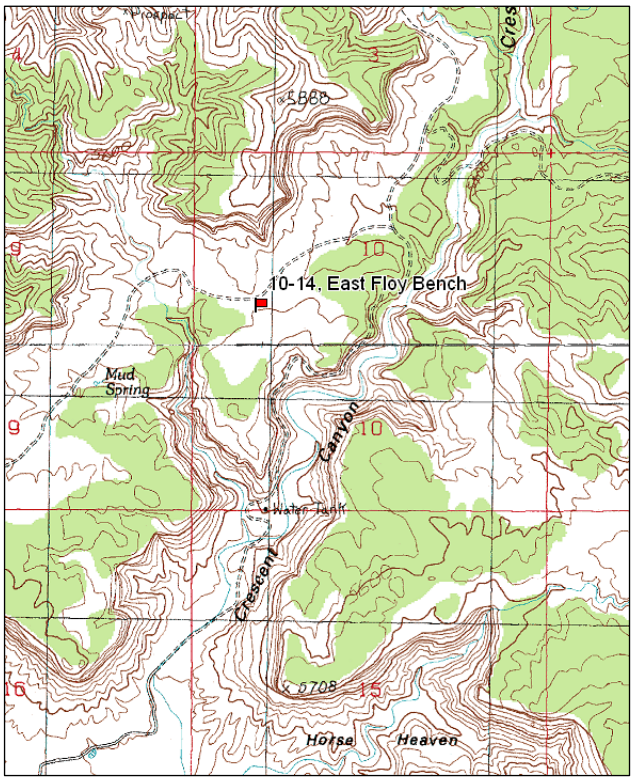
EAST FLOY BENCH - TREND STUDY NO. 10-14-10

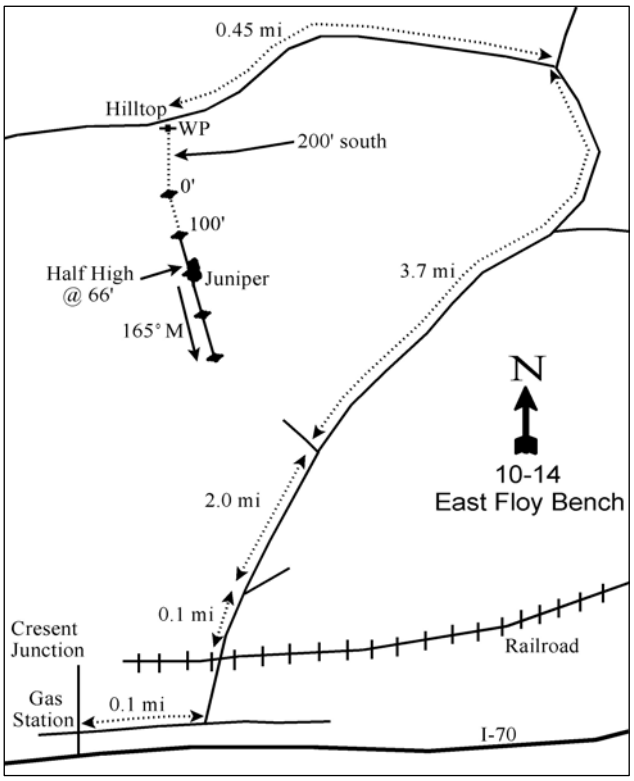
Vegetation Type: Wyoming Big Sagebrush
Range Type: Crucial Deer Winter
NRCS Ecological Site Description: Not Available
Land Ownership: BLM
Elevation: 5600 ft. (1707 m)
Aspect: West
Slope: 5%
Transect bearing: 165° magnetic
Belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). Belt 3 rebar at 15ft

Directions:
Go to Crescent Junction, off of I-70 east of Green River. From the paved road 0.1 miles east of the gas station and SR 163 junction, cross the east-west running tracks. After the tracks go 0.1 miles and turn left onto a dirt road. 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: Cresent Junction



Diagrammatic Sketch:



Township: 21S Range: 19E Section: 9/16

GPS: NAD 83, UTM 12S 602868 E 4317594 N

EAST FLOY BENCH - TREND STUDY NO. 10-14

Site Information

Site Description: The study is located on a low lying bench running along the south end of the Book Cliffs. This Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) flat drops off abruptly at the southern edge to the salt desert below. The study is located on Bureau of Land Management (BLM) administered land in the Crescent Canyon allotment. Pellet group transect data estimated moderate deer use in 2000 and 2005, with heavier use in 2010. Estimated elk use has been light since 2000. Estimated cattle use was lightly moderate in 2000 and 2005, but was heavy in 2010. Rabbit use was very high in 2005, but was moderate in other sample years (Table - Pellet Group Data).

Browse: Wyoming big sagebrush is the key browse species. The sagebrush population is mostly mature with moderate decadence and good vigor. Recruitment of young sagebrush plants was good at the outset of the study, but has been somewhat low since 2000. Sagebrush utilization has been mostly moderate with heavy use in 1986 and 2010. Due to the larger sample size and better sample distribution used in 1995, considerably more browse species were sampled. These species include: fourwing saltbush (*Atriplex canescens*), shadscale (*A. confertifolia*), winterfat (*Ceratoides lanata*), spiny hopsage (*Grayia spinosa*), green ephedra (*Ephedra viridis*), rubber rabbitbrush (*Chrysothamnus nauseosus* ssp. *consimilis*), stickyleaf low rabbitbrush (*C. viscidiflorus* ssp. *stenophyllus*), slenderbush eriogonum (*Eriogonum microthecum*) and broom snakeweed (*Gutierrezia sarothrae*). Many of these species are preferred by wildlife and livestock, but most occur in low densities and shadscale has not been sampled since 2005. Broom snakeweed density has varied and has been reflective of drought conditions (Table - Browse Characteristics). Juniper density (Table - Point-Quarter Tree Data) and cover (Table - Browse Trends) have been increasing since 1995, but remain moderately low.

Herbaceous Understory: Perennial grasses are diverse, but are not overly abundant on this site. Common perennial species include: galleta (*Hilaria jamesii*), bottlebrush squirreltail (*Sitanion hystrix*), sand dropseed (*Sporobolus cryptandrus*), Indian ricegrass (*Oryzopsis hymenoides*) and needle-and-thread (*Stipa comata*). Cheatgrass (*Bromus tectorum*) is common on the site, but has fluctuated in frequency and cover with precipitation patterns. Forbs are sparse and mostly comprised of annuals (Table - Herbaceous Trends).

Soil: The soil is a sandy loam with neutral soil reactivity (pH 7.0) and large areas of exposed or shallow covered sandstone bedrock. Phosphorus may be limiting to plant growth and development at 4.3 ppm (Tiedemann and Lopez 2004) and organic matter is low at less than 1% (Table - Soil Analysis Data). Bare ground is abundant on this site with low amounts of vegetation and litter cover, though cryptogam cover is quite high (Table - Basic Cover). Some soil movement is evident in plant interspaces, but due to the gentle slope, erosion is minimal. The soil erosion condition was classified as slight in 2005 and 2010.

Trend Assessments

Browse:

- **1986 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. There was a slight increase in poor vigor of sagebrush, but decadence decreased slightly.
- **1995 to 2000 - slightly down (-1):** Density of sagebrush decreased 11% from 1,060 plants/acre to 940 plants/acre with a large decrease in the recruitment of young plants. Sagebrush decadence increased from 2% to 28% and poor vigor increased from 13% to 19%. Cover of sagebrush decreased slightly from 4% to 3%.
- **2000 to 2005 - stable (0):** Sagebrush density increased 17% to 1,100 plants/acre, but decadence increased to 38% and cover remained similar at 3%. Recruitment of young sagebrush plants remained low at 4%. Shadscale was not sampled on the site. Winterfat density and cover increased slightly.

- **2005 to 2010 - stable (0):** There was a 24% decrease in the density of sagebrush to 840 plants/acre, but decadence decreased to 19% and cover increased to 6%. Recruitment of young sagebrush plants increased slightly, but is still relatively low.

Grass:

- **1986 to 1995 - down (-2):** The sum of nested frequency of perennial grasses decreased by 46% with a significant decrease in the nested frequency of galleta, bottlebrush squirreltail and needle-and-thread. Annual species were not included in the sample in 1986, but cheatgrass was the dominant grass species in 1995.
- **1995 to 2000 - up (+2):** The perennial grass sum of nested frequency increased by 28%, though there was little change in cover. Cheatgrass decreased significantly in nested frequency and cover decreased from 7% to 1%.
- **2000 to 2005 - down (-2):** There was a 14% decrease in the sum of nested frequency and cover decreased from 5% to 3%. Cheatgrass increased significantly in nested frequency and cover increased to 8%.
- **2005 to 2010 - down (-2):** The sum of nested frequency of perennial grasses decreased by 39% with little change in cover. Cheatgrass cover decreased to 3%, but there was little change in nested frequency.

Forb:

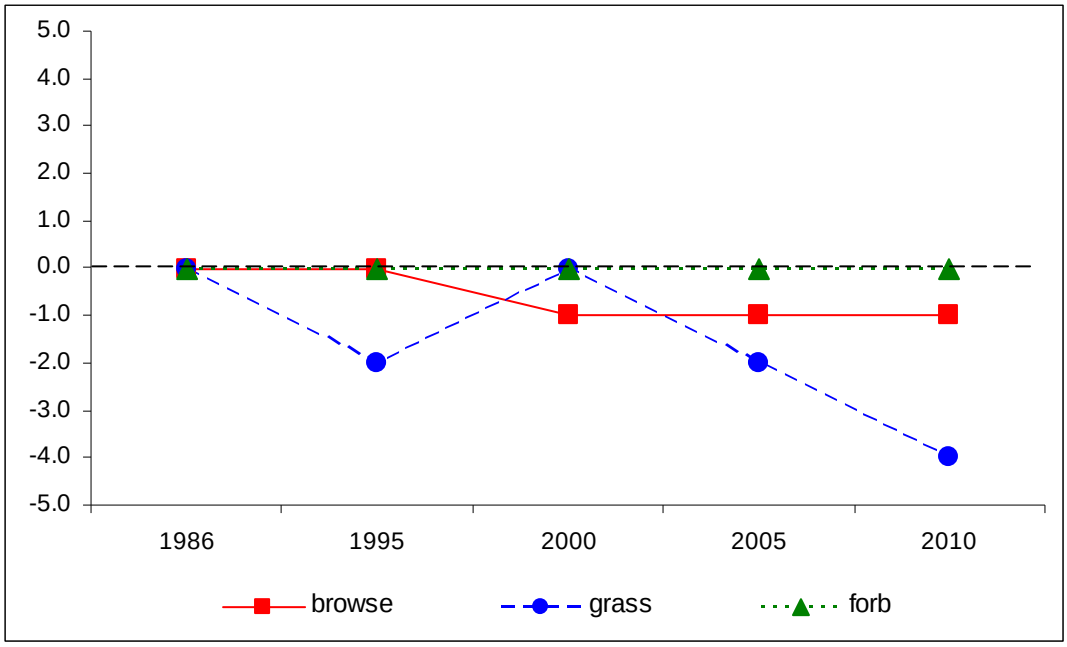
- **1986 to 1995 - stable (0):** Perennial forbs are very rare.
- **1995 to 2000 - stable (0):** Perennial forbs are very rare.
- **2000 to 2005 - stable (0):** Perennial forbs are very rare.
- **2005 to 2010 - stable (0):** Perennial forbs are very rare.

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --
Management unit 10, study no: 14

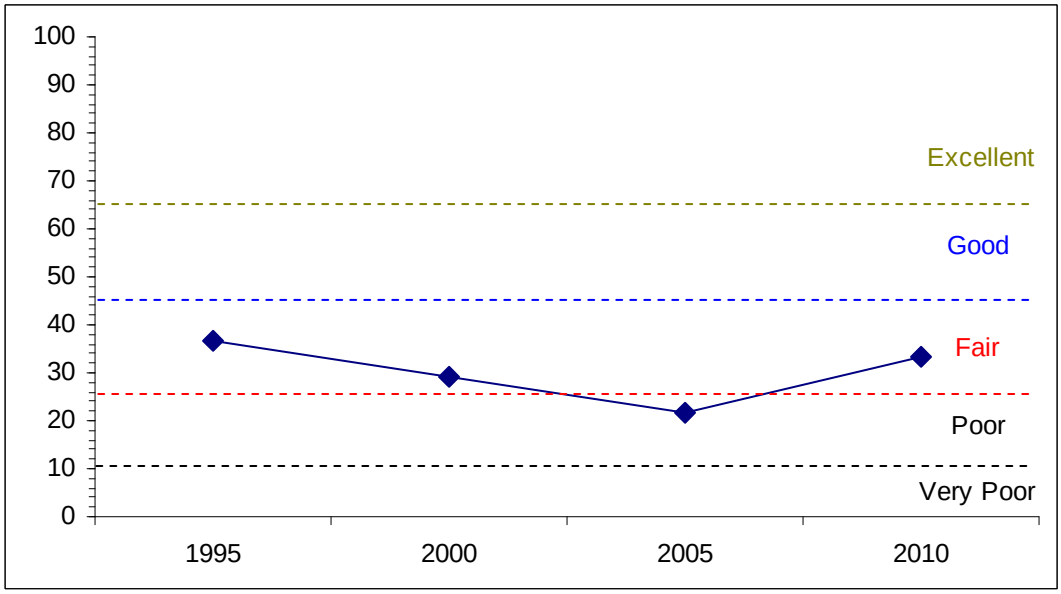
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	**Total Score**	Ranking
95	6.5	14.5	10.3	10.4	-5.2	0.0	0.0	**36.6**	Fair
00	7.2	5.6	7.1	10.2	-0.8	0.0	0.0	**29.3**	Fair
05	7.5	8.3	5.8	6.5	-6.8	0.4	0.0	**21.7**	Poor
10	9.7	10.9	7.6	6.3	-2.1	0.9	0.0	**33.2**	Fair

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
Management unit 10, Study no: 14



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--
Management unit 10, Study no: 14



HERBACEOUS TRENDS--
Management unit 10, Study no: 14

Type	Species	Nested Frequency					Average Cover %			
		'86	'95	'00	'05	'10	'95	'00	'05	'10
G	Aristida purpurea	-	1	7	4	-	.03	.07	.30	-
G	Bromus tectorum (a)	-	$_{c}$318	$_{a}$56	$_{b}$161	$_{b}$167	6.72	1.10	8.11	2.75
G	Elymus salina	$_{a}$-	$_{b}$15	$_{b}$13	$_{a}$-	$_{a}$-	1.10	.18	-	-
G	Hilaria jamesii	$_{b}$156	$_{a}$65	$_{a}$76	$_{a}$80	$_{a}$50	1.10	2.01	1.71	1.87
G	Oryzopsis hymenoides	$_{ab}$36	$_{ab}$37	$_{a}$17	$_{b}$57	$_{b}$41	1.91	.30	.50	.66
G	Poa secunda	-	-	-	6	1	-	-	.04	.00
G	Sitanion hystrix	$_{b}$40	$_{a}$7	$_{a}$2	$_{a}$10	$_{a}$14	.07	.03	.19	.39
G	Sporobolus cryptandrus	$_{a}$-	$_{ab}$5	$_{c}$63	$_{b}$9	$_{ab}$2	.03	1.58	.05	.03
G	Stipa comata	$_{c}$92	$_{b}$40	$_{b}$39	$_{ab}$20	$_{a}$6	.92	.93	.47	.15
G	Vulpia octoflora (a)	-	$_{c}$75	$_{a}$4	$_{d}$114	$_{b}$40	.21	.01	.92	.10
Total for Annual Grasses		0	393	60	275	207	6.93	1.11	9.03	2.86
Total for Perennial Grasses		324	170	217	186	114	5.18	5.12	3.27	3.13
Total for Grasses		324	563	277	461	321	12.11	6.23	12.31	5.99
F	Arabis sp.	-	-	-	-	-	-	-	.03	-
F	Chaenactis stevioides	-	-	-	1	-	-	-	.00	-
F	Chenopodium fremontii (a)	-	-	-	3	3	-	-	.00	.00
F	Chenopodium leptophyllum(a)	-	$_{a}$2	$_{a}$-	$_{b}$14	$_{a}$-	.00	-	.06	-
F	Cryptantha sp.	-	-	-	3	18	-	-	.00	.06
F	Descurainia pinnata (a)	-	$_{a}$3	$_{a}$-	$_{b}$13	$_{a}$-	.00	-	.31	-
F	Draba sp. (a)	-	$_{b}$17	$_{a}$-	$_{c}$50	$_{a}$-	.02	-	.22	-
F	Erigeron pumilus	-	5	-	2	3	.01	-	.00	.03
F	Eriogonum cernuum (a)	-	10	-	1	-	.02	-	.01	-
F	Euphorbia sp.	-	-	-	-	1	-	-	-	.03
F	Gilia sp. (a)	-	$_{a}$-	$_{a}$-	$_{c}$73	$_{b}$31	-	-	.38	.06
F	Halogeton glomeratus (a)	-	-	-	-	3	-	-	-	.01
F	Lappula occidentalis (a)	-	$_{b}$67	$_{a}$-	$_{c}$118	$_{b}$64	.12	-	1.68	.13
F	Lepidium sp. (a)	-	-	-	3	7	-	-	.03	.04
F	Machaeranthera grindelioides	-	-	-	1	-	-	-	.03	-
F	Malcolmia africana	-	-	-	-	1	-	-	-	.00
F	Mentzelia sp.	-	-	-	5	3	-	-	.04	.00
F	Navarretia intertexta (a)	-	-$_{a}$	$_{a}$-	$_{b}$35	$_{a}$-	-	-	1.08	-
F	Oenothera sp.	-	-	-	3	-	-	-	.00	-
F	Plantago patagonica (a)	-	$_{bc}$42	$_{a}$-	$_{c}$58	$_{b}$34	.09	-	.21	.07
F	Ranunculus testiculatus (a)	-	$_{a}$-	$_{a}$1	$_{b}$20	$_{a}$1	-	.00	.06	.00
F	Salsola iberica (a)	-	$_{a}$-	$_{ab}$2	$_{b}$11	$_{b}$12	-	.00	.03	.07
F	Sphaeralcea coccinea	-	-	-	5	8	-	-	.09	.31
F	Tragopogon dubius	3	-	-	-	-	-	-	-	-
Total for Annual Forbs		0	141	3	399	155	0.26	0.00	4.09	0.40
Total for Perennial Forbs		3	5	0	20	34	0.01	0	0.22	0.43
Total for Forbs		3	146	3	419	189	0.28	0.00	4.31	0.84

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	'10	'95	'00	'05	'10
B	Artemisia tridentata wyomingensis	24	21	21	21	4.20	3.29	3.37	5.60
B	Atriplex canescens	7	7	10	8	.56	.15	.82	1.18
B	Atriplex confertifolia	4	5	0	0	.03	.88	-	-
B	Ceratoides lanata	6	2	7	6	.45	.15	.48	.18
B	Chrysothamnus nauseosus consimilis	1	0	0	1	-	-	-	-
B	Chrysothamnus viscidiflorus stenophyllus	9	7	4	3	.15	.44	.33	.18
B	Ephedra viridis	1	4	4	4	-	1.50	1.32	.79
B	Eriogonum microthecum	2	0	3	1	.00	-	-	-
B	Grayia spinosa	5	2	5	4	.33	.15	.63	.78
B	Gutierrezia sarothrae	80	27	51	60	3.82	.32	1.93	1.00
B	Juniperus osteosperma	0	0	1	1	2.25	3.11	4.48	4.91
B	Opuntia sp.	1	4	4	3	-	.03	.00	-
Total for Browse		140	79	110	112	11.82	10.05	13.39	14.65

CANOPY COVER, LINE INTERCEPT--
Management unit 10, Study no: 14

Species	Percent Cover		
	'00	'05	'10
Artemisia tridentata wyomingensis	-	3.88	5.11
Atriplex canescens	-	1.39	1.28
Ceratoides lanata	-	.30	.35
Chrysothamnus viscidiflorus stenophyllus	-	-	.10
Ephedra viridis	-	1.95	1.00
Grayia spinosa	-	.88	.66
Gutierrezia sarothrae	-	2.58	1.58
Juniperus osteosperma	4.40	6.59	7.93
Opuntia sp.	-	.01	-

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

Species	Average leader growth (in)	
	'05	'10
Artemisia tridentata wyomingensis	2.9	2.6
Atriplex canescens	4.5	2.6
Ceratoides lanata	6.2	6.3
Grayia spinosa	-	4.4

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

Species	Trees per Acre			
	'95	'00	'05	'10
Juniperus osteosperma	16	16	32	30

Average diameter (in)			
'95	'00	'05	'10
6.18	4.9	10.0	7.2

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

Cover Type	Average Cover %				
	'86	'95	'00	'05	'10
Vegetation	2.25	23.38	17.85	25.43	21.59
Rock	0	1.45	1.17	.84	.66
Pavement	0	.44	.42	.41	.30
Litter	35.75	31.51	24.85	18.26	25.18
Cryptogams	2.50	10.39	10.03	11.91	7.36
Bare Ground	59.50	39.23	57.54	54.95	54.77

SOIL ANALYSIS DATA --
Management unit 10, Study no: 14, Study Name: East Floy Bench

Effective rooting depth (in)	pH	sandy loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
12.8	7.0	60.0	23.4	16.6	0.6	4.3	185.6	0.5

PELLET GROUP DATA--
Management unit 10, Study no: 14

Type	Quadrat Frequency			
	'95	'00	'05	'10
Sheep	7	4	-	-
Rabbit	58	42	83	24
Elk	5	3	1	-
Deer	20	15	10	10
Cattle	-	2	12	15

Days use per acre (ha)		
'00	'05	'10
-	-	-
-	-	-
7 (17)	5 (12)	4 (10)
27 (67)	27 (66)	59 (146)
18 (44)	23 (57)	70 (174)

BROWSE CHARACTERISTICS--
Management unit 10, Study no: 14

		Age class distribution				Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Artemisia tridentata wyomingensis									
86	**2697**	37	44	19	66	31	41	6	15/14
95	**1060**	23	75	2	140	58	4	13	23/39
00	**940**	4	68	28	-	68	11	19	24/41
05	**1100**	4	58	38	-	49	45	7	26/39
10	**840**	10	71	19	-	86	7	17	20/38
Atriplex canescens									
86	**333**	0	0	100	-	20	50	40	-/-
95	**140**	14	86	0	-	0	0	0	27/37
00	**300**	0	7	93	20	33	0	73	23/28
05	**260**	15	77	8	-	31	38	0	25/33
10	**200**	10	90	0	-	50	30	0	27/42
Atriplex confertifolia									
86	**0**	0	0	0	-	0	0	0	-/-
95	**100**	0	100	0	-	60	20	0	22/32
00	**160**	13	13	75	80	63	0	0	21/44
05	**0**	0	0	0	-	0	0	0	-/-
10	**0**	0	0	0	-	0	0	0	-/-
Ceratoides lanata									
86	**0**	0	0	-	-	0	0	0	-/-
95	**260**	8	92	-	-	77	0	0	15/17
00	**180**	0	100	-	-	33	0	0	13/22
05	**360**	33	67	-	300	6	67	0	13/12
10	**380**	11	89	-	220	0	11	0	16/20
Chrysothamnus nauseosus consimilis									
86	**0**	0	0	0	-	0	0	0	-/-
95	**20**	0	0	100	-	0	0	0	21/20
00	**0**	0	0	0	-	0	0	0	-/-
05	**0**	0	0	0	-	0	0	0	19/20
10	**20**	0	100	0	-	0	100	0	17/32
Chrysothamnus viscidiflorus stenophyllus									
86	**0**	0	0	0	-	0	0	0	-/-
95	**200**	30	50	20	-	0	0	10	16/34
00	**200**	10	80	10	20	0	10	10	13/28
05	**100**	0	100	0	-	0	0	0	13/19
10	**60**	67	33	0	-	0	0	0	10/23

		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 viridis									
86	**0**	0	0	0	-	0	0	0	-/-
95	**20**	100	0	0	-	0	0	0	63/97
00	**200**	40	50	10	-	60	20	0	25/25
05	**380**	21	79	0	-	79	0	0	31/46
10	**360**	61	39	0	-	11	0	0	22/31
Eriogonum microthecum									
86	**0**	0	0	-	-	0	0	0	-/-
95	**140**	14	86	-	-	0	0	0	-/-
00	**0**	0	0	-	-	0	0	0	-/-
05	**80**	0	100	-	-	50	50	0	6/8
10	**20**	0	100	-	-	100	0	0	5/12
Grayia spinosa									
86	**0**	0	0	0	-	0	0	0	-/-
95	**120**	0	50	50	-	0	0	0	25/44
00	**40**	0	0	100	-	100	0	100	23/44
05	**120**	0	67	33	-	0	83	33	25/45
10	**80**	0	100	0	-	50	50	0	19/39
Gutierrezia sarothrae									
86	**8198**	46	52	2	333	0	0	0	8/7
95	**6140**	2	98	0	40	0	0	0	9/11
00	**960**	0	69	31	-	2	0	17	6/8
05	**3280**	7	93	0	240	2	0	0	10/12
10	**8060**	51	48	2	80	0	0	1	7/8
Juniperus osteosperma									
86	**66**	50	50	-	-	0	0	0	71/71
95	**0**	0	0	-	-	0	0	0	-/-
00	**0**	0	0	-	-	0	0	0	-/-
05	**20**	0	100	-	-	0	0	0	-/-
10	**20**	0	100	-	-	0	0	0	-/-
Opuntia sp.									
86	**33**	0	100	0	-	0	0	0	7/1
95	**20**	0	100	0	-	0	0	0	5/21
00	**80**	0	75	25	-	0	0	0	6/21
05	**80**	0	100	0	-	0	0	25	7/20
10	**100**	0	100	0	-	0	0	0	4/14