

HIGGINS HOLLOW - TREND STUDY NO. 2-35-11

Vegetation Type: Wyoming Big Sagebrush

Range Type: Crucial Deer Winter, Substantial Elk Winter

NRCS Ecological Site Description: [Semidesert Loam \(Wyoming Big Sagebrush\), R034XY212UT](#)

Land Ownership: BLM

Elevation: 6,500 ft (1,981 m)

Aspect: Northeast

Slope: 14%

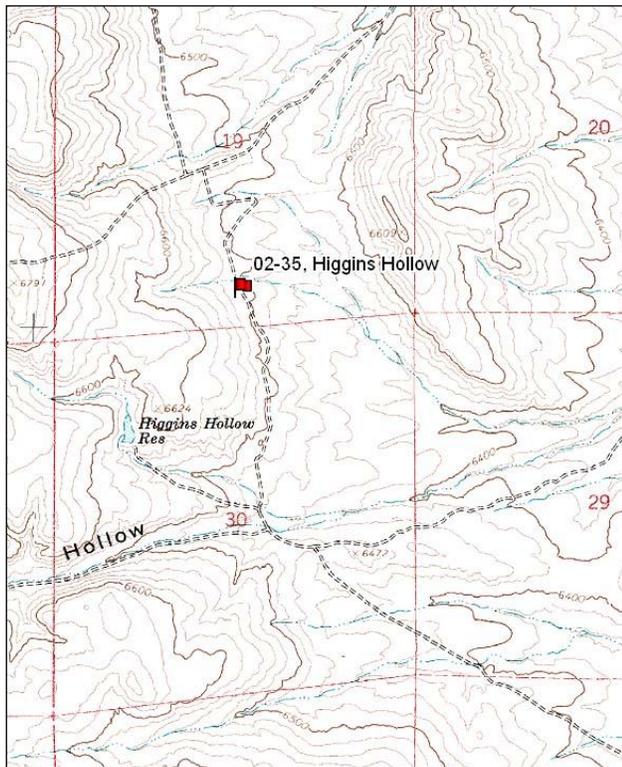
Transect bearing: 165° magnetic

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

Directions:

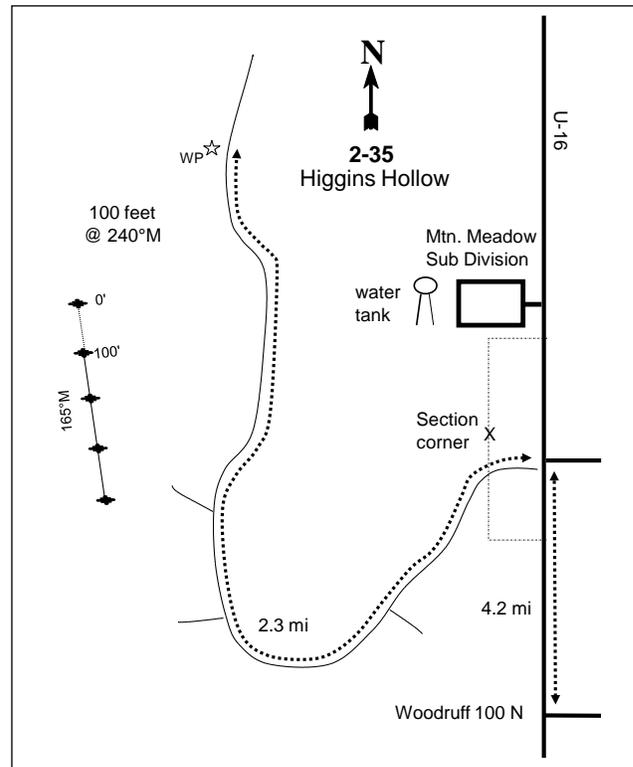
From 1st North in Woodruff proceed north on U-16 for 4.2 miles, and turn west to a dirt road. Proceed through pasture passing section marker at west gate. Travel a total of 2.3 miles (staying right) to a witness post on west side of road. From the witness post walk 100 feet at 240 degrees magnetic to the 0-foot stake (browse tag #9158) of the baseline.

Map Name: Woodruff



Township: 10N Range: 7E Section: 19

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 483456 E 4603655 N

HIGGINS HOLLOW - TREND STUDY NO. 2-35

Site Information

Site Description: This study is located north of Woodruff on the west side of SR 16. The area is administered by the Bureau of Land Management (BLM) as part of the Woodruff Pastures. The area is similar physically and edaphically to the Otter Creek study (2-34). The principal differences between these two areas are slope and past management practices. This study samples relatively undisturbed Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) community. Thus, it provides a good comparison to the Otter Creek study (2-34), an area that was mechanically treated and seeded. Wildlife occupies the Higgin's Hollow study area infrequently. Deer and pronghorn pellet groups were combined due to their similarity in appearance. Deer/pronghorn pellet groups were sampled in low abundance in 2001 and 2006, but moderate abundance in 2011. Cattle pats have been sampled in low abundance since 2001 (Table - Pellet Group Data).

Browse: The preferred browse species is Wyoming big sagebrush. It is the most abundant and palatable shrub on the study site. The Wyoming big sagebrush population varied slightly in density over the course of the study; however density decreased notably in 2006 and 2011. Over the sample years there has been a relatively high amount of decadence within the sagebrush population. Recruitment of young within the sagebrush population has progressively declined over the course of the study. The sagebrush population has had mostly moderate utilization over the sample years. Narrowleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *stenophyllus*) occurs in fairly high numbers, although it is much smaller and seldom utilized (Table - Browse Characteristics).

Herbaceous Understory: The herbaceous component is dominated by the perennial grass species Sandberg bluegrass (*Poa secunda*). Several other perennial grass species are present, but in limited numbers. These species include western wheatgrass (*Agropyron smithii*), bluebunch wheatgrass (*A. spicatum*), mutton bluegrass (*Poa fendleriana*), and bottlebrush squirreltail (*Sitanion hystrix*). Forbs occur only rarely and are primarily low growing species with little forage value. Hoods phlox (*Phlox hoodii*) and longleaf phlox (*P. longifolia*) are the most common species (Table - Herbaceous Trends).

Soil: Soils are part of the Pancheri component, which is found on hilltops. The parent material consists of eolian deposits derived from mixed sources (Soil Survey Staff 2011). The soil is mostly rock free and has a loam texture with a neutral soil reaction (pH 7.1) (Table - Soil Analysis Data). Exposed bare ground cover is moderate, and is found primarily between the interspaces of browse cover. Adequate protective ground cover is provided by high amounts of vegetation and litter (Table - Basic Cover). Some erosion is apparent, but is not serious. The soil erosion condition was classified as stable in 2001, but slight in 2006 and 2011 due to apparent pedestalling around shrubs. A few active gullies have also formed on the steeper slopes.

Trend Assessments

Browse:

- **1984 to 1990 - stable (0):** The density for Wyoming big sagebrush decreased remained similar, decreasing slightly from 6,865 plants/acre to 6,798 plants/acre. Decadence within the sagebrush population increased negligibly from 43% to 45%. The sagebrush population increased in poor vigor from 3% to 8%. Recruitment of young sagebrush increased from 23% to 33% of the population.
- **1990 to 1996 - stable (0):** Differences in density may be related to the larger sample area used in 1996; therefore, trend was determined using other parameters. Decadence within the sagebrush population decreased to 19%. The sagebrush population decreased in poor vigor to 2%. Young sagebrush recruitment decreased to 19% of the population.
- **1996 to 2001 - slightly up (+1):** The density for Wyoming big sagebrush increased 20% from 6,798 plants/acre to 8,080 plants/acre. However, decadence within the sagebrush population increased to 48%, and recruitment of young sagebrush decreased to 2% of the total population.

- **2001 to 2006 - down (-2):** The density for Wyoming big sagebrush decreased 25% to 6,040 plants/acre, returning to near 1996 levels. Cover for Wyoming big sagebrush decreased from 27% to 23%, but is still considered to be high. Decadence within the sagebrush population decreased to 36%. The sagebrush population increased in poor vigor from 2% to 26%. Recruitment of young sagebrush comprised 1% of the population.
- **2006 to 2011 - stable (0):** The density for Wyoming big sagebrush decreased 25% to 4,520 plants/acre. However, cover for Wyoming big sagebrush increased to 29%. Decadence within the sagebrush population remained similar at 35%. The sagebrush population maintained poor vigor at 26%. Recruitment of young sagebrush comprised 2% of the total population.

Grass:

- **1984 to 1990 - stable (0):** The sum of nested frequency for perennial grasses remained similar. Western wheatgrass and Sandberg bluegrass increased significantly in nested frequency. A sedge species (*Carex sp.*) was present in small numbers, and also had a significant increase in nested frequency. However, bluebunch wheatgrass and bottlebrush squirreltail decreased significantly in nested frequency.
- **1990 to 1996 - down (-2):** The sum of nested frequency for perennial grasses decreased 26%. Sandberg bluegrass increased significantly in nested frequency, and had a cover of 16%. Western wheatgrass, bottlebrush squirreltail, and the sedge species had a significant decrease in nested frequency, and all had covers below 1%.
- **1996 to 2001 - slightly up (+1):** The sum of nested frequency for perennial grasses increased 17%. Western wheatgrass increased significantly in nested frequency and increased in cover to nearly 1%. Sandberg bluegrass decreased in cover to 14%.
- **2001 to 2006 - slightly up (+1):** The sum of nested frequency for perennial grasses increased 12%. Bluebunch wheatgrass increased significantly in nested frequency and increased in cover from less than 1% to 2%. Sandberg bluegrass maintained cover near 14%.
- **2006 to 2011 - stable (0):** The sum of nested frequency for perennial grasses remained similar. Sandberg bluegrass had a significant increase in nested frequency and increased in cover to 19%. However, the decrease in the sum of nested frequency is likely due to small, accumulative decreases in nested frequency across the perennial grass community.

Forb:

- **1984 to 1990 - up (+2):** The sum of nested frequency for perennial forbs increased 70%. The increase is directly related to the significant increase in nested frequency for longleaf phlox.
- **1990 to 1996 - slightly down (-1):** The sum of nested frequency for perennial forbs decreased 17%. Hoods phlox had a significant increase in nested frequency, and had a cover just over 1%. However, the decrease in the sum of nested frequency is likely due to small, accumulative decreases in nested frequency across the perennial forb community.
- **1996 to 2001 - slightly up (+1):** The sum of nested frequency for perennial forbs increased 12%. Clover (*Trifolium sp.*) had a significant increase in nested frequency, but was an insignificant component in cover.
- **2001 to 2006 - up (+2):** The sum of nested frequency for perennial forbs increased 27%, and cover increased from 2% to 4%. Milkvetch (*Astragalus sp.*) and low fleabane (*Erigeron pumilus*) increased significantly in nested frequency, but provided limited cover.
- **2006 to 2011 - up (+2):** The sum of nested frequency for perennial forbs increased 24%, and cover increased to 5%. Milkvetch, spreading fleabane (*Erigeron divergens*), and clover increased significantly in nested frequency. Hoods phlox and spreading fleabane had covers near 1%.

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

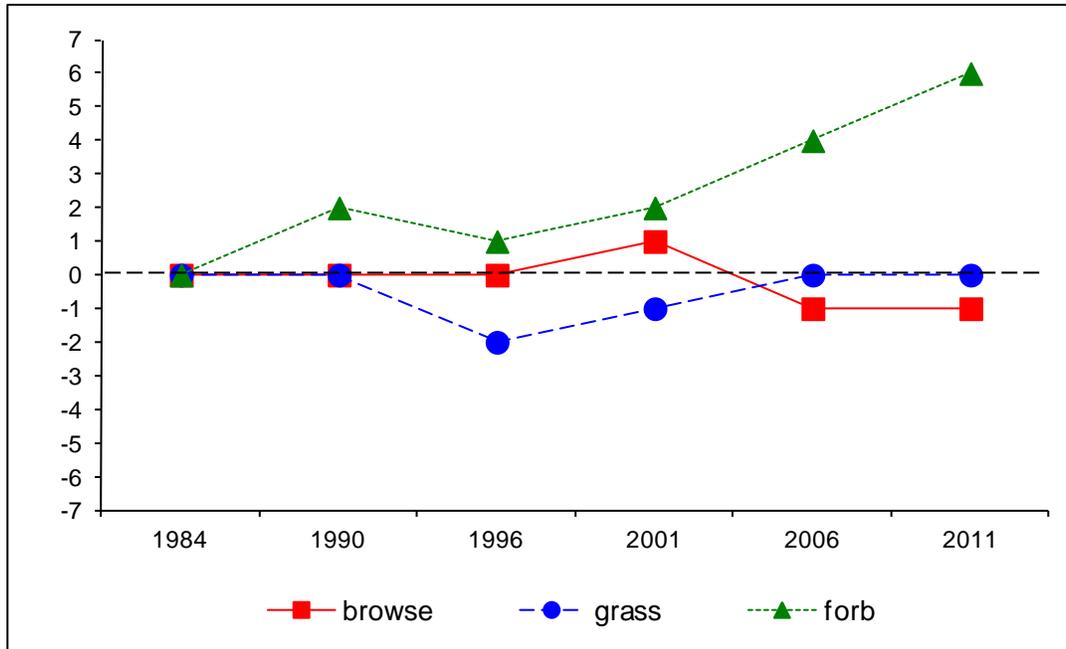
Management unit 2, study no: 35

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover (-POBU)	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
96	25.7	9.3	9.5	30.0	0.0	4.2	0.0	78.7	Excellent
01	30.0	0.6	1.0	30.0	0.0	4.4	0.0	66.0	Good-Excellent
06	28.4	4.2	0.5	30.0	0.0	7.0	0.0	70.2	Excellent
11	30.0	4.5	1.0	30.0	0.0	10.0	0.0	75.5	Excellent

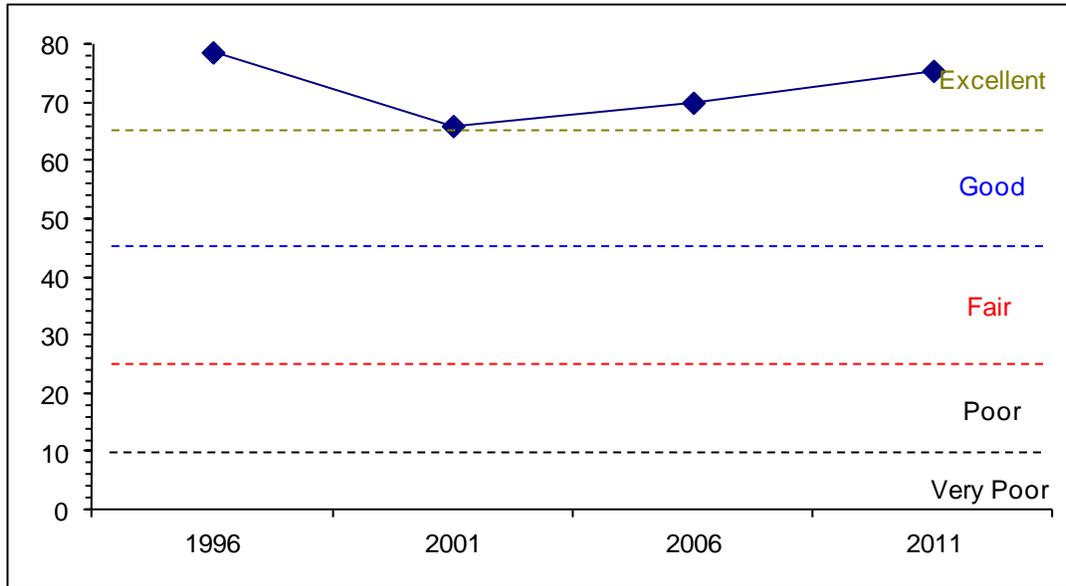
Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--

Management unit 2 Study no: 35



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--
Management unit 2, Study no: 35



HERBACEOUS TRENDS--
Management unit 02, Study no: 35

Type	Species	Nestled Frequency						Average Cover %			
		'84	'90	'96	'01	'06	'11	'96	'01	'06	'11
G	Agropyron smithii	a-	c105	b14	c84	c111	c91	.07	.62	1.06	.85
G	Agropyron spicatum	c217	a14	a9	a24	b53	b56	.04	.29	1.72	.82
G	Bromus tectorum (a)	-	-	2	-	-	-	.00	-	-	-
G	Carex sp.	b29	c55	a4	a2	a10	ab20	.02	.03	.02	.11
G	Oryzopsis hymenoides	-	-	1	-	2	1	.00	-	.00	.00
G	Poa bulbosa	-	-	4	-	-	-	.15	-	-	-
G	Poa fendleriana	-	-	4	8	10	12	.04	.06	.44	.12
G	Poa pratensis	-	-	-	2	10	1	-	.03	.12	.00
G	Poa secunda	a263	ab304	d339	ab318	cd281	310	15.75	14.18	14.19	18.84
G	Sitanion hystrix	c91	b69	a30	ab34	ab53	ab31	.25	.50	.79	.53
G	Stipa comata	-	-	-	2	-	-	-	.03	-	-
Total for Annual Grasses		0	0	2	0	0	0	0.00	0	0	0
Total for Perennial Grasses		600	547	405	474	530	522	16.32	15.75	18.37	21.30
Total for Grasses		600	547	407	474	530	522	16.33	15.75	18.37	21.30
F	Agoseris glauca	4	-	-	4	3	-	-	.03	.03	-
F	Alyssum alyssoides (a)	-	-	-	-	-	7	-	-	-	.01
F	Antennaria rosea	-	8	4	2	3	4	.06	.03	.06	.04
F	Arabis sp.	2	13	3	6	-	14	.00	.02	-	.05
F	Astragalus convallarius	2	2	3	4	7	1	.03	.01	.04	.01
F	Astragalus sp.	a-	a-	a-	a-	b20	c38	-	-	.36	.25
F	Calochortus nuttallii	a3	a4	a-	a3	a1	b32	-	.00	.00	1.88
F	Chenopodium leptophyllum(a)	-	-	-	-	-	1	-	-	-	.00
F	Collinsia parviflora (a)	-	-	a-	a1	a3	b36	-	.00	.00	.39
F	Cordylanthus ramosus (a)	-	-	a8	ab23	b40	c142	.04	.14	.20	5.05

Type	Species	Nested Frequency					Average Cover %				
		'84	'90	'96	'01	'06	'11	'96	'01	'06	'11
F	<i>Crepis acuminata</i>	-	-	-	-	1	-	-	-	.03	-
F	<i>Cryptantha</i> sp.	b13	a-	a-	a-	a-	a1	-	-	-	.00
F	<i>Descurainia pinnata</i> (a)	-	-	5	10	5	9	.01	.02	.01	.02
F	<i>Draba</i> sp. (a)	-	-	-	-	-	2	-	-	-	.00
F	<i>Erigeron divergens</i>	a14	a14	a19	a18	a12	b65	.28	.14	.15	.98
F	<i>Erigeron pumilus</i>	a12	a-	a3	a8	b42	a6	.03	.02	.69	.04
F	<i>Haplopappus acaulis</i>	-	-	-	-	-	4	-	-	.00	.18
F	<i>Lomatium triternatum</i>	-	9	-	5	5	1	-	.18	.01	.00
F	<i>Microsteris gracilis</i> (a)	-	-	a-	b16	a-	a5	-	.03	-	.01
F	<i>Penstemon humilis</i>	5	1	1	-	5	-	.00	-	.06	-
F	<i>Phlox hoodii</i>	a5	a7	b53	b60	b54	b50	1.12	1.24	1.28	1.10
F	<i>Phlox longifolia</i>	a57	c160	bc113	ab89	ab101	ab83	.55	.40	.57	.42
F	<i>Polygonum douglasii</i> (a)	-	-	-	-	-	1	-	-	-	.00
F	<i>Salsola iberica</i> (a)	-	-	-	3	-	-	-	.00	-	-
F	<i>Schoenrambe linifolia</i>	-	-	-	1	5	4	-	.00	.01	.01
F	<i>Trifolium</i> sp.	bc25	b12	a-	b24	b15	c44	-	.08	.04	.24
F	<i>Veronica biloba</i> (a)	-	-	-	-	-	1	-	-	-	.00
F	<i>Zigadenus paniculatus</i>	a-	ab11	a2	a1	b11	ab6	.03	.03	.13	.03
Total for Annual Forbs		0	0	13	53	48	204	0.06	0.21	0.21	5.50
Total for Perennial Forbs		142	241	201	225	285	353	2.11	2.21	3.51	5.27
Total for Forbs		142	241	214	278	333	557	2.17	2.43	3.74	10.78

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

BROWSE TRENDS--

Management unit 02, Study no: 35

Type	Species	Strip Frequency				Average Cover %			
		'96	'01	'06	'11	'96	'01	'06	'11
B	<i>Amelanchier alnifolia</i>	0	0	1	0	-	-	-	-
B	<i>Artemisia tridentata wyomingensis</i>	96	97	92	93	20.53	26.73	22.64	29.08
B	<i>Chrysothamnus viscidiflorus stenophyllus</i>	39	46	45	45	1.36	1.90	2.61	3.44
B	<i>Eriogonum microthecum</i>	8	4	6	6	.01	.00	.09	.09
B	<i>Opuntia</i> sp.	3	6	5	4	.00	-	-	.15
B	<i>Tetradymia canescens</i>	3	7	6	4	-	.06	.21	.21
Total for Browse		149	160	155	152	21.92	28.70	25.56	32.98

CANOPY COVER, LINE INTERCEPT--

Management unit 02, Study no: 35

Species	Percent Cover	
	'06	'11
Artemisia tridentata wyomingensis	30.46	31.14
Chrysothamnus viscidiflorus stenophyllus	3.38	3.41
Eriogonum microthecum	.10	.05
Opuntia sp.	.08	.03
Tetradymia canescens	-	.15

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 02, Study no: 35

Species	Average leader growth (in)		
	'01	'06	'11
Artemisia tridentata wyomingensis	0.7	0.8	1.4

BASIC COVER--

Management unit 02, Study no: 35

Cover Type	Average Cover %					
	'84	'90	'96	'01	'06	'11
Vegetation	7.75	7.75	39.28	49.63	45.86	51.70
Rock	0	0	.10	.09	.11	.13
Pavement	.75	.25	.36	.46	1.01	.29
Litter	76.00	54.25	38.15	44.29	43.97	44.40
Cryptogams	2.75	14.25	10.31	13.38	6.60	3.42
Bare Ground	12.75	23.50	23.33	17.78	21.75	19.97

SOIL ANALYSIS DATA --

Management unit 02, Study no: 35, Study Name: Higgins Hollow

Effective rooting depth (in)	pH	Loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
12.9	7.1	42.9	31.1	26.0	1.9	11.8	137.6	0.6

PELLET GROUP DATA--

Management unit 02, Study no: 35

Type	Quadrat Frequency				Days use per acre (ha)		
	'96	'01	'06	'11	'01	'06	'11
Rabbit	12	14	23	29	-	-	-
Grouse	-	-	-	2	-	-	-
Elk	-	-	1	2	-	-	-
Deer/Pronghorn	13	11	9	6	7 (17)	11 (26)	21 (53)
Cattle	9	2	2	-	12 (29)	4 (11)	4 (9)

BROWSE CHARACTERISTICS--

Management unit 02, Study no: 35

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Amelanchier alnifolia</i>										
84	0	0	0	-	-	0	0	0	-/-	
90	0	0	0	-	-	0	0	0	-/-	
96	0	0	0	-	-	0	0	0	-/-	
01	0	0	0	-	-	0	0	0	-/-	
06	160	0	100	-	-	0	0	0	-/-	
11	0	0	0	-	-	0	0	0	-/-	
<i>Artemisia tridentata wyomingensis</i>										
84	6865	23	34	43	4266	44	17	3	17/21	
90	6798	33	22	45	1399	34	10	8	23/21	
96	6760	19	62	19	80	43	4	2	24/33	
01	8080	2	50	48	20	23	1	1	23/30	
06	6040	1	63	36	-	14	2	26	23/32	
11	4520	2	62	35	260	39	6	26	24/35	
<i>Chrysothamnus viscidiflorus stenophyllus</i>										
84	5531	16	66	18	-	0	0	0	9/13	
90	4998	4	5	91	199	4	0	52	8/12	
96	1620	0	96	4	-	0	0	9	10/17	
01	2320	0	90	10	-	0	0	5	10/17	
06	2480	0	91	9	20	0	0	12	10/17	
11	2460	6	93	2	-	0	0	0	10/16	
<i>Eriogonum microthecum</i>										
84	266	0	100	0	-	0	0	0	4/4	
90	133	100	0	0	-	0	0	0	-/-	
96	220	9	82	9	-	0	0	9	7/8	
01	80	0	100	0	-	0	0	0	6/9	
06	140	0	100	0	-	0	0	0	6/9	
11	140	0	100	0	-	0	0	0	6/10	
<i>Opuntia sp.</i>										
84	399	0	100	0	-	0	0	0	5/7	
90	199	0	100	0	66	0	0	0	5/1	
96	100	0	100	0	-	0	0	0	4/11	
01	180	0	89	11	-	0	0	0	3/8	
06	140	0	100	0	-	0	0	0	5/13	
11	80	0	75	25	-	0	0	25	5/15	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Tetradymia canescens										
84	332	20	80	0	-	80	0	0	5/4	
90	265	25	0	75	199	0	75	75	-/-	
96	60	0	67	33	-	0	0	33	5/10	
01	180	11	67	22	-	33	0	22	7/12	
06	140	14	71	14	-	0	0	0	6/8	
11	100	20	80	0	-	0	0	0	6/9	