

MUD SPRING DRAW - TREND STUDY NO. 9-15-10

Vegetation Type: Mountain Brush

Range Type: Crucial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: Not Available

Land Ownership: Ute Tribe

Elevation: 7906 ft. (2410 m)

Aspect: East

Slope: 18%-30%

Transect bearing: 245° magnetic

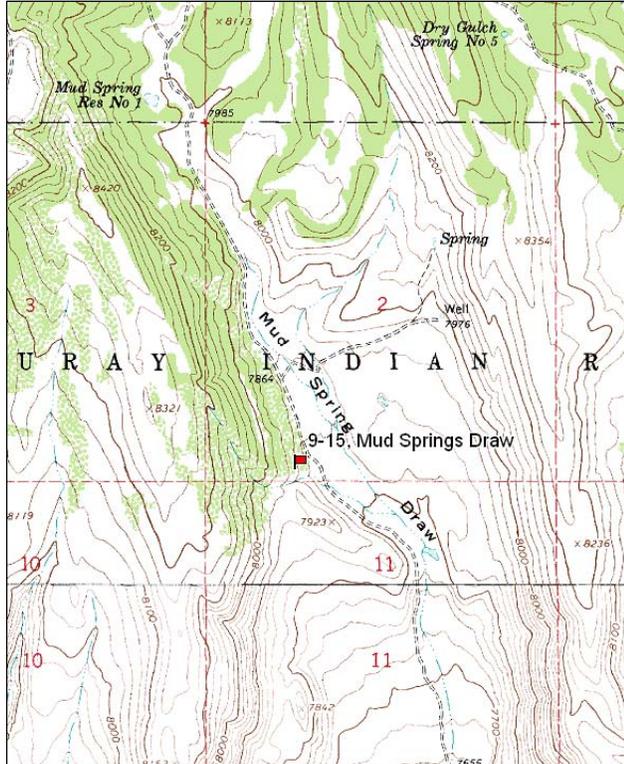
Belt placement: line 1 (7 & 96ft), line 2 (32ft), line 3 (50ft), line 4 (79ft).

Note: Soil sample needs to be collected.

Directions:

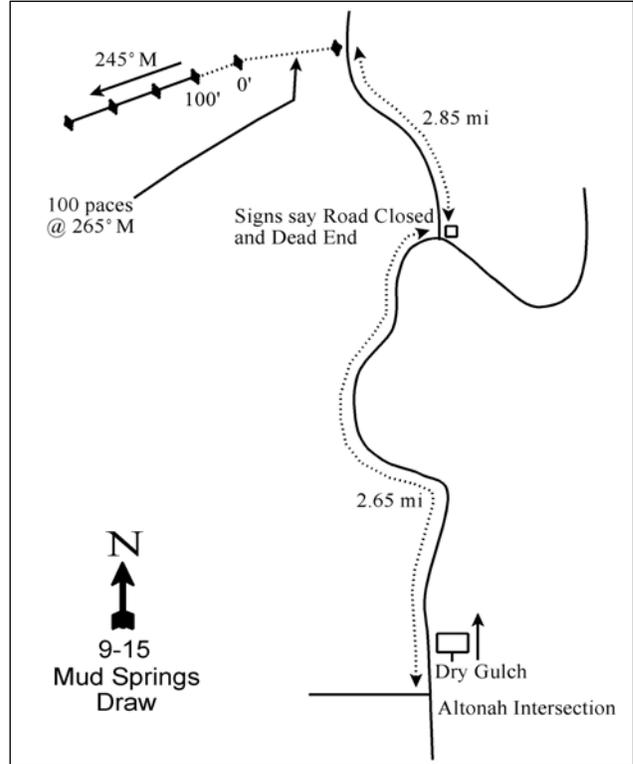
From the town of Altonah, proceed north for 2.0 miles to an intersection. Take the road which runs to the northwest for 2.65 miles until you come to another intersection. Go straight through the intersection and go up Mud Spring Draw for 2.85 miles to a red stake on the left side of the road. From the stake, the 0-foot baseline stake is 100 paces away, up the hill, at a bearing of 265°M. The 0-foot stake has a piece of wire wrapped around it.

Map Name: Burnt Mill Springs



Township: 1N Range: 4W Section: 11

Diagrammatic Sketch:



GPS: NAD 83, UTM 12T 558438 E 4483997 N

MUD SPRING DRAW - TREND STUDY NO. 9-15

Site Information

Site Description: This study is located within the Ute Indian Reservation in Mud Spring Draw. The site was not read in 2000 due to a road closure. Pellet group transect data has estimated heavy use by elk since 2005. Estimated use by deer was moderate in 2005, with light use in 2010. Estimated cattle use has been light since 2005. Moose also appear to occasionally use the area (Table - Pellet Group Data).

Browse: The key browse species is true mountain mahogany (*Cercocarpus montanus*), which provides the majority of the browse cover on the site (Table - Browse Trends). The true mountain mahogany population is comprised of mostly mature plants that have displayed moderate to heavy hedging. Health of the population has been good over the course of the study with low decadence, good vigor and good recruitment of young plants. Other browse species include serviceberry (*Amelanchier utahensis*), mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), antelope bitterbrush (*Purshia tridentata*) and snowberry (*Symphoricarpos oreophilus*). Utilization of serviceberry and bitterbrush has been moderate to heavy and use of sagebrush has been mostly moderate. There was heavy use of sagebrush noted in 2010 (Table - Browse Characteristics).

Herbaceous Understory: Grasses are diverse and quite abundant. Bluebunch wheatgrass (*Agropyron spicatum*), needle-and-thread (*Stipa comata*) and mutton bluegrass (*Poa fendleriana*) are the most abundant grass species. Cheatgrass (*Bromus tectorum*) was fairly common in 2005, but has been rare in other sample years. Forbs are diverse, but are not particularly abundant. Hooker balsamroot (*Balsamorhiza hookeri*) was the only common perennial forb species. At times, annual forbs have dominated the forb component, but annual forbs were rare in 2010 (Table - Herbaceous Trends).

Soil: Bare ground cover is low on the site. Abundant amounts of vegetation, litter and rock provide good protective ground cover (Table - Basic Cover). The soil erosion condition was classified as stable in 2005 and 2010.

Trend Assessments

Browse:

- **1982 to 1988 - slightly up (+1):** The density of true mountain mahogany, serviceberry and mountain big sagebrush all increased with an increase in the recruitment of young plants in all three species.
- **1988 to 1995 - stable (0):** Differences in density may be related to the larger sample area used in 1995; therefore, trend was determined using other parameters. Decadence and poor vigor remained similar in true mountain mahogany, serviceberry and mountain big sagebrush. Recruitment of young plants decreased in mahogany, but remained good at 17%. Recruitment of young serviceberry plants also decreased to poor levels at 7% of the population.
- **1995 to 2005 - slightly down (-1):** The density of true mountain mahogany decreased by 17% from 3,600 plants/acre to 2,980 plants/acre, though cover increased from 15% to 20%. The density of mountain big sagebrush decreased by 76% from 500 plants/acre to 120 plants/acre, and cover decreased from 2% to less than 1%. There was no new recruitment of young sagebrush plants. The density of serviceberry remained similar, but cover increased from 2% to 4%.
- **2005 to 2010 - stable (0):** The density of true mountain mahogany remained similar, but cover decreased to 16%. Serviceberry density increased 45% from 580 plants/acre to 800 plants/acre, but cover remained similar. The density of mountain big sagebrush increased slightly, but cover remained similar.

Grass:

- **1982 to 1988 - no trend (NT):** Only quadrat frequency data for grasses are available from 1982, so no trend was given.

- **1988 to 1995 - slightly down (-1):** The perennial grass sum of nested frequency decreased by 17% with a significant decrease in the nested frequency of mutton bluegrass.
- **1995 to 2005 - stable (0):** There was little change in the sum of nested frequency of perennial grasses, but cover increased from 9% to 15%.
- **2005 to 2010 - stable (0):** The sum of nested frequency of perennial grasses remained similar, but cover increased to 17%.

Forb:

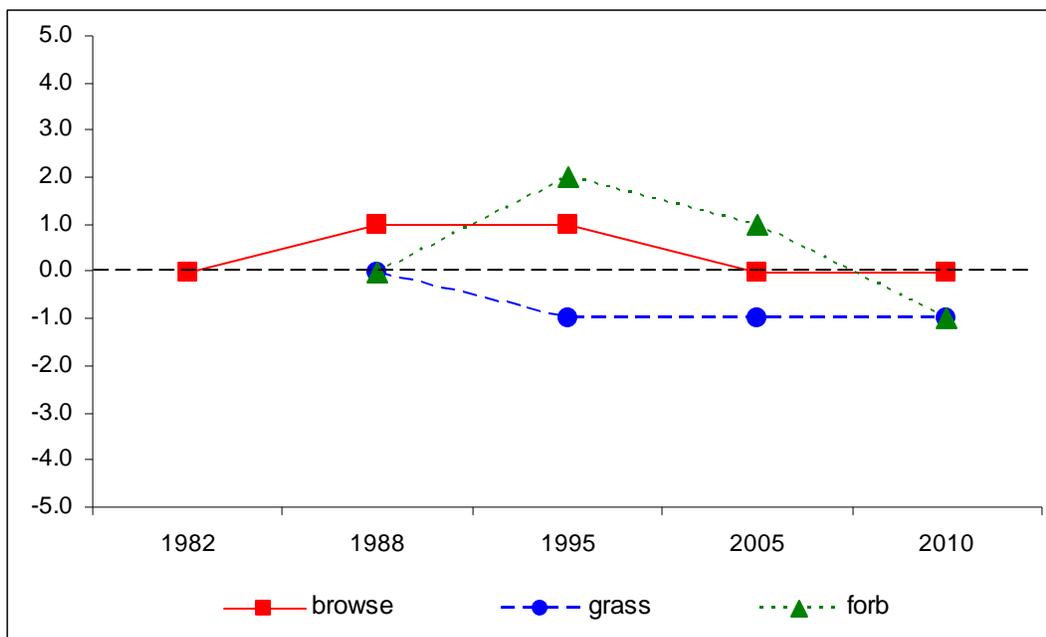
- **1982 to 1988 - no trend (NT):** Only quadrat frequency data for forbs are available from 1982, so no trend was given.
- **1988 to 1995 - up (+2):** The sum of nested frequency of perennial forbs increased by 41%.
- **1995 to 2005 - slightly down (-1):** The perennial forb sum of nested frequency decreased by 14%, but cover remained similar.
- **2005 to 2010 - down (-2):** There was a 34% decrease in the sum of nested frequency of perennial forbs, though cover remained similar.

DEER DESIRABLE COMPONENTS INDEX - HIGH POTENTIAL SCALE --
Management unit 9, study no: 15

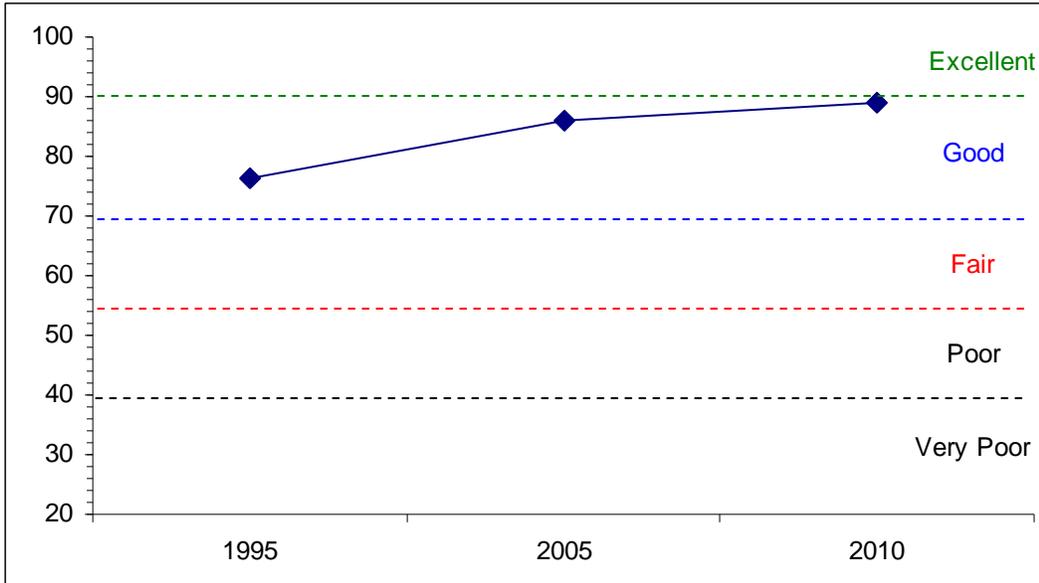
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
95	30.0	13.0	7.3	18.4	0.0	7.5	0.0	76.2	Good
05	30.0	11.4	9.3	29.0	-1.2	7.4	0.0	86.0	Good
10	30.0	14.5	7.9	30.0	-0.3	6.9	0.0	89.0	Good-Excellent

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 9, Study no: 15



DEER DESIRABLE COMPONENTS INDEX TREND, HIGH POTENTIAL--
 Management unit 9, Study no: 15



HERBACEOUS TRENDS--
 Management unit 09, Study no: 15

Type	Species	Nested Frequency				Average Cover %		
		'88	'95	'05	'10	'95	'05	'10
G	<i>Agropyron dasystachyum</i>	a ⁻	b ²⁰	b ²³	c ⁹⁵	.30	.57	1.51
G	<i>Agropyron spicatum</i>	d ²⁶³	c ²³⁹	b ¹⁹⁵	a ¹¹³	4.48	5.93	4.15
G	<i>Bouteloua gracilis</i>	3	-	-	3	-	-	.15
G	<i>Bromus tectorum</i> (a)	-	a ⁻	c ⁵⁷	b ⁹	-	1.55	.34
G	<i>Carex</i> sp.	ab ⁵⁴	b ⁸³	a ³⁴	a ³⁷	1.22	.60	1.23
G	<i>Elymus salina</i>	a ⁻	ab ¹⁰	b ¹⁹	b ¹¹	.07	.11	.13
G	<i>Oryzopsis hymenoides</i>	-	-	10	5	-	.22	.16
G	<i>Poa fendleriana</i>	c ²⁵⁶	a ⁷⁹	ab ¹²⁴	b ¹⁵⁷	1.52	4.09	4.91
G	<i>Poa pratensis</i>	a ⁻	b ³⁶	a ⁻	a ⁻	.53	-	-
G	<i>Poa secunda</i>	b ⁴⁷	a ⁻	a ¹	a ³	-	.03	.03
G	<i>Sitanion hystrix</i>	9	6	8	16	.01	.11	.10
G	<i>Stipa comata</i>	a ⁵⁰	ab ⁹⁵	b ¹²⁰	b ¹¹⁵	1.04	2.82	4.50
Total for Annual Grasses		0	0	57	9	0	1.55	0.34
Total for Perennial Grasses		682	568	534	555	9.19	14.50	16.90
Total for Grasses		682	568	591	564	9.19	16.06	17.25
F	<i>Agoseris glauca</i>	a ⁻	b ¹⁶	b ¹²	a ⁻	.07	.20	-
F	<i>Allium</i> sp.	a ⁻	d ¹⁴⁷	c ¹²¹	b ³⁵	.59	.62	.15
F	<i>Arabis</i> sp.	6	7	1	-	.01	.00	-
F	<i>Artemisia dracunculus</i>	-	-	1	1	-	.00	.15
F	<i>Artemisia ludoviciana</i>	23	13	15	40	.16	.07	.88
F	<i>Astragalus convallarius</i>	4	-	-	-	-	-	-
F	<i>Balsamorhiza hookeri</i>	55	50	41	48	.83	1.89	1.33
F	<i>Calochortus nuttallii</i>	a ⁻	b ²³	c ⁴³	a ²	.11	.14	.00
F	<i>Castilleja chromosa</i>	b ¹¹	a ²	a ⁻	a ⁻	.00	-	-

Type	Species	Nested Frequency				Average Cover %		
		'88	'95	'05	'10	'95	'05	'10
F	Chaenactis douglasii	2	-	-	-	-	-	-
F	Collinsia parviflora (a)	-	_b 238	_b 272	_a 57	4.19	4.19	.21
F	Collomia linearis (a)	-	_b 143	_c 124	_a 14	.82	.50	.08
F	Comandra pallida	_b 15	_{ab} 11	_a 1	_a 1	.17	.00	.00
F	Crepis acuminata	-	3	4	1	.00	.18	.15
F	Cryptantha sp.	-	2	7	7	.00	.06	.04
F	Delphinium nuttallianum	-	1	2	-	.00	.03	-
F	Descurainia pinnata (a)	-	_b 156	_a 15	_a -	2.56	.05	-
F	Draba sp. (a)	-	_b 55	_b 30	_a 3	.29	.07	.01
F	Erigeron eatonii	-	-	1	-	-	.00	.03
F	Erigeron flagellaris	-	-	2	2	-	.00	.03
F	Eriogonum umbellatum	_b 19	_{ab} 10	_a 1	_{ab} 8	.25	.03	.04
F	Gilia sp. (a)	-	5	5	-	.04	.01	-
F	Helianthella microcephala	-	-	-	3	-	-	.15
F	Heterotheca villosa	-	4	-	3	.03	-	.00
F	Heuchera parvifolia	-	-	-	1	-	-	.03
F	Lappula occidentalis (a)	-	3	10	4	.00	.03	.01
F	Lepidium densiflorum (a)	-	_{ab} 13	_b 30	_a 3	.08	.18	.00
F	Lepidium sp. (a)	-	-	-	8	-	-	.04
F	Linum lewisii	-	-	-	-	.03	-	-
F	Lithospermum sp.	_b 14	_{ab} 3	_a 3	_a 1	.30	.03	.06
F	Lomatium sp.	-	-	2	-	-	.03	-
F	Lupinus argenteus	_b 25	_b 27	_a -	_a -	.56	-	-
F	Machaeranthera grindelioides	5	2	-	2	.15	.00	.00
F	Microsteris gracilis (a)	-	_a -	_b 79	_a 5	-	.40	.01
F	Penstemon sp.	_b 30	_a 6	_a 2	_a 7	.03	.03	.06
F	Petrorhiza pumila	3	5	2	-	.30	.03	-
F	Phlox longifolia	1	-	-	2	-	-	.00
F	Polygonum douglasii (a)	-	_b 15	_a 1	_{ab} 4	.03	.00	.01
F	Schoenocrambe linifolia	_a -	_a 2	_{ab} 11	_b 32	.01	.11	.27
F	Sedum sp.	_c 35	_b 14	_a -	_a -	.09	-	-
F	Sphaeralcea coccinea	1	-	3	-	-	.03	-
F	Taraxacum officinale	-	2	-	-	.00	-	-
F	Tragopogon dubius	2	2	-	-	.01	.00	-
F	Unknown forb-perennial	-	2	-	-	.01	-	-
F	Zigadenus elegans	_a -	_a -	_b 31	_a -	-	.16	-
F	Zigadenus paniculatus	_a -	_a -	_a -	_b 9	-	-	.06
Total for Annual Forbs		0	628	566	98	8.03	5.45	0.38
Total for Perennial Forbs		251	354	306	205	3.77	3.72	3.49
Total for Forbs		251	982	872	303	11.81	9.17	3.88

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

BROWSE TRENDS--

Management unit 09, Study no: 15

Type	Species	Strip Frequency			Average Cover %		
		'95	'05	'10	'95	'05	'10
B	Amelanchier utahensis	21	23	30	1.86	3.52	3.71
B	Artemisia tridentata vaseyana	19	6	7	1.89	.41	.19
B	Cercocarpus montanus	77	77	80	15.03	20.06	15.48
B	Chrysothamnus viscidiflorus viscidiflorus	26	25	23	1.84	.64	1.63
B	Mahonia repens	76	74	74	4.90	3.90	4.73
B	Opuntia sp.	47	24	23	.46	.27	.37
B	Pediocactus simpsonii	1	2	1	-	-	-
B	Purshia tridentata	23	17	24	2.01	1.12	4.46
B	Symphoricarpos oreophilus	32	22	26	2.25	1.95	1.27
B	Tetradymia canescens	0	0	1	-	-	.15
Total for Browse		322	270	289	30.27	31.89	32.01

CANOPY COVER, LINE INTERCEPT--

Management unit 09, Study no: 15

Species	Percent Cover	
	'05	'10
Amelanchier utahensis	4.40	4.73
Artemisia tridentata vaseyana	.61	.46
Cercocarpus montanus	29.48	25.29
Chrysothamnus viscidiflorus viscidiflorus	1.95	.50
Mahonia repens	3.83	4.96
Opuntia sp.	.08	.11
Pediocactus simpsonii	.05	-
Purshia tridentata	4.03	5.11
Symphoricarpos oreophilus	3.54	2.78

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 09, Study no: 15

Species	Average leader growth (in)	
	'05	'10
Cecocarpus montanus	3.4	3.6
Purshia tridentata	2.4	2.1

BASIC COVER--

Management unit 09, Study no: 15

Cover Type	Average Cover %				
	'82	'88	'95	'05	'10
Vegetation	6.75	12.25	45.35	49.86	51.27
Rock	3.50	7.50	14.46	17.57	16.00
Pavement	0	.50	.53	1.65	1.79
Litter	73.50	71.50	56.93	42.75	46.56
Cryptogams	3.00	1.00	.43	.08	.58
Bare Ground	13.25	7.25	4.13	11.20	8.55

PELLET GROUP DATA--

Management unit 09, Study no: 15

Type	Quadrat Frequency			Days use per acre (ha)	
	'95	'05	'10	'05	'10
Rabbit	9	20	17	-	-
Moose	-	1	-	1 (2)	-
Elk	15	28	13	56 (137)	62 (152)
Deer	29	19	24	31 (76)	17 (41)
Cattle	-	1	-	2 (4)	1 (2)

BROWSE CHARACTERISTICS--

Management unit 09, Study no: 15

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Amelanchier utahensis</i>									
82	466	0	100	0	-	14	29	0	27/25
88	664	60	30	10	-	40	30	30	45/53
95	600	7	90	3	20	53	7	0	30/35
05	580	24	62	14	-	24	28	0	34/42
10	840	26	71	2	-	26	12	2	33/40
<i>Artemisia tridentata vaseyana</i>									
82	265	0	75	25	-	25	0	0	22/29
88	398	50	17	33	-	50	0	0	22/20
95	500	8	56	36	-	68	8	12	23/25
05	120	0	83	17	-	50	0	0	13/20
10	140	14	71	14	-	29	43	14	17/29
<i>Cercocarpus montanus</i>									
82	3132	26	74	0	-	28	0	0	33/24
88	4799	69	28	3	733	63	18	0	43/43
95	3600	17	79	4	60	72	6	2	35/42
05	2980	19	70	11	20	16	59	7	40/48
10	3060	16	82	1	20	30	56	10	42/49
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
82	1599	0	100	0	-	0	0	0	18/13
88	1198	6	44	50	-	0	0	33	10/11
95	680	0	97	3	-	0	0	0	16/21
05	680	3	94	3	-	0	0	3	12/18
10	580	17	83	0	-	0	0	0	15/22
<i>Gutierrezia sarothrae</i>									
82	0	0	0	-	-	0	0	0	-/-
88	0	0	0	-	-	0	0	0	-/-
95	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	10/6
10	0	0	0	-	-	0	0	0	-/-

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
Mahonia repens									
82	3932	0	49	-	-	0	0	0	5/7
88	31065	8	92	-	-	0	0	.85	4/3
95	27720	3	97	-	40	0	0	0	4/6
05	22440	1	99	-	-	0	0	0	4/5
10	29180	42	58	-	560	0	0	0	4/7
Opuntia sp.									
82	999	0	100	0	-	0	0	0	2/5
88	933	100	0	0	733	0	0	0	-/-
95	2120	17	82	1	-	0	0	.94	2/8
05	980	22	78	0	-	0	0	0	3/6
10	900	4	96	0	-	0	0	0	2/9
Pediocactus simpsonii									
82	0	0	0	-	-	0	0	0	-/-
88	0	0	0	-	-	0	0	0	-/-
95	20	0	100	-	-	0	0	0	1/4
05	60	0	100	-	-	0	0	0	1/3
10	20	0	100	-	-	0	0	0	2/5
Purshia tridentata									
82	199	0	100	0	-	33	67	0	17/25
88	133	0	100	0	-	50	0	0	19/25
95	600	10	87	3	-	67	10	0	22/41
05	380	0	79	21	-	47	37	11	21/40
10	560	7	89	4	-	25	50	11	21/42
Symphoricarpos oreophilus									
82	999	33	67	-	-	0	0	0	13/15
88	1199	39	61	-	-	11	0	0	12/16
95	1780	16	84	-	60	1	0	0	14/25
05	1940	31	69	-	-	0	0	0	9/14
10	1300	17	83	-	-	8	0	0	9/16
Tetradymia canescens									
82	0	0	0	-	-	0	0	0	-/-
88	0	0	0	-	-	0	0	0	-/-
95	0	0	0	-	-	0	0	0	11/17
05	0	0	0	-	-	0	0	0	11/23
10	20	0	100	-	-	0	100	0	9/19