

Trend Study 25C-2-08

Study site name: Wildcat .

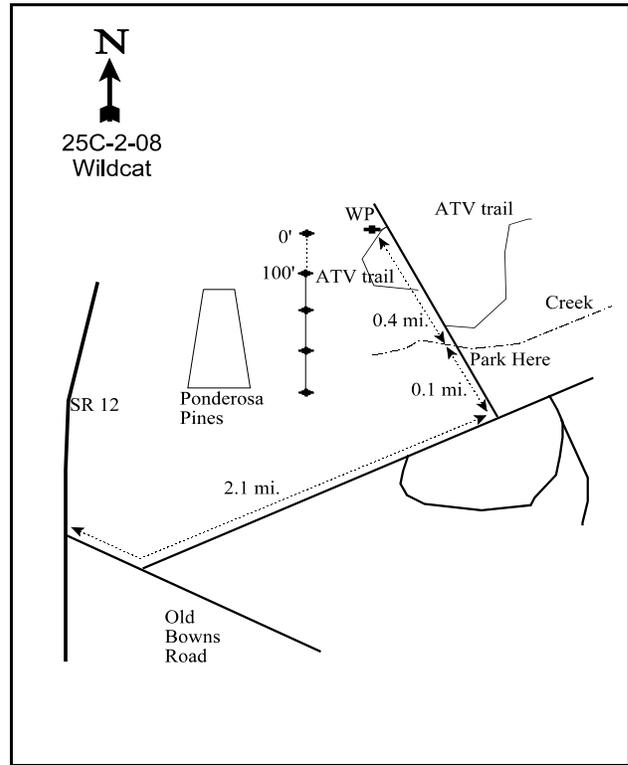
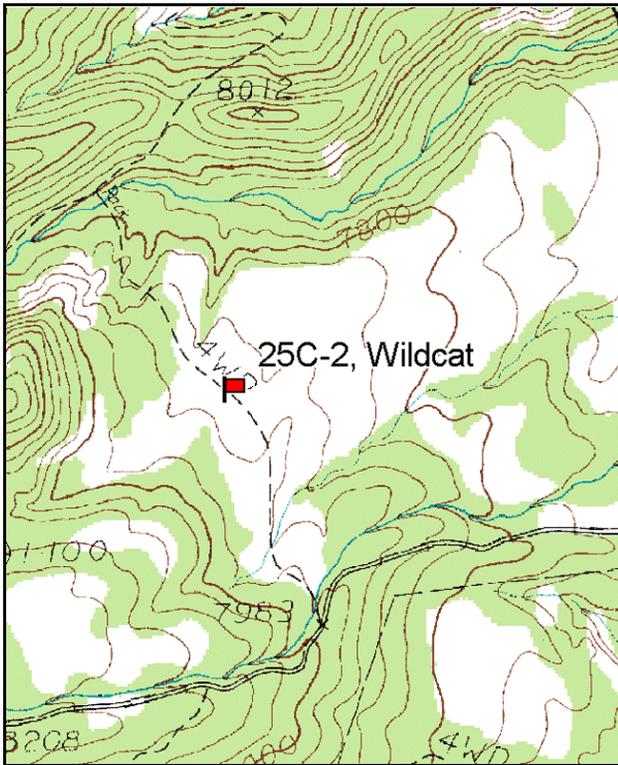
Vegetation type: Chained, Shrubland .

Compass bearing: frequency baseline 165 degrees magnetic.

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

LOCATION DESCRIPTION

On SR12 south of Torrey, go about 50 yards south of Pleasant Creek Campgrounds then turn east onto the Lower Bowns Reservoir Road. Proceed 2.1 miles and turn left. Continue 0.1 miles. From here the road is closed. Walk across the creek and down the ATV trail approximately 0.4 miles to the witness post on the left side of the road. The stakes are full-high fenceposts. The 0-foot stake is marked by browse tag #7116. Ignore the fencepost that was misplaced near the south end of the baseline.



Map Name: Lower Bowns Res

Diagrammatic Sketch

Township and Range Unsurveyed

GPS: NAD 83, UTM 12S 473193 E, 4217861 N

## DISCUSSION

### Wildcat - Trend Study No. 25C-2

#### Study Information

This study is located on an area that was chained and seeded in 1970 and is a sagebrush-grass type [elevation: 7,900 feet (2,408 m), slope: 5%, aspect: northeast]. This open flat is bordered by large ponderosa pine (*Pinus ponderosa*), scattered pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*). The nearby DWR Wildcat seeding pellet group transect indicates that winter deer use varies considerably from year to year, with a low of <1 deer days use/acre in 1976-77 and a high of 43 days use/acre (106 ddu/ha) the next winter, 1977-78 (Jense et al. 1981). An average of 25 deer days use/acre (62 ddu/ha) was recorded between 1985 and 1990 (Jense et al. 1991). Some deer use occurs during the summer as well. Deer use was estimated to be light in 1998 (17 ddu/acre:42 ddu/ha), and moderately high in 2003 and 2008 (46 ddu/acre:92 ddu/ha and 32 ddu/acre:78 ddu/ha, respectively). Elk use was estimated to be moderately high in 1998 and 2008 (45 edu/acre:111 edu/ha and 42 edu/acre/104 edu/ha, respectively), and moderate in 2003 (29 edu/ha:58 edu/ha). Cattle use was estimated to be moderately high in 1998 and 2003 (33 cdu/acre:82 cdu/ha and 41 cdu/acre:102 cdu/ha, respectively), and moderate in 2008 ( 23 cdu/acre:56 cdu/ha). Due to the high elevation of this site, the area is used during mild winters and as transitional range.

#### Soil

Soil texture is a loamy sand which is slightly acidic (pH 6.4). Soil at the site is moderately deep with an effective rooting depth of just over 18 inches. The surface is smooth, with few large rocks or pavement. There are some very small gullies through the area and some wind and water erosion was evident in 1991. The relative combined vegetation and litter cover ranged from 60%-75% from 1994 to 2008. Relative bare ground cover ranged from 20%-31% from 1994 to 2008. The erosion condition class was rated as stable in 2003 and 2008.

#### Browse

The key browse species is Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), which is the dominant and most abundant browse present. Some black sagebrush (*Artemisia nova*) is also mixed in and is hybridizing with the Wyoming big sagebrush population, making identification difficult. All sagebrush was classified as Wyoming big sagebrush in 1994, but both black sagebrush and Wyoming big sagebrush were listed in the other readings. Density of Wyoming big sagebrush was estimated at 2,860 plants/acre in 2003, and increased to 4,360 plants/acre in 2008. Black sagebrush numbered only 880 plants/acre in 2003, and the population decreased slightly to 820 plants/acre in 2008. Wyoming big sagebrush populations appear to be slowly increasing with good young recruitment during most readings and moderate numbers of decadent plants. Vigor has remained normal on most shrubs during all readings.

Broom snakeweed (*Gutierrezia sarothrae*) was also common in 1985 and 1991, but declined considerably in density in 1994. Gray horsebrush (*Tetradymia canescens*) is also fairly common and has displayed moderate to heavy use since 1994. The population was stable at around 800 plants/acre from 1994 to 2003, then increased slightly to 1,240plants/acre in 2008. Slenderbush eriogonum (*Eriogonum microthecum*) also occurs in small numbers.

#### Herbaceous Understory

The grass composition is made up mostly of blue grama (*Bouteloua gracilis*) and the introduced species crested wheatgrass (*Agropyron cristatum*). Together they make up nearly 100% of the grass cover. Crested wheatgrass is abundant and produces substantial amounts of forage especially in the spring since it greens-up early. Blue grama (*Bouteloua gracilis*), a native warm season grass, is also quite abundant, but due to its low growing habit, provides limited forage. Both grasses are in good vigor and are lightly to moderately utilized.

The forb component is diverse, but only a few species occur more than occasionally. The most prominent forb species is silvery lupine (*Lupinus argenteus*) which accounted for 92% of the forb cover in 1998. Due to drought conditions during the spring of 1994, production was limited with forbs combining to produce less than 2% cover and grasses only 15%. More normal precipitation patterns in 1997 and 1998 dramatically increased production doubling grass cover to 32% and increasing forb cover to 13% in 1998. A return to drier than normal conditions caused perennial grass and forb cover and sum of nested frequency values to decline in 2003 and 2008.

#### 1991 TREND ASSESSMENT

The browse trend would be considered slightly up with an increase in both Wyoming big and black sagebrush populations. The grass trend would also be considered up slightly with a slight increase in nested frequency of perennial grasses. The trend for forbs was slightly down with a slight decrease in the sum of nested frequency of perennial forbs, but they make up less than 10% of the herbaceous cover.

browse - slightly up (+1)

grass - slightly up (+1)

forb - slightly down (-1)

#### 1994 TREND ASSESSMENT

Trend for the main browse species, black and Wyoming big sagebrush, is stable. Population density has declined slightly mostly due to the larger sample area used in 1994. Decadence has remained low. Broom snakeweed and gray horsebrush have also declined significantly. Photos indicate a definite decrease in production of grasses since 1985, but the sum of nested frequencies for perennial grasses has had little change since 1991, indicating a stable trend. Trend for forbs is down. Sum of nested frequency of perennial forbs decreased by 26% since 1991. Spring precipitation in 1994 was only 59% of normal and is probably the primary cause for the decline in herbaceous production.

winter range condition (DCI) - good (58) Low potential scale

browse - stable (0)

grass - stable (0)

forb - down (-2)

#### 1998 TREND ASSESSMENT

Density of the combined black and Wyoming big sagebrush populations has declined slightly, but decadence is lower and vigor improved. Recruitment is currently adequate to maintain the population. Trend for browse is stable. Trend for the grasses is slightly up. Cover for perennial grasses doubled and the sum of nested frequency increased slightly. The trend for the forbs is slightly up due to an increase in the sum of nested frequency of perennial forbs. In addition, production increased dramatically since 1994, with cover of forbs increasing from 2% to 13%. The increase in forb cover and nested frequency comes primarily from silvery lupine.

winter range condition (DCI) - good-excellent (67) Low potential scale

browse - stable (0)

grass - slightly up (+1)

forb - slightly up (+1)

#### 2003 TREND ASSESSMENT

Trend for browse continues to be stable. Density of Wyoming big sagebrush has increased slightly. Vigor is normal on most plants, and decadence moderate at 22%. Trend for the grasses is slightly down. Sum of nested frequency of perennial grasses has declined 16% while cover dropped 46% (32% to 17%). Nested frequency of crested wheatgrass declined significantly. Since 1994, blue grama has provided an increasing portion of the perennial grass cover (23%, 59%, 61%) while crested wheatgrass has steadily declined (51%, 41%, 39%). This trend is most likely caused by a combination of early summer cattle grazing and drier than normal spring periods for the past 4 years. The trend for forbs is down. Sum of nested frequency of perennial forbs also declined and cover fell from 13% to 4%. Most of the change is due to a decline in the nested frequency and cover of silvery lupine. Several other perennial forbs are found on the site but they occur rarely.

winter range condition (DCI) - good (63) Low potential scale  
 browse - stable (0) grass - slightly down (-1) forb - down (-2)

2008 TREND ASSESSMENT

The trend for browse is up with the primary browse species, Wyoming big sagebrush, population increasing 34% from 2,860 plants/acre in 2003 to 4,360 plants/acre. Black sagebrush population showed little change since 2003. Vigor remained good and decadence remained low for both browse species. Recruitment was also good with young plants comprising a significant part of each species population. There was also a small population of dwarf rabbitbrush (*Chrysothamnus depressus*) recorded for the first time (60 plants/acre). The trend for grasses is stable. The sum of nested frequency of perennial grasses remained constant and cover of the dominant grasses increased slightly. Blue grama continues to be the dominant species constituting 61% of the grass cover with crested wheatgrass comprising 39% of the grass cover. The trend for forbs is stable. The sum of nested frequency of perennial forbs remained constant, but the cover of perennial forbs increased slightly. This was mostly due to the dominant forb, silvery lupine.

winter range condition (DCI) - excellent (69) Low potential scale  
 browse - up (+2) grass - stable (0) forb - stable (0)

HERBACEOUS TRENDS --  
 Management unit 25C, Study no: 2

T y p e	Species	Nested Frequency						Average Cover %			
		'85	'91	'94	'98	'03	'08	'94	'98	'03	'08
G	Agropyron cristatum	a268	c302	bc293	c303	a237	a240	7.61	13.10	6.69	9.01
G	Aristida purpurea	-	-	-	3	3	-	-	.03	.00	-
G	Bouteloua gracilis	a186	b234	bc255	c282	bc263	bc273	7.39	18.85	10.53	14.07
G	Sitanion hystrix	b44	a9	a4	a4	a-	a4	.01	.00	-	.06
G	Sporobolus cryptandrus	-	-	3	6	-	-	.00	.06	-	-
Total for Annual Grasses		0	0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		498	545	555	598	503	517	15.02	32.04	17.23	23.14
Total for Grasses		498	545	555	598	503	517	15.02	32.04	17.23	23.14
F	Allium sp.	6	3	-	2	-	-	-	.00	-	-
F	Antennaria rosea	3	3	-	-	-	-	-	-	-	-
F	Arenaria fendleri	a-	a-	a-	b27	a-	a-	-	.15	-	-
F	Artemisia ludoviciana	-	3	-	-	-	-	-	-	-	-
F	Astragalus sp.	2	1	-	2	-	1	-	.00	-	.00
F	Cryptantha sp.	a-	a-	ab1	b12	a-	ab6	.00	.02	-	.03
F	Descurainia pinnata (a)	-	-	1	-	11	-	.00	-	.02	-
F	Eriogonum alatum	2	2	-	-	2	-	-	-	.03	-
F	Erigeron pumilus	9	5	-	3	-	2	-	.00	-	.01
F	Eriogonum racemosum	a12	b25	ab19	ab25	b29	ab25	.18	.26	.21	.31
F	Gayophytum ramosissimum(a)	-	-	-	6	-	-	-	.01	-	-

T y p e	Species	Nested Frequency						Average Cover %			
		'85	'91	'94	'98	'03	'08	'94	'98	'03	'08
F	<i>Gilia hutchinifolia</i> (a)	-	-	<sub>b</sub> 52	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	.19	-	-	-
F	<i>Lepidium</i> sp. (a)	-	-	<sub>a</sub> -	<sub>b</sub> 71	<sub>a</sub> -	<sub>a</sub> -	-	.21	-	.00
F	<i>Lupinus argenteus</i>	<sub>c</sub> 139	<sub>a</sub> 59	<sub>a</sub> 81	<sub>bc</sub> 128	<sub>ab</sub> 92	<sub>a</sub> 89	.94	11.93	3.35	5.38
F	<i>Lygodesmia</i> sp.	3	1	-	2	3	3	-	.00	.03	.03
F	<i>Oenothera pallida</i>	<sub>a</sub> -	<sub>a</sub> 2	<sub>a</sub> 4	<sub>b</sub> 22	<sub>ab</sub> 17	<sub>ab</sub> 15	.02	.23	.03	.09
F	<i>Orthocarpus luteus</i> (a)	-	-	<sub>a</sub> 20	<sub>a</sub> 14	<sub>b</sub> 131	<sub>a</sub> 15	.08	.03	1.82	.38
F	<i>Penstemon</i> sp.	<sub>ab</sub> 11	<sub>b</sub> 15	<sub>a</sub> 1	<sub>ab</sub> 3	<sub>a</sub> 3	<sub>ab</sub> 15	.00	.01	.00	.10
F	<i>Phlox longifolia</i>	<sub>cd</sub> 28	<sub>c</sub> 46	<sub>bcd</sub> 20	<sub>abc</sub> 6	<sub>a</sub> 3	<sub>ab</sub> 5	.05	.02	.00	.01
F	<i>Polygonum douglasii</i> (a)	-	-	<sub>a</sub> 2	<sub>b</sub> 26	<sub>a</sub> -	<sub>ab</sub> 17	.00	.07	-	.04
F	<i>Senecio douglasii</i>	-	-	-	-	-	2	-	-	-	.15
F	<i>Sphaeralcea coccinea</i>	-	4	2	1	1	1	.00	.00	.00	.00
F	<i>Tragopogon dubius</i>	-	-	-	1	-	-	-	.00	-	-
F	Unknown forb-perennial	-	4	-	-	-	-	-	-	-	-
Total for Annual Forbs		0	0	75	117	142	32	0.28	0.31	1.84	0.42
Total for Perennial Forbs		215	173	128	234	150	164	1.21	12.67	3.69	6.14
Total for Forbs		215	173	203	351	292	196	1.50	12.99	5.53	6.57

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

BROWSE TRENDS --

Management unit 25C, Study no: 2

Type	Species	Strip Frequency				Average Cover %			
		'94	'98	'03	'08	'94	'98	'03	'08
B	Artemisia nova	0	17	21	18	-	1.29	1.64	1.61
B	Artemisia tridentata wyomingensis	92	79	75	83	9.67	6.50	10.67	8.80
B	Chrysothamnus depressus	0	0	0	3	-	-	-	.00
B	Chrysothamnus nauseosus	0	1	1	0	-	.00	.00	-
B	Chrysothamnus viscidiflorus stenophyllus	3	0	4	0	.00	-	.18	-
B	Eriogonum microthecum	9	3	6	4	.09	.06	.04	.00
B	Gutierrezia sarothrae	12	5	8	11	.07	.07	.18	.19
B	Leptodactylon pungens	0	0	1	0	-	-	.00	-
B	Opuntia sp.	2	0	9	13	.01	-	.03	.21
B	Pinus edulis	0	0	0	0	.30	-	-	-
B	Tetradymia canescens	26	27	25	32	.45	.21	.41	.35
Total for Browse		144	132	150	164	10.60	8.14	13.17	11.16

CANOPY COVER, LINE INTERCEPT --

Management unit 25C, Study no: 2

Species	Percent Cover	
	'03	'08
Artemisia nova	1.63	.10
Artemisia tridentata wyomingensis	14.80	13.63
Eriogonum microthecum	.05	-
Gutierrezia sarothrae	.20	-
Opuntia sp.	.01	.11
Tetradymia canescens	.13	.01

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 25C, Study no: 2

Species	Average leader growth (in)	
	'03	'08
Artemisia tridentata wyomingensis	2.0	1.4

POINT-QUARTER TREE DATA --  
Management unit 25C, Study no: 2

Species	Trees per Acre		
	'98	'03	'08
Juniper osteosperma	6	<18	<18
Pinus edulis	8	<18	<18

Average diameter (in)		
'98	'03	'08
1.2	-	-
3.7	-	-

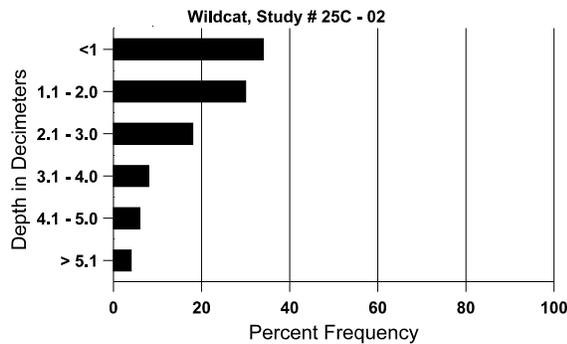
BASIC COVER --  
Management unit 25C, Study no: 2

Cover Type	Average Cover %					
	'85	'91	'94	'98	'03	'08
Vegetation	19.50	9.50	25.40	55.13	36.59	46.68
Rock	2.00	2.75	1.31	2.17	1.34	.82
Pavement	3.75	1.25	2.27	3.62	2.98	6.63
Litter	44.25	39.50	31.28	47.79	39.74	33.62
Cryptogams	0	.25	0	0	.63	.00
Bare Ground	30.50	46.75	34.77	27.63	32.24	22.64

SOIL ANALYSIS DATA --  
Management unit 25C, Study no: 2, Study Name: Wildcat

Effective rooting depth (in)	Temp °F (depth)	pH	loamy sand			%0M	PPM P	PPM K	ds/m
			% sand	% silt	% clay				
18.4	63.0 (16.3)	6.4	82.0	9.4	8.6	1.2	13.6	91.8	0.6

Stoniness Index



PELLET GROUP DATA --  
 Management unit 25C, Study no: 2

Type	Quadrat Frequency			
	'94	'98	'03	'08
Rabbit	28	17	27	62
Elk	41	41	27	41
Deer	32	31	39	35
Cattle	18	16	23	15

Days use per acre (ha)		
'98	'03	'08
-	-	-
45 (111)	29 (58)	42 (104)
17 (42)	46 (92)	32 (78)
33 (82)	41 (101)	23 (56)

BROWSE CHARACTERISTICS --  
 Management unit 25C, Study no: 2

		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)
<b>Amelanchier utahensis</b>												
85	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
91	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	25/37
98	<b>0</b>	-	-	-	-	-	0	0	-	-	0	40/52
03	<b>0</b>	-	-	-	-	-	0	0	-	-	0	36/41
08	<b>0</b>	-	-	-	-	-	0	0	-	-	0	59/61
<b>Artemisia nova</b>												
85	<b>1199</b>	666	533	533	133	-	0	0	11	-	0	14/13
91	<b>2199</b>	133	133	1933	133	-	21	0	6	-	3	11/18
94	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
98	<b>940</b>	140	260	520	160	40	47	2	17	2	2	14/21
03	<b>880</b>	-	-	780	100	20	34	2	11	2	2	14/22
08	<b>820</b>	40	140	440	240	-	27	0	29	5	20	12/25
<b>Artemisia tridentata wyomingensis</b>												
85	<b>5064</b>	199	1399	2666	999	-	13	5	20	-	1	23/20
91	<b>5399</b>	-	733	3533	1133	-	58	21	21	1	5	15/21
94	<b>5320</b>	40	580	3400	1340	240	40	4	25	4	16	15/24
98	<b>2640</b>	100	320	1860	460	240	31	5	17	2	5	22/30
03	<b>2860</b>	-	100	2140	620	340	21	3	22	7	8	24/33
08	<b>4360</b>	100	880	2220	1260	260	27	12	29	6	12	23/34

		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)
<b>Chrysothamnus depressus</b>												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	-/-
03	0	-	-	-	-	-	0	0	-	-	0	-/-
08	60	-	-	60	-	-	33	33	-	-	0	4/5
<b>Chrysothamnus nauseosus</b>												
85	0	-	-	-	-	-	0	0	-	-	0	-/-
91	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	-/-
98	20	-	-	20	-	-	100	0	-	-	0	-/-
03	20	-	-	20	-	-	0	100	-	-	0	-/-
08	0	-	-	-	-	-	0	0	-	-	0	-/-
<b>Chrysothamnus viscidiflorus stenophyllus</b>												
85	66	-	66	-	-	-	0	0	-	-	0	-/-
91	133	-	-	133	-	-	0	100	-	-	0	2/3
94	80	-	20	60	-	-	75	0	-	-	0	-/-
98	0	-	-	-	-	-	0	0	-	-	0	8/22
03	80	-	-	80	-	-	0	0	-	-	0	8/8
08	0	-	-	-	-	-	0	0	-	-	0	-/-
<b>Eriogonum microthecum</b>												
85	132	-	66	66	-	-	0	0	-	-	0	6/7
91	332	-	133	199	-	-	40	0	-	-	0	5/6
94	500	-	20	480	-	-	0	84	-	-	0	3/5
98	240	-	60	180	-	-	25	0	-	-	0	4/7
03	220	-	-	220	-	-	18	73	-	-	0	4/6
08	140	-	-	140	-	-	0	0	-	-	0	4/4
<b>Gutierrezia sarothrae</b>												
85	4665	-	1399	3266	-	-	0	0	0	-	0	10/8
91	6332	-	733	5466	133	-	1	0	2	-	2	6/6
94	280	-	40	220	20	-	0	0	7	-	0	5/4
98	120	40	-	120	-	-	17	0	0	-	0	10/8
03	340	-	-	320	20	-	0	0	6	-	0	7/7
08	280	-	-	280	-	20	0	0	0	-	0	8/8

		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)
<b>Leptodactylon pungens</b>												
85	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
91	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
98	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
03	<b>20</b>	-	-	20	-	-	0	0	-	-	0	-/-
08	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
<b>Opuntia sp.</b>												
85	<b>332</b>	333	266	66	-	-	0	0	-	-	0	2/5
91	<b>532</b>	1733	466	66	-	-	0	0	-	-	0	2/5
94	<b>40</b>	-	20	20	-	-	0	0	-	-	0	3/11
98	<b>0</b>	40	-	-	-	-	0	0	-	-	0	-/-
03	<b>400</b>	-	-	400	-	-	0	0	-	-	5	2/4
08	<b>320</b>	120	80	240	-	-	0	0	-	-	6	3/9
<b>Tetradymia canescens</b>												
85	<b>2665</b>	-	1333	933	399	-	3	0	15	-	5	7/7
91	<b>1998</b>	-	799	666	533	-	33	10	27	-	7	6/10
94	<b>800</b>	20	260	460	80	-	28	33	10	3	13	4/5
98	<b>820</b>	60	280	460	80	-	41	32	10	-	2	5/8
03	<b>880</b>	-	140	680	60	-	23	18	7	-	2	7/8
08	<b>1240</b>	100	360	840	40	-	5	0	3	-	2	5/6