

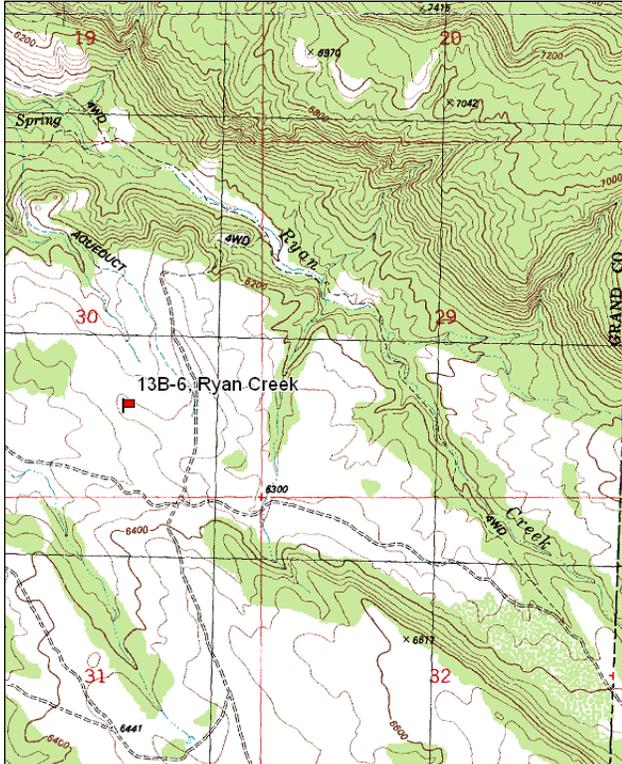
RYAN CREEK - TREND STUDY NO. 13B-6-10

Vegetation Type: Chained, Seeded Pinyon-Juniper
Range Type: Crucial Deer Winter, Crucial Elk Winter
NRCS Ecological Site Description: Not Available
Land Ownership: BLM
Elevation: 6350 ft. (1936 m)
Aspect: South-Southwest
Slope: 10%
Transect bearing: 165° magnetic
Belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

Directions:

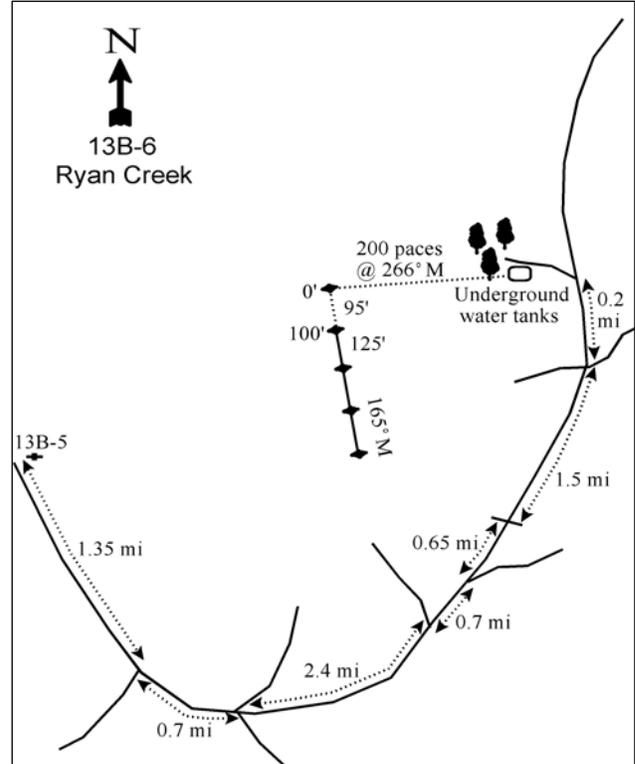
At the "Granary" intersection 1.35 miles south of Buckhorn Draw, 13B-5 (Coates Creek 15-minute Quad; T23S, R25E, southeast quarter of section 3) bear left and go east 0.7 miles to a fork. Take the middle fork, go 2.4 miles and turn right at the next fork. Continue 0.7 miles to another fork. Turn left. Go 0.65 miles to a cattle guard. Continue 1.5 miles to a fork. Continue straight (north) and go 0.2 miles to a water development and a few lone junipers on the left. From here, walk up the small ridge to the west for 200 paces at 266°M to a full high fence post with browse tag #7678 attached. The transect runs south from the start of the baseline. All other plots are marked by rebar stakes.

Map Name: Steamboat Mesa



Township: 22S Range: 26E Section: 30

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 666520 E 4302852 N

RYAN CREEK - TREND STUDY NO. 13B-6

Site Information

Site Description: The study is located within an old 1,800 acre pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) chaining, which in the past had been considered an important big game winter range. The area was chained and aerially seeded with crested wheatgrass (*Agropyron cristatum*), fourwing saltbush (*Atriplex canescens*), big sagebrush (*Artemisia tridentata*), alfalfa (*Medicago sativa*) and bitterbrush (*Purshia tridentata*) in 1968. To help maintain the integrity of the chaining, the Bureau of Land Management (BLM) used the herbicide tebuthiuron (Spike) to eliminate the released population of pinyon pine and Utah juniper trees on 300 acres of the chaining. The Ryan Creek Wildfire burned 3,947 acres of the area in 1989, which eliminated nearly all of the browse on the site. Grazing in the area is managed by the BLM as part of the Buckhorn allotment. A nearby deer pellet group transect in Ryan Park, on the Utah side, averaged 8 deer days use/acre (20 ddu/ha) between 1986 and 1996. Pellet group data taken along the trend study site base line indicated moderately light use by deer in 2000 and 2005 with heavier use in 2010. Estimated elk use has been light and estimated cattle use has been light to moderately light since 2000 (Table - Pellet Group Data). Cattle grazing is managed as part of the large Buckhorn allotment.

Browse: The pinyon and juniper trees, and a very low density of various browse species, were eliminated from the site when it burned. Previous to the fire the estimated combined density of pinyon and juniper trees was about 198 trees/acre. The most numerous shrubs on the site after the burn were Harriman's yucca (*Yucca harrimaniae*), broom snakeweed (*Gutierrezia sarothrae*), white stemmed rabbitbrush (*Chrysothamnus nauseosus* ssp. *hololeucus*) and a few scattered fourwing saltbush. Harriman's yucca subsequently decreased in following sample years and is now longer present on the site (Table - Browse Characteristics). There was no measurable browse cover sampled on the site in 2010 (Table - Browse Trends). Little change has occurred with the browse species since the fire. With the loss of the browse species, this site is no longer considered crucial winter range for wildlife.

Herbaceous Understory: The dominant grass species on the site are the seeded perennial species crested wheatgrass and the invasive annual cheatgrass (*Bromus tectorum*). These two species provide nearly all of the grass cover on the site with other grass species being rare. Other perennial grass species sampled include: Indian ricegrass (*Oryzopsis hymenoides*), galleta (*Hilaria jamesii*) and purple threeawn (*Aristida purpurea*). Forbs are diverse on the site, but are primarily dominated by annual species. Common perennial forbs include alfalfa and heath aster (*Leucelene ericoides*). Common annual species include storksbill (*Erodium cicutarium*) and burr buttercup (*Ranunculus testiculatus*) (Table - Herbaceous Trends).

Soil: The soil has a sandy clay loam texture with a neutral soil reaction (pH 7.3) (Table - Soil Analysis Data). The cover of bare ground has been moderate with a high of 35% in 2000. However, the vegetation and litter cover have provided adequate protection for the soil (Table- Basic Cover), and there has been no evidence of noticeable erosion. The soil erosion condition was classified as stable in 2005 and 2010.

Trend Assessments

Browse:

- **1986 to 1995 - down (-2):** A wildfire burned the site in 1989 and removed nearly all of the browse.
- **1995 to 2000 - stable (0):** Browse species were limited on the site.
- **2000 to 2005 - stable (0):** Browse species were limited on the site.
- **2005 to 2010 - stable (0):** Browse species were limited on the site.

Grass:

- **1986 to 1995 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 18% with a significant decrease in the nested frequency of crested wheatgrass.

- **1995 to 2000 - up (+2):** Perennial grass sum of nested frequency increased by 21% and cover increased from 6% to 17%. The increase was due to a significant increase in the nested frequency of crested wheatgrass. Cheatgrass nested frequency decreased two levels of significance and cover decreased from 19% to 2%.
- **2000 to 2005 - slightly down (-1):** There was little change in the sum of nested frequency of perennial grasses, but cover decreased to 10%. There was a slight change in composition with a significant decrease in crested wheatgrass nested frequency and a significant increase in the nested frequency of Indian ricegrass. Cheatgrass increased significantly in nested frequency and cover increased to 9%.
- **2005 to 2010 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased 11%, but cover increased to 19%. Crested wheatgrass nested frequency decreased significantly, but Indian ricegrass was not sampled. There was little change in the nested frequency of cheatgrass, but cover increased to 14%.

Forb:

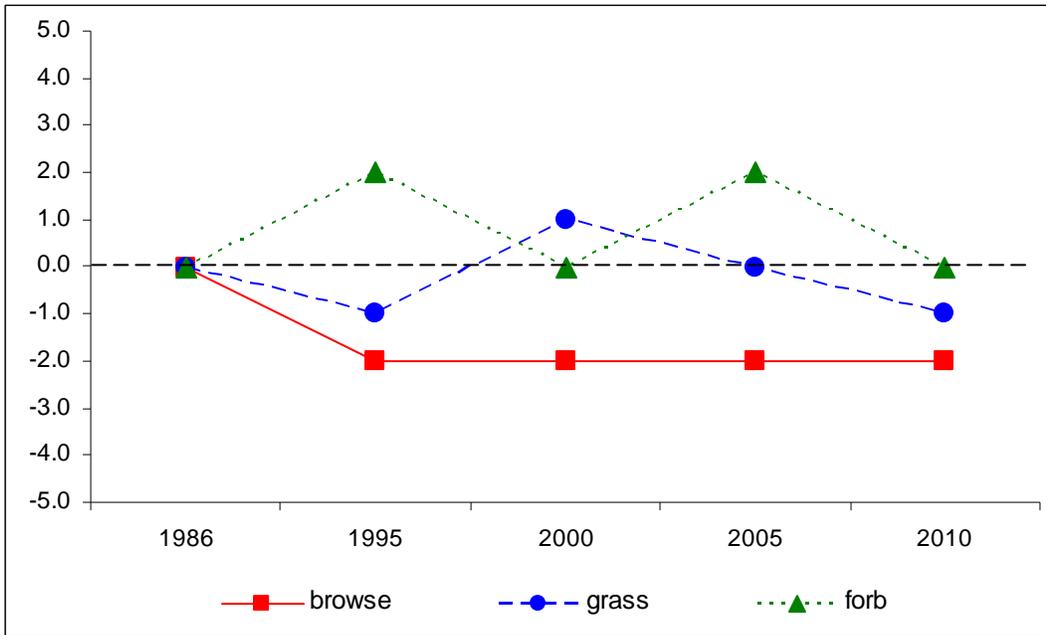
- **1986 to 1995 - up (+2):** There was a substantial increase in the sum of nested frequency of perennial forbs with a significant increase in the nested frequency of alfalfa and an aster (*Machaeranthera spp.*).
- **1995 to 2000 - down (-2):** Perennial forb sum of nested frequency decreased by 63%, but cover remained similar. Annual forbs also decreased substantially in nested frequency.
- **2000 to 2005 - up (+2):** The sum of nested frequency of perennial forbs increased by 55% and cover increased from 3% to 5%. There was a significant increase in the nested frequency of alfalfa. Annual species also increased markedly in nested frequency and annual forb cover increased from less than 1% to 16%.
- **2005 to 2010 - down (-2):** The sum of nested frequency of perennial forbs decreased by 57% and cover decreased to 1%. The nested frequency of alfalfa decreased significantly. Annual forbs also declined substantially.

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --
Management unit 13B, study no: 6

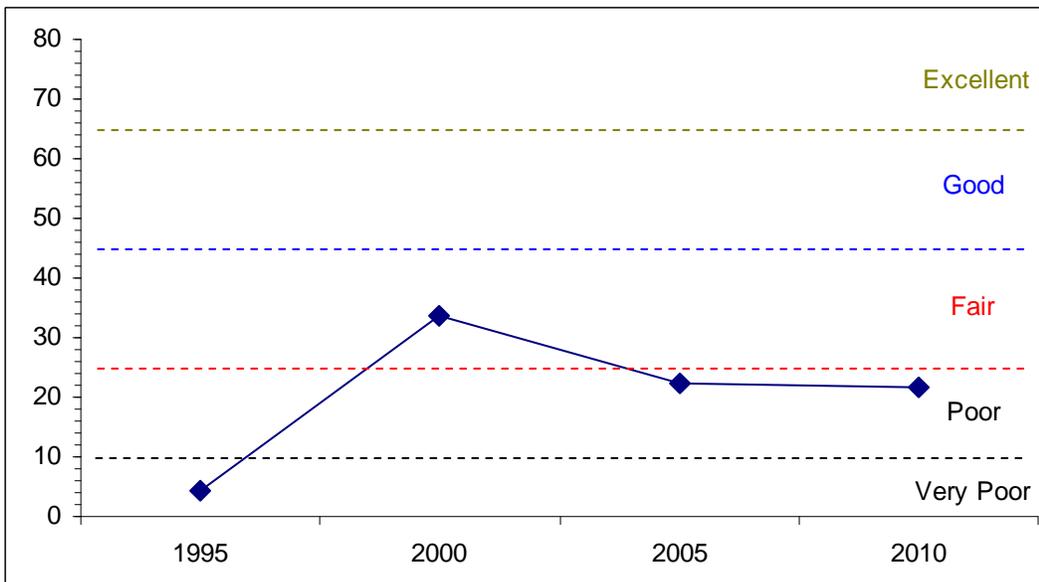
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
95	0.0	0.0	0.0	12.7	-13.9	5.4	0.0	4.2	Very Poor
00	0.0	0.0	0.0	30.0	-1.3	5.1	0.0	33.8	Fair
05	0.0	0.0	0.0	19.7	-6.9	9.4	0.0	22.2	Poor
10	0.0	0.0	0.0	30.0	-10.7	2.4	0.0	21.7	Poor

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 13B, Study no: 6



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--
Management unit 13B, Study no: 6



HERBACEOUS TRENDS--
Management unit 13B, Study no: 6

T y p e	Species	Nested Frequency					Average Cover %			
		'86	'95	'00	'05	'10	'95	'00	'05	'10
G	Agropyron cristatum	d286	ab215	cd255	a194	bc242	5.60	14.70	9.10	18.80
G	Aristida purpurea	-	1	7	-	-	.00	.24	-	-
G	Bromus tectorum (a)	-	c365	a138	b273	b287	18.56	1.72	9.25	14.30
G	Hilaria jamesii	-	3	7	7	9	.15	.53	.21	.07
G	Oryzopsis hymenoides	a-	a12	a12	b80	a-	.57	1.10	.52	-
G	Poa fendleriana	-	2	-	-	-	.03	-	-	-
G	Poa secunda	-	-	-	-	1	-	-	-	.03
G	Sitanion hystrix	2	4	4	-	-	.00	.18	-	-
G	Sporobolus cryptandrus	-	-	2	2	-	-	.15	.00	-
G	Stipa comata	-	-	-	-	-	-	-	.01	-
G	Vulpia octoflora (a)	4	3	-	-	-	.00	-	-	-
Total for Annual Grasses		4	368	138	273	287	18.57	1.72	9.25	14.30
Total for Perennial Grasses		288	237	287	283	252	6.37	16.90	9.85	18.90
Total for Grasses		292	605	425	556	539	24.95	18.63	19.10	33.20
F	Astragalus mollissimus	ab2	b7	ab1	ab7	a-	.02	.00	.05	-
F	Astragalus nuttallianus (a)	-	6	-	5	-	.02	-	.01	-
F	Calochortus nuttallii	-	-	-	2	3	-	-	.01	.03
F	Chenopodium fremontii (a)	-	-	3	-	-	-	.00	-	-
F	Chorispora tenella (a)	-	-	-	2	-	-	-	.06	-
F	Cryptantha sp.	-	-	-	7	2	-	-	.21	.00
F	Cymopterus sp.	-	3	6	6	2	.00	.01	.06	.01
F	Descurainia pinnata (a)	-	a-	a-	b22	a1	-	-	.06	.00
F	Draba nemorosa (a)	-	a6	a2	c105	b26	.01	.00	.59	.09
F	Erigeron sp.	-	-	-	3	9	-	-	.03	.19
F	Erodium cicutarium (a)	-	b125	a24	c246	b153	1.60	.39	13.15	1.90
F	Euphorbia sp.	a-	b14	b13	b15	ab8	.03	.10	.40	.06
F	Gilia sp. (a)	-	a-	a-	c33	b12	-	-	.21	.03
F	Heterotheca villosa	-	-	-	8	-	-	-	.16	-
F	Lactuca serriola	-	6	4	-	-	.02	.01	-	-
F	Lappula occidentalis (a)	-	ab5	a3	c62	b24	.01	.00	.65	.09
F	Lepidium densiflorum (a)	-	a-	a-	a-	b49	-	-	-	.56
F	Leucelene ericoides	a-	bc28	c38	bc29	b17	1.46	.79	1.60	.54
F	Machaeranthera spp	a-	b127	a-	a7	a-	.28	-	.01	-
F	Medicago sativa	a1	bc24	ab12	c34	a6	.84	1.60	2.12	.18
F	Phlox longifolia	-	-	3	-	-	-	.00	-	-
F	Ranunculus testiculatus (a)	-	a-	a-	b49	c106	-	-	.40	1.56
F	Salsola iberica (a)	-	a1	a-	b42	a-	.00	-	.12	-
F	Silene sp.	-	5	-	2	-	.01	-	.01	-
F	Sisymbrium altissimum (a)	-	c150	a2	b50	a3	1.22	.01	.80	.03
F	Sphaeralcea coccinea	-	-	3	4	7	-	.03	.03	.18
F	Unknown forb-perennial	2	-	-	-	-	-	-	-	-
Total for Annual Forbs		0	293	34	616	374	2.87	0.41	16.06	4.28
Total for Perennial Forbs		5	214	80	124	54	2.68	2.55	4.70	1.21

Type	Species	Nested Frequency					Average Cover %			
		'86	'95	'00	'05	'10	'95	'00	'05	'10
Total for Forbs		5	507	114	740	428	5.56	2.97	20.77	5.50

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

BROWSE TRENDS--

Management unit 13B, Study no: 6

Type	Species	Strip Frequency				Average Cover %			
		'95	'00	'05	'10	'95	'00	'05	'10
B	Chrysothamnus nauseosus hololeucus	1	1	1	1	.15	.15	.85	-
B	Gutierrezia sarothrae	1	4	3	0	.15	.15	.21	-
B	Yucca harrimaniae	5	4	0	0	.30	.30	-	-
Total for Browse		7	9	4	1	0.60	0.61	1.06	0.00

CANOPY COVER, LINE INTERCEPT--

Management unit 13B, Study no: 6

Species	Percent Cover	
	'05	'10
Chrysothamnus nauseosus hololeucus	.96	.86

BASIC COVER--

Management unit 13B, Study no: 6

Cover Type	Average Cover %				
	'86	'95	'00	'05	'10
Vegetation	7.25	41.22	23.49	35.27	39.81
Rock	4.00	13.35	16.52	17.92	16.11
Pavement	4.00	1.11	3.95	1.92	2.98
Litter	53.00	45.07	22.25	21.54	37.34
Cryptogams	2.25	.61	1.08	.71	.93
Bare Ground	29.50	13.15	34.65	30.96	24.38

SOIL ANALYSIS DATA --

Management unit 13B, Study no: 6, Study Name: Ryan Creek

Effective rooting depth (in)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
14.3	7.3	64.0	15.4	20.6	4.9	7.7	80.0	1.0

PELLET GROUP DATA--

Management unit 13B, Study no: 6

Type	Quadrat Frequency			
	'95	'00	'05	'10
Rabbit	6	38	23	8
Elk	12	4	12	16
Deer	17	29	20	21
Cattle	3	4	8	6

Days use per acre (ha)		
'00	'05	'10
-	-	-
9 (24)	9 (22)	1 (3)
20 (50)	27 (68)	59 (146)
10 (26)	7 (16)	23 (56)

BROWSE CHARACTERISTICS--
Management unit 13B, Study no: 6

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<i>Artemisia tridentata wyomingensis</i>									
86	33	0	0	100	-	0	100	0	-/-
95	0	0	0	0	-	0	0	0	-/-
00	0	0	0	0	-	0	0	0	-/-
05	0	0	0	0	-	0	0	0	-/-
10	0	0	0	0	-	0	0	0	-/-
<i>Atriplex canescens</i>									
86	0	0	0	-	-	0	0	0	-/-
95	0	0	0	-	-	0	0	0	28/27
00	0	0	0	-	-	0	0	0	39/34
05	0	0	0	-	-	0	0	0	38/55
10	0	0	0	-	-	0	0	0	27/56
<i>Chrysothamnus nauseosus hololeucus</i>									
86	0	0	0	-	-	0	0	0	-/-
95	20	0	100	-	-	0	0	0	30/46
00	20	0	100	-	-	0	0	0	36/63
05	20	0	100	-	-	0	0	0	42/64
10	20	0	100	-	-	0	0	0	30/59
<i>Chrysothamnus viscidiflorus</i>									
86	0	0	0	-	-	0	0	0	-/-
95	0	0	0	-	-	0	0	0	-/-
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	-/-
10	0	0	0	-	-	0	0	0	33/81
<i>Echinocactus sp.</i>									
86	0	0	0	-	-	0	0	0	-/-
95	0	0	0	-	-	0	0	0	-/-
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	-/-
10	0	0	0	-	-	0	0	0	11/18
<i>Ephedra viridis</i>									
86	0	0	0	-	-	0	0	0	-/-
95	0	0	0	-	-	0	0	0	-/-
00	0	0	0	-	-	0	0	0	-/-
05	0	0	0	-	-	0	0	0	16/17
10	0	0	0	-	-	0	0	0	20/28

		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>Gutierrezia sarothrae</i>										
86	66	0	100	-	-	0	0	0	10/11	
95	20	0	100	-	-	0	0	0	7/22	
00	280	21	79	-	-	0	0	0	7/7	
05	180	22	78	-	20	0	0	0	12/20	
10	0	0	0	-	-	0	0	0	-/-	
<i>Juniperus osteosperma</i>										
86	66	0	100	-	-	0	0	0	98/79	
95	0	0	0	-	-	0	0	0	-/-	
00	0	0	0	-	-	0	0	0	-/-	
05	0	0	0	-	-	0	0	0	-/-	
10	0	0	0	-	-	0	0	0	-/-	
<i>Opuntia sp.</i>										
86	0	0	0	-	-	0	0	0	-/-	
95	0	0	0	-	-	0	0	0	-/-	
00	0	0	0	-	-	0	0	0	-/-	
05	0	0	0	-	-	0	0	0	4/11	
10	0	0	0	-	-	0	0	0	-/-	
<i>Pinus edulis</i>										
86	132	50	50	-	-	0	0	0	78/50	
95	0	0	0	-	-	0	0	0	-/-	
00	0	0	0	-	-	0	0	0	-/-	
05	0	0	0	-	-	0	0	0	-/-	
10	0	0	0	-	-	0	0	0	-/-	
<i>Yucca harrimaniae</i>										
86	0	0	0	0	-	0	0	0	-/-	
95	680	0	97	3	-	0	0	0	10/14	
00	240	0	42	58	-	0	0	33	13/19	
05	0	0	0	0	-	0	0	0	-/-	
10	0	0	0	0	-	0	0	0	-/-	