

Trend Study 10-14-05

Study site name: East Floy Bench .

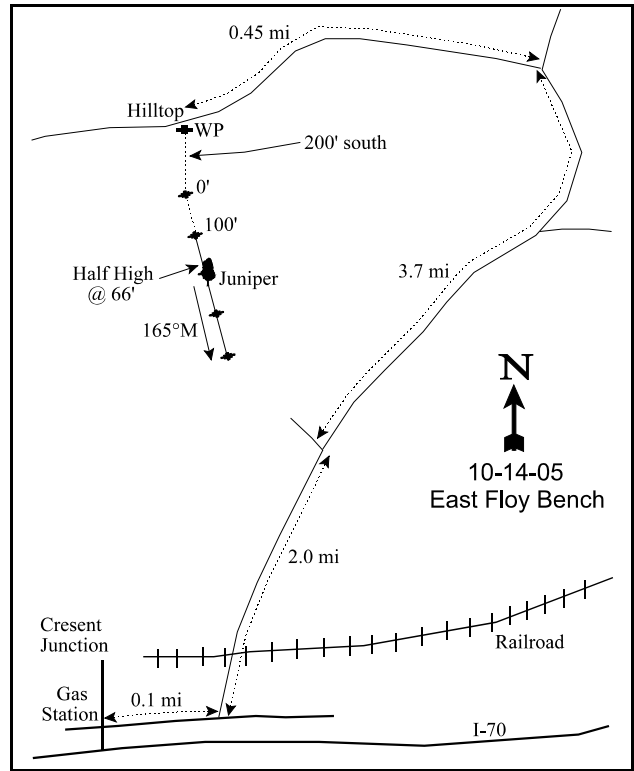
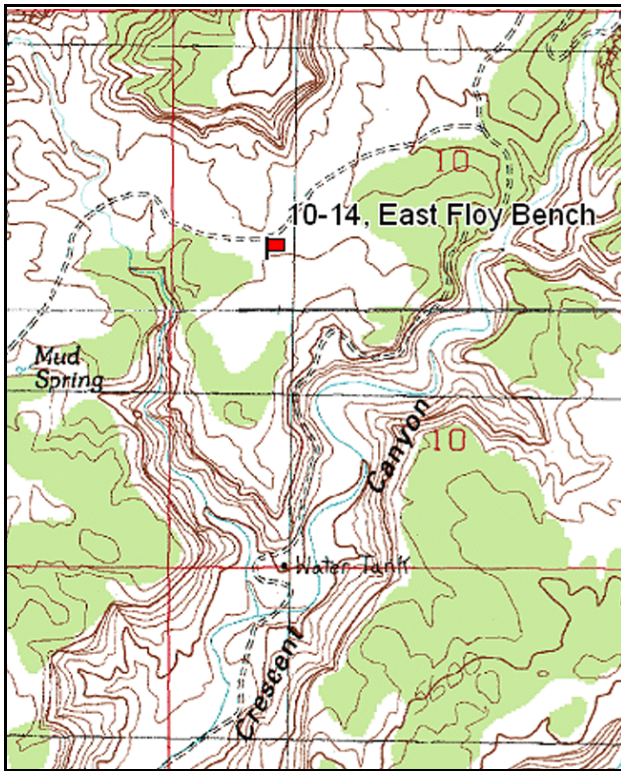
Vegetation type: Wyoming Big Sagebrush .

Compass bearing: frequency baseline 165 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). Belt 3 rebar at 15ft.

LOCATION DESCRIPTION

Go to Crescent Junction, off of I-70 east of Green River. From the dirt road 0.1 miles east of the gas station and SR 163 junction, cross the east-west running tracks and go north 2 miles on the main dirt road to a fork. Bear right and go 3.7 miles to a fork on top of a hill, stay left and climb out of the wash and up the west side of the canyon. Turn left. Continue 0.45 miles to the crest of a small hill. There is a rebar witness post 10 feet to the left. The 0-foot baseline stake, marked with a browse tag, is 200 feet south of the witness post.



Map Name: Crescent Junction

Diagrammatic Sketch

Township 21S, Range 19E, Section 10

GPS: NAD 27, UTM 12S 4317389 N, 602929 E

## DISCUSSION

### East Floy Bench - Trend Study No. 10-14

The East Floy Bench transect is located on a low lying bench running along the south end of the Book Cliffs. The bench slopes to the north with a 3-5% slope at an elevation of 5,500 feet. This sagebrush/pinyon-juniper flat drops off abruptly at the southern edge to the salt desert below. This study is located on BLM administered land in the Crescent Canyon Allotment. In 1986, it was grazed by 1,208 sheep from mid-November to mid-April. This allotment was converted to cattle use after 1995. Grazing is permitted from November 1st through April 20 for cows at 958 AUM's on a 4 pasture deferred rotation system. Pellet group transect data from 2000 estimated 27 deer days use/acre (67 ddu/ha), 7 elk days use/acre (17 edu/ha), and 18 cow days use/acre (44 cdu/ha). Pellet group data in 2005 estimated 27 deer days use/acre (66 ddu/ha), 5 elk days use/acre (12 edu/ha), and 23 cow days use/acre (57 cdu/ha). Most cattle pats were found under the shade of juniper trees. Rabbit use was also very high in 2005 with rabbit pellets in 83% of the quadrats.

The sandy loam soil is moderately deep, although there are large areas of exposed and shallow covered sandstone bedrock. Chemical analysis indicates the soil is low in phosphorus at 4.3 ppm (Tiedemann and Lopez 2004). The soil is neutral in reactivity (pH of 7.0) and organic matter is low at less than 1%. A profile stoniness index estimated from penetrometer readings show the majority of the rockiness to occur between 8 and 12 inches in depth. Effective rooting depth is nearly 13 inches. Bare ground is abundant on this site. In 1995, bare ground cover was estimated at 39%. It increased to over 55% in 2000 and 2005. Average cover from vegetation and litter both decreased in 2000. Litter decreased again in 2005. Some soil movement is evident in plant interspaces, but due to the gentle slope, erosion is minimal. An erosion condition class assessment rated erosion as slight in 2005.

Wyoming big sagebrush is the key browse species. Estimated density was 2,700 plants/acre in 1986, then declined to 1,060 plants/acre in 1995, and 940 plant/acre in 2000. This increased slightly in 2005 to 1,100 plants/acre. The decrease in density after 1986 is likely due to the increased sample size used beginning in mid-1992. The number of mature and young plants did not change between 2000 and 2005. In 2005, the number of decadent plants increased from 260 plants/acre (28% of population) in 2000 to 420 plants/acre (38% of population) in 2005. Decadence was only 2% in 1995. Sagebrush cover has averaged 3-4% from 1995-2005. Recruitment from young plants was moderately high in 1995 at 23%, but decreased to only 4% in 2000 and 2005. Utilization has been moderate to heavy for each reading. A sample of sagebrush annual leader growth measured in 2000 showed an average of about 7 inches. In 2005, leader growth was measured at only 2.7 inches. The population appeared to be naturally thinning itself in response to drought with one out of every five plants sampled classified as dead in 1995. Increased decadence, decreased recruitment, and reduced vigor since 1995 is most likely due to the drought and the abundance of winter annuals.

Due to the larger sample size and better sample distribution used in 1995, considerably more browse species were sampled. These species include: fourwing saltbush, winterfat, spiny hopsage, green ephedra, shadscale, rubber rabbitbrush, low rabbitbrush, slenderbush eriogonum, broom snakeweed, and pricklypear cactus. Many of these species are preferred by wildlife and livestock, but most occur in low densities. In 2005, shadscale was not sampled. Broom snakeweed density has varied and has been reflective of drought conditions. Point center-quarter data estimated 16 juniper trees/acre in both 1995 and 2000; this increased to 32 trees/acre in 2005.

Perennial grasses that are abundant on this site include galleta, bottlebrush squirreltail, sand dropseed, and needle-and-thread. Sum of nested frequency for perennials declined between 1986 and 1995. In 2000, nested frequency for each perennial species was stable, except for sand dropseed which increased. In 2005, sand dropseed and Salina wildrye significantly declined. In 1995, cheatgrass was very abundant. It was sampled in 97% of the quadrats and had nearly 7% cover. It declined significantly in 2000, which was a dry year, and

was only sampled in 25% of the quadrats. In 2005, cheatgrass nested frequency increased significantly, but was not as high as in 1995. Cheatgrass cover was robust in 2005 with over 8% cover. Forbs are sparse and mostly comprised of annuals. Annual stickseed was very abundant in 2005.

#### 1986 APPARENT TREND ASSESSMENT

The palatable shrubs are moderately to heavily hedged and generally declining in vigor and reproductive success. The Wyoming big sagebrush population has an encouraging amount of young plants, however, broom snakeweed and juniper appear to be increasing. Of particular concern is the fact that unless the new grazing plan includes a reduction in sheep AUM's, excessive shrub utilization will result in pastures that are not rested. This sagebrush range gradually gives way to the more traditional salt desert shrub sheep winter range at lower elevations. Management strategies should strive to minimize sheep use on critical big game winter range and limit winter use to the lower elevational areas. The soil is stable, but would benefit from less disturbance.

#### 1995 TREND ASSESSMENT

Although this area had early spring precipitation, the rest of the summer was drier than usual. The early spring precipitation likely did not benefit the perennial grasses due to the abundance of cheatgrass. Perennial grass species compete poorly for soil moisture with cheatgrass when moisture only comes in the winter and spring, especially when cheatgrass is abundant. Although grasses provide 50% of the total vegetation cover on the site, the sum of nested frequency for perennial grass has declined by nearly 50% since 1986. For this reason, the herbaceous understory trend is downward with a notably poor forb component. The browse trend for this site appears to be stable. The Wyoming big sagebrush population has many seedlings with nearly one-fourth of the population classified as young plants. Also, the intensity of hedging has shifted from heavy to moderate with a decline in decadence. Some soil movement is evident, but due to the gentle slope, vegetation cover, and good cryptogamic crust cover, the movement is slight. Therefore, soil trend is considered stable. The Desirable Components Index (see methods) rated this site as fair. Browse cover is low, decadence and young recruitment are good, and perennial grass cover is moderate.

#### TREND ASSESSMENT

soil - stable (0)

browse - stable (0)

herbaceous understory - down (-2)

winter range condition (DC Index) - fair (38) Lower potential scale

#### 2000 TREND ASSESSMENT

Trend for soil is slightly down with a large increase in bare ground cover and decreases in cover from herbaceous vegetation and litter. The ratio of bare soil to protective ground cover is low at 1:2.2. Trend for browse is slightly down. Wyoming big sagebrush has increased decadence and poor vigor, as well as decreased recruitment from 23% in 1995 to 4% in 2000. Other less abundant palatable species such as fourwing saltbush, spiny hopsage, and shadscale have high rates of decadence. Trend for the herbaceous understory is up with an increase in sum of nested frequency for perennial grasses and decreases in annual grasses. The DCI score decreased to poor, because of an increase in decadence, a decrease in browse cover, and a decrease in young.

#### TREND ASSESSMENT

soil - slightly down (-1)

browse - slightly down (-1)

herbaceous understory - up (+2)

winter range condition (DC Index) - poor (22) Lower potential scale

## 2005 TREND ASSESSMENT

The trend for soil is stable. The ratio of bare ground to protective ground cover (vegetation, litter, and cryptogams) improved very slightly. The amount of bare ground is unchanged since 2000 and litter cover decreased from 25% to 18%. The browse trend is stable. Wyoming big sagebrush density is slightly higher, but percent decadence is also higher. Sagebrush cover has remained at about 3%. Shadscale has declined, but winterfat has increased and young plants were abundant. The herbaceous understory trend is slightly down and is similar to conditions in 1995. Cheatgrass has increased since 2000 and perennial nested frequency declined slightly. Forbs are sparse. The DCI score continued to be poor, because of a decrease in perennial grass cover and an increase in annual forb cover.

### TREND ASSESSMENT

soil - stable (0)

browse - stable (0)

herbaceous understory - slightly down (-1)

winter range condition (DC Index) - poor (17) Lower potential scale

### HERBACEOUS TRENDS --

Management unit 10 , Study no: 14

T y p e	Species	Nested Frequency				Average Cover %		
		'86	'95	'00	'05	'95	'00	'05
G	Aristida purpurea	-	1	7	4	.03	.07	.30
G	Bromus tectorum (a)	-	<sub>c</sub> 318	<sub>a</sub> 56	<sub>b</sub> 161	6.72	1.10	8.11
G	Elymus salina	<sub>a</sub> -	<sub>b</sub> 15	<sub>b</sub> 13	<sub>a</sub> -	1.10	.18	-
G	Hilaria jamesii	<sub>b</sub> 156	<sub>a</sub> 65	<sub>a</sub> 76	<sub>a</sub> 80	1.10	2.01	1.71
G	Oryzopsis hymenoides	<sub>b</sub> 36	<sub>ab</sub> 37	<sub>a</sub> 17	<sub>b</sub> 57	1.91	.30	.50
G	Poa secunda	-	-	-	6	-	-	.04
G	Sitanion hystrix	<sub>b</sub> 40	<sub>a</sub> 7	<sub>a</sub> 2	<sub>a</sub> 10	.07	.03	.19
G	Sporobolus cryptandrus	<sub>a</sub> -	<sub>ab</sub> 5	<sub>c</sub> 63	<sub>ab</sub> 9	.03	1.58	.05
G	Stipa comata	<sub>b</sub> 92	<sub>a</sub> 40	<sub>a</sub> 39	<sub>a</sub> 20	.92	.93	.47
G	Vulpia octoflora (a)	-	<sub>b</sub> 75	<sub>a</sub> 4	<sub>c</sub> 114	.21	.01	.92
Total for Annual Grasses		0	393	60	275	6.93	1.11	9.03
Total for Perennial Grasses		324	170	217	186	5.18	5.12	3.27
Total for Grasses		324	563	277	461	12.11	6.23	12.31
F	Arabis sp.	-	-	-	-	-	-	.03
F	Chenopodium fremontii (a)	-	-	-	3	-	-	.00
F	Chenopodium leptophyllum(a)	-	<sub>a</sub> 2	<sub>a</sub> -	<sub>b</sub> 14	.00	-	.06
F	Chaenactis stevioides	-	-	-	1	-	-	.00
F	Cryptantha sp.	-	-	-	3	-	-	.00
F	Descurainia pinnata (a)	-	<sub>a</sub> 3	<sub>a</sub> -	<sub>b</sub> 13	.00	-	.31
F	Draba sp. (a)	-	<sub>b</sub> 17	<sub>a</sub> -	<sub>c</sub> 50	.02	-	.22
F	Eriogonum cernuum (a)	-	10	-	1	.02	-	.01

T y p e	Species	Nested Frequency				Average Cover %		
		'86	'95	'00	'05	'95	'00	'05
F	<i>Erigeron pumilus</i>	-	5	-	2	.01	-	.00
F	<i>Gilia</i> sp. (a)	-	a <sup>-</sup>	a <sup>-</sup>	b <sup>73</sup>	-	-	.38
F	<i>Lappula occidentalis</i> (a)	-	b <sup>67</sup>	a <sup>-</sup>	c <sup>118</sup>	.12	-	1.68
F	<i>Lepidium</i> sp. (a)	-	-	-	3	-	-	.03
F	<i>Machaeranthera grindelioides</i>	-	-	-	1	-	-	.03
F	<i>Mentzelia</i> sp.	-	-	-	5	-	-	.04
F	<i>Navarretia intertexta</i> (a)	-	a <sup>-</sup>	a <sup>-</sup>	b <sup>35</sup>	-	-	1.08
F	<i>Oenothera</i> sp.	-	-	-	3	-	-	.00
F	<i>Plantago patagonica</i> (a)	-	b <sup>42</sup>	a <sup>-</sup>	c <sup>58</sup>	.09	-	.21
F	<i>Ranunculus testiculatus</i> (a)	-	a <sup>-</sup>	a <sup>1</sup>	b <sup>20</sup>	-	.00	.06
F	<i>Salsola iberica</i> (a)	-	a <sup>-</sup>	a <sup>2</sup>	b <sup>11</sup>	-	.00	.03
F	<i>Sphaeralcea coccinea</i>	-	-	-	5	-	-	.09
F	<i>Tragopogon dubius</i>	3	-	-	-	-	-	-
Total for Annual Forbs		0	141	3	399	0.26	0.00	4.09
Total for Perennial Forbs		3	5	0	20	0.01	0	0.22
Total for Forbs		3	146	3	419	0.28	0.00	4.31

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

BROWSE TRENDS --

Management unit 10 , Study no: 14

Type	Species	Strip Frequency			Average Cover %		
		'95	'00	'05	'95	'00	'05
B	<i>Artemisia tridentata wyomingensis</i>	24	21	21	4.20	3.29	3.37
B	<i>Atriplex canescens</i>	7	7	10	.56	.15	.82
B	<i>Atriplex confertifolia</i>	4	5	0	.03	.88	-
B	<i>Ceratoides lanata</i>	6	2	7	.45	.15	.48
B	<i>Chrysothamnus nauseosus consimilis</i>	1	0	0	-	-	-
B	<i>Chrysothamnus viscidiflorus stenophyllus</i>	9	7	4	.15	.44	.33
B	<i>Ephedra viridis</i>	1	4	4	-	1.50	1.32
B	<i>Eriogonum microthecum</i>	2	0	3	.00	-	-
B	<i>Grayia spinosa</i>	5	2	5	.33	.15	.63
B	<i>Gutierrezia sarothrae</i>	80	27	51	3.82	.32	1.93
B	<i>Juniperus osteosperma</i>	0	0	1	2.25	3.11	4.48
B	<i>Opuntia sp.</i>	1	4	4	-	.03	.00
Total for Browse		140	79	110	11.82	10.05	13.39

CANOPY COVER, LINE INTERCEPT --

Management unit 10 , Study no: 14

Species	Percent Cover	
	'00	'05
<i>Artemisia tridentata wyomingensis</i>	-	3.88
<i>Atriplex canescens</i>	-	1.39
<i>Ceratoides lanata</i>	-	.30
<i>Ephedra viridis</i>	-	1.95
<i>Grayia spinosa</i>	-	.88
<i>Gutierrezia sarothrae</i>	-	2.58
<i>Juniperus osteosperma</i>	4.40	6.59
<i>Opuntia sp.</i>	-	.01

KEY BROWSE ANNUAL LEADER GROWTH --  
Management unit 10 , Study no: 14

Species	Average leader growth (in)
	'05
Artemisia tridentata wyomingensis	2.9
Atriplex canescens	4.5
Ceratoides lanata	6.2

POINT-QUARTER TREE DATA --  
Management unit 10 , Study no: 14

Species	Trees per Acre	
	'00	'05
Juniperus osteosperma	16	32

Average diameter (in)	
'00	'05
4.9	10.0

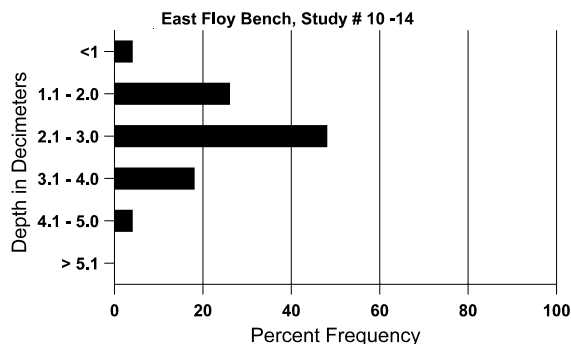
BASIC COVER --  
Management unit 10 , Study no: 14

Cover Type	Average Cover %			
	'86	'95	'00	'05
Vegetation	2.25	23.38	17.85	25.43
Rock	0	1.45	1.17	.84
Pavement	0	.44	.42	.41
Litter	35.75	31.51	24.85	18.26
Cryptogams	2.50	10.39	10.03	11.91
Bare Ground	59.50	39.23	57.54	54.95

SOIL ANALYSIS DATA --  
Herd Unit 10, Study # 14, Study Name: East Floy Bench

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	ppm P	ppm K	dS/m
12.8	62.0 (11.0)	7.0	60.0	23.4	16.6	0.6	4.3	185.6	0.5

### Stoniness Index



PELLET GROUP DATA --

Management unit 10 , Study no: 14

Type	Quadrat Frequency		
	'95	'00	'05
Sheep	7	4	-
Rabbit	58	42	83
Elk	5	3	1
Deer	20	15	10
Cattle	-	2	12

Days use per acre (ha)	
'00	'05
-	-
-	-
7 (17)	5 (12)
27 (67)	27 (66)
18 (44)	23 (57)

BROWSE CHARACTERISTICS --

Management unit 10 , Study no: 14

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Artemisia tridentata wyomingensis</i>												
86	<b>2700</b>	66	1000	1200	500	-	31	41	19	-	6	15/14
95	<b>1060</b>	140	240	800	20	220	58	4	2	2	13	23/39
00	<b>940</b>	-	40	640	260	60	68	11	28	19	19	24/41
05	<b>1100</b>	-	40	640	420	180	49	45	38	7	7	26/39
<i>Atriplex canescens</i>												
86	<b>333</b>	-	-	-	333	-	20	50	100	12	40	-/-
95	<b>140</b>	-	20	120	-	-	0	0	0	-	0	27/37
00	<b>300</b>	20	-	20	280	-	33	0	93	73	73	23/28
05	<b>260</b>	-	40	200	20	-	31	38	8	-	0	25/33
<i>Atriplex confertifolia</i>												
86	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
95	<b>100</b>	-	-	100	-	-	60	20	0	-	0	22/32
00	<b>160</b>	80	20	20	120	-	63	0	75	-	0	21/44
05	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
<i>Ceratoides lanata</i>												
86	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
95	<b>260</b>	-	20	240	-	-	77	0	-	-	0	15/17
00	<b>180</b>	-	-	180	-	-	33	0	-	-	0	13/22
05	<b>360</b>	300	120	240	-	-	6	67	-	-	0	13/12
<i>Chrysothamnus nauseosus consimilis</i>												
86	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
95	<b>20</b>	-	-	-	20	-	0	0	100	-	0	21/20
00	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
05	<b>0</b>	-	-	-	-	-	0	0	0	-	0	19/20

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Chrysothamnus viscidiflorus stenophyllus</i>												
86	0	-	-	-	-	-	0	0	0	-	0	-/-
95	200	-	60	100	40	-	0	0	20	10	10	16/34
00	200	20	20	160	20	80	0	10	10	10	10	13/28
05	100	-	-	100	-	-	0	0	0	-	0	13/19
<i>Ephedra viridis</i>												
86	0	-	-	-	-	-	0	0	0	-	0	-/-
95	20	-	20	-	-	-	0	0	0	-	0	63/97
00	200	-	80	100	20	20	60	20	10	-	0	25/25
05	380	-	80	300	-	-	79	0	0	-	0	31/46
<i>Eriogonum microthecum</i>												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
95	140	-	20	120	-	-	0	0	-	-	0	-/-
00	0	-	-	-	-	-	0	0	-	-	0	-/-
05	80	-	-	80	-	-	50	50	-	-	0	6/8
<i>Grayia spinosa</i>												
86	0	-	-	-	-	-	0	0	0	-	0	-/-
95	120	-	-	60	60	-	0	0	50	-	0	25/44
00	40	-	-	-	40	-	100	0	100	100	100	23/44
05	120	-	-	80	40	-	0	83	33	33	33	25/45
<i>Gutierrezia sarothrae</i>												
86	8199	333	3733	4300	166	-	0	0	2	-	0	8/7
95	6140	40	100	6040	-	-	0	0	0	-	0	9/11
00	960	-	-	660	300	1500	2	0	31	15	17	6/8
05	3020	240	220	2800	-	-	2	0	0	-	0	10/12
<i>Juniperus osteosperma</i>												
86	66	-	33	33	-	-	0	0	-	-	0	71/71
95	0	-	-	-	-	-	0	0	-	-	0	-/-
00	0	-	-	-	-	-	0	0	-	-	0	-/-
05	20	-	-	20	-	-	0	0	-	-	0	-/-
<i>Opuntia sp.</i>												
86	33	-	-	33	-	-	0	0	0	-	0	7/1
95	20	-	-	20	-	-	0	0	0	-	0	5/21
00	80	-	-	60	20	-	0	0	25	-	0	6/21
05	80	-	-	80	-	-	0	0	0	-	25	7/20