

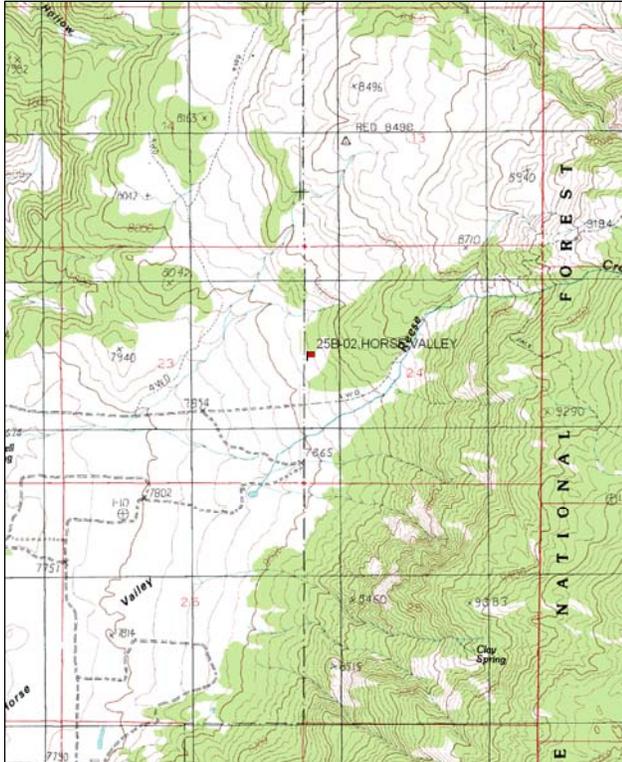
HORSE VALLEY - TREND STUDY NO. 25B-2-09

Vegetation Type: Wyoming Big Sagebrush  
Range Type: Crucial Deer Winter, Substantial Elk Winter  
NRCS Ecological Site Description: Not Available  
Land Ownership: USFS  
Elevation: 8,020 ft (2,444 m)  
Aspect: Southwest  
Slope: 5%-10%  
Transect bearing: 165 degrees magnetic  
Belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft)

Directions:

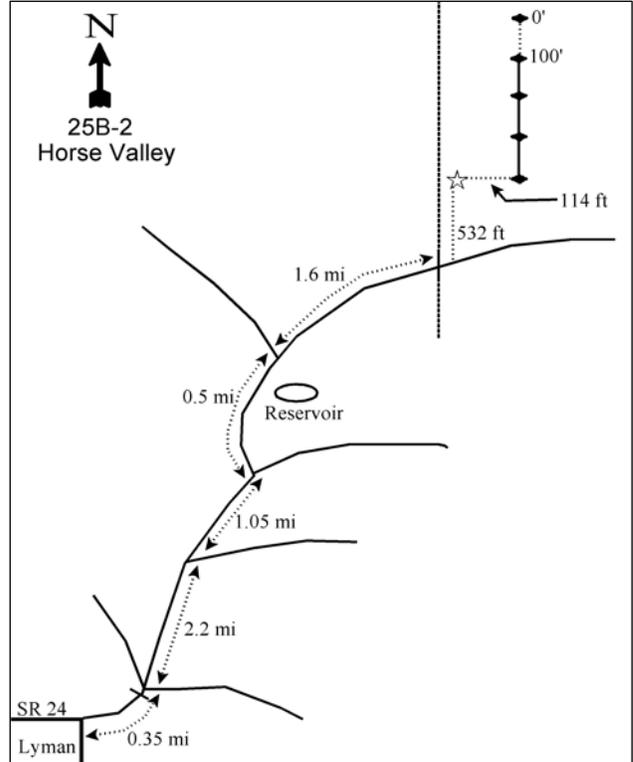
At the north end of main street (SR 24) in Lyman, SR 24 turns west towards Loa. Turn east here and go 0.35 miles to a 3-way split just beyond a cattleguard. Take the middle fork (the main road) and go 2.2 miles to a fork. Stay left and continue 1.05 miles on the main road to another fork. Again stay left and proceed 0.5 miles north just past a small reservoir to an intersection. Take the right fork toward Neffs Reservoir. On the main road, go 1.6 miles up and east across the top of some private land to a cattleguard at the Forest Service boundary. Park here, then walk 532 feet north along the east side of the fence to a witness post (rebar) next to the fence. The 400' stake is 114 feet east of the witness post. The 0-foot baseline stake lies 400 feet north, and has a red browse tag #7065 attached.

Map Name: Loa 1 NE, Utah



Township: 27S, Range: 3E, Section: 24

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 452723 E 4255665 N

## HORSE VALLEY - TREND STUDY NO. 25B-2

### Site Information

Site Description: This study is located in a sagebrush opening just east of the Forest Service boundary fence in Horse Valley. The west side of the fence is a strip of BLM land which has been proposed for a pinyon-juniper chaining and seeding treatment. Most of the valley is privately owned farmland. The key browse species is Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*). Cattle graze in the area as part of the Thousand Lakes allotment. The area is thought to be a winter deer concentration area, with many moving into the lower fields in late winter or early spring. Pellet group data has shown very light use by cattle and elk, with increasing use by deer from 1999 to 2009 (Table - Pellet Group Data).

Browse: Wyoming big sagebrush provides almost all of the browse cover on this site and about three-fourths of vegetation cover. However, there has been a lot difficulty through the years differentiating between black sagebrush (*Artemisia nova*) and Wyoming big sagebrush on this site due to hybridization. The population has matured and decadence increased in 2009 while recruitment of young plants was very low. The density of Wyoming big sagebrush has not fluctuated greatly since 1985 (Tables - Browse Characteristics). Broom snakeweed (*Gutierrezia sarothrae*) and narrowleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *stenophyllus*) are also commonly found here, but do not provide much cover. Pinyon pine (*Pinus edulis*) density was estimated, using the point centered quarter method, at 53 trees/acre in 1999 and an average diameter was 2.3 inches. In 2004, this density increased to 118 trees/acre with an average diameter of only 1.0 inch. In 2004, 89% of the trees sampled were classified less than 4 feet tall. By 2009, density was constant at 114 trees/acre, with 65% of trees were less than 4 feet tall (Table - Point-Quarter Tree Data).

Herbaceous Understory: Perennial grass cover has averaged 2% cover since 1994. Blue grama (*Bouteloua gracilis*) is the most common grass and provided approximately 75% of grass cover in all sample years. Forbs are scarce and diversity is low. Pinguic hynenoxy (*Hymenoxys richardsonii*) is the most common forb and is poisonous to cattle (Table - Herbaceous Trends).

Soil: The soil is a sandy clay loam with little organic matter and a mildly alkaline pH (7.6). Soil phosphorus has marginal availability for plant growth and development (Tiedemann and Lopez 2004) (Table - Soil Analysis Data). Rocks and pavement together make up over 30% of the ground cover. Percent bare soil has varied from year to year, however the ratio of bare soil to protective cover has ranged from 1.8 to 2.4 from 1994 to 2009 (Table - Basic Cover). Active gullies up to 1.5 feet deep are common. Flow patterns are evidenced by the movement of soil and rock fragments and in some places plant roots are exposed. The soil erosion condition was classified as slight in both 2004 and 2009.

### Trend Assessments

#### Browse:

- **1985 to 1991 – slightly down (-1):** Wyoming big sagebrush density decreased slightly and decadence increased from 14% to 45%. Broom snakeweed density also increased 24% to 8,199 plants/acre
- **1991 to 1994 – stable (0):** Differences in density may be related to the larger sample area used in 1994; therefore trend was determined using other parameters. Wyoming big sagebrush decadence is still high at 42% and recruitment of young plants decreased from 14% of the population to 3%.
- **1994 to 1999 - slightly up (+1):** Wyoming big sagebrush density increased 18% and recruitment of young plants has increased to 10% while decadence is similar to past years. However, broom snakeweed density increased more than threefold to 4,980 plants/acre, but cover remained low at 1%.
- **1999 to 2004 - stable (0):** Wyoming big sagebrush density is similar to past years, as is decadence. Recruitment of young plants decreased to 4% of the population.

- **2004 to 2009 – stable (0):** Wyoming big sagebrush density is similar to past years while decadence has increased from 37% to 60% and recruitment young plants is low at 2%. However, broom snakeweed density decreased 84% to just 940 plants/acre.

Grass:

- **1985 to 1991 - up (+2):** The sum of nested frequency for perennial grasses increased 62%. Blue grama and bottlebrush squirreltail (*Sitanion hystrix*) are the most common species.
- **1991 to 1994 - down (-2):** The sum of nested frequency for perennial grasses declined 29%. Blue grama accounts at 1% cover and provides 77% of the grass cover. Total grass cover is low at 2%.
- **1994 to 1999 - stable (0):** The sum of nested frequency of perennial grasses is similar to the last reading and cover is at 2%.
- **1999 to 2004 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased 15%, but cover remained similar.
- **2004 to 2009 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased 12%, but cover remained similar.

Forb:

- **1985 to 1991 - up (+2):** The sum of nested frequency for perennial forbs increased 38%, however, forbs are very rare.
- **1991 to 1994 - down (-2):** The sum of nested frequency for perennial forbs decreased 44%. Pinguicula accounts for 93% of forb cover and provides 1% cover.
- **1994 to 1999 - stable (0):** The sum of nested frequency of perennial forbs is similar to the last reading while cover has increased to 2%. Pinguicula accounts for 98% of forb cover.
- **1999 to 2004 - down (-2):** The sum of nested frequency of perennial forbs fell 70% and cover well was below 1%. Only two forb species were sampled.
- **2004 to 2009 - stable (0):** Forb values remained similar.

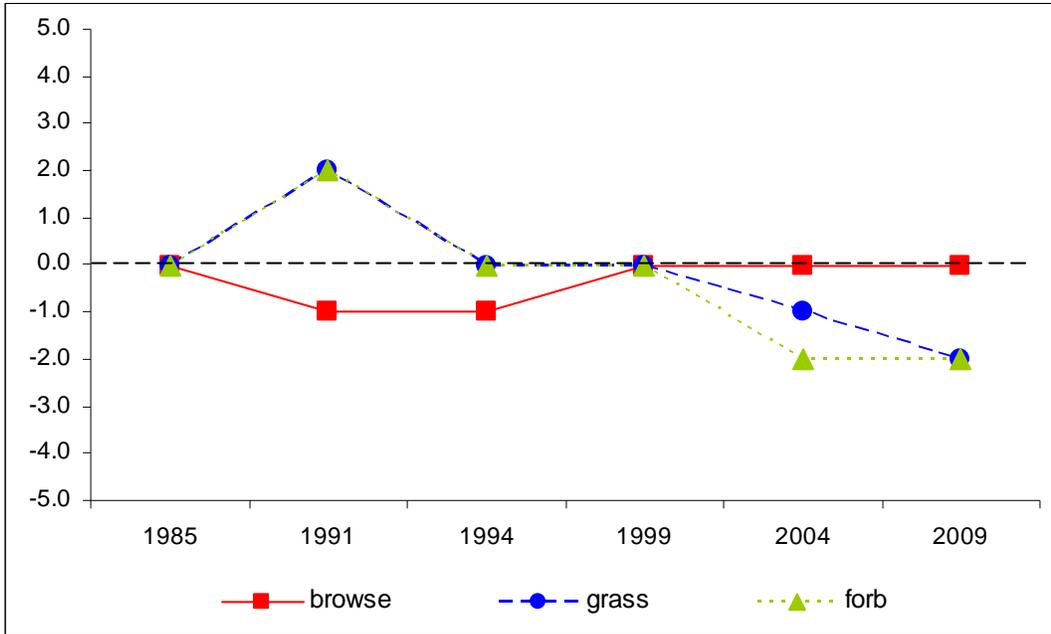
DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 25B, study no: 2

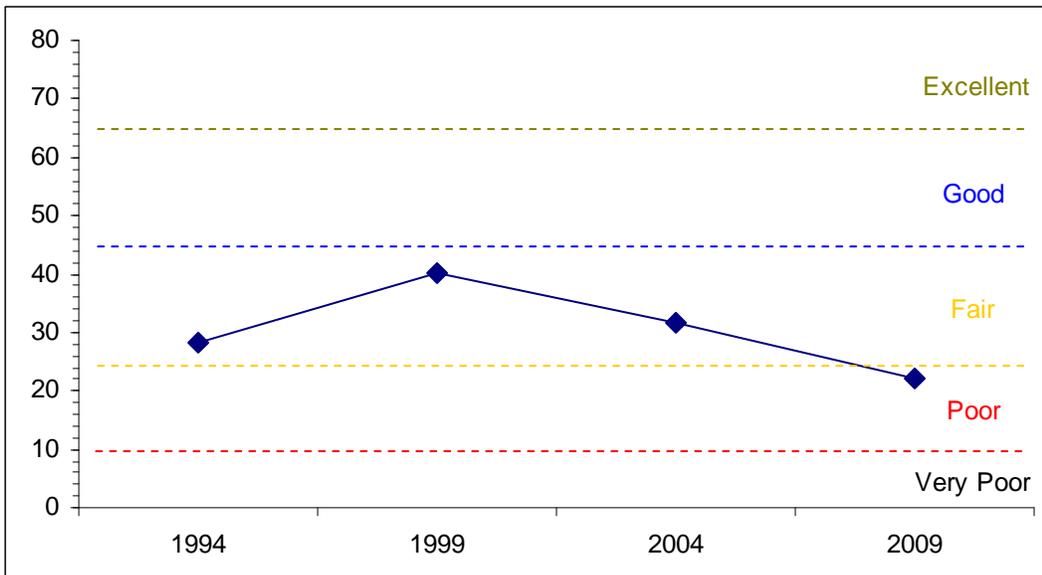
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
94	18.9	2.4	1.5	3.0	0.0	2.5	0.0	<b>28.3</b>	Fair
99	23.7	2.7	5.0	4.4	0.0	4.4	0.0	<b>40.2</b>	Fair
04	22.2	3.9	2.0	3.1	0.0	0.4	0.0	<b>31.6</b>	Fair
09	20.7	-3.0	1.0	3.1	0.0	0.3	0.0	<b>22.1</b>	Poor

## Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--  
 Management unit 25B Study no: 2



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE  
 Management unit 25B, Study no: 2



HERBACEOUS TRENDS--

Management unit 25B, Study no: 2

Type	Species	Nested Frequency						Average Cover %			
		'85	'91	'94	'99	'04	'09	'94	'99	'04	'09
G	<i>Bouteloua gracilis</i>	48	66	61	64	56	43	1.16	1.66	1.24	1.10
G	<i>Carex</i> sp.	a-	b6	a-	a-	a-	a-	-	-	-	-
G	<i>Oryzopsis hymenoides</i>	a1	a3	a-	a1	b14	a3	-	.00	.12	.04
G	<i>Sitanion hystrix</i>	ab43	b72	ab56	ab50	a29	a41	.34	.55	.18	.41
G	<i>Stipa comata</i>	ab9	b17	a-	a1	a-	a-	.00	.00	-	-
Total for Annual Grasses		0	0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		101	164	117	116	99	87	1.50	2.22	1.54	1.55
Total for Grasses		101	164	117	116	99	87	1.50	2.22	1.54	1.55
F	<i>Androsace septentrionalis</i> (a)	-	-	-	7	-	-	-	.02	-	-
F	<i>Arabis demissa</i>	-	3	-	-	-	-	-	-	-	-
F	<i>Astragalus convallarius</i>	1	2	3	3	-	1	.00	.01	-	.00
F	<i>Chaenactis douglasii</i>	-	3	-	-	-	-	-	-	-	-
F	<i>Cryptantha jamesii</i>	b30	ab24	a6	a-	ab11	a9	.04	-	.06	.07
F	<i>Cryptantha</i> sp.	-	-	3	-	-	-	.03	-	-	-
F	<i>Erigeron pumilus</i>	4	8	3	3	-	-	.01	.01	-	-
F	<i>Hymenoxys richardsonii</i>	b39	b59	b42	b51	a7	a8	1.16	2.17	.15	.06
F	<i>Phlox longifolia</i>	-	-	-	3	-	-	-	.00	-	-
F	<i>Townsendia incana</i>	-	3	-	-	-	-	-	-	-	-
Total for Annual Forbs		0	0	0	7	0	0	0	0.01	0	0
Total for Perennial Forbs		74	102	57	60	18	18	1.25	2.19	0.21	0.13
Total for Forbs		74	102	57	67	18	18	1.25	2.21	0.21	0.13

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

BROWSE TRENDS--

Management unit 25B, Study no: 2

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	<i>Artemisia nova</i>	0	0	0	1	-	-	-	.03
B	<i>Artemisia tridentata wyomingensis</i>	82	84	83	85	15.11	18.95	17.78	16.52
B	<i>Atriplex canescens</i>	0	3	0	0	-	.00	-	-
B	<i>Chrysothamnus viscidiflorus stenophyllus</i>	46	25	36	34	1.06	.46	1.72	.28
B	<i>Echinocereus triglochidatus</i>	0	1	1	1	-	.00	.00	.00
B	<i>Gutierrezia sarothrae</i>	41	68	75	31	.18	1.15	3.43	.14
B	<i>Juniperus osteosperma</i>	0	0	0	1	-	-	-	.00
B	<i>Leptodactylon pungens</i>	0	1	0	0	-	.00	-	-
B	<i>Opuntia</i> sp.	7	17	13	10	.04	.13	.21	.04
B	<i>Pinus edulis</i>	0	4	5	6	-	.15	.21	.16
Total for Browse		176	203	213	169	16.39	20.85	23.37	17.17

CANOPY COVER, LINE INTERCEPT--

Management unit 25B, Study no: 2

Species	Percent Cover	
	'04	'09
Artemisia nova	-	.16
Artemisia tridentata wyomingensis	18.28	20.23
Chrysothamnus viscidiflorus stenophyllus	.75	.20
Gutierrezia sarothrae	4.80	.25
Pinus edulis	.65	.96

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 25B, Study no: 2

Species	Average leader growth (in)	
	'04	'09
Artemisia tridentata wyomingensis	1.4	0.7

POINT-QUARTER TREE DATA--

Management unit 25B, Study no: 2

Species	Trees per Acre			Average diameter (in)		
	'99	'04	'09	'99	'04	'09
Pinus edulis	53	118	114	2.3	1.0	1.6

BASIC COVER--

Management unit 25B, Study no: 2

Cover Type	Average Cover %					
	'85	'91	'94	'99	'04	'09
Vegetation	6.50	5.75	18.79	24.79	24.46	19.28
Rock	11.00	17.25	18.92	12.81	16.38	12.79
Pavement	31.50	25.75	8.72	22.56	27.48	23.88
Litter	23.50	14.50	16.85	21.91	23.25	20.76
Cryptogams	1.75	.75	1.15	2.45	1.54	.39
Bare Ground	25.75	36.00	34.85	24.42	25.75	31.72

SOIL ANALYSIS DATA --

Management unit 25B, Study no: 2, Study Name: Horse Valley

Effective rooting depth (in)	pH	sandy clay loam			%OM	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
14.5	7.6	50.9	27.8	21.3	2.2	7.7	112	0.5

PELLET GROUP DATA--

Management unit 25B, Study no: 2

Type	Quadrat Frequency				Days use per acre (ha)		
	'94	'99	'04	'09	'99	'04	'09
Rabbit	14	9	3	37	-	-	-
Elk	-	-	-	1	-	1 (3)	1 (2)
Deer	8	3	-	2	1 (2)	1 (3)	17 (41)
Cattle	-	-	-	-	1 (2)	-	-

BROWSE CHARACTERISTICS--  
Management unit 25B, Study no: 2

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 frigida</i>									
85	0	0	0	-	-	0	0	0	-/-
91	66	0	100	-	-	0	0	0	3/3
94	0	0	0	-	-	0	0	0	-/-
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
<i>Artemisia nova</i>									
85	0	0	0	-	-	0	0	0	-/-
91	0	0	0	-	-	0	0	0	-/-
94	0	0	0	-	-	0	0	0	-/-
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	20	0	100	-	-	0	0	0	8/14
<i>Artemisia tridentata wyomingensis</i>									
85	4798	15	71	14	266	69	6	8	19/25
91	4398	14	39	47	66	29	14	17	17/23
94	3820	3	55	42	200	24	3	26	19/35
99	4520	10	50	41	60	28	3	14	18/28
04	4400	4	59	37	100	7	0	23	17/27
09	4760	2	38	60	-	28	13	33	16/26
<i>Atriplex canescens</i>									
85	0	0	0	0	-	0	0	0	-/-
91	0	0	0	0	-	0	0	0	-/-
94	0	0	0	0	-	0	0	0	-/-
99	80	0	75	25	-	25	0	25	-/-
04	0	0	0	0	-	0	0	0	-/-
09	0	0	0	0	-	0	0	0	-/-
<i>Chrysothamnus viscidiflorus stenophyllus</i>									
85	8665	12	43	45	399	22	10	13	5/7
91	7531	1	4	96	-	35	22	62	5/7
94	2940	0	69	31	-	30	7	12	4/6
99	1180	15	63	22	20	0	0	12	6/10
04	1480	5	64	31	-	8	7	12	7/11
09	1300	5	77	18	40	0	0	17	12/6

		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>Echinocereus triglochidatus</i>										
85	0	0	0	-	-	0	0	0	-/-	
91	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	20	0	100	-	-	0	0	0	4/6	
04	20	0	100	-	-	0	0	0	3/6	
09	20	100	0	-	-	0	0	0	-/-	
<i>Gutierrezia sarothrae</i>										
85	6198	16	82	2	9466	9	0	9	7/6	
91	8198	8	80	12	66	2	.81	2	5/4	
94	1420	14	79	7	-	0	0	1	7/6	
99	4980	64	26	10	2340	0	0	.40	7/8	
04	5920	2	98	0	-	0	0	0	7/9	
09	940	17	70	13	-	0	2	9	6/5	
<i>Juniperus osteosperma</i>										
85	0	0	0	-	-	0	0	0	-/-	
91	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	60	100	0	-	-	0	0	0	-/-	
<i>Leptodactylon pungens</i>										
85	0	0	0	-	-	0	0	0	-/-	
91	0	0	0	-	-	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	40	100	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
<i>Opuntia sp.</i>										
85	1798	7	82	11	-	0	0	33	3/4	
91	931	29	50	21	-	7	0	0	3/4	
94	160	0	88	13	-	0	0	0	3/7	
99	600	27	53	20	20	0	0	20	3/11	
04	400	0	100	0	-	0	0	0	3/12	
09	240	0	100	0	-	0	0	0	3/10	
<i>Pinus edulis</i>										
85	66	100	0	-	266	0	0	0	-/-	
91	66	100	0	-	133	0	0	0	-/-	
94	0	0	0	-	-	0	0	0	-/-	
99	80	100	0	-	40	0	0	0	-/-	
04	120	83	17	-	20	0	0	0	-/-	
09	120	50	50	-	20	0	17	0	-/-	