

SOUTH SIDE EMIGRANT PASS - TREND STUDY NO. 1-7-11

Vegetation Type: Black Sagebrush

Range Type: Crucial Deer Winter, Crucial Elk Year-long

NRCS Ecological Site Description: [Semidesert Stony Loam \(Black Sagebrush\), R028AY252UT](#)

Land Ownership: BLM

Elevation: 5,620 ft. (1,713 m)

Aspect: Southwest

Slope: 11%

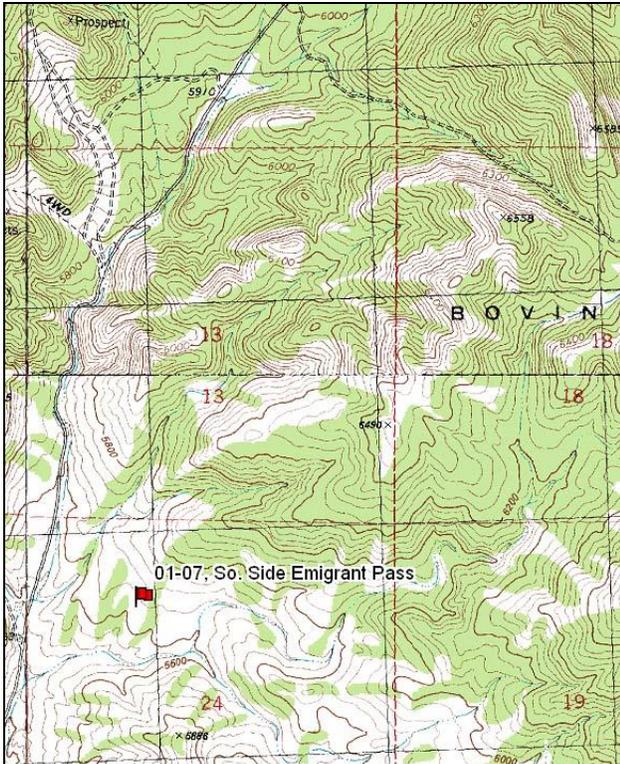
Transect bearing: 162° magnetic

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

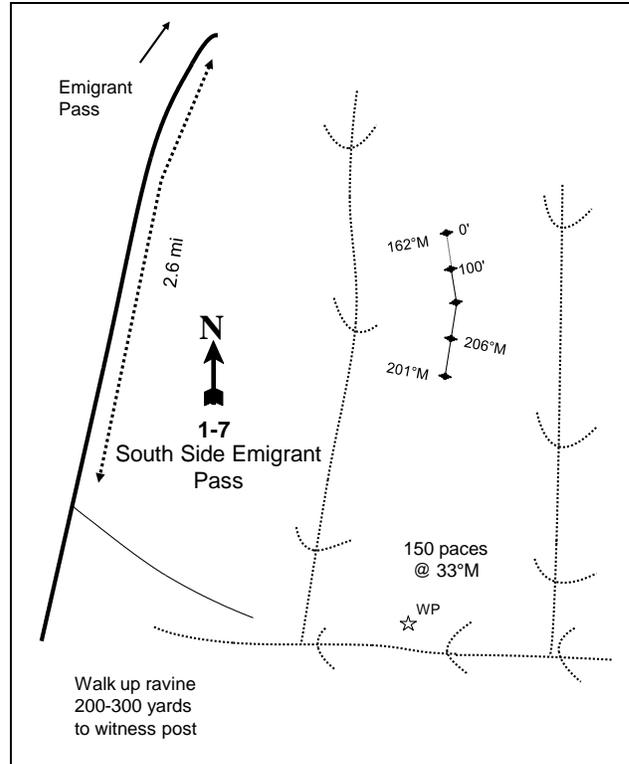
Directions:

From the cattleguard at the summit of Emigrant Pass Road, travel 2.6 miles southwest to a cheatgrass flat on the east side of the road. Turn left crossing the flat and drive east to the wash. Walk up the wash approximately 200-300 yards to a witness post. Take a bearing of 33 degrees magnetic and walk 150 paces up the ridge to the 400-foot stake of the baseline. The 0-foot stake is marked with a red browse tag, #7911. The baseline runs at a bearing of 162 degrees magnetic. The 300-foot baseline runs 206 degrees magnetic. The 400-foot baseline runs 201 degrees magnetic.

Map Name: Bovine



Diagrammatic Sketch:



Township: 9N Range: 17W Section: 24

GPS: NAD 83, UTM 12S 270844 E 4596873 N

SOUTH SIDE EMIGRANT PASS - TREND STUDY NO. 1-7

Site Information

Site Description: The study samples a black sagebrush (*Artemisia nova*) ridge on the south side of Emigrant Pass. Shallow draws containing a few Utah juniper (*Juniperus osteosperma*) trees are located to either side of the study area. The area is managed by the Bureau of Land Management (BLM) as part of the White Lake allotment. Deer pellet groups were sampled in low abundance in 2001, but in more moderate abundance since 2006. Elk pellet groups were high in abundance in 2001, but low in abundance since 2006. Sampled cattle sign has been minimal since 2001. Several sage-grouse pellet groups were sampled in 2006 (Table - Pellet Group Data).

Browse: Black sagebrush is the key browse species, and has provided nearly all of the browse cover on the site since 1996 (Table Browse Trends). The black sagebrush on the site is comprised of a dense population of moderately used plants. Decadence is moderate within the population. Recruitment of young black sagebrush plants was high at the outset of the study, but decreased markedly in 2001. Recruitment of young plants has been poor since that time. Other preferred browse species on the site include shadscale (*Atriplex confertifolia*), Nevada ephedra (*Ephedra nevadensis*), and green molly summer cypress (*Kochia americana*). All three species occur in relatively low numbers, with mostly light to moderate use. Shadscale density has steadily decreased over the course of the study. Other associated shrub species include narrowleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *stenophyllus*) and bud sagebrush (*Artemisia spinescens*) (Table - Browse Characteristics).

Herbaceous Understory: Grasses occur infrequently and produce limited cover. The most common species are Indian ricegrass (*Oryzopsis hymenoides*), bottlebrush squirreltail (*Sitanion hystrix*), and the annual species cheatgrass (*Bromus tectorum*). Forbs are diverse, but also produce limited cover (Table - Herbaceous Trends).

Soil: The soil is part of the Tosser-Puett association, likely as part of the Tosser component. These soils occur on hillslopes, and parent material consists of alluvium derived from limestone and chert (Soil Survey Staff 2011). The soil is a sandy clay with a slightly alkaline soil reaction (pH 7.7). Phosphorus may have limited availability for plant growth and development at 3.9 ppm (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). The surface is very rocky and appears almost armored with extensive areas of pavement. Litter cover is scarce, and vegetation cover is limited almost exclusively to black sagebrush crowns. Bare ground cover is low (Table - Basic Cover). Pedestalling around sagebrush plants is common, but is not extreme. The soil erosion condition was classified as stable in 2001 and 2011, but was slight in 2006.

Trend Assessments

Browse:

- **1984 to 1990 - stable (0):** The black sagebrush density decreased by 8% from 10,465 plants/acre to 9,665 plants/acre. Decadence increased from 15% to 30%, but poor vigor decreased from 10% to 2%. Recruitment of young black sagebrush plants remained very high at 41% 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 of black sagebrush decreased to 9%, and poor vigor stayed low at 2%. Recruitment of young black sagebrush plants decreased to 25%, but is still considered to be very good.
- **1996 to 2001 - stable (0):** The density of black sagebrush increased slightly from 11,500 plants/acre to 12,380 plants/acre, and cover increased from 17% to 19%. Decadence increased to 18%, and poor vigor increased to 4%. Recruitment of young black sagebrush plants decreased substantially to 5% of the population.
- **2001 to 2006 - slightly down (-1):** The black sagebrush density decreased 10% to 11,160 plants/acre, but cover increased to 24%. Decadence increased to 22%, and poor vigor increased to 9%.

Recruitment of young sagebrush plants remained very poor at 3%, but there were numerous seedlings sampled.

- **2006 to 2011 - stable (0):** Black sagebrush density remained similar at 10,520 plants/acre, but cover decreased slightly to 22%. Decadence decreased to 18%, but poor vigor increased to 11% of the population. Recruitment of young sagebrush plants remained very poor at 3%.

Grass:

- **1984 to 1990 - slightly up (+1):** The sum of nested frequency of perennial grasses increased two-fold, but perennial grasses are not abundant on the site. There was a significant increase in the nested frequency of Indian ricegrass.
- **1990 to 1996 - stable (0):** There was a 20% increase in the sum of nested frequency of perennial grasses, but perennial grasses remain relatively rare on the site.
- **1996 to 2001 - slightly up (+1):** The perennial grass sum of nested frequency increased 38%, and cover increased from 1% to 2%. Cheatgrass increased significantly in nested frequency, but cover remained less than 1%.
- **2001 to 2006 - down (-2):** The sum of nested frequency of perennial grasses decreased by 29%, but cover remained similar at 2%. Cheatgrass increased significantly in nested frequency, and cover increased slightly to just over 1%. Cheatgrass was the dominant grass in frequency and cover.
- **2006 to 2011 - stable (0):** The perennial grass sum of nested frequency decreased by 10%, and cover decreased to less than 1%. However, cheatgrass also decreased significantly in nested frequency, and cover decreased to near 0%.

Forb:

- **1984 to 1990 - stable (0):** There was little change in the sum of nested frequency of perennial forbs.
- **1990 to 1996 - up (+2):** The sum of nested frequency of perennial forbs increased by 23%.
- **1996 to 2001 - down (-2):** The perennial forb sum of nested frequency decreased by 24%, and cover decreased from 2% to 1%.
- **2001 to 2006 - down (-2):** The sum of nested frequency of perennial forbs decreased by 25%, though cover remained similar.
- **2006 to 2011 - stable (0):** There was little change in the sum of nested frequency or cover of perennial forbs. The sum of nested frequency of annual forbs increased substantially.

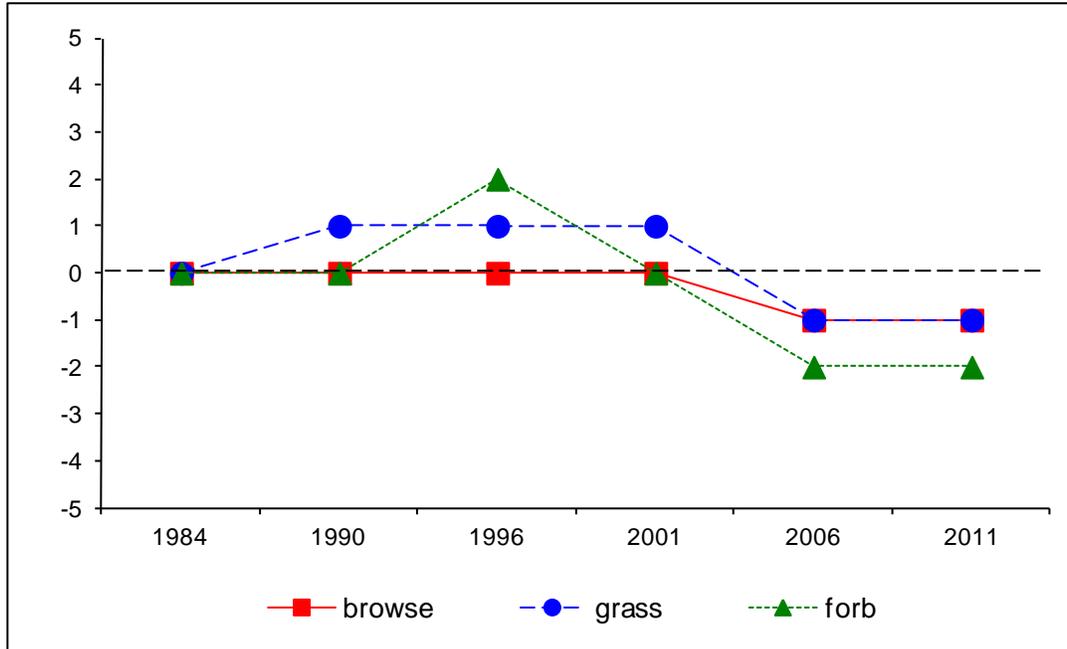
DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 1, study no: 7

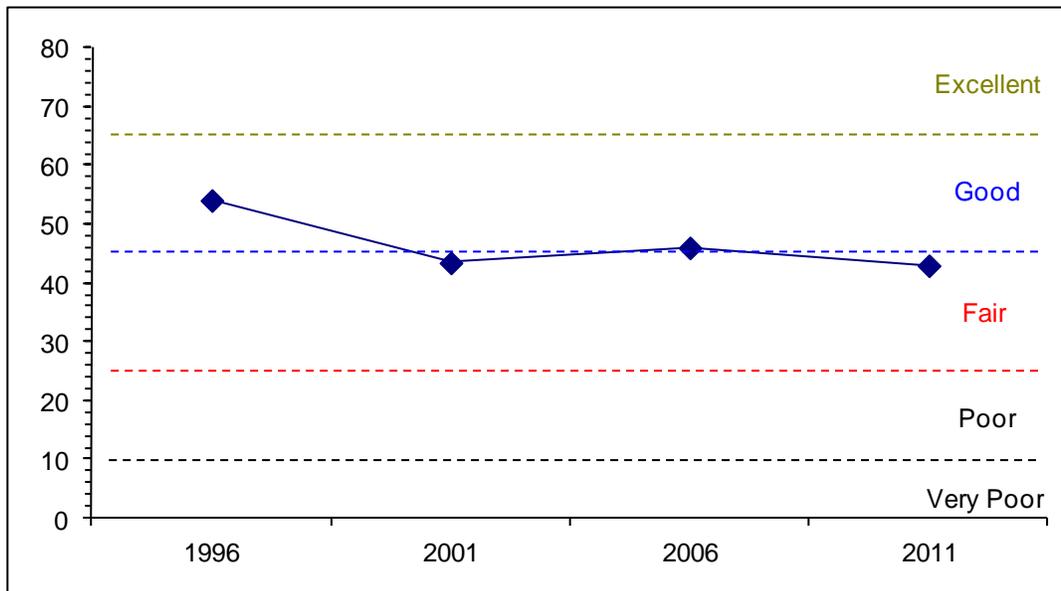
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
96	23.3	12.4	12.1	2.7	-0.1	3.7	0.0	54.0	Good
01	25.2	9.2	3.1	3.9	-0.5	2.5	0.0	43.4	Fair-Good
06	30.0	8.6	2.0	3.7	-0.9	2.6	0.0	46.0	Fair-Good
11	27.8	9.4	1.5	1.4	-0.1	2.8	0.0	42.9	Fair

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
 Management unit 1 Study no: 7



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--
 Management unit 1, Study no: 7



HERBACEOUS TRENDS--
Management unit 01, Study no: 7

Type	Species	Nested Frequency						Average Cover %			
		'84	'90	'96	'01	'06	'11	'96	'01	'06	'11
G	Agropyron spicatum	a-	a2	a-	b35	a1	a5	.00	.32	.03	.01
G	Bromus tectorum (a)	-	-	a51	b99	c249	a38	.13	.60	1.21	.08
G	Oryzopsis hymenoides	a26	c70	bc54	a20	ab29	ab35	.84	.37	.83	.24
G	Poa secunda	a3	a6	ab19	b43	b28	b39	.23	.74	.39	.37
G	Sitanion hystrix	ab15	ab9	cd31	b45	b43	a12	.26	.49	.58	.07
Total for Annual Grasses		0	0	51	99	249	38	0.12	0.60	1.21	0.07
Total for Perennial Grasses		44	87	104	143	101	91	1.34	1.93	1.84	0.69
Total for Grasses		44	87	155	242	350	129	1.47	2.53	3.06	0.77
F	Allium sp.	ab5	a-	ab3	a-	a-	b16	.00	-	-	.03
F	Artemisia ludoviciana	-	-	-	-	-	3	-	-	-	.00
F	Astragalus newberryi	a-	a-	b23	ab6	ab16	b1	.18	.02	.06	.00
F	Astragalus utahensis	ab18	b23	a9	a4	a4	ab25	.01	.04	.01	.15
F	Balsamorhiza hookeri	-	-	1	4	3	4	.00	.03	.15	.15
F	Castilleja chromosa	5	-	-	-	-	-	.00	-	-	-
F	Caulanthus crassicaulis	-	-	14	-	-	3	.06	-	-	.01
F	Crepis acuminata	3	-	-	-	-	-	-	-	-	-
F	Cryptantha sp.	d116	b58	c92	a18	ab35	a8	.47	.13	.12	.04
F	Cymopterus sp.	a-	a-	a8	b30	a-	ab13	.01	.13	-	.06
F	Descurainia pinnata (a)	-	-	-	1	3	3	-	.00	.00	.01
F	Erigeron argentatus	-	2	1	-	1	-	.00	-	.01	-
F	Erigeron pumilus	a-	a-	a3	b39	a-	a3	.00	.29	-	.03
F	Erigeron sp.	-	-	3	-	-	-	.03	-	-	-
F	Eriogonum ovalifolium	-	-	3	6	3	-	.00	.02	.00	-
F	Gilia sp. (a)	-	-	b38	b34	a-	c110	.08	.10	-	.26
F	Haplopappus acaulis	a4	b32	ab18	a6	ab19	ab20	.08	.03	.24	.46
F	Malcolmia africana	-	-	5	-	-	-	.01	-	-	-
F	Phlox hoodii	ab57	b43	ab34	ab28	a23	a21	.37	.22	.23	.18
F	Phlox longifolia	ab90	bc124	c133	bc126	abc96	a87	.56	.32	.46	.28
F	Ranunculus testiculatus (a)	-	-	a2	ab16	ab14	b19	.00	.03	.03	.12
F	Sisymbrium altissimum (a)	-	-	-	-	-	3	-	-	-	.00
F	Sphaeralcea coccinea	-	2	-	-	-	-	-	-	-	-
F	Sphaeralcea grossulariifolia	1	-	-	-	-	-	-	-	-	-
Total for Annual Forbs		0	0	40	51	17	135	0.08	0.13	0.03	0.39
Total for Perennial Forbs		299	284	350	267	200	204	1.84	1.25	1.32	1.42
Total for Forbs		299	284	390	318	217	339	1.93	1.39	1.35	1.82

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

BROWSE TRENDS--

Management unit 01, Study no: 7

Type	Species	Strip Frequency				Average Cover %			
		'96	'01	'06	'11	'96	'01	'06	'11
B	Artemisia nova	99	99	100	100	17.45	19.28	23.78	21.46
B	Atriplex confertifolia	33	24	21	14	1.37	.95	1.18	.91
B	Chrysothamnus viscidiflorus stenophyllus	75	68	72	68	2.51	2.30	2.02	1.70
B	Ephedra nevadensis	0	1	2	2	-	-	-	-
B	Juniperus osteosperma	0	1	0	0	-	-	-	-
B	Kochia americana	23	22	25	11	.06	.10	.29	.04
B	Pinus edulis	0	0	0	1	-	-	.00	-
B	Tetradymia nuttallii	14	14	10	8	.30	1.83	.39	.42
Total for Browse		244	229	230	204	21.71	24.48	27.70	24.55

CANOPY COVER, LINE INTERCEPT--

Management unit 01, Study no: 7

Species	Percent Cover	
	'06	'11
Artemisia nova	26.58	23.98
Atriplex confertifolia	.16	.20
Chrysothamnus viscidiflorus stenophyllus	3.31	2.26
Kochia americana	.08	.05
Tetradymia nuttallii	.13	.15

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 01, Study no: 7

Species	Average leader growth (in)		
	'01	'06	'11
Artemisia nova	0.8	0.6	0.5

BASIC COVER--

Management unit 01, Study no: 7

Cover Type	Average Cover %					
	'84	'90	'96	'01	'06	'11
Vegetation	3.25	9.75	25.04	30.18	30.17	27.15
Rock	5.75	11.00	11.69	5.50	8.19	11.06
Pavement	62.75	56.00	33.71	46.00	39.92	43.79
Litter	23.50	14.75	12.81	13.06	16.79	13.31
Cryptogams	1.50	1.50	2.55	2.16	1.70	1.73
Bare Ground	3.25	7.00	8.89	11.87	13.94	12.31

SOIL ANALYSIS DATA --

Management unit 01, Study no: 7, Study Name: South Side Emigrant Pass

Effective rooting depth (in)	pH	Sandy-Clay			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
10.2	7.7	55.9	9.1	35.0	1.4	3.9	172.8	0.6

PELLET GROUP DATA--

Management unit 01, Study no: 7

Type	Quadrat Frequency			
	'96	'01	'06	'11
Rabbit	16	5	48	-
Elk	-	48	1	2
Deer	17	-	18	8
Cattle	-	-	-	2
Sage Grouse	-	-	-	-

Days use per acre (ha)		
'01	'06	'11
-	-	-
71 (175)	-	-
5 (12)	27 (66)	25 (61)
-	2 (4)	4 (9)
-	9 groups/acre	-

BROWSE CHARACTERISTICS--

Management unit 01, Study no: 7

		Age class distribution					Utilization			
Y	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia nova</i>										
84	10465	44	41	15	1866	49	18	10	8/11	
90	9665	41	30	30	2533	5	0	2	11/14	
96	11500	25	66	9	340	52	29	2	9/23	
01	12380	5	77	18	60	42	10	4	7/18	
06	11160	3	74	22	50020	42	19	9	9/21	
11	10520	3	79	18	60	28	1	11	9/22	
<i>Artemisia spinescens</i>										
84	1931	31	66	3	-	31	34	3	6/8	
90	0	0	0	0	-	0	0	0	-/-	
96	0	0	0	0	-	0	0	0	7/13	
01	0	0	0	0	-	0	0	0	-/-	
06	0	0	0	0	-	0	0	0	-/-	
11	0	0	0	0	-	0	0	0	6/13	
<i>Atriplex confertifolia</i>										
84	2598	28	33	38	-	49	33	26	7/10	
90	1864	4	21	75	333	0	0	43	10/8	
96	920	13	83	4	40	41	9	0	9/15	
01	840	26	29	45	20	0	0	19	8/12	
06	680	21	68	12	40	6	3	3	10/16	
11	380	5	63	32	-	5	0	26	7/14	
<i>Chrysothamnus viscidiflorus stenophyllus</i>										
84	2865	56	40	5	66	14	28	2	7/11	
90	3331	54	16	30	199	0	0	4	11/13	
96	3100	6	81	13	300	3	0	3	8/15	
01	2580	4	60	36	20	2	2	10	5/10	
06	2940	7	67	25	180	9	13	13	7/13	
11	2660	4	79	17	-	11	0	11	6/12	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Ephedra nevadensis										
84	0	0	0	-	-	0	0	0	-/-	
90	0	0	0	-	-	0	0	0	-/-	
96	0	0	0	-	-	0	0	0	16/19	
01	20	0	100	-	-	0	0	0	12/15	
06	40	0	100	-	-	0	100	0	11/13	
11	40	0	100	-	-	100	0	0	14/22	
Grayia spinosa										
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	-/-	
11	0	0	0	-	-	0	0	0	21/20	
Juniperus osteosperma										
84	0	0	0	-	-	0	0	0	-/-	
90	0	0	0	-	-	0	0	0	-/-	
96	0	0	0	-	20	0	0	0	-/-	
01	20	100	0	-	-	0	0	0	-/-	
06	0	0	0	-	20	0	0	0	-/-	
11	0	0	0	-	20	0	0	0	-/-	
Kochia americana										
84	1864	57	32	11	-	11	14	11	2/2	
90	399	100	0	0	-	0	0	0	-/-	
96	960	40	60	0	100	0	0	0	4/6	
01	1100	44	49	7	20	4	0	4	¾	
06	1340	9	91	0	120	51	4	0	5/6	
11	380	11	89	0	-	5	5	0	2/3	
Pinus edulis										
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	-	20	0	0	0	-/-	
11	20	100	0	-	20	0	0	0	-/-	
Tetradymia nuttallii										
84	265	25	0	75	-	25	25	50	-/-	
90	866	38	0	62	66	0	0	23	-/-	
96	280	0	14	86	-	7	0	36	16/24	
01	280	7	29	64	-	7	0	50	13/15	
06	200	10	50	40	-	0	0	10	17/21	
11	180	11	44	44	-	22	0	56	14/18	