

SPRING HOLLOW BURN - TREND STUDY NO. 6-3-11

Vegetation Type: Mountain Big Sagebrush

Range Type: Crucial Deer Summer (Fawning habitat), Crucial Elk Summer (Calving habitat)

NRCS Ecological Site Description: [Mountain Loam \(Mountain Big Sagebrush\), R047XA430UT](#)

Land Ownership: Private

Elevation: 6,500 ft (1,829 m)

Aspect: Southeast

Slope: 7%

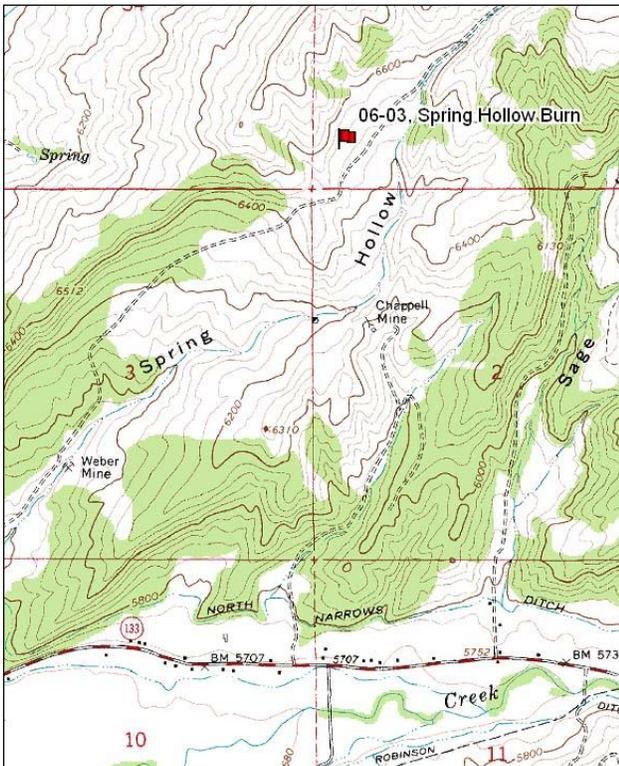
Transect bearing: 165° magnetic

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

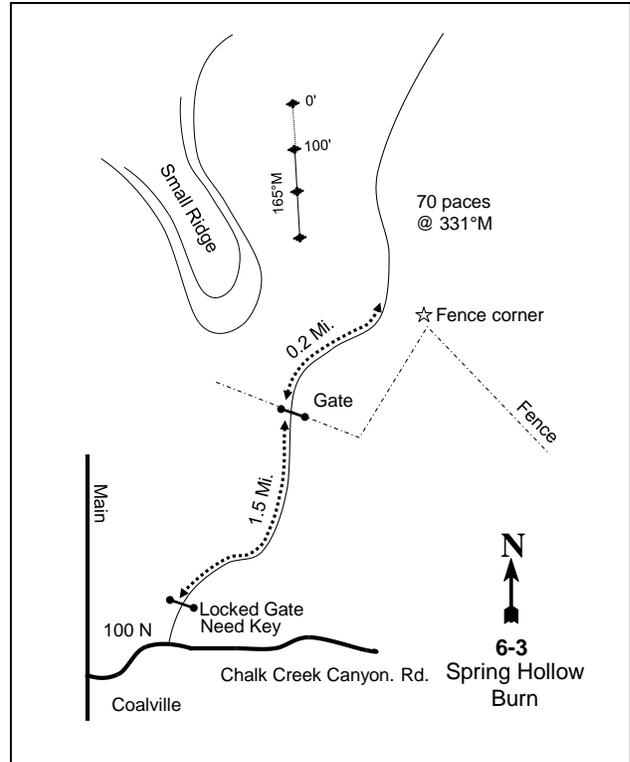
Directions:

From 100 North and Main in Coalville, travel east 1.3 miles to Spring Hollow Road. Turn left (northeast) and proceed 0.2 mile to a locked gate. Proceed through gate, and continue 1.5 miles to a gate. Continue 0.2 miles to a fence line corner on the right. From corner post, walk 70 paces at 331 degrees magnetic to the 100-foot stake of the baseline. The 0-foot stake is marked by browse tag #7974.

Map Name: Turner Hollow



Diagrammatic Sketch:



Township: 3N Range: 5E Section: 35

GPS: NAD 83, UTM 12S 469866 E 4532699 N

SPRING HOLLOW BURN - TREND STUDY NO. 6-3

Site Information

Site Description: The study is located on an old burn in the upper part of Spring Hollow, near an old line-intercept study. Prior to the fire the area was dominated by sagebrush (*Artemisia spp.*), grass, Utah juniper (*Juniperus osteosperma*), and pinyon pine (*Pinus edulis*) communities. After the burn, the area was seeded with perennial grasses, mostly crested wheatgrass (*Agropyron cristatum*) and intermediate wheatgrass (*Agropyron intermedium*). The area is privately-owned and grazed by a variety of domestic animals in addition to winter use by deer and elk. During heavy winters, it may not be as crucial for wildlife due to the lack of browse. Deer, elk, and cattle pellet groups have been sampled in low abundance since 2001 (Table - Pellet Group Data). In 1984, deer pellet groups occurred frequently, and three deer and one elk antler sheds were found. The study was not read in 1996 because access to the private property was not obtained.

Browse: Browse is very limited on the site. Mountain big sagebrush (*Artemisia tridentata ssp. vaseyana*) and Saskatoon serviceberry (*Amelanchier alnifolia*) are the most abundant preferred species, but both occur in low density. Serviceberry has had moderate to heavy use, and sagebrush has had mostly moderate use. The sagebrush defoliator moth (*Aroga websteri*) was identified on a few sagebrush plants in 2006, but was not sampled in the density measurements. Broom snakeweed (*Gutierrezia sarothrae*) is the most abundant species (Table - Browse Characteristics), and provides the majority of the limited browse cover on the site (Table - Browse Trends).

Herbaceous Understory: The herbaceous understory is dominated by crested wheatgrass and Sandberg bluegrass (*Poa secunda*). Other perennial species are rare. Forbs are diverse and abundant on the site. Both perennial and annual forbs have steadily increased since 2001 (Table - Herbaceous Trends).

Soil: The soil is in the Ant Flat series, which occur on fan remnants. Parent material consists of slope alluvium derived from sandstone, shale, and conglomerate (Soil Survey Staff 2011). The soil texture is a clay loam with a slightly acidic soil reaction (pH 6.5) (Table - Soil Analysis Data). There is an abundance of herbaceous vegetation cover and litter cover, with a low amount of bare ground cover (Table - Basic Cover). Relative bare ground cover was 11% in 2001 and 10% in 2006. The soil erosion condition has been classified as stable since 2001.

Trend Assessments

Browse:

- **1984 to 1990 - down (-2):** The density of mountain big sagebrush decreased 27% from 964 plants/acre to 699 plants/acre. Decadence increased from 21% to 48%. In addition to increased decadence, the site had an infestation of ants and aphids on the sagebrush.
- **1990 to 2001 - stable (0):** Differences in density may be related to the larger sample area used in 2001; therefore, trend was determined using other parameters. The sagebrush and serviceberry populations are very small, and distribution is patchy throughout the area. The high competition from crested wheatgrass will likely hinder future recruitment of young plants.
- **2001 to 2006 - stable (0):** There was little change in browse on the study site.
- **2006 to 2011 - stable (0):** There was little change in browse on the study site.

Grass:

- **1984 to 1990 - up (+2):** The sum of nested frequency of perennial grasses increased by 40%, with a significant increase in the nested frequency of crested wheatgrass and Sandberg bluegrass.
- **1990 to 2001 - slightly up (+1):** The sum of nested frequency of perennial grasses increased by 11%.
- **2001 to 2006 - down (-2):** There was a 28% decrease in the sum of nested frequency of perennial grasses, and cover decreased from 36% to 28%.

- **2006 to 2011 - up (+2):** The sum of nested frequency of perennial grasses increased 20%, and cover increased 35%.

Forb:

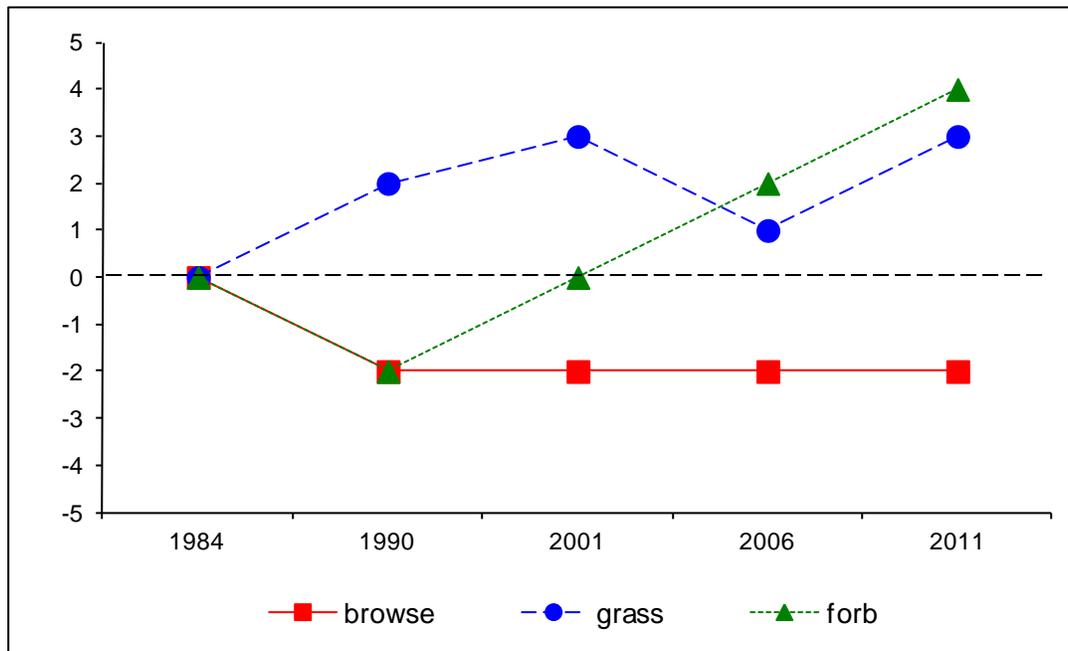
- **1984 to 1990 - down (-2):** There was a 29% decrease in the sum of nested frequency of perennial forbs.
- **1990 to 2001 - up (+2):** The sum of nested frequency of perennial forbs increased two-fold, and many new species were sampled for the first time.
- **2001 to 2006 - up (+2):** The sum of nested frequency of perennial forbs increased 23%, and cover increased from 4% to 8%.
- **2006 to 2011 - up (+2):** The sum of nested frequency of perennial forbs increased 63%, and cover increased to 16%.

DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --
Management unit 6, study no: 3

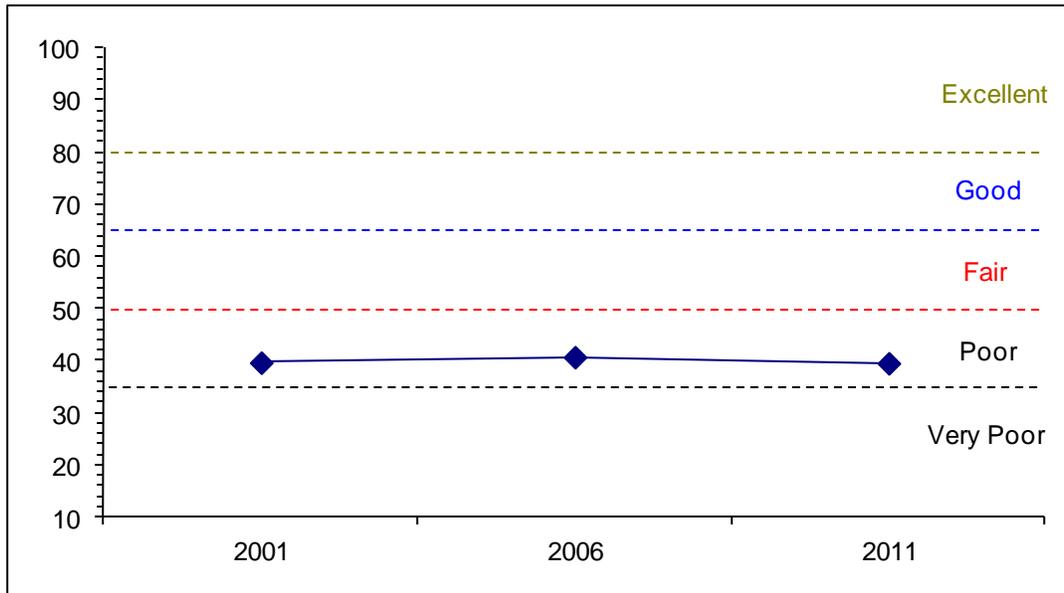
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover (-POBU)	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
01	0.8	0.0	0.0	30.0	0.0	8.8	0.0	39.7	Poor
06	0.7	0.0	0.0	30.0	0.0	10.0	0.0	40.7	Poor
11	0.0	0.0	0.0	30.0	-0.5	10.0	0.0	39.5	Poor

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 6 Study no: 3



DEER DESIRABLE COMPONENTS INDEX TREND, MID-LEVEL POTENTIAL--
Management unit 6, Study no: 3



HERBACEOUS TRENDS--
Management unit 06, Study no: 3

Type	Species	Nested Frequency					Average Cover %		
		'84	'90	'01	'06	'11	'01	'06	'11
G	Agropyron cristatum	a312	b348	ab323	ab317	ab304	27.98	24.37	25.01
G	Agropyron dasystachyum	10	-	11	-	-	.67	-	-
G	Agropyron intermedium	-	9	5	13	18	.04	.42	.30
G	Agropyron spicatum	a5	a7	b46	a24	a10	2.08	1.18	.18
G	Bromus tectorum (a)	-	-	-	3	16	-	.00	.70
G	Elymus cinereus	-	-	3	-	-	.03	-	-
G	Koeleria cristata	ab14	a2	c44	ab12	bc30	.59	.10	1.55
G	Poa bulbosa	-	-	9	4	21	.12	.03	1.26
G	Poa fendleriana	-	5	-	-	-	-	-	-
G	Poa pratensis	a1	a-	ab8	ab10	b15	.07	.09	.57
G	Poa secunda	a77	c214	bc205	a92	b166	4.55	1.52	6.52
G	Stipa sp.	-	3	-	-	-	-	-	-
Total for Annual Grasses		0	0	0	3	16	0	0.00	0.69
Total for Perennial Grasses		419	588	654	472	564	36.16	27.73	35.43
Total for Grasses		419	588	654	475	580	36.16	27.73	36.13
F	Achillea millefolium	a3	a4	b20	ab7	a1	.11	.21	.03
F	Agoseris glauca	-	a-	b12	c96	d144	.04	.36	3.47
F	Allium sp.	a-	a-	c54	b12	d231	.18	.03	4.02
F	Alyssum alyssoides (a)	-	-	42	58	136	.25	.16	1.43
F	Antennaria rosea	-	-	2	3	4	.03	.03	.15
F	Arabis sp.	-	4	-	-	-	-	-	-
F	Artemisia ludoviciana	4	8	8	5	6	.06	.21	.30
F	Aster chilensis	a7	a8	b60	b61	c82	1.82	2.24	3.38

Type	Species	Nested Frequency					Average Cover %		
		'84	'90	'01	'06	'11	'01	'06	'11
F	<i>Astragalus cibarius</i>	a ⁻	a ⁻	b ⁵⁹	c ¹³⁸	b ⁷⁴	.39	3.90	2.43
F	<i>Astragalus convallarius</i>	-	-	2	-	-	.03	-	-
F	<i>Calochortus nuttallii</i>	-	-	3	9	5	.01	.05	.01
F	<i>Cirsium undulatum</i>	5	3	4	3	-	.06	.06	-
F	<i>Collinsia parviflora</i> (a)	-	a ⁻	b ⁹⁸	b ⁸⁰	b ⁷³	.33	.21	.84
F	<i>Collomia linearis</i> (a)	-	a ⁻	b ³⁴	c ⁶⁸	b ⁴⁵	.08	.22	.60
F	<i>Crepis acuminata</i>	-	-	-	1	3	-	.00	.03
F	<i>Cryptantha</i> sp.	a ⁻	a ⁻	a ⁻	a ⁴	b ²¹	-	.01	.46
F	<i>Descurainia pinnata</i> (a)	-	-	6	-	-	.01	-	-
F	<i>Descurainia</i> sp. (a)	a ⁻	a ⁻	a ⁻	a ⁻	b ¹⁵³	-	-	1.30
F	<i>Draba</i> sp. (a)	-	a ⁻	c ⁸⁵	b ³³	c ¹²¹	.18	.10	.62
F	<i>Epilobium brachycarpum</i> (a)	-	a ⁻	b ⁸⁵	d ²²¹	c ¹⁷³	.46	2.70	5.74
F	<i>Erigeron divergens</i>	c ¹²⁴	b ⁵⁶	b ⁴⁶	a ⁶	ab ³⁰	.65	.09	.84
F	<i>Eriogonum umbellatum</i>	-	-	-	-	2	-	-	.00
F	<i>Erodium cicutarium</i> (a)	-	a ⁻	a ³	a ⁷	b ³⁰	.01	.01	.18
F	<i>Holosteum umbellatum</i> (a)	-	a ⁻	b ³¹	b ³⁸	b ²²	.09	.10	.09
F	<i>Lactuca serriola</i> (a)	-	a ⁻	a ⁸	a ²³	b ¹¹⁸	.04	.09	1.61
F	<i>Lappula occidentalis</i> (a)	-	a ⁻	a ⁹	a ⁸	b ²⁰¹	.04	.04	2.86
F	<i>Lithospermum ruderales</i>	b ⁴⁵	b ⁴²	a ⁸	a ¹	a ⁹	.49	.33	.27
F	<i>Lupinus argenteus</i>	a ⁻	a ⁻	a ²	b ¹⁴	ab ¹³	.06	.36	.22
F	<i>Microsteris gracilis</i> (a)	-	a ⁻	bc ²⁷	c ⁴⁴	b ¹⁵	.11	.10	.04
F	<i>Oenothera pallida</i>	c ⁴⁰	c ³²	b ¹⁴	bc ²¹	a ⁻	.23	.29	-
F	<i>Phlox longifolia</i>	-	-	7	-	-	.01	-	-
F	<i>Polygonum douglasii</i> (a)	-	a ⁻	b ³⁴	b ⁴⁶	a ⁻	.07	.11	-
F	<i>Ranunculus testiculatus</i> (a)	-	a ⁻	b ⁴⁶	c ⁸²	c ¹¹⁵	.15	.30	.92
F	<i>Senecio integerrimus</i>	-	-	2	-	3	.01	-	.03
F	<i>Sphaeralcea coccinea</i>	-	4	4	8	-	.02	.07	-
F	<i>Tragopogon dubius</i> (a)	a ⁸	a ¹²	b ⁵⁶	a ¹¹	a ¹⁵	.42	.19	.21
F	<i>Viguiera multiflora</i>	-	1	-	-	-	-	-	-
F	<i>Zigadenus paniculatus</i>	-	-	13	4	11	.19	.06	.16
Total for Annual Forbs		8	12	564	719	1217	2.26	4.38	16.50
Total for Perennial Forbs		228	162	320	393	639	4.43	8.34	15.86
Total for Forbs		236	174	884	1112	1856	6.70	12.72	32.36

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

BROWSE TRENDS--

Management unit 06, Study no: 3

Type	Species	Strip Frequency			Average Cover %		
		'01	'06	'11	'01	'06	'11
B	Amelanchier alnifolia	2	2	2	.03	.15	.03
B	Artemisia tridentata vaseyana	1	1	1	.63	.38	-
B	Chrysothamnus viscidiflorus viscidiflorus	8	7	8	.18	.03	.76
B	Gutierrezia sarothrae	63	37	26	1.19	2.45	1.17
B	Leptodactylon pungens	1	0	0	-	-	-
B	Opuntia sp.	3	4	3	-	-	-
B	Symphoricarpos oreophilus	1	2	1	-	-	-
Total for Browse		79	53	41	2.03	3.01	1.96

CANOPY COVER, LINE INTERCEPT--

Management unit 06, Study no: 3

Species	Percent Cover	
	'06	'11
Amelanchier alnifolia	.20	.11
Chrysothamnus viscidiflorus viscidiflorus	.71	.58
Gutierrezia sarothrae	3.11	.23
Opuntia sp.	.03	.08
Symphoricarpos oreophilus	.13	.28

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 06, Study no: 3

Species	Average leader growth (in)		
	'01	'06	'11
Artemisia tridentata vaseyana	2.3	1.9	2.3

BASIC COVER--

Management unit 06, Study no: 3

Cover Type	Average Cover %				
	'84	'90	'01	'06	'11
Vegetation	3.50	15.50	49.49	45.59	62.85
Rock	7.00	3.25	3.73	5.75	4.47
Pavement	11.50	15.75	6.90	10.15	11.37
Litter	49.50	43.25	43.11	43.63	10.62
Cryptogams	11.25	2.00	.07	0	.06
Bare Ground	17.25	20.25	13.19	11.42	22.12

SOIL ANALYSIS DATA --

Management unit 06, Study no: 3, Study Name: Spring Hollow Burn

Effective rooting depth (in)	pH	Clay-Loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
8.6	6.5	30.9	38.4	30.6	4.6	25.8	384.0	0.9

PELLET GROUP DATA--

Management unit 06, Study no: 3

Type	Quadrat Frequency			Days use per acre (ha)		
	'01	'06	'11	'01	'06	'11
Rabbit	10	10	-	-	-	-
Horse	1	-	-	-	-	-
Elk	5	4	1	9 (22)	17 (41)	5 (13)
Deer	2	11	5	6 (15)	13 (33)	8 (20)
Cattle	16	6	4	21 (52)	14 (34)	8 (20)

BROWSE CHARACTERISTICS--

Management unit 06, Study no: 3

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 alnifolia</i>									
84	0	0	0	0	-	0	0	0	-/-
90	0	0	0	0	-	0	0	0	-/-
01	40	0	0	100	-	50	50	0	21/23
06	40	0	50	50	-	50	0	0	25/25
11	40	0	100	0	-	50	50	0	20/26
<i>Artemisia tridentata vaseyana</i>									
84	964	7	73	21	66	59	34	0	17/23
90	699	0	52	48	-	62	38	5	23/36
01	20	0	100	0	-	100	0	0	22/34
06	20	0	0	100	-	100	0	100	22/38
11	20	0	0	100	-	100	0	100	20/43
<i>Chrysothamnus nauseosus albicaulis</i>									
84	0	0	0	-	-	0	0	0	-/-
90	0	0	0	-	-	0	0	0	-/-
01	0	0	0	-	-	0	0	0	-/-
06	0	0	0	-	-	0	0	0	24/28
11	0	0	0	-	-	0	0	0	14/46
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
84	66	0	50	50	-	0	0	50	11/17
90	331	30	10	60	-	10	0	20	12/11
01	320	0	100	0	-	0	0	0	9/13
06	180	22	78	0	-	11	11	0	12/24
11	260	8	92	0	-	0	0	0	12/24
<i>Gutierrezia sarothrae</i>									
84	20332	20	80	0	1433	0	0	0	7/6
90	16998	47	48	5	966	.78	0	3	7/7
01	4100	5	94	0	-	0	0	.48	7/8
06	3480	3	93	4	-	10	5	3	8/10
11	1580	37	61	3	-	0	0	0	6/8

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Leptodactylon pungens										
84	0	0	0	-	-	0	0	0	-/-	
90	0	0	0	-	-	0	0	0	-/-	
01	60	0	100	-	-	0	0	0	-/-	
06	0	0	0	-	-	0	0	0	-/-	
11	0	0	0	-	-	0	0	0	-/-	
Opuntia sp.										
84	399	8	92	0	-	0	0	0	3/3	
90	298	67	22	11	66	0	0	11	5/10	
01	60	0	100	0	-	0	0	0	4/9	
06	80	25	75	0	-	0	0	0	6/21	
11	60	0	100	0	-	33	0	0	6/19	
Symphoricarpos oreophilus										
84	0	0	0	0	-	0	0	0	-/-	
90	33	0	0	100	-	0	0	0	-/-	
01	20	0	100	0	-	0	0	0	15/23	
06	40	0	100	0	-	0	0	0	23/53	
11	40	0	100	0	-	100	0	0	25/40	