

CORVALLIS PLANT MATERIALS CENTER
NATURAL RESOURCES CONSERVATION SERVICE
CORVALLIS, OREGON
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THE 2007 FEDERAL HIGHWAY ADMINISTRATION ANNUAL REPORT:
Rock Creek Bridge Replacement



Figure 1. *Achillea millefolium* seed increase field at the Corvallis Plant Materials Center, June 12, 2007.

I. Brief Background of Project

The Corvallis Plant Materials Center (PMC) entered into a new agreement with the Federal Highway Administration in 2006 to provide native plant materials for ecological restoration after the Rock Creek Bridge is reconstructed. This area lies within the critical habitat of the endangered Oregon silverspot butterfly (*Speyeria zerene hippolyta*). The butterfly has become threatened due to the degradation and loss of its coastal meadow habitat. The early blue violet is the obligate host to the silverspots' caterpillars and has also been negatively impacted in its coastal meadow ranges by the encroachment of tall, spreading exotic plants. The butterfly also needs access to nectar sources such as Pacific aster (*Aster chilensis*), goldenrod (*Solidago canadensis*), yarrow (*Achillea millefolium*),

and pearly everlasting (*Anaphalis margaritacea*). It was agreed that the PMC would establish and maintain seed increase fields of one grass and two forbs, as well as produce a total of 9500 plugs of four forbs and one grass. Prior to planting, the restoration site will have six inches of soil removed to reduce the presence of exotic vegetation and seed. Soils on the site are classified as fertile fluvial deposits and range between 4 and 6 feet deep. Activities in 2007 included maintenance and harvest of three seed increase plots and production and delivery of 9800 plants.

II. Accessions Involved

Accessions included in the Rock Creek Bridge Replacement project are listed below. These accessions are also being used for the USFW Oregon Silverspot Butterfly Seed Increase Project.

Table 1. Accessions involved for the Rock Creek Bridge Replacement Project at the Corvallis Plant Materials Center in 2007.

Species	Common name	Symbol	Accession	Activity in 2007
<i>Achillea millefolium</i>	common yarrow	ACMI2	9079448	sfp, dlv
<i>Anaphalis margaritacea</i>	pearly everlasting	ANMA	9079451	pxn, dlv
<i>Aster chilensis</i>	Pacific aster	ASCH2	9079449	pxn, dlv
<i>Soildago canadensis</i>	goldenrod	SOCA6	9079497	pxn, dlv
<i>Festuca rubra</i>	red fescue	FERU	9079450	pxn, sfp, dlv
<i>Viola adunca</i>	early blue violet	VIAD	9079406	pxn, sfp, dlv

1- sfp= seed increase, pxn=plant production, dlv= delivered plant materials

III. Field Seed Increase Activities

The *Achillea millefolium* seed increase field grew vigorously throughout the growing season. Weed control was primarily performed by hand weeding; borders were sprayed with glyphosate. The plot was harvested with the “moon rover”, a self-propelled swather. The harvester cuts the plant material and feeds it up on a conveyor belt where it can be pushed into large poly bags. Material in the bags was dumped out onto tarps inside an open shed to dry. Material was threshed by hand and seed was cleaned using an air-screen machine and an air-density separator.

A small seed increase plot of *Viola adunca* was established using plants that were collected from the Rock Creek area in 2004. The plot was expanded in 2007 using extra plants that were produced in 2006. A sheet of weed fabric was stapled down over the field, then holes were cut in the fabric and plants were transplanted into the ground through the holes. As the violet plants grew, they spread out onto the weed fabric. When they flowered and seed pods matured, the pods released the seed onto the weed fabric. The seeds were then vacuumed up using battery-powered, handheld vacuums. Pods were also collected by hand when feasible. Violet pods turn upright when they are mature, which makes determining seed ripeness simple.



Figure 2. *Viola adunca* seed increase plot at the Corvallis PMC, April 10, 2007.

Using container plants that were grown in 2006, a small plot of *Festuca rubra* was established. About 700 plants were transplanted into a field on February 18, 2007, on 1 ft spacing. The field was hand weeded twice during the growing season. The plants experienced an outbreak of rust and were treated with sulfur dust. The rust occurred when the plants were flowering so other rust treatments such as Propiconazole /Chlorothalonil (Tilt/Bravo™) or Azoxystrobin and Propiconazole(Quilt™) were not used. Seeds were harvested by hand as they matured. After harvest, plants were treated with Quilt™ to control rust.

Table 2. Seed yields for the Rock Creek Bridge Replacement Project at the Corvallis Plant Materials Center in 2007.

Species	Method	Dates	Yield
	moon		
<i>Achillea millefolium</i>	rover	August 10	8 lbs
<i>Festuca rubra</i>	hand	July 5-17	1.5 lbs
		March 15-	
<i>Viola adunca</i>	hand	June 28	454 g

IV. Container Plant Production.

On January 30, 2007, seeds of *V. adunca* were sown into Ray Leach stubby cone-tainers filled with moistened media (Sunshine #1 a special peat-based soil-less mix) and lightly covered with fine vermiculite. Racks of cone-tainers were placed in polyethylene bags and moved into a walk-in cooler (36-38° F) for 120 days. They were then moved outside to a shadehouse.

Table 3. Containerized plant production for the Rock Creek Bridge Replacement Project at the Corvallis Plant Materials Center in 2007.

Species	Accession Number	Number of conetainers planted	Amount of seed used	Number of conetainers produced
<i>Anaphalis margaritacea</i>	9079451	1200	1g	1086
<i>Aster chiliensis</i>	9079449	1700	6g	1629
<i>Solidago canadensis</i>	9079497	1700	2g	1614
<i>Festuca rubra</i>	9079450	2800	17g	2788
<i>Viola adunca</i>	9079406	2100	4g	2058

The seeds of *F. rubra*, *Solidago canadensis*, *Aster chiliensis*, and *Anaphalis margaritacea* were sown on May 30, 2007, into Ray Leach stubby cone-tainers filled with moistened media (Sunshine #1 a special peat-based soil-less mix) and lightly covered with fine vermiculite (except for the *A. margaritacea*, which was not covered with vermiculite). Racks of cone-tainers were placed into a shadehouse.



Figure 3. Nectar plants growing in the PMC shadehouse, August 12, 2007.

All plants were watered overhead daily. *V. adunca* plants were fertilized with a light rate of water-soluble 20-20-20 mix twice during the later part of the growing season. Plants were sprayed with a soap and neem oil mix to prevent insect pests at 2-week intervals during June and July. The *A. margaritacea*, *S. canadensis*, and *A. chiliensis* plants became so large that they could not be effectively watered by overhead means.

Shallow water troughs were built and racks were placed in the troughs for bottom watering once or twice a week to supplement overhead watering.

Plants were hardened off in early October to prepare them for outplanting. All nectar plants (*A. margaritacea*, *A. chiliensis*, *S. canadensis*) were cut back to 1” before outplanting. These plants typically die back in the winter and it was much easier to transport and transplant the trimmed plants.

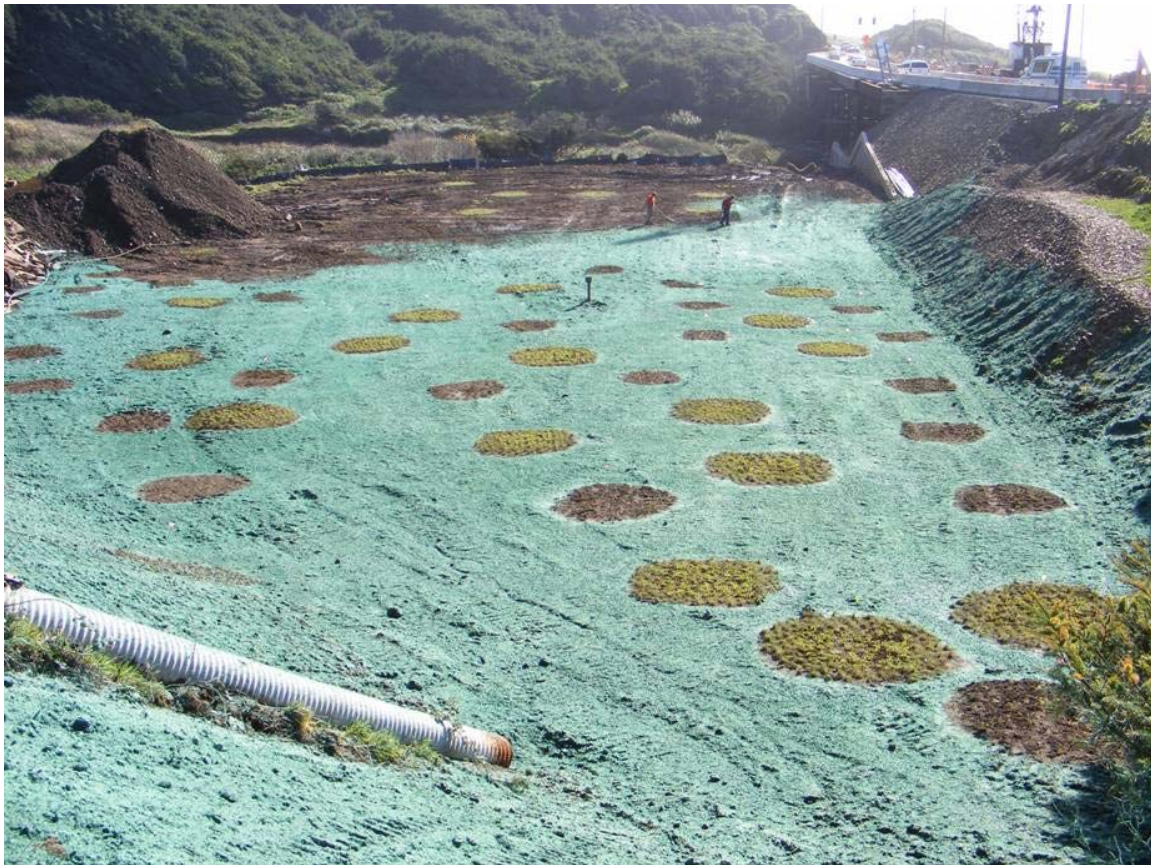


Figure 4. Hydroseeding Rock Creek Bridge replacement site after transplanting. Green circles are dense patches of violets surrounded by fescue plants. The brown circles are patches of nectar plants. The remaining area was hydroseeded with yarrow, sand fescue, and violet seed (photo provided by Nick Testa).

V. Delivery of Plant Materials.

A total of 9831 plants and 5 lbs of seed were picked up by ODOT staff on October 15, 2007. Remaining *A. millefolium* will be held at the PMC seed storage facilities until needed by ODOT. Yarrow seed was tested at the PMC for purity and germination. The seed lot was found to be 48% pure and germination was 92%.

Table 4. Seed and plants delivered to ODOT staff on October 15, 2007 for the Rock Creek Bridge Replacement Project at the Corvallis Plant Materials Center in 2007.

Species	Common Name	Code	Accession number	Number of containers	Amount of seed
<i>Achillea millefolium</i>	common yarrow	ACMI2	9079448	0	1.5 lbs
<i>Anaphalis margaritacea</i>	pearly everlasting	ANMA	9079451	1086	0
<i>Aster chiliensis</i>	Pacific aster	ASCH2	9079449	1629	0
<i>Solidago canadensis</i>	goldenrod	SOCA6	9079497	1614	0
<i>Festuca rubra</i>	red fescue	FERU	9079450	2788	1.5 lbs
<i>Viola adunca</i>	early blue violet	VIAD	9079406	2058	1 lb