CORVALLIS PLANT MATERIALS CENTER
NATURAL RESOURCES CONSERVATION SERVICE
CORVALLIS, OREGON
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THE 2008 LASSEN VOLCANIC NATIONAL PARK ANNUAL REPORT:
Visitors' Center Landscape Project

Figure 1. PMC staff members, Jenny Freitag and Vanessa East, pose in front of the new Visitors' Center, Lassen Volcanic National Park, October 16, 2008 (photo by Kathy Pendergrass).

I. Brief Background of Project

The Corvallis Plant Materials Center (PMC) entered into a new agreement with Lassen Volcanic National Park in 2007 to provide native plant materials for planting around the new visitors' center. It was agreed that the PMC would produce a minimum of 6200 container plants including: 2000 grass plugs, 1000 sedge and rush plugs, and 3200 containers of shrubs. In the original contract, containers of red fir, mountain hemlock and chinquapin were ordered, but due to lack of seed, these species were replaced by an appropriate number of forb containers. Activities in 2008 included collection and vegetative propagation of two shrubs and production of five sedges and rushes, two shrubs, two grasses, one legume, and three forbs.

II. Accessions Involved

Table 1. Accessions involved in the Visitors Center Landscape Project in 2008.

Species	Common name	Code	Accession Number	Activity in 2008[1]
Elymus glaucus	blue wildrye	ELGL	9079530	Pxn, dlv
Bromus carinatus	California brome	BRCA5	9079531	Pxn, dlv
Holodiscus microphyllus	oceanspray	HOMI3	9079548	Pxn, dlv
Ceanothus cordulatus	whitethorn ceanothus	CECO	9079553	Pxn, dlv
Arctostaphylos nevadensis	pine mat manzanita	ARNE	9079554	Pxn, dlv, col
Senecio triangularis	arrowleaf ragwort	SETR	9079545	Pxn, dlv
Anaphalis margaritacea	pearly everlasting	ANMA	9079547	Pxn, dlv
Carex jonesii	jones's sedge	CAJO	9079541	Pxn, dlv
Carex microptera	smallwing sedge	CAMI7	9079543	Pxn, dlv
Juncus balticus	baltic rush	JUBA	9079555	Pxn, dlv
Juncus ensifolius	swordleaf rush	JUEN	9079549	Pxn, dlv
Wyethia mollis	woolly mules-ears	WYMO	9079546	Pxn, dlv
Ribes sp	currant	RIBES	9079572	Pxn, dlv
Eriogonum sp	buckwheat	ERIOG	9079573	Pxn, dlv
Potentilla sp	cinquefoil	POTEN	9079574	Pxn, dlv
Lupinus arbustus	longspur lupine	LUAR6	9079551	Pxn, dlv

1-pxn=produced plants, dlv=delivered plant materials, col= collected plant materials

III. Experimental Propagation

The PMC is to provide 100 containers of *Ceanothus cordulatus* for this agreement. This species has not been propagated previously at the PMC. Seeds were collected by park staff and delivered to the PMC. Seed was cleaned and placed in hot water (180°F) and left to cool/soak for 24 hours. Seeds were then mixed with moistened peat-based media in a plastic zip-lock bag and placed in a walk-in cooler. Seeds were monitored weekly for germination (no germination was observed). After 60 days in the cooler, media and seeds were spread out in a shallow flat and placed in the greenhouse. Within two weeks, seedlings began to germinate. Seedlings were transplanted into 7” stubby cells. Stem cuttings were also collected at the park by PMC staff on October 23-24, 2007. Target materials were stems that were at least six inches long, current season’s growth, and free of diseases. Cuttings were packed with moistened vermiculite and stored in a walk-in cooler (38°F). In February, cuttings were prepared for rooting by stripping the leaves from the lower 4 inches, making a fresh basal cut, dipping them in an 0.8% IBA rooting powder, and sticking them into moist perlite in 4” deep propagation flats. Flats were placed on heat mats set at 70° F in an unheated greenhouse and lightly watered weekly or as needed. A small percent of the cuttings did form roots (approximately 40%), but survival after being transplanted into pots was extremely low (less than 10%).

Table 2. Results of germination trials of select species for the Visitors' Center agreement at the PMC in 2008.

Species	Treatment	Average germination per treatment
Carex jonesii	Warm	56
	45 day cold moist stratification	61
	90 day cold-moist stratification	45
Carex microptera	Warm	86
	45 day cold moist stratification	86
	90 day cold-moist stratification	82
Wyethia mollis	Warm	35
	45 day cold moist stratification	40
	90 day cold-moist stratification	44
Potentilla sp	Warm	35
	90 day cold-moist stratification	71

Informal germination tests were set up on *Juncus* and *Carex* species that have never been propagated at the Corvallis PMC. 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. Treatments include 45 or 90 days cold-moist stratification or no cold-moist stratification. Each treatment contained three replications per species.

Figure 2. Juncus plants growing in the PMC greenhouse.

Cuttings of a *Ribes* species were also collected from the Park in October of 2007. Only 10 cuttings were taken. They were packed and processed the same way as the *C. cordulatus* cuttings except that they were rooted in moistened vermiculite and were not placed on heat mats. All ten cuttings rooted and were transplanted into 1-gallon pots. Shrubs were almost 3 ft tall at delivery time. This species was very successful (100% survival) and easy to work with.

IV. Plant Propagation

Figure 3. *Arctostaphylos nevadensis* growing in the PMC greenhouse.

Arctostaphylos nevadensis cuttings were collected at the Park by PMC staff on October 23-24, 2007. Collection area was defined by the Park as the south entrance sign north to the visitors' center. Staff collected 4000 cuttings from this area. Target material were stems that were at least six inches long, non-branching, this season's growth, free of diseases. Cuttings were packed with moistened vermiculite and stored in a walk-in cooler (38°F) until December 20, 2007. Half of the cuttings (approximately 2000) were prepared for rooting by stripping the leaves from the lower 4 inches, making a fresh basal cut, dipping them in an 0.8% IBA rooting powder, and sticking them into moist perlite in 4" deep propagation flats. Flats were placed on heat mats set at 70° F in an unheated greenhouse and lightly watered weekly or as needed. Due to space limitations on the heat mats, cuttings were propagated in two rounds. The second round of cuttings was started in early February. Rooting success was lower this year compared to last year. After cuttings were sufficiently rooted, they were transplanted into D40 cone-tainers filled with moistened media (Sunshine #4, a special peat-based soil-less mix amended with a balanced slow-release fertilizer and micronutrients) and placed in a heated greenhouse. The rooted cuttings grew slowly at first, and then in late May began to send out many new leaves. Due to a sudden hot spell (100° F), plants were moved out of the greenhouse and into a shadehouse. After a week of unusually hot spring temperatures, the weather turned to unusually wet and cool. Days did not reach 65° F for at least four weeks and most days were rainy. The cool wet weather seemed to affect the manzanita plants. In July and August many plants began to yellow and die. About half of the plants were lost and the ones that did survive were weak and small. More manzanita plants will be produced in 2009 to fulfill the needs of the contract.

On December 18, 2007, racks of Ray Leach "stubby" cone-tainers filled with moistened media (Sunshine #4, a special peat-based soil-less mix) were sown with seeds of three *Carex* sp, an *Erigognum* sp, a *Potentila* sp, *Wyethia mollis*, *Holodiscus discolor*, and *Juncus balticus* and lightly covered with fine vermiculite. Seeded flats were placed in polyethylene bags and moved into a walk-in cooler (36-38° F) for four months. After stratification, they were moved to a heated greenhouse. Seedlings emerged within two to four weeks.

On May 15, 2008, 15 racks of Ray Leach "stubby" cone-tainers filled with moistened media (Sunshine #4, a special peat-based soil-less mix) were sown with seeds of *Bromus carinatus, Senecio triangularis, Juncus ensifolius,* a *Lupine* sp*, Anaphalis margaritacea,* and *Elymus glaucus*. Before sowing, lupine seeds were lightly scarified by hand by rubbing them on sandpaper and then were inoculated with a Lupine specific rhizobium. Flats were placed in a heated greenhouse.

On June 1, 2008 all plants were moved from the greenhouse to a shadehouse. Plants were watered overhead daily or as needed and were monitored for pests and diseases. In July, 100 *H. discolor* plants were transplanted into larger D40 cone-tainers. In late August, plants were watered less to prepare them for delivery and transplanting.

V. Delivery of Plant Materials

Figure 4. Plants produced by the PMC in 2008 delivered to the new Visitor's Center.

On September 3, 2008, PMC staff traveled to the park to deliver the plants. The plants were unloaded at the planting site at the visitors' center.

Table 3. Plants Delivered to Lassen Volcanic National Park, September 3, 2008, for the Visitors' Center agreement.

Species	Code	Accession Number	Amount Delivered	Amount ordered
Elymus glaucus	ELGL	9079530	1171	1000
Bromus carinatus	BRCA5	9079531	1086	1000
Holodiscus microphyllus	HOMI3	9079548	486	100
Ceanothus cordulatus	CECO	9079553	20	100
Arctostaphylos nevadensis	ARNE	9079554	579	2800
Senecio triangularis	SETR	9079545	172	100
Anaphalis margaritacea	ANMA	9079547	196	150
Carex jonesii	CAJO	9079541	287	100
Carex microptera	CAMI7	9079543	680	400
Juncus balticus	JUBA	9079555	488	400
Juncus ensifolius	JUEN	9079549	53	100
Wyethia mollis	WYMO	9079546	269	250
Eriogonum sp	ERIOG	9079573	6	0
Potentilla sp	POTEN	9079574	46	0
Ribes sp	RIBES	9079572	10	0
Lupinus arbustus	LUAR6	9079551	60	60