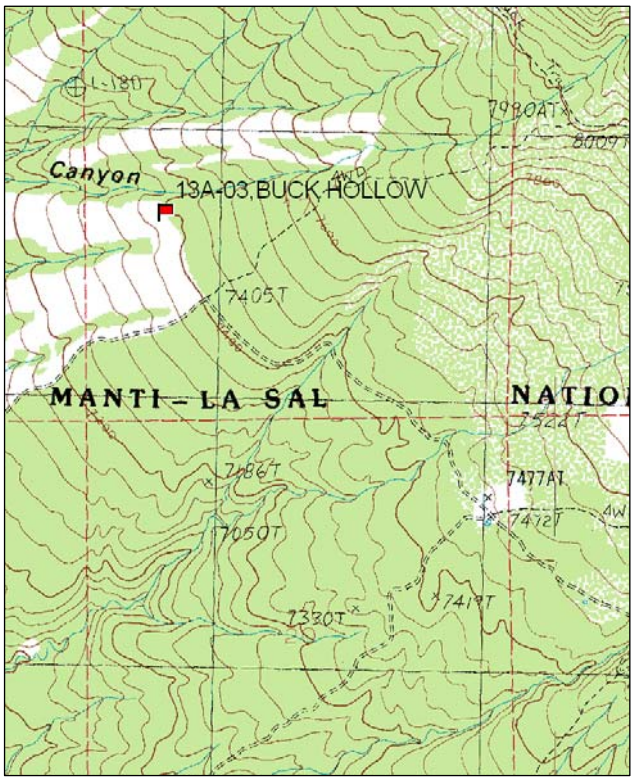
BUCK HOLLOW - TREND STUDY NO. 13A-3-09

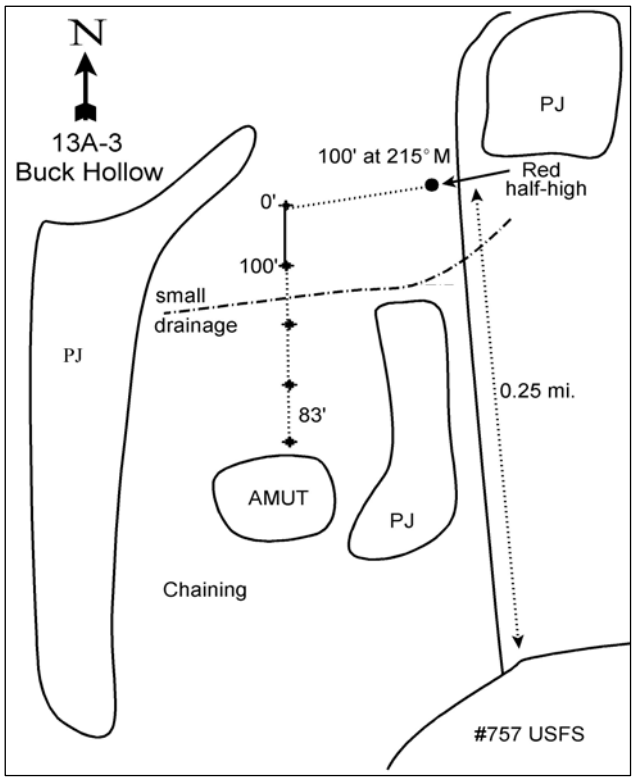
Vegetation Type: Chained, Seeded P-J
Range Type: Crucial Deer Winter, Crucial Elk Winter
NRCS Ecological Site Description: Upland Stony Sand (Utah Juniper - Pinyon), R035XY323UT
Land Ownership: US Forest Service
Elevation: 7,400 ft (2,255 m)
Aspect: Southwest
Slope: 5%-10%
Transect bearing: 165 degrees magnetic
Belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft)
Site Notes: Needs rebar on line 4

Description:
From La Sal Junction, proceed east on SR 46 for 0.3 miles past mile marker 5. Turn left onto County Road 130 and travel 2.95 miles to a fork. Bear right on road #166 and go 0.8 miles to another fork. Bear right, and continue 1.3 miles to a cattleguard marking the Forest Service boundary. Continue 1.55 miles to a fork, turn left and go 0.25 miles. A red witness post (1 ½ foot tall fencepost) is located on the left side of the road. The transect starts 100 feet out in the chaining. The study is marked by half high green t-posts.
***An alternate route is to take SR 191 south from Moab. At mile marker 113, continue 0.15 miles south and turn left (east) on county road #166. Continue south on main road for 11.4 miles to a fork, and turn left (east). Go 1.3 miles to the cattleguard and Forest Service boundary listed above. Follow remainder of directions as noted above.

Map Name: LaSal West



Diagrammatic Sketch:



Township: 28S, Range: 24E, Section: 17

GPS: NAD 83, UTM 12S 647710 E 4247863 N

BUCK HOLLOW - TREND STUDY NO. 13A-3

Site Information

Site Description: The Buck Hollow study samples a chaining within the wide-ranging pinyon-juniper type on the south slope of the La Sal Mountains. The 700 acre Buck Hollow chaining and seeding project was completed in 1982. The site is now dominated by seeded grasses which contribute over half of the total vegetation cover. Scattered clumps of unchained, mature pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) provide excellent escape cover. Estimated deer use has been moderately high on the site with a slight decline in use from 1999 to 2004. Estimated elk use has been light in all sample years. Estimated cattle use was moderate in 1999, but decreased to light use in 2004 and 2009 (Table - Pellet Group Data). This study site is part of the La Sal grazing allotment.

Browse: Besides scattered clumps of Utah serviceberry (*Amelanchier utahensis*) and true mountain mahogany (*Cercocarpus montanus*), there is little other desirable browse within the chaining. Four-wing saltbush (*Atriplex canescens*) was seeded on the site with some nearby plants being measured for height/crown, but no plants have been sampled on the transect. There are some patches of Gambel oak (*Quercus gambelii*) that are lightly browsed. There is some reinvasion and/or releasing of young pinyon and juniper that escaped the chaining. Estimated density and basal diameter has remained similar for both species since 1999 (Table - Point Quarter Tree Data), though pinyon canopy cover has tripled from 1999 to 2009 (Table - Canopy Cover).

Herbaceous Understory: The seeded grasses, smooth brome (*Bromus inermis*), intermediate wheatgrass (*Agropyron intermedium*), and crested wheatgrass (*A. cristatum*) are the prevalent forage available in this chaining. Combined, they have provided almost all of the grass cover and over 60% of the total vegetation cover since 1994. Several other grass species are present including Indian ricegrass (*Oryzopsis hymenoides*), bottlebrush squirreltail (*Sitanion hystrix*), and a sedge (*Carex sp.*). Perennial forbs provide a good amount of cover on the site, but only three species, alfalfa (*Medicago sativa*), timber poisonvetch (*Astragalus convallarius*), and scarlet globemallow (*Sphlaeralcea coccinea*), are prevalent. These three species combined have provided from 74%-93% of the total forb cover since 1994 (Table - Herbaceous Trends).

Soil: The soil is a reddish-brown sandy clay loam with stones throughout the upper profile. It is mildly alkaline (7.6 pH) and has an effective rooting depth of almost 13 inches. Besides the good cover of perennial grasses, litter left in place from the chaining also provides excellent soil protection. There is definite soil movement in the surrounding mature pinyon-juniper woodland type. The erosion condition class determined soil movement on the site as stable in 2004 and 2009.

Trend Assessments

Browse:

- **1987 to 1994 - stable (0):** The browse species are not a significant contributor to the productivity of this site as they provide only 15% of the total vegetation cover, with 100% of the total browse cover provided by pinyon pine.
- **1994 to 1999 - stable (0):** Pinyon remains the only browse species that provides any substantial cover on the site.
- **1999 to 2004 - stable (0):** Pinyon remains the dominant browse species. Cover of true mountain mahogany rose slightly, but is still less than 1%.
- **2004 to 2009 - stable (0):** Pinyon remains the dominant browse species. Cover of true mountain mahogany decreased to 1999 levels.

Grass:

- **1987 to 1994 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 14%. There was a significant decrease in nested frequency of intermediate and crested wheatgrass, and a significant increase in nested frequency of smooth brome.

- **1994 to 1999 - stable (0):** The sum of nested frequency of perennial grasses changed little, though cover of perennial grasses increased from 15% to 20%. There was a significant decrease in nested frequency of bottlebrush squirreltail.
- **1999 to 2004 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 14%, and cover of perennial grasses decreased to 15% again. There was a significant decrease in the nested frequency of intermediate wheatgrass. Cheatgrass (*Bromus tectorum*) was sampled for the first time in low frequency and cover.
- **2004 to 2009 - slightly down (-1):** The sum of nested frequency of perennial grasses decreased by 11%, though there was little change in the cover of perennial grasses.

Forb:

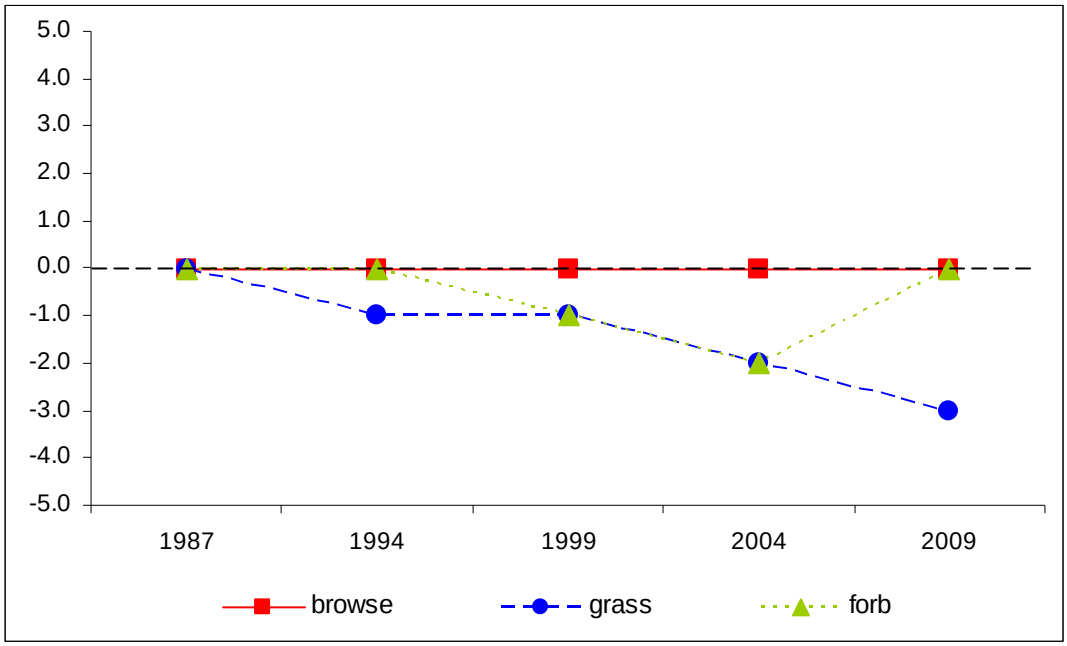
- **1987 to 1994 - stable (0):** There was little change in the sum of nested frequency of perennial forbs.
- **1994 to 1999 - slightly down (-1):** The sum of nested frequency of perennial forbs decreased by 20%, but cover increased more than two-fold from 3% to 7%.
- **1999 to 2004 - slightly down (-1):** The sum of nested frequency of perennial forbs decreased by 13%, and cover decreased to 5%.
- **2004 to 2009 - up (+2):** The sum of nested frequency of perennial forbs increased by 28%, though cover remained similar.

DEER DESIRABLE COMPONENTS INDEX - MID-LEVEL POTENTIAL SCALE --
Management unit 13A, study no: 3

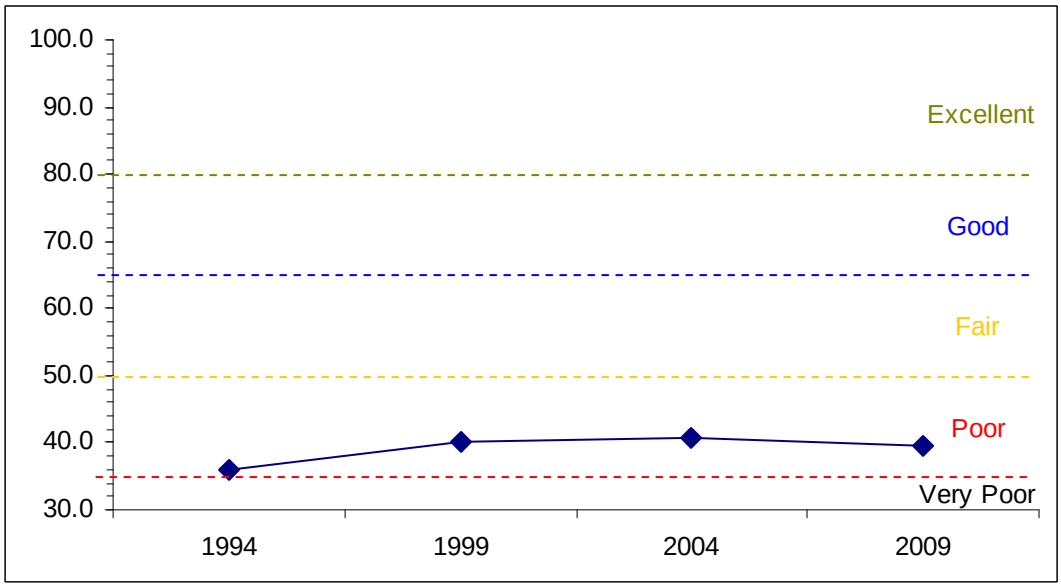
Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	**Total Score**	Ranking
94	0	0	0	30	0	6	0	**36**	VeryPoor-Poor
99	0	0	0	30	0	10	0	**40**	Poor
04	1	0	0	30	0	10	0	**41**	Poor
09	0	0	0	30	0	9	0	**39**	Poor

Trend Summary

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



DESIRABLE COMPONENTS INDEX TREND: MID-LEVEL POTENTIAL
Management unit 13A, Study no: 3



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

Type	Species	Nested Frequency					Average Cover %			
		'87	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron cristatum	$_{c}$119	$_{a}$58	$_{ab}$80	$_{bc}$97	$_{ab}$78	.88	2.45	3.74	2.53

Type	Species	Nested Frequency					Average Cover %			
		'87	'94	'99	'04	'09	'94	'99	'04	'09
G	Agropyron intermedium	$_{c}$290	$_{b}$208	$_{b}$205	$_{a}$139	$_{a}$123	6.18	6.94	2.75	2.72
G	Bromus inermis	$_{a}$150	$_{b}$208	$_{b}$231	$_{b}$223	$_{b}$205	7.42	10.11	8.41	10.11
G	Bromus tectorum (a)	-	-	-	13	2	-	-	.02	.01
G	Carex sp.	9	23	19	13	5	.46	.44	.16	.46
G	Oryzopsis hymenoides	5	-	-	-	2	-	.00	-	.03
G	Poa fendleriana	-	3	8	4	12	.03	.09	.02	.39
G	Poa secunda	-	-	6	-	1	-	.06	.00	.00
G	Sitanion hystrix	$_{b}$34	$_{b}$21	$_{a}$3	$_{a}$-	$_{a}$-	.13	.03	.00	-
G	Sporobolus cryptandrus	-	-	-	-	-	-	-	.03	-
Total for Annual Grasses		0	0	0	13	2	0	0	0.01	0.00
Total for Perennial Grasses		607	521	552	476	426	15.12	20.14	15.14	16.27
Total for Grasses		607	521	552	489	428	15.12	20.14	15.16	16.28
F	Alyssum sp. (a)	-	-	-	-	-	.00	-	-	-
F	Arabis hirsuta	2	-	6	-	-	-	.01	-	-
F	Aster sp.	-	2	-	-	-	.03	-	-	.03
F	Astragalus convallarius	18	21	22	29	32	.37	1.35	1.49	1.41
F	Chaenactis douglasii	3	3	-	-	-	.01	-	-	-
F	Collinsia parviflora (a)	-	3	-	-	5	.00	-	-	.01
F	Cruciferae	4	-	-	-	-	-	-	-	-
F	Cryptantha sp.	$_{a}$-	$_{b}$17	$_{a}$4	$_{a}$1	$_{ab}$10	.06	.01	.00	.01
F	Descurainia pinnata (a)	-	7	1	-	-	.01	.01	-	-
F	Gilia sp. (a)	-	3	-	-	-	.00	-	-	-
F	Lesquerella sp.	$_{b}$22	$_{a}$-	$_{a}$-	$_{a}$5	$_{b}$11	-	-	.01	.07
F	Machaeranthera canescens	-	-	-	-	3	-	-	-	.00
F	Machaeranthera spp	-	1	-	-	-	.00	-	-	-
F	Medicago sativa	$_{a}$1	$_{b}$28	$_{b}$27	$_{b}$22	$_{b}$26	1.64	4.81	2.38	2.16
F	Melilotus officinalis	$_{c}$53	$_{b}$18	$_{a}$-	$_{a}$-	$_{a}$-	.16	-	-	-
F	Penstemon sp.	$_{a}$-	$_{b}$24	$_{b}$21	$_{a}$6	$_{ab}$13	.13	.17	.04	.22
F	Phacelia sp.	$_{b}$10	$_{a}$-	$_{a}$-	$_{a}$-	$_{a}$-	-	-	-	-
F	Phlox austromontana	-	14	10	9	5	.25	.09	.19	.03
F	Phlox longifolia	-	-	-	-	1	-	-	-	.00
F	Physaria chambersii	$_{a}$-	$_{b}$14	$_{b}$16	$_{a}$-	$_{a}$-	.03	.20	-	-
F	Polygonum douglasii (a)	-	10	1	11	14	.02	.00	.08	.05
F	Sanguisorba minor	3	-	-	-	-	-	-	-	-
F	Senecio multilobatus	-	-	2	2	-	-	.03	.06	-
F	Sphaeralcea coccinea	$_{a}$11	$_{a}$12	$_{ab}$15	$_{b}$35	$_{b}$38	.25	.28	.75	.63
F	Tragopogon dubius	3	2	-	-	-	.03	-	-	-
F	Trifolium sp.	-	-	2	-	-	-	.03	-	-
F	Unknown forb-perennial	4	-	-	-	-	-	-	-	-
Total for Annual Forbs		0	23	2	11	19	0.05	0.01	0.07	0.06
Total for Perennial Forbs		134	156	125	109	139	3.00	7.01	4.94	4.59
Total for Forbs		134	179	127	120	158	3.05	7.02	5.02	4.66

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

BROWSE TRENDS--
Management unit 13A, Study no: 3

Type	Species	Strip Frequency				Average Cover %			
		'94	'99	'04	'09	'94	'99	'04	'09
B	Amelanchier utahensis	2	0	1	1	.00	-	.00	.00
B	Cercocarpus montanus	4	4	5	5	.00	.15	.53	.15
B	Juniperus osteosperma	0	4	6	6	-	.15	.38	.15
B	Opuntia sp.	0	1	1	8	-	.00	.00	.04
B	Pinus edulis	0	4	6	5	2.64	3.98	3.06	3.82
B	Symphoricarpos oreophilus	1	0	0	0	.00	-	-	-
Total for Browse		7	13	19	25	2.64	4.28	3.97	4.17

CANOPY COVER, LINE INTERCEPT--
Management unit 13A, Study no: 3

Species	Percent Cover		
	'99	'04	'09
Amelanchier utahensis	-	.05	-
Cercocarpus montanus	-	.80	2.41
Juniperus osteosperma	2.00	1.79	1.41
Opuntia sp.	-	-	.06
Pinus edulis	3.59	7.81	12.11

KEY BROWSE ANNUAL LEADER GROWTH--
Management unit 13A, Study no: 3

Species	Average leader growth (in)	
	'04	'09
Amelanchier utahensis	5.8	3.1
Cercocarpus montanus	7.3	1.0

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

Species	Trees per Acre		
	'99	'04	'09
Juniperus osteosperma	64	68	61
Pinus edulis	115	106	101

Average diameter (in)		
'99	'04	'09
3.3	2.5	2.2
3.9	3.7	2.7

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

Cover Type	Average Cover %				
	'87	'94	'99	'04	'09
Vegetation	11.25	24.78	34.29	24.39	28.29
Rock	2.50	4.80	5.32	6.10	4.20
Pavement	2.25	.96	4.56	5.10	3.35
Litter	72.75	53.42	61.43	54.18	52.18
Cryptogams	0	0	.12	.21	.16
Bare Ground	11.25	14.31	12.04	20.52	17.88

SOIL ANALYSIS DATA --
Management unit 13A, Study no: 3, Study Name: Buck Hollow

Effective rooting depth (in)	pH	sandy clay loam			%0M	PPM P	PPM K	ds/m
		%sand	%silt	%clay				
12.7	7.6	52.9	21.8	25.3	4.5	25	144	0.7

PELLET GROUP DATA--
Management unit 13A, Study no: 3

Type	Quadrat Frequency			
	'94	'99	'04	'09
Rabbit	10	19	15	25
Elk	14	12	14	5
Deer	17	29	42	42
Cattle	2	6	1	4

Days use per acre (ha)		
'99	'04	'09
-	-	-
15 (37)	11 (28)	12 (30)
66 (163)	42 (104)	48 (117)
20 (49)	4 (9)	7 (16)

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

		Age class distribution				Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Amelanchier utahensis									
87	**665**	85	15	-	699	45	5	10	59/28
94	**40**	50	50	-	-	0	0	0	66/75
99	**0**	0	0	-	-	0	0	0	59/73
04	**20**	100	0	-	580	0	0	0	74/80
09	**20**	100	0	-	-	0	0	0	69/78
Atriplex canescens									
87	**0**	0	0	-	-	0	0	0	-/-
94	**0**	0	0	-	-	0	0	0	18/14
99	**0**	0	0	-	-	0	0	0	-/-
04	**0**	0	0	-	-	0	0	0	26/20
09	**0**	0	0	-	-	0	0	0	30/26
Cercocarpus montanus									
87	**66**	50	50	-	-	50	50	0	21/19
94	**100**	0	100	-	-	20	0	0	33/30
99	**100**	0	100	-	-	80	0	0	48/38
04	**100**	20	80	-	20	0	100	0	44/39
09	**100**	0	100	-	-	0	60	0	45/41
Ephedra viridis									
87	**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	**0**	0	0	-	-	0	0	0	37/34

		Age class distribution				Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Gutierrezia sarothrae									
87	**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	**0**	0	0	-	-	0	0	0	11/12
Juniperus osteosperma									
87	**33**	0	100	-	66	0	0	0	51/197
94	**0**	0	0	-	-	0	0	0	-/-
99	**100**	100	0	-	-	0	0	0	-/-
04	**120**	100	0	-	-	0	0	0	-/-
09	**120**	17	83	-	-	0	17	0	-/-
Opuntia sp.									
87	**33**	0	100	-	-	0	0	0	12/6
94	**0**	0	0	-	-	0	0	0	4/19
99	**20**	0	100	-	-	0	0	0	8/18
04	**20**	0	100	-	-	0	0	0	5/18
09	**220**	0	100	-	-	0	0	0	4/12
Pinus edulis									
87	**132**	75	25	-	33	0	0	0	35/24
94	**0**	0	0	-	-	0	0	0	-/-
99	**100**	80	20	-	-	0	0	0	-/-
04	**120**	33	67	-	-	0	0	0	-/-
09	**100**	0	100	-	-	0	0	0	-/-
Quercus gambelii									
87	**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	33/30
09	**0**	0	0	-	-	0	0	0	14/15
Symphoricarpos oreophilus									
87	**0**	0	0	-	-	0	0	0	-/-
94	**20**	0	100	-	-	0	0	0	30/55
99	**0**	0	0	-	-	0	0	0	26/52
04	**0**	0	0	-	-	0	0	0	26/46
09	**0**	0	0	-	-	0	0	0	25/51