

STATE LINE - TREND STUDY NO. 2-30-11

Vegetation Type: Wyoming Big Sagebrush

Range Type: Crucial Deer Winter

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

Land Ownership: BLM

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

Aspect: Level

Slope: 3%

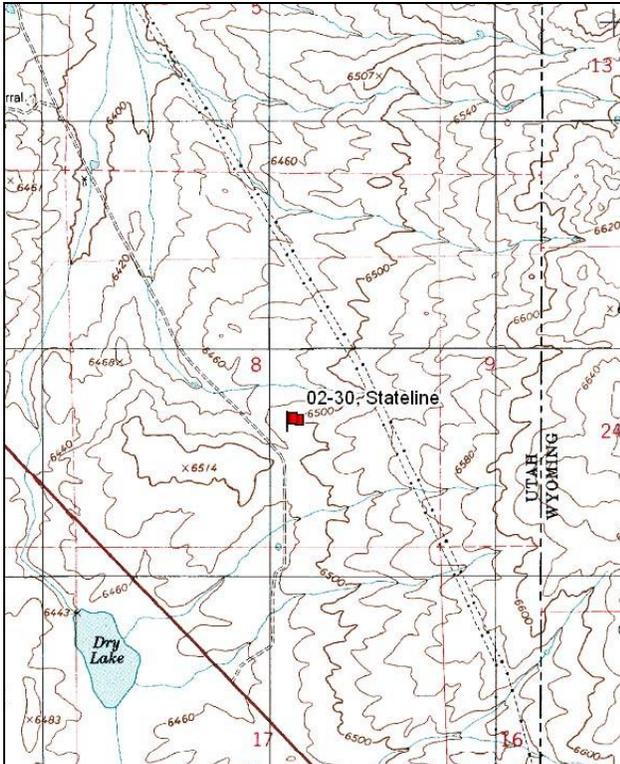
Transect bearing: 170° magnetic

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

Directions:

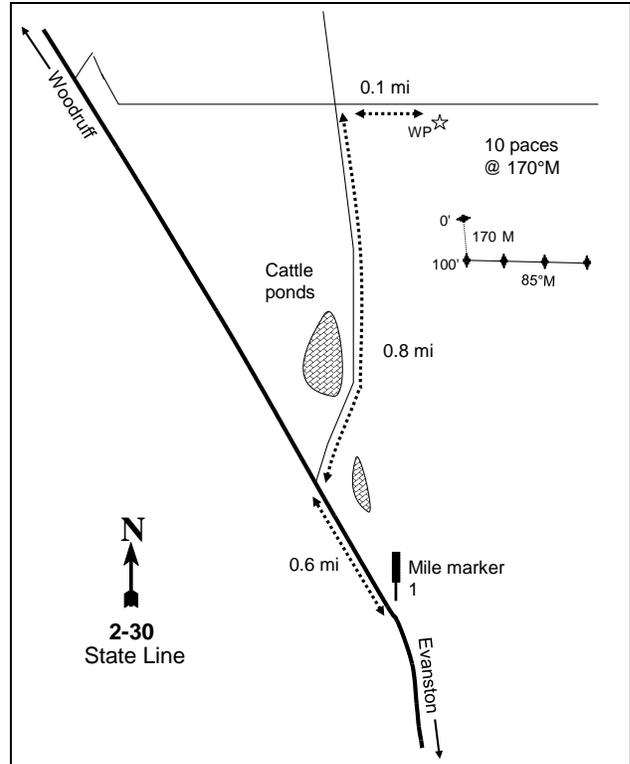
From the Utah/Wyoming border, proceed north on Highway 16 for 0.6 miles past mile marker 1. Turn right proceeding through gate, and travel 0.8 miles north to an intersection in a wash. Turn right, and drive 0.1 miles east to a witness post. Walk ten paces at a bearing of 170 degrees magnetic. From 0' to 100' at 170 degrees magnetic, and from 100' to 400' at 85 degrees magnetic. The 0-foot stake is wired with a browse tag # 7991.

Map Name: Neponset Reservoir NE



Township: 8N Range: 8E Section: 8

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 495018 E 4587837 N

## STATE LINE - TREND STUDY NO. 2-30

### Site Information

Site Description: This study is located near the Utah-Wyoming border southeast of Woodruff. The area is administered by the Bureau of Land Management (BLM) as part of the East Woodruff allotment. This area is dominated by Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and has very few species in the herbaceous understory. The area is used by deer, elk, and pronghorn. Due to their similarity in pellet appearance, deer and pronghorn pellet groups were combined. Deer/pronghorn pellet groups were sampled in moderate abundance in 2001 and 2006, but high abundance in 2011. Elk and cattle sign has been minimal since 2001. Cattle were in the area during the spring and early summer of 2001 and 2006. Sage-grouse are also present in the area, and some sage-grouse droppings were encountered in 2001 (Table - Pellet Group Data).

Browse: The landscape is dominated by the preferred browse species Wyoming big sagebrush. Wyoming big sagebrush is a dense, mature population that has been fairly stable over the course of the study. Decadence within the sagebrush population has been high since the outset of the study. Sagebrush plants have been moderately to heavily utilized over the duration of the study. Sagebrush plants displaying poor vigor within the population have fluctuated over the course of the study, but since 2001 the population has had a steady increase of plants displaying poor vigor within the population. Recruitment of young Wyoming big sagebrush plants has been nominal since 1990. Other fairly common browse species include Gardner saltbush (*Atriplex gardneri* ssp. *falcate*) and stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*). Gardner saltbush is a very small, low-growing saltbush that is strongly rhizomatous and sprouts profusely. Stickyleaf low rabbitbrush is a vigorous, mature population that has been lightly hedged over the duration of the study (Table - Browse Characteristics).

Herbaceous Understory: The herbaceous community lacks diversity and produces little forage. The most common perennial grass species is Sandberg bluegrass (*Poa secunda*). Annual grass species are not yet present on the study, and have been absent since 1984. Perennial forbs species are infrequent and produce very little cover. Common species found on the site include Hoods phlox (*Phlox hoodii*) and stemless goldenweed (*Haplopappus acaulis*) (Table - Herbaceous Trends).

Soil: Soil is in the Neponset component, which occurs on upland slopes. The parent material consists of residuum weathered from sandstone and siltstone (Soil Survey Staff 2011). The soil has a clay loam texture and a soil reaction that is slightly alkaline (pH 7.8). Bare ground cover is high and is found primarily in the interspaces of Wyoming big sagebrush. Protective ground cover is provided by a high amount of vegetation, and a moderate amount of litter (Table - Basic Cover). Vegetation and litter is concentrated near sagebrush. Terrain is nearly level, so water erosion is not excessive. Soil pedestalling is evident around plants, and the soil is held in place by the abundance of cryptogam crusts under sagebrush crowns. The presence of flow patterns, rills, and soil movement indicate continual erosion is occurring; therefore, the soil erosion condition has been determined to be slight since 2001.

### Trend Assessments

#### Browse:

- **1984 to 1990 - stable (0):** The density for Wyoming big sagebrush increased slightly from 7,532 plants/acre to 8,064 plants/acre. Decadence within the sagebrush population decreased from 39% to 38%. The sagebrush population increased in poor vigor from 3% to 19%.
- **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. The Wyoming big sagebrush population decreased in decadence to 32%. Poor vigor within the sagebrush population decreased to

8%. Recruitment of young sagebrush plants decreased from 17% to 2% of the population. Sagebrush had a cover of 23%.

- **1996 to 2001 - stable (0):** The density for Wyoming big sagebrush remained similar increasing from 6,500 plants/acre to 6,700 plants/acre. Decadence within the sagebrush population decreased to 21%. The sagebrush population displayed no change in vigor. Sagebrush increased in cover to 25%.
- **2001 to 2006 - stable (0):** The density for Wyoming big sagebrush remained similar at 6,600 plants/acre. Decadence within the sagebrush population increased to 30%. Poor vigor within the sagebrush population increased to 19%. Cover for sagebrush decreased to 22%.
- **2006 to 2011 - stable (0):** The density for Wyoming big sagebrush remained similar at 6,380 plants/acre. Decadence for the sagebrush population increased to 32%. Poor vigor increased to 34% of the sagebrush population. Cover for sagebrush decreased to 20%.

#### Grass:

- **1984 to 1990 - slightly down (-1):** The sum of nested frequency for perennial grasses decreased 14%. Sandberg bluegrass was the most dominant perennial grass. Western wheatgrass (*Agropyron smithii*) decreased significantly in nested frequency.
- **1990 to 1996 - slightly down (-1):** The sum of nested frequency for perennial grasses decreased 13%. Sandberg bluegrass was the most dominant grass, and had a cover of 4%.
- **1996 to 2001 - slightly up (+1):** The sum of nested frequency for perennial grasses increased 12%. The increase is not due to any one specific species, and is likely due to small, accumulative increases in nested frequency across the perennial grass community. However, Sandberg bluegrass increased in cover to 5%, and western wheatgrass increased in cover from less than 1% to 1%.
- **2001 to 2006 - stable (0):** The sum of nested frequency for perennial grasses remained similar. Sandberg bluegrass decreased in cover to 3%.
- **2006 to 2011 - up (+2):** The sum of nested frequency for perennial grasses increased 27%. Sandberg bluegrass had a significant increase in nested frequency, and increased in cover from 4% to 8%. Bottlebrush squirreltail (*Sitanion hystrix*) had a significant increase in nested frequency, and had a cover of less than 1%.

#### Forb:

- **1984 to 1990 - stable (0):** The sum of nested frequency for perennial forb remained similar. Timber poisonvetch (*Astragalus convallarius*) had a significant decrease in nested frequency.
- **1990 to 1996 - slightly down (-1):** The sum of nested frequency for perennial forbs decreased 16%. Hoods phlox was the most dominant forb found on the site, and had a cover of 2%.
- **1996 to 2001 - down (-2):** The sum of nested frequency for perennial forbs decreased 27%. Hoods phlox decreased significantly in nested frequency, but maintained cover near 2%.
- **2001 to 2006 - up (+2):** The sum of nested frequency for perennial forbs increased 37%. Longleaf phlox increased significantly in nested frequency and had a cover of less than 1%. Hoods phlox decreased in cover to 1%.
- **2006 to 2011 - slightly up (+1):** The sum of nested frequency for perennial forbs increased 11%. Rockcress (*Arabis sp.*) had a significant increase in nested frequency, but had very little cover. The annual species pale alyssum (*Alyssum alyssoides*) was the most abundant forb of the community, and had a cover of 3%.

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

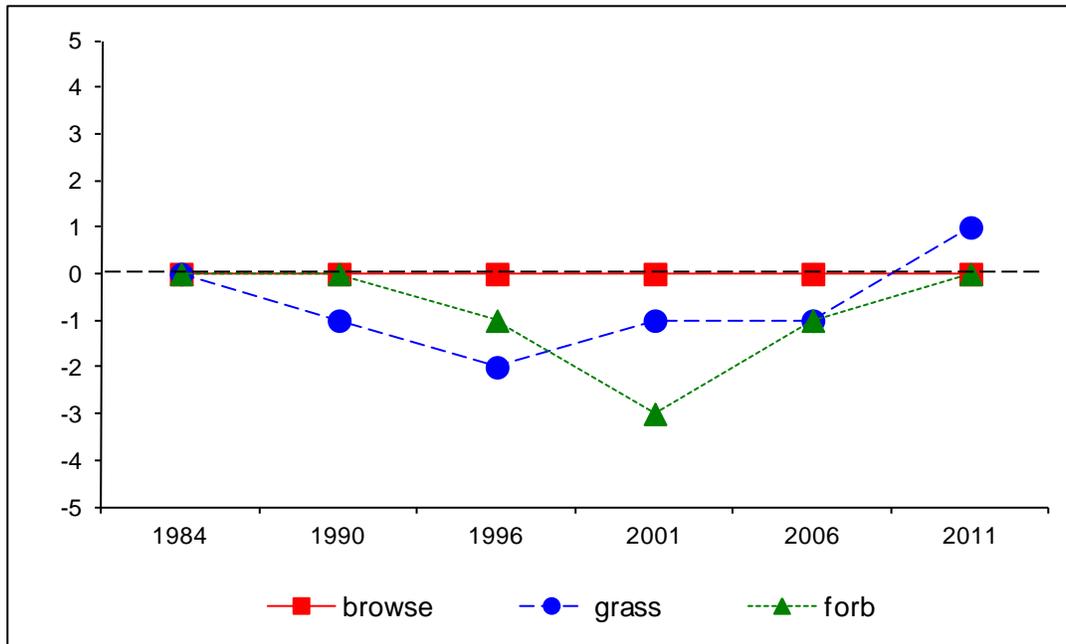
Management unit 2, study no: 30

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
96	29.2	5.4	1.0	9.5	0.0	6.2	0.0	<b>51.3</b>	Good
01	30.0	8.7	0.0	12.6	0.0	5.3	0.0	<b>56.6</b>	Good
06	27.5	6.0	2.0	10.1	0.0	0.0	0.0	<b>45.6</b>	Fair-Good
11	25.1	5.4	4.0	17.8	0.0	0.0	0.0	<b>52.2</b>	Good

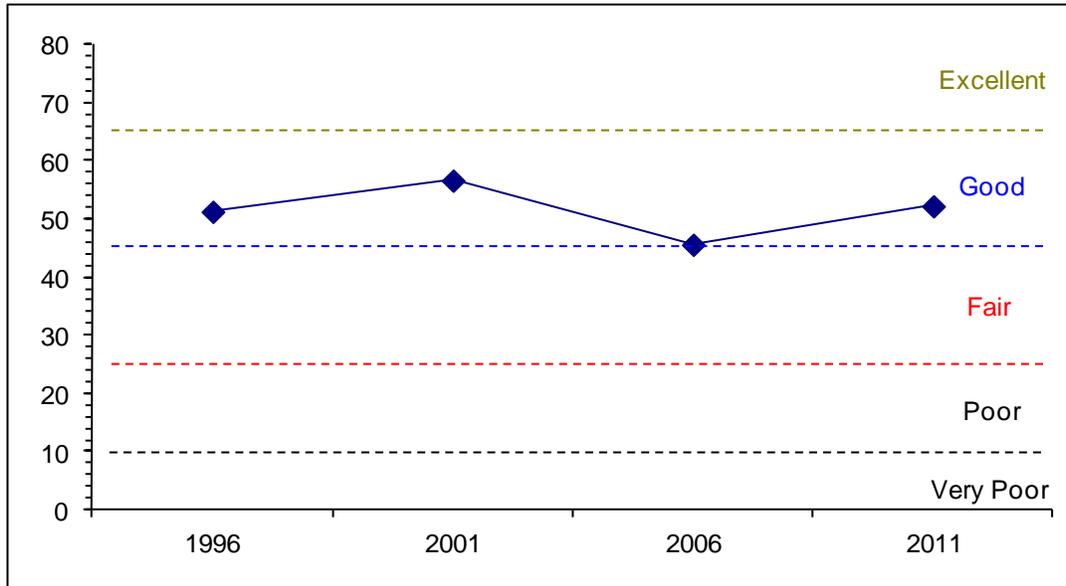
**Trend Summary**

CUMULATIVE RANGE TREND ASSESSMENT--

Management unit 2 Study no: 30



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--  
 Management unit 2, Study no: 30



HERBACEOUS TRENDS--  
 Management unit 02, Study no: 30

Type	Species	Nested Frequency						Average Cover %			
		'84	'90	'96	'01	'06	'11	'96	'01	'06	'11
G	Agropyron cristatum	-	-	-	-	-	4	-	-	-	.00
G	Agropyron smithii	c140	ab94	a51	abc96	bc108	bc129	.36	.87	1.23	1.03
G	Oryzopsis hymenoides	5	9	8	10	12	8	.19	.51	.08	.07
G	Poa secunda	ab235	b248	ab232	ab245	a212	b253	4.11	4.94	3.68	7.52
G	Sitanion hystrix	a-	a9	a23	a-	a17	b45	.07	-	.07	.23
G	Stipa comata	b39	a-	a-	a-	a-	a3	-	-	-	.01
Total for Annual Grasses		0	0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		419	360	314	351	349	442	4.73	6.32	5.07	8.88
Total for Grasses		419	360	314	351	349	442	4.73	6.32	5.07	8.88
F	Allium sp.	-	-	-	-	-	3	-	-	-	.00
F	Alyssum alyssoides (a)	-	-	a2	c211	b147	d331	.00	.69	.57	2.59
F	Antennaria rosea	6	9	2	1	3	2	.15	.00	.00	.03
F	Arabis sp.	b19	a-	a-	a3	a1	b16	-	.00	.00	.04
F	Astragalus convallarius	b20	ab6	a2	ab9	a-	ab19	.00	.07	-	.28
F	Astragalus sp.	-	-	-	-	-	3	-	-	-	.03
F	Astragalus utahensis	-	2	1	1	-	8	.00	.00	-	.07
F	Cordylanthus ramosus (a)	-	-	-	-	-	11	-	-	-	.09
F	Cryptantha sp.	-	-	-	-	-	1	-	-	-	.00
F	Cymopterus sp.	a-	a-	a-	a3	b15	ab2	-	.00	.05	.01
F	Draba sp. (a)	-	-	3	3	-	-	.00	.03	-	-
F	Erigeron pumilus	3	5	-	-	-	-	-	-	-	-
F	Eriogonum caespitosum	-	2	-	-	-	-	-	-	-	-
F	Eriogonum cernuum (a)	-	-	-	1	-	-	-	.00	-	-
F	Gayophytum ramosissimum(a)	-	-	-	-	-	5	-	-	-	.03

Type	Species	Nestled Frequency						Average Cover %			
		'84	'90	'96	'01	'06	'11	'96	'01	'06	'11
F	Haplopappus acaulis	<sub>b</sub> 69	<sub>b</sub> 64	<sub>a</sub> 30	<sub>a</sub> 15	<sub>a</sub> 16	<sub>a</sub> 13	.74	.54	.42	.84
F	Phlox hoodii	<sub>b</sub> 125	<sub>ab</sub> 128	<sub>b</sub> 133	<sub>ab</sub> 89	<sub>ab</sub> 102	<sub>a</sub> 84	2.08	1.88	1.34	1.48
F	Phlox longifolia	<sub>a</sub> 3	<sub>abc</sub> 25	<sub>bcd</sub> 39	<sub>ab</sub> 29	<sub>d</sub> 70	<sub>cd</sub> 60	.11	.12	.32	.34
F	Ranunculus testiculatus (a)	-	-	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> 4	<sub>b</sub> 71	-	-	.00	.25
F	Trifolium sp.	<sub>ab</sub> 7	<sub>a</sub> 4	<sub>a</sub> -	<sub>a</sub> 2	<sub>a</sub> 1	<sub>b</sub> 20	-	.00	.00	.04
F	Unknown forb-perennial	1	-	-	-	-	-	-	-	-	-
Total for Annual Forbs		0	0	5	215	151	418	0.00	0.73	0.57	2.97
Total for Perennial Forbs		253	245	207	152	208	231	3.09	2.64	2.16	3.19
Total for Forbs		253	245	212	367	359	649	3.10	3.37	2.74	6.17

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

#### BROWSE TRENDS--

Management unit 02, Study no: 30

Type	Species	Strip Frequency				Average Cover %			
		'96	'01	'06	'11	'96	'01	'06	'11
B	Artemisia tridentata wyomingensis	98	96	94	97	23.38	25.17	21.96	20.04
B	Atriplex gardneri falcata	14	15	14	17	.56	.27	.28	.67
B	Ceratoides lanata	0	0	0	1	-	-	-	-
B	Chrysothamnus viscidiflorus viscidiflorus	56	51	47	52	1.41	1.91	1.71	1.33
B	Leptodactylon pungens	0	3	4	7	-	.53	.30	.03
B	Opuntia sp.	9	12	17	17	.21	.21	.16	.36
B	Tetradymia canescens	6	4	5	5	.01	.00	.01	.16
Total for Browse		183	181	181	196	25.57	28.10	24.44	22.61

#### CANOPY COVER, LINE INTERCEPT--

Management unit 02, Study no: 30

Species	Percent Cover	
	'06	'11
Artemisia tridentata wyomingensis	24.26	24.58
Atriplex gardneri falcata	.21	1.06
Chrysothamnus viscidiflorus viscidiflorus	1.58	2.66
Leptodactylon pungens	.25	.05
Opuntia sp.	.28	.58
Tetradymia canescens	.08	.13

#### KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 02, Study no: 30

Species	Average leader growth (in)		
	'01	'06	'11
Artemisia tridentata wyomingensis	1.0	0.5	2.8

**BASIC COVER--**

Management unit 02, Study no: 30

Cover Type	Average Cover %					
	'84	'90	'96	'01	'06	'11
Vegetation	6.25	12.00	31.88	39.17	31.01	37.00
Rock	.75	.25	.33	.11	.41	.03
Pavement	7.00	7.00	1.16	1.01	.74	.19
Litter	42.75	24.00	26.83	28.42	31.02	28.21
Cryptogams	5.50	14.00	8.70	12.45	11.36	7.52
Bare Ground	37.75	42.75	39.54	42.63	43.56	37.40

**SOIL ANALYSIS DATA --**

Management unit 02, Study no: 30, Study Name: State Line

Effective rooting depth (in)	pH	Clay Loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
10.4	7.8	41.9	28.1	30.0	2.0	8.4	99.2	0.8

**PELLET GROUP DATA--**

Management unit 02, Study no: 30

Type	Quadrat Frequency				Days use per acre (ha)		
	'96	'01	'06	'11	'01	'06	'11
Rabbit	4	1	27	21	-	-	-
Grouse	-	5	-	2	-	-	-
Elk	-	-	4	10	7 (17)	5 (12)	4 (10)
Deer/Pronghorn	27	14	21	36	31 (26)	25 (63)	64 (159)
Cattle	-	1	2	-	12 (29)	14 (34)	2 (4)

**BROWSE CHARACTERISTICS--**

Management unit 02, Study no: 30

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Artemisia tridentata wyomingensis</b>									
84	<b>7532</b>	15	46	39	1533	45	27	3	14/19
90	<b>8064</b>	17	45	38	66	42	37	19	15/16
96	<b>6500</b>	2	66	32	40	46	11	8	15/31
01	<b>6700</b>	0	79	21	40	58	15	8	18/30
06	<b>6600</b>	4	66	30	17180	14	0	19	16/28
11	<b>6380</b>	8	60	32	220	29	39	34	17/28
<b>Atriplex gardneri falcate</b>									
84	<b>3865</b>	57	43	0	5399	38	0	0	7/11
90	<b>5532</b>	81	19	0	3599	5	5	0	5/7
96	<b>1840</b>	0	98	2	-	0	0	0	3/7
01	<b>1060</b>	6	94	0	-	23	38	0	4/7
06	<b>1100</b>	29	67	4	40	2	0	2	4/7
11	<b>1260</b>	22	78	0	20	0	0	0	11/14

		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>Ceratoides lanata</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	0	0	0	-	-	0	0	0	5/11	
11	20	0	100	-	-	0	0	0	9/11	
<i>Chrysothamnus viscidiflorus viscidiflorus</i>										
84	1731	4	92	4	66	0	0	4	11/14	
90	2065	6	52	42	-	39	3	6	6/10	
96	2020	0	82	18	-	0	0	10	8/13	
01	2000	1	92	7	-	0	0	4	8/12	
06	1880	3	64	33	200	11	0	24	7/12	
11	2260	0	100	0	-	6	2	5	8/12	
<i>Eriogonum microthecum</i>										
84	66	0	100	-	-	0	0	0	1/2	
90	0	0	0	-	-	0	0	0	-/-	
96	0	0	0	-	-	0	0	0	-/-	
01	0	0	0	-	-	0	0	0	-/-	
06	0	0	0	-	-	0	0	0	-/-	
11	0	0	0	-	-	0	0	0	-/-	
<i>Leptodactylon pungens</i>										
84	0	0	0	-	-	0	0	0	-/-	
90	0	0	0	-	-	0	0	0	-/-	
96	0	0	0	-	-	0	0	0	-/-	
01	220	9	91	-	-	0	0	0	4/9	
06	180	0	100	-	-	0	0	0	5/12	
11	260	8	92	-	-	0	0	0	3/7	
<i>Opuntia sp.</i>										
84	599	0	100	0	-	0	0	0	5/13	
90	932	57	14	29	133	0	0	14	4/6	
96	500	20	68	12	-	0	0	4	3/11	
01	440	5	77	18	20	0	0	5	3/7	
06	540	15	81	4	60	0	0	0	3/10	
11	500	0	100	0	-	0	0	0	4/11	
<i>Tetradymia canescens</i>										
84	66	0	100	0	-	100	0	0	4/5	
90	0	0	0	0	-	0	0	0	-/-	
96	360	0	56	44	-	0	17	11	4/9	
01	80	0	100	0	-	25	0	0	7/12	
06	120	17	33	50	-	17	0	33	6/10	
11	120	17	83	0	-	0	0	33	7/14	