

FISH PARK - TREND STUDY NO. 13B-3-10

Vegetation Type: Chained, Seeded Pinyon-Juniper

Range Type: Crucial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: Not Available

Land Ownership: BLM

Elevation: 6300 ft. (1921 m)

Aspect: West

Slope: 6%-8%

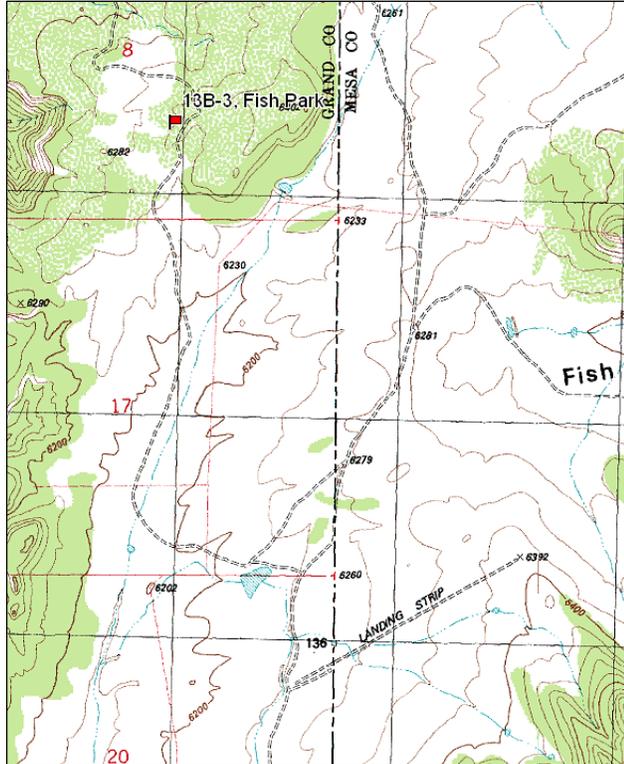
Transect bearing: 255° magnetic

Belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

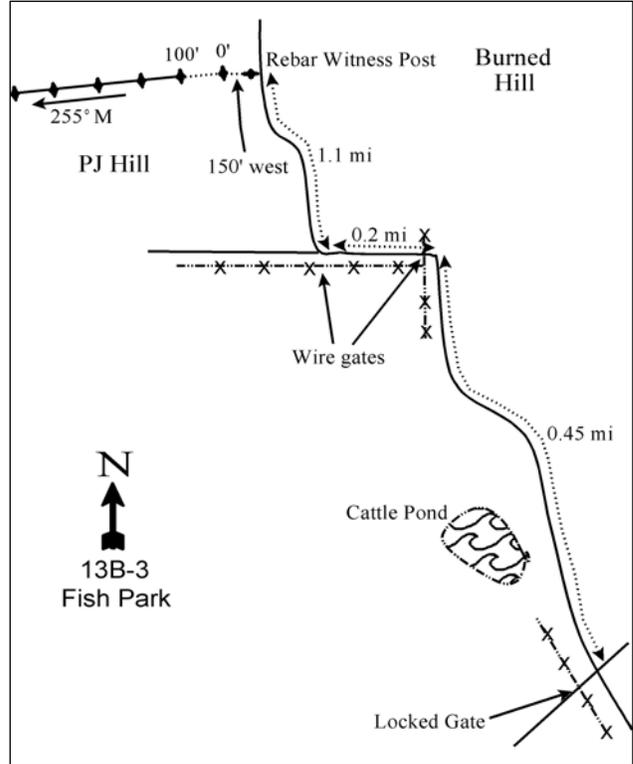
Directions:

Starting from the turnoff to the Picture Gallery Ranch (approximately 0.75 miles west of the Utah_Colorado state line out of Glade Park, CO), turn right off the main road and drive 0.1 mile to a fork. Take the right (upper) fork, go 1.2 miles to a ranch. Just past the first house, turn right and proceed northeast toward a hill. You are heading basically north-northwest toward the juniper-covered hills. At 0.6 miles beyond the house, go through a gate and continue north 0.4 miles to a locked gate (permission and combo needed). After going through the locked gate turn left and go 0.45 miles to another wire gate. Go through the wire gate and continue 0.2 miles. Turn right onto a faint road that has been seeded over. This turn is opposite a gate in the fence. Continue 1.1 miles gradually climbing the hill. The road becomes very rocky toward the top. Pass a fencepost which is not the witness post. Once in the pinyon and juniper look for a rebar witness post on the left side of the road. The 0-foot baseline stake, a rebar tagged #7874, is 150 feet west of the witness post.

Map Name: Marble Canyon



Diagrammatic Sketch:



Township: 21S Range: 26E Section: 8

GPS: NAD 83, UTM 12S 667883 E 4317496 N

FISH PARK - TREND STUDY NO. 13B-3

Site Information

Site Description: The study is on the upper, eastern edge of a 2,600 acre Bureau of Land Management (BLM) chaining and seeding completed in 1968. To the south and east are the pastures and fields in Fish Park. The gentle west-sloping country is cut by intermittent canyons which flow directly into the Colorado River. To accommodate the increased sample size and stay within the same vegetation type, the transect was repositioned in 1995. The chaining is part of the Mountain Island allotment, which is administered by the Grand Junction BLM office. Livestock grazing pressure appears moderately light in the study area. Deer pellet groups were rarely encountered and pellet group data has indicated light use by deer since 2000. Estimated elk use has increased steadily from light use in 2000 to moderately heavy use in 2010. Estimated cattle use has been very light since 2000. Rabbit pellet group quadrat frequency was quite high in 1995 and 2005, which could account for much of the utilization (Table - Pellet Group Data).

Browse: Basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) is the key browse species on this chained site. Browse seed was provided by the Utah Division of Wildlife Resources, which included big sagebrush and four-wing saltbush (*Atriplex canescens*). However, which sagebrush subspecies was included in the seed mix is not clear because both basin big sagebrush and Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) are present on the site. Basin big sagebrush appears to be dominant; therefore the data tables refer to all sagebrush as basin big sagebrush. In general, the sagebrush has been lightly used and vigorous, with good seed production. The age structure has shifted from a young population to a more mature population with more decadent individuals (Table - Browse Characteristics). Broom snakeweed (*Gutierrezia sarothrae*) and cactus (*Opuntia* sp.) are present and have fluctuated in numbers, yet these populations together have made up less than 1% total cover (Table - Browse Trends).

There is a healthy, mature and moderately dense stand of pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) on and surrounding the site. The size of the pinyon-juniper trees has noticeably increased since 1986 as evidenced by comparing photographs from each year. The point-center quarter estimation has fluctuated in density since 2000, but has been moderately low for a 42 year old chaining (Table - Point Quarter Tree Data). Much of the herbaceous understory on this site appeared to be around the drip line of the mature trees.

Herbaceous Understory: The seeded species crested wheatgrass (*Agropyron cristatum*) is the dominant grass species on the site and has steadily increased in cover since 1995. Other perennial grass species include galleta (*Hilaria jamesii*), needle and thread (*Stipa comata*) and several bluegrass species (*Poa* spp.), but none of these species is overly abundant. The annual grasses, cheatgrass (*Bromus tectorum*) and sixweeks fescue (*Vulpia octoflora*) are common on the site and account for most of the grass cover other than crested wheatgrass. Both annual species have fluctuated highly in cover and frequency over the course of the study, however. Forbs occur infrequently and account for only a small amount of the total vegetation cover. Alfalfa (*Medicago sativa*) was reported as large and vigorous in 1986, yet with the extended drought has not been sampled in any of the subsequent readings. Other perennial forbs have steadily decreased in sum of nested frequency since 1995 (Table - Herbaceous Trends).

Soil: The soil is a loam texture with a neutral soil reaction (pH of 6.8). Effective rooting depth is almost 16 inches, at which depth there is a bedrock of sandstone. Phosphorus has limited availability at 5.9 ppm and potassium marginal availability at 61 ppm for plant growth and development (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). The soil surface contains very few rocks or pavement, although there is good vegetation and litter cover on this site with some scattered bare interspaces between clumps of basin big sagebrush and pinyon-juniper trees (Table - Basic Cover). In the bare interspaces, erosion doesn't appear to be a problem. Annual plants and slight erosion can be found near the roadside where the soil has been disturbed. The soil erosion condition was classified as stable 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 little change in decadence, vigor or the recruitment of young sagebrush plants.
- **1995 to 2000 - slightly up (+1):** The density of sagebrush increased 25% from 3,240 plants/acre to 4,040 plants/acre, and cover increased from 12% to 17%. Recruitment of young sagebrush plants decreased substantially, but remained good at 16%.
- **2000 to 2005 - down (-2):** Sagebrush density decreased by 42% to 2,340 plants/acre and cover decreased to 8%. Decadence increased from 9% to 57% and plants displaying poor vigor increased from 2% of the population to 38%. However, recruitment of young sagebrush plants decreased to its lowest levels at 2% of the population.
- **2005 to 2010 - stable (0):** There was a slight increase in the density of sagebrush to 2,500 plants/acre, but cover remained similar. Decadence and poor vigor decreased to 26%, and 11%, respectively, but recruitment of young sagebrush plants increased to 10% of the population.

Grass:

- **1986 to 1995 - down (-2):** There was a 20% decrease in the sum of nested frequency of perennial grasses with a significant decrease in the nested frequency of crested wheatgrass and needle and thread.
- **1995 to 2000 - slightly up (+1):** The sum of nested frequency of perennial grasses increased 9%, but cover decreased slightly. Crested wheatgrass increased two degrees of significance and cover increased from 4% to 6%. Cheatgrass and sixweeks fescue both decreased significantly in nested frequency and the cover of annual grasses decreased from 6% to 1%.
- **2000 to 2005 - down (-2):** The perennial grass sum of nested frequency decreased by 13%, though cover increased to 11%. There was a significant decrease in the nested frequency of crested wheatgrass and galleta, though the cover of crested wheatgrass increased slightly. Cheatgrass and sixweeks fescue increased significantly in nested frequency and cover of annual grasses increased to 21%.
- **2005 to 2010 - slightly up (+1):** Perennial grass sum of nested frequency increased by 7%, but cover increased substantially to 20%. There was a significant decrease in the nested frequency of sixweeks fescue and the cover of annual grasses decreased to 6%.

Forb:

- **1986 to 1995 - up (+2):** The sum of nested frequency of perennial forbs increased by 35%.
- **1995 to 2000 - slightly down (-1):** Perennial forb sum of nested frequency decreased by 13%, though cover increased slightly.
- **2000 to 2005 - slightly down (-1):** There was a 20% decrease in the sum of nested frequency of perennial forbs, though cover remained similar. Forbs were not abundant on the site.
- **2005 to 2010 - down (-2):** The sum of nested frequency of perennial forbs decreased by 62% and cover decreased to less than 1%. Perennial forbs were very rare on the site.

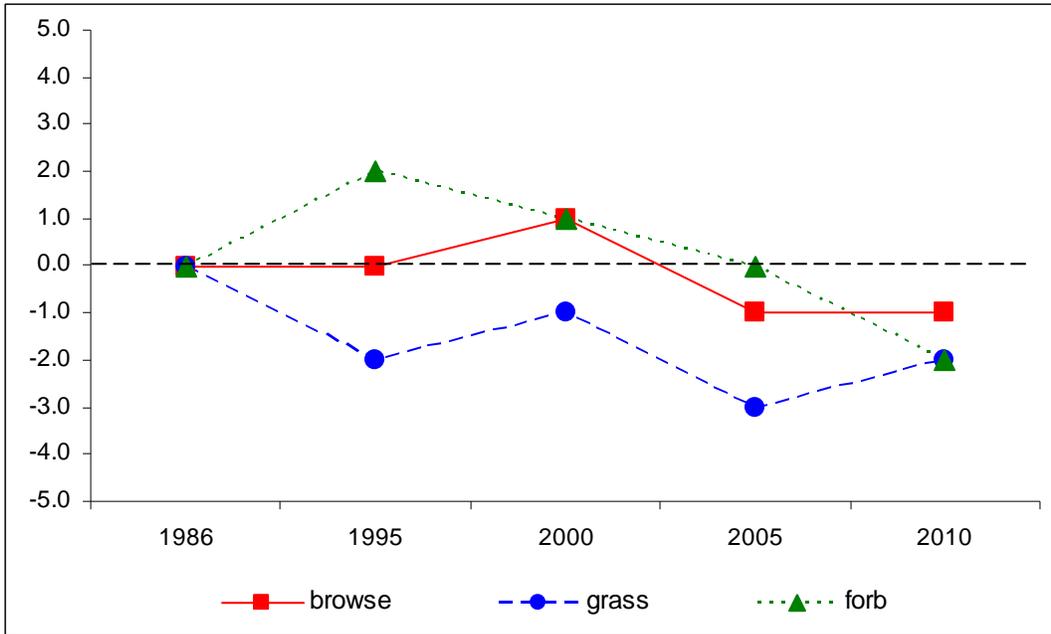
DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 13B, study no: 3

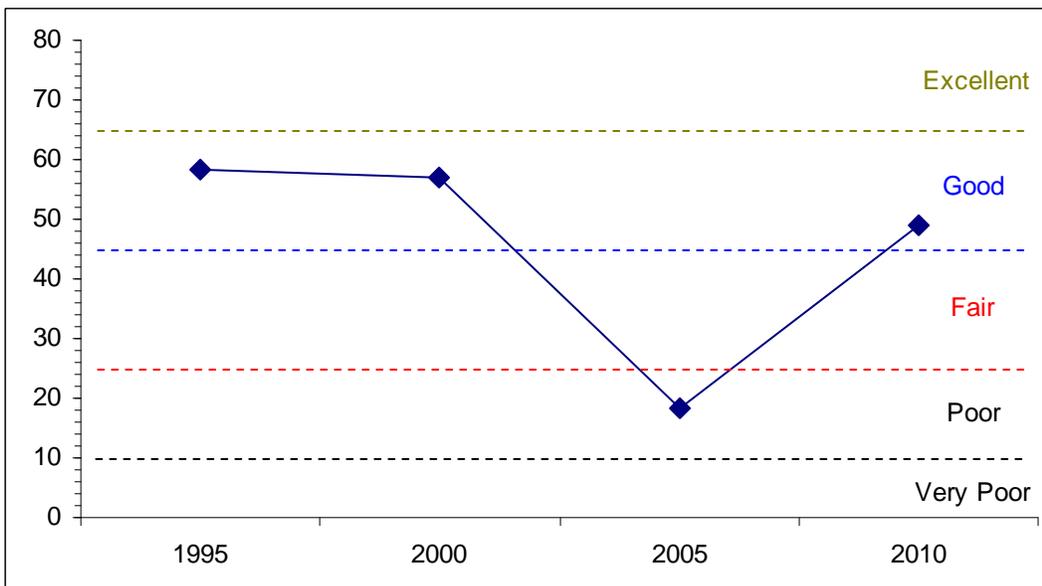
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
95	14.5	14.4	15.0	15.8	-4.2	2.7	0.0	58.2	Good
00	20.9	12.3	8.0	13.5	-0.8	3.2	0.0	57.0	Good
05	10.3	-2.1	1.0	21.9	-15.7	3.0	0.0	18.5	Poor
10	10.5	7.2	5.0	30.0	-4.8	1.2	0.0	49.1	Good

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
 Management unit 13B, Study no: 3



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--
 Management unit 13B, Study no: 3



HERBACEOUS TRENDS--
Management unit 13B, Study no: 3

T y p e	Species	Nested Frequency					Average Cover %			
		'86	'95	'00	'05	'10	'95	'00	'05	'10
G	Agropyron cristatum	bc169	a115	c171	ab131	bc158	3.70	5.76	7.48	15.87
G	Agropyron intermedium	-	-	-	2	-	-	-	.03	-
G	Bromus tectorum (a)	-	b278	a125	b264	b246	4.42	.77	12.88	6.28
G	Hilaria jamesii	b76	b97	b65	a27	a13	3.12	.49	.38	.33
G	Poa bulbosa	-	-	-	5	10	-	-	.04	.21
G	Poa fendleriana	a-	b38	ab24	ab23	a8	1.05	.12	.63	.33
G	Poa secunda	a-	a-	a-	b27	c55	-	-	1.50	1.15
G	Sitanion hystrix	9	1	-	8	8	.00	-	.21	.33
G	Sporobolus cryptandrus	-	-	2	-	-	-	.00	-	-
G	Stipa comata	b70	a8	a21	a23	a12	.02	.35	.66	1.65
G	Vulpia octoflora (a)	-	c186	b77	c234	a25	1.23	.36	8.05	.05
Total for Annual Grasses		0	464	202	498	271	5.65	1.13	20.94	6.34
Total for Perennial Grasses		324	259	283	246	264	7.91	6.74	10.95	19.89
Total for Grasses		324	723	485	744	535	13.57	7.88	31.89	26.23
F	Agoseris glauca	-	2	-	-	-	.00	-	-	-
F	Allium sp.	-	-	-	3	-	-	-	.00	-
F	Astragalus convallarius	b10	b14	ab9	a-	a-	.44	.12	-	-
F	Astragalus mollissimus	a-	b13	ab4	ab5	a-	.18	.06	.16	-
F	Astragalus sp.	-	-	-	5	2	-	-	.03	.18
F	Calochortus nuttallii	-	2	-	5	3	.00	-	.01	.00
F	Castilleja linariaefolia	-	2	-	-	1	.03	.03	-	.00
F	Cryptantha fulvocanescens	5	-	-	-	-	-	-	-	-
F	Cryptantha sp.(a)	-	-	-	6	-	-	-	.04	-
F	Cymopterus sp.	-	2	-	2	-	.00	-	.00	-
F	Delphinium nuttallianum	-	-	-	-	6	-	-	-	.03
F	Descurainia pinnata (a)	-	b22	a1	ab12	a-	.04	.00	.66	-
F	Draba nemorosa (a)	-	c95	ab6	b14	a-	.20	.01	.03	-
F	Erigeron pumilus	5	8	8	8	6	.02	.05	.24	.24
F	Erodium cicutarium (a)	-	-	-	3	5	-	-	.03	.01
F	Gayophytum ramosissimum(a)	-	b31	a-	a7	a-	.08	-	.01	-
F	Gilia hutchinifolia (a)	-	c43	a-	c42	b13	.08	-	.13	.03
F	Haplopappus acaulis	-	3	-	-	1	.00	-	-	.03
F	Ipomopsis aggregata	-	1	-	-	-	.03	-	-	-
F	Lappula occidentalis (a)	-	b18	a-	b9	ab7	.06	-	.08	.02
F	Lepidium densiflorum (a)	-	c21	a2	ab4	bc14	.04	.00	.01	.05
F	Lithospermum sp.	-	6	-	-	-	.01	-	-	-
F	Lygodesmia spinosa	-	2	-	-	-	.00	-	-	-
F	Medicago sativa	4	-	-	-	-	-	-	-	-
F	Microsteris gracilis (a)	-	a-	ab2	b12	a-	-	.00	.08	-
F	Petradoria pumila	-	-	8	-	3	-	.06	-	.00
F	Phlox hoodii	-	-	23	-	-	-	.26	-	-
F	Phlox longifolia	b87	b92	b91	b81	a10	.33	.69	.93	.04
F	Plantago patagonica (a)	-	b114	a51	b108	a50	.27	.21	1.04	.13

Type	Species	Nested Frequency					Average Cover %			
		'86	'95	'00	'05	'10	'95	'00	'05	'10
F	<i>Polygonum douglasii</i> (a)	-	9	-	-	-	.02	-	-	-
F	<i>Ranunculus testiculatus</i> (a)	-	-	-	-	3	-	-	-	.00
F	<i>Salsola iberica</i> (a)	-	-	-	-	3	-	-	-	.00
F	<i>Sisymbrium altissimum</i> (a)	-	8	-	-	-	.01	-	-	-
F	<i>Sphaeralcea coccinea</i>	ab23	b30	a14	ab16	a13	.27	.32	.14	.03
F	<i>Streptanthus cordatus</i>	-	1	-	-	-	.00	-	-	-
F	<i>Trifolium</i> sp.	-	3	-	-	-	.00	-	-	-
F	<i>Zigadenus paniculatus</i>	-	-	-	-	3	-	-	-	.01
Total for Annual Forbs		0	361	62	217	95	0.82	0.24	2.13	0.25
Total for Perennial Forbs		134	181	157	125	48	1.35	1.60	1.52	0.58
Total for Forbs		134	542	219	342	143	2.17	1.84	3.65	0.84

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

BROWSE TRENDS--

Management unit 13B, Study no: 3

Type	Species	Strip Frequency				Average Cover %			
		'95	'00	'05	'10	'95	'00	'05	'10
B	<i>Artemisia tridentata tridentata</i>	56	63	56	61	11.60	16.71	8.27	8.38
B	<i>Gutierrezia sarothrae</i>	8	17	5	1	.05	.64	.03	.00
B	<i>Juniperus osteosperma</i>	0	7	8	7	6.21	6.83	7.33	9.55
B	<i>Opuntia</i> sp.	4	4	3	5	.38	.30	.30	.15
B	<i>Pinus edulis</i>	0	3	2	1	2.67	5.52	1.86	.03
Total for Browse		68	94	74	75	20.93	30.02	17.79	18.11

CANOPY COVER, LINE INTERCEPT--

Management unit 13B, Study no: 3

Species	Percent Cover		
	'00	'05	'10
<i>Artemisia tridentata tridentata</i>	-	10.85	10.91
<i>Gutierrezia sarothrae</i>	-	-	.23
<i>Juniperus osteosperma</i>	6.59	12.10	8.16
<i>Opuntia</i> sp.	-	.16	.21
<i>Pinus edulis</i>	3.00	3.54	.45

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 13B, Study no: 3

Species	Average leader growth (in)	
	'05	'10
<i>Artemisia tridentata tridentata</i>	1.3	6.2

POINT-QUARTER TREE DATA--
Management unit 13B, Study no: 3

Species	Trees per Acre				Average diameter (in)			
	'95	'00	'05	'10	'95	'00	'05	'10
Juniperus osteosperma	68	73	41	93	5.2	5.0	5.7	8.5
Pinus edulis	25	13	34	22	3.5	6.2	5.1	7.2

BASIC COVER--
Management unit 13B, Study no: 3

Cover Type	Average Cover %				
	'86	'95	'00	'05	'10
Vegetation	16.50	37.57	40.97	50.97	45.07
Rock	0	.12	.33	.06	.15
Pavement	0	.04	.18	.05	.36
Litter	68.50	44.53	48.42	35.73	51.99
Cryptogams	0	5.65	10.93	2.52	4.68
Bare Ground	15.00	24.65	31.86	25.11	20.38

SOIL ANALYSIS DATA --

Management unit 13B, Study no: 3, Study Name: Fish Park

Effective rooting depth (in)	pH	loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
15.5	6.8	48.0	30.0	22.0	1.0	5.9	60.8	0.6

PELLET GROUP DATA--

Management unit 13B, Study no: 3

Type	Quadrat Frequency				Days use per acre (ha)		
	'95	'00	'05	'10	'00	'05	'10
Rabbit	48	20	49	28	-	-	-
Elk	-	-	11	21	1 (2)	23 (58)	50 (122)
Deer	3	7	20	20	14 (35)	13 (33)	15 (36)
Cattle	5	1	-	-	3 (8)	2 (5)	1 (2)

BROWSE CHARACTERISTICS--
Management unit 13B, Study no: 3

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 tridentata</i>									
86	2265	71	24	6	933	7	0	3	24/20
95	3240	35	63	2	1440	2	.61	4	29/42
00	4040	16	75	9	760	29	8	2	28/38
05	2340	2	41	57	1380	44	10	38	29/41
10	2500	10	65	26	100	29	5	11	25/37
<i>Gutierrezia sarothrae</i>									
86	531	19	75	6	-	0	0	0	7/8
95	200	30	70	0	-	0	0	0	10/12
00	1640	0	100	0	20	0	0	0	7/9
05	240	17	83	0	-	0	0	0	9/11
10	20	0	100	0	-	0	0	0	7/8
<i>Juniperus osteosperma</i>									
86	33	0	100	0	-	0	0	0	61/44
95	0	0	0	0	-	0	0	0	-/-
00	160	13	88	0	-	0	0	0	-/-
05	160	13	75	13	-	0	0	13	-/-
10	140	14	86	0	-	0	0	14	-/-
<i>Opuntia sp.</i>									
86	0	0	0	0	-	0	0	0	-/-
95	200	0	90	10	-	0	0	10	4/18
00	380	0	100	0	-	0	0	0	4/10
05	120	0	100	0	-	0	0	0	5/24
10	320	0	100	0	-	0	0	0	4/11
<i>Pinus edulis</i>									
86	0	0	0	0	-	0	0	0	-/-
95	0	0	0	0	-	0	0	0	-/-
00	100	0	100	0	-	0	0	0	-/-
05	40	0	50	50	-	0	0	50	-/-
10	20	100	0	0	-	0	0	0	-/-