CORVALLIS PLANT MATERIALS CENTER
NATURAL RESOURCES CONSERVATION SERVICE
CORVALLIS, OREGON
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THE 2007 LASSEN VOLCANIC NATIONAL PARK ANNUAL REPORT:
Kings Creek Revegetation Project

I. Brief Background of Project

Figure 1. Lake Helen, Lassen Volcanic National Park, October 24, 2007.

The Corvallis Plant Materials Center (PMC) entered into a new agreement with Lassen Volcanic National Park in 2006 to provide native plant materials for revegetation in the King's Creek area. It was agreed that the PMC would produce a minimum of 3700 container plants including 700 legume plugs, 2500 sedge and rush plugs, 500 grass plugs and 1800 containers of one shrub species. Activities in 2007 included propagation and delivery of manzanita plants plus germination trials on one grass, two rushes, four sedges and one legume. PMC staff also traveled to the Park to collect more manzanita cuttings.

II. Accessions Involved

Table 1. Accessions involved in the Kings Creek Revegetation Project.

Species	Common name	Code	Accession	Activity in 2007 [1]
Juncus balticus	Baltic rush	JUBA	9079507	trl
Carex abrupta	abruptbeak sedge	CAAB2	9079503	trl
Carex staminiformis	Shasta sedge	CAST7	9079506	trl
Lupinus obtusilobus	satin lupine	LUOB	9079501	trl
Deschampsia cespitosa	tufted hairgrass	DECE	9079500	trl
Arctostaphylos nevadensis	pinemat manzanita	ARNE	9079498	pxn, trl, dlv, col
Carex nigricans	black alpine sedge	CANI2	9079499	trl
Carex breweri	Brewer's sedge	CABR12	9079505	trl
Juncus parryi	Parry's rush	JUPA	9079504	trl

1- trl= germination trials, pxn= plant production, dlv= delivered plant materials, col= collected plant materials

III. Experimental Propagation

Figure 2. *Arctostaphylos nevadensis* cuttings rooting in perlite with bottom heat in the PMC greenhouse, February 20, 2007.

Most species involved in this project are ones that have never been propagated before at the Corvallis PMC. Informal germination tests were set up on all of the species. For each species, nine sets of 100 seeds were counted, weighed and placed in plastic germination boxes on moistened germination paper and stored in a growth chamber set at 8°(C) days and 4°(C) nights with 8 hours of light. *Juncus* sp. underwent two stratification treatments: 45 days and 90 days. *Carex* sp. were removed from stratification after 90 days and 120 days. The grass and legume were removed from stratification after two weeks and four weeks. Each treatment had three replications per species. Three boxes of each species were also set out at room temperature as a "control" treatment. When germination boxes were removed from stratification they were placed with the control treatments at room temperature. Germination was recorded weekly.

Table 2. Results of germination trials conducted at the PMC for the King's Creek Revegetation Project.

Species	Germination
Juncus balticus	
45 days cold (JUBA1)	31%
90 days cold (JUBA2)	11%
90 days cold (JUBA3)	17%
Carex abrupta	
90 days cold (CAAB1)	43%
120 days cold (CAAB2)	33%
120 days cold (CAAB3)	44%
No strat (CAAB4)	0%
Carex staminiformis	
90 days cold (CAST1)	46%
120 days cold (CAST2)	40%
120 days cold (CAST3)	58%
No strat (CAST4)	8%
Lupinus obtusilobus	
2 weeks cold+scarfiy (LUOB1)	81%
4 weeks cold+scarfiy (LUOB2)	81%
4 weeks cold+scarfiy (LUOB3)	81%

Species	Germination
Deschampsia cespitosa	
2 weeks cold (DECE1)	23%
4 weeks cold (DECE1)	18%
4 weeks cold (DECE1)	15%
Carex nigricans	
90 days cold (CANI1)	49%
120 days cold (CANI2)	43%
120 days cold (CANI3)	39%
No strat (CANI4)	7%
Carex breweri	
90 days cold (CABR1)	1%
120 days cold (CABR2)	12%
120 days cold (CABR3)	11%
No strat (CABR4)	0%

Two weeks after the 90-day stratification treatment boxes were removed from the cooler; all the boxes were moved into a greenhouse where daytime temperatures were around 80 degrees. Many of the boxes displayed rapid germination once they were in the hot greenhouse. "Control" germination boxes were again made and placed in the hot greenhouse. These boxes exhibited no germination. It is concluded that a long stratification is needed to break dormancy on most of these species and hot temperatures

are needed for germination. This information is important for propagation of this species and also to understand the importance of fall sowing, if seeds of these species are ever used in restoration projects.

IV. Plant Propagation

Arctostaphylos nevadensis cuttings that were collected in the fall of 2006 were kept in a cooler until the end of January. On January 28, 2007, cuttings were removed from the coolers. Stems were stripped of lower leaves, re-cut, dipped in a 0.8% IBA powder, and stuck into 6" deep propagation flats filled with perlite. Flats were placed on heat mats set at 70° (F) in an unheated greenhouse. Flats were watered lightly and kept barely moist. Rooting occurred rapidly. Within 4 weeks, 65% of cuttings were ready to be potted up. Weak or non-rooted cuttings were left in the flats. Rooted cuttings were placed in "D40" cones (40cc containers) with Sunshine #4 (a soil-less, peat based media) amended with a slow release fertilizer and micronutrients. Potted cuttings were left in the unheated greenhouse and were overhead watered weekly. Pots were carefully monitored for overwatering.

Figure 1. Rooted cutting of *Arctostaphylos nevadensis*, March 3, 2007

Four weeks later, cuttings that were remaining in the propagation flats were checked for root abundance and ones that were ready were transplanted into D40 cones. All pots were moved to an outdoor shadehouse on May 25, 2007, and remained there until delivery to the park on September 11, 2007. Overall, rooting success was rated at 82% (1630 cuttings out of 1980 formed roots). Of the 1630 cuttings that were potted up, 1340 survived (82% survival rate).

The PMC is to deliver 1800 *A. nevadenis* plants for the park by fall of 2009. The majority of the plants were delivered this year. Another 460 plants will be delivered in 2008. PMC staff traveled to the park on October 23, 2007 to collect more cuttings. Staff collected 800 cuttings and brought them back to the PMC for cold storage until they will be rooted in the late winter.

VI. Delivery of Plant Materials.

Park staff came to the PMC to pick up the manzanita plants that had been propagated this year. 1340 plants were delivered to the park on September 11, 2007. Early snows in the park created delays in the road construction and not all areas were ready to plant. About 260 plants would not be able to be planted at the park in the fall of 2007. PMC and Park staff agreed that it would be best for the plants to be returned to the PMC, cared for

Figure 4. *Arctostaphylos nevadenis* plants ready for delivery, August 31, 2007.

throughout 2008, and delivered to the Park in the fall of 2008 when the road construction will be finished.

Returned manzanitas will be overwintered in a walk-in cooler. The cool, wet winters at the PMC cause many high elevation plants to rot or become disease ridden if left outside. Through previous experience with high elevation plants, the PMC has found that the most successful way to overwinter these plants is by keeping them slightly dry and as close to freezing temperatures as possible. Plants will be removed from the cooler when the spring rains have lightened (May-June 2008).

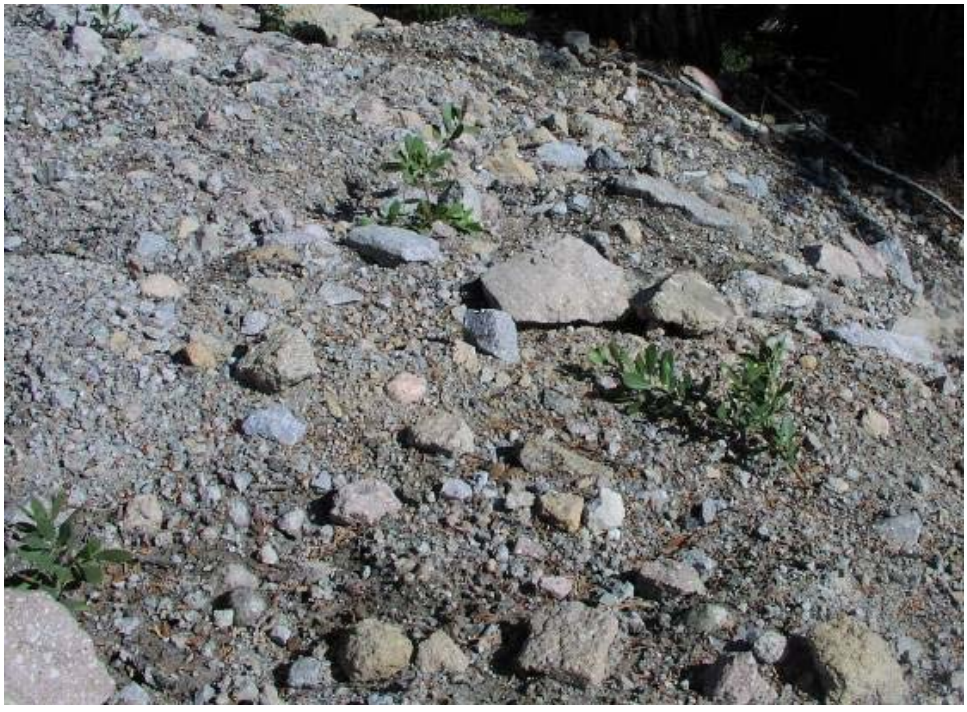

Figure 5. *Arctostaphylos nevadensis* plants after transplanting at Lassen Volcanic National Park, October 24, 2007.