359	32.81	22.72	17.32	12.52
F	<i>Artemisia dracunculus</i>	-	-	-	6	3	-	-	.30	.15
F	<i>Astragalus convallarius</i>	ab9	b20	ab14	b31	a2	.46	.07	.83	.00
F	<i>Astragalus</i> spp.	b13	a-	a-	ab6	b14	-	-	.06	.11
F	<i>Calochortus nuttallii</i>	-	1	-	-	-	.00	-	-	-
F	<i>Castilleja</i> spp.	a-	a-	b24	a-	a-	-	.06	-	-
F	<i>Chenopodium</i> spp. (a)	-	b17	a-	a-	a-	.65	-	-	-
F	<i>Conyza canadensis</i> (a)	-	10	-	-	-	.02	-	-	-
F	<i>Comandra pallida</i>	-	-	-	-	2	-	-	-	.01
F	<i>Cordylanthus wrightii</i> (a)	-	b10	a-	a-	b25	.52	-	-	.20
F	<i>Descurainia pinnata</i> (a)	-	-	-	4	3	-	-	.01	.00
F	<i>Epilobium</i> spp.	a-	b13	a-	a-	a-	.15	-	-	-
F	<i>Eriogonum cernuum</i> (a)	-	3	-	-	-	.03	-	-	-
F	<i>Erigeron pumilus</i>	ab18	b25	b27	a3	a4	1.72	.52	.01	.03
F	<i>Euphorbia glyptosperma</i> (a)	-	b19	a-	a-	a-	.04	-	-	-
F	<i>Gayophytum ramosissimum</i> (a)	-	-	3	-	-	-	.03	-	-
F	<i>Gilia</i> spp. (a)	-	-	-	-	7	-	-	-	.01
F	<i>Lathyrus lanszwertii</i>	a2	bc38	bc45	c70	ab26	1.43	.77	1.85	.12
F	<i>Lappula occidentalis</i> (a)	-	-	-	3	7	-	-	.00	.16
F	<i>Lactuca serriola</i>	a-	b164	a8	a3	a1	5.43	.02	.00	.00
F	<i>Leucelene ericoides</i>	a-	a2	a-	ab20	b30	.00	-	1.35	.47
F	<i>Machaeranthera canescens</i>	a-	b262	a-	a3	ab15	15.27	-	.01	.19
F	<i>Oenothera</i> spp.	-	-	-	-	1	-	-	-	.00
F	<i>Penstemon comarrhenus</i>	5	12	8	6	8	.12	.03	.07	.04
F	<i>Phlox longifolia</i>	6	4	4	4	5	.01	.01	.15	.01
F	<i>Plantago patagonica</i> (a)	-	a92	a112	b209	a88	2.24	.64	6.81	.31
F	<i>Polygonum douglasii</i> (a)	-	b19	a-	a-	a1	.69	-	-	.00
F	<i>Portulaca oleracea</i> (a)	-	b99	a-	a-	a-	1.46	-	-	-
F	<i>Salsola pestifer</i> (a)	-	b45	a-	a-	a-	.87	-	-	-
F	<i>Senecio multilobatus</i>	1	-	-	-	-	-	-	-	-
F	<i>Sphaeralcea coccinea</i>	ab55	a40	a38	a54	b88	1.36	.27	.88	1.83
F	<i>Streptanthus cordatus</i>	-	-	1	-	-	-	.03	-	-
F	<i>Tragopogon dubius</i>	a-	b17	ab6	ab4	a-	.25	.02	.01	-
F	Unknown forb-annual (a)	-	8	-	-	-	.18	-	-	-
F	<i>Zigadenus paniculatus</i>	-	-	-	3	3	-	-	.00	.00
	Total for Annual Forbs	0	322	115	216	131	6.71	0.66	6.82	0.70

Type	Species	Nested Frequency					Average Cover %			
		'86	'92	'94	'99	'04	'92	'94	'99	'04
	Total for Perennial Forbs	109	598	175	213	202	26.25	1.83	5.55	3.01
	Total for Forbs	109	920	290	429	333	32.97	2.50	12.38	3.72

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

BROWSE TRENDS --

Management unit 14 , Study no: 14

Type	Species	Strip Frequency				Average Cover %			
		'92	'94	'99	'04	'92	'94	'99	'04
B	Amelanchier utahensis	0	0	1	0	-	-	.53	-
B	Artemisia tridentata tridentata	7	15	17	18	.22	2.38	.48	.90
B	Chrysothamnus nauseosus albicaulis	0	0	0	5	-	.00	-	.00
B	Chrysothamnus viscidiflorus stenophyllus	6	0	6	4	.15	-	.38	.78
B	Eriogonum microthecum	6	0	5	7	.18	-	.03	.06
B	Gutierrezia sarothrae	51	43	28	34	2.94	1.25	.46	.98
B	Juniperus osteosperma	1	0	1	1	2.83	-	2.20	1.70
B	Opuntia fragilis	8	9	25	19	.42	.05	.46	.33
B	Sclerocactus	16	3	0	0	-	.03	-	-
	Total for Browse	95	70	83	88	6.76	3.73	4.55	4.76

CANOPY COVER, LINE INTERCEPT --

Management unit 14 , Study no: 14

Species	Percent Cover	
	'99	'04
Amelanchier utahensis	-	2.28
Artemisia tridentata tridentata	-	2.81
Eriogonum microthecum	-	.05
Gutierrezia sarothrae	-	1.00
Juniperus osteosperma	4.19	4.00
Opuntia fragilis	-	.16

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 14 , Study no: 14

Species	Average leader growth (in)
	'04
Artemisia tridentata tridentata	2.6

POINT-QUARTER TREE DATA --
Management unit 14 , Study no: 14

Species	Trees per Acre	
	'99	'04
Juniperus osteosperma	10	-
Pinus edulis	9	-

Average diameter (in)	
'99	'04
10	-
4.8	-

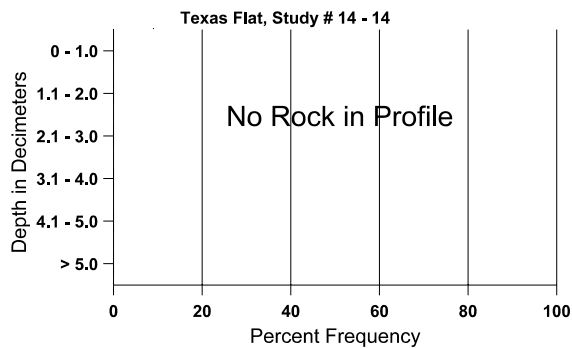
BASIC COVER --
Management unit 14 , Study no: 14

Cover Type	Average Cover %				
	'86	'92	'94	'99	'04
Vegetation	1.25	52.89	33.92	37.51	23.71
Rock	0	0	.03	0	0
Pavement	0	0	.39	0	.03
Litter	58.75	29.62	51.50	44.35	32.81
Cryptogams	0	1.19	.12	.68	.19
Bare Ground	40.00	29.62	22.07	24.50	52.61

SOIL ANALYSIS DATA --
Management unit 14, Study no: 14, Study Name: Texas Flat

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
7.9	75.0 (10.9)	6.9	76.9	8.6	14.6	1.6	12.7	89.6	0.4

Stoniness Index



PELLET GROUP DATA --

Management unit 14 , Study no: 14

Type	Quadrat Frequency			
	'92	'94	'99	'04
Rabbit	11	34	48	40
Elk	-	-	-	3
Deer	7	14	8	33
Cattle	6	1	19	18

Days use per acre (ha)	
'99	'04
-	-
-	2 (5)
19 (47)	17 (41)
46 (114)	30 (73)

BROWSE CHARACTERISTICS --

Management unit 14 , Study no: 14

		Age class distribution (plants per acre)					Utilization						
Y	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)	
<i>Amelanchier utahensis</i>													
86	0	-	-	-	-	-	0	0	-	-	0	-/-	
92	0	-	-	-	-	-	0	0	-	-	0	-/-	
94	0	-	-	-	-	-	0	0	-	-	0	123/102	
99	20	-	-	20	-	-	0	0	-	-	0	129/150	
04	0	-	-	-	-	-	0	0	-	-	0	119/157	
<i>Artemisia tridentata tridentata</i>													
86	5466	3133	4533	733	200	-	2	0	4	-	0	25/24	
92	180	380	40	140	-	-	22	0	0	-	0	-/-	
94	500	20	20	440	40	1260	0	0	8	-	16	24/23	
99	500	80	20	420	60	1160	8	0	12	4	4	30/31	
04	540	1920	40	340	160	740	44	26	30	11	11	28/38	
<i>Chrysothamnus nauseosus albicaulis</i>													
86	0	-	-	-	-	-	0	0	0	-	0	-/-	
92	0	-	-	-	-	-	0	0	0	-	0	-/-	
94	0	-	-	-	-	-	0	0	0	-	0	18/21	
99	0	-	-	-	-	-	0	0	0	-	0	44/32	
04	120	-	-	80	40	-	0	33	33	-	0	21/28	
<i>Chrysothamnus viscidiflorus stenophyllus</i>													
86	200	-	200	-	-	-	0	0	0	-	0	-/-	
92	160	-	40	120	-	-	50	13	0	-	0	-/-	
94	0	-	-	-	-	-	0	0	0	-	0	-/-	
99	140	-	20	120	-	-	0	0	0	-	0	19/27	
04	100	-	-	80	20	-	20	0	20	20	20	12/17	

		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)
Eriogonum microthecum												
86	800	66	800	-	-	-	0	0	0	-	0	-/-
92	480	-	-	460	20	-	8	0	4	-	0	-/-
94	0	-	-	-	-	-	0	0	0	-	0	-/-
99	160	-	20	140	-	-	75	13	0	-	0	12/13
04	440	-	-	400	40	-	9	91	9	-	0	7/8
Gutierrezia sarothrae												
86	2465	66	466	1666	333	-	0	0	14	-	0	9/7
92	3080	20	340	2740	-	-	0	0	0	-	0	-/-
94	2340	20	160	1860	320	20	0	0	14	3	3	10/12
99	2020	80	720	1300	-	20	0	0	0	-	0	8/7
04	1780	20	40	1680	60	-	20	1	3	-	0	6/7
Juniperus osteosperma												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
92	20	20	-	20	-	-	0	100	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	20	-	-	20	-	-	0	0	-	-	0	-/-
04	20	-	-	20	-	-	0	0	-	-	0	-/-
Mahonia repens												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
92	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	0	-	-	-	-	-	0	0	-	-	0	-/-
04	0	-	-	-	-	-	0	0	-	-	0	6/24
Opuntia fragilis												
86	1799	-	1533	266	-	-	0	0	0	-	0	4/8
92	220	-	100	100	20	-	9	0	9	-	9	-/-
94	340	-	80	240	20	-	0	0	6	-	12	6/13
99	680	60	260	320	100	-	0	0	15	12	26	5/18
04	540	20	60	420	60	40	0	0	11	-	11	5/17
Sclerocactus												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
92	720	-	460	260	-	-	3	0	-	-	0	-/-
94	60	-	40	20	-	-	0	0	-	-	0	-/-
99	0	-	-	-	-	-	0	0	-	-	0	-/-
04	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)	
Yucca spp.													
86	0	-	-	-	-	-	0	0	-	-	0	-/-	
92	0	-	-	-	-	-	0	0	-	-	0	-/-	
94	0	-	-	-	-	-	0	0	-	-	0	16/39	
99	0	-	-	-	-	-	0	0	-	-	0	-/-	
04	0	-	-	-	-	-	0	0	-	-	0	-/-	