

CORVALLIS PLANT MATERIALS CENTER  
NATURAL RESOURCES CONSERVATION SERVICE  
CORVALLIS, OREGON  
Amy Bartow

December 30, 2006

**THE 2006 OLYMPIC NATIONAL PARK ANNUAL REPORT:**  
*Hurricane Ridge Road Revegetation Project*

**I. Brief Background of Project**

The Corvallis Plant Materials Center (PMC) entered into a new agreement with Olympic National Park in 2004 to provide native plant materials for revegetation of Hurricane Ridge Road. It was agreed that the PMC would produce a minimum of 255 lbs (PLS) of two lower elevation grasses, 100 lbs (PLS) of two upper elevation grasses, and 45 lbs of three upper elevation forbs. The PMC is also responsible for collecting a minimum of 3.5 lbs of seed of four native forbs. Delivery is planned to occur in fall of 2007.



Figure 1. *Eriophyllum lanatum* seed increase field at the Corvallis PMC, June 8, 2006.

Activities in 2006 included collecting seed of seven species, cleaning of native seed collected by PMC staff; expansion, maintenance, and harvest of seed production fields including three grasses and three forbs; and containerized stock production. Details are provided below.

## II. Accessions Involved

NPS staff defined the low elevation collection area to be the roadsides of Hurricane Ridge Rd. from the intersection of Race Rd. north to the “double parking area”. High elevation collection area included roadsides from the “Switchbacks” trailhead north to the Visitor’s Center parking lot.

Table 1. Accessions involved for Hurricane Ridge Road Cooperative Agreement at the Corvallis Plant Materials Center.

Species	Common Name	Symbol	Accession Number	2005 Activities <sup>1</sup>
<b>Low elevation</b>				
<i>Elymus glaucus</i>	blue wildrye	<b>ELGL</b>	9079352	sfp,
<i>Bromus vulgaris</i>	Columbia brome	<b>BRVU</b>	9079353	sfp, col
<i>Eriophyllum lanatum</i>	common woolly sunflower	<b>ERLA6</b>	9079405	-
<i>Achillea millefolium</i>	common yarrow	<b>ACMI2</b>	9079407	-
<i>Anaphalis margaritacea</i>	pearly everlasting	<b>ANMA</b>	9079408	-
<i>Heracleum maximum</i>	common cow parsnip	<b>HEMA80</b>	9079414	col
<i>Chamerion angustifolium</i>	fireweed	<b>CHAN9</b>	9079409	-
<b>High elevation</b>				
<i>Elymus glaucus</i>	blue wildrye	<b>ELGL</b>	9079356	sfp
<i>Bromus sitchensis</i>	Alaska Brome	<b>BRSI</b>	9079357	sfp, col
<i>Eriophyllum lanatum</i>	common woolly sunflower	<b>ERLA6</b>	9079358	sfp
<i>Lupinus latifolius</i>	broadleaf lupine	<b>LULA4</b>	9079351	sfp, col
<i>Artemisia ludoviciana</i>	Louisiana sage (white sagebrush)	<b>ARLU</b>	9079359	sfp, col
<i>Achillea millefolium</i>	common yarrow	<b>ACMI2</b>	9079402	col
<i>Anaphalis margaritacea</i>	pearly everlasting	<b>ANMA</b>	9079403	col
<i>Heracleum maximum</i>	common cow parsnip	<b>HEMA80</b>	9079413	-
<i>Chamerion angustifolium</i>	fireweed	<b>CHAN9</b>	9079404	col

<sup>1</sup> Activity codes: col= collected at Park (by PMC staff); sfp= seed produced at PMC.

## III. Native Seed and Plant Collections

PMC staff was responsible for native seed collections. They were performed primarily along the roadsides of Hurricane Ridge Road. Approximately 96 hours were recorded as actual collection time. A total of 9 lbs of clean seed of nine species was collected in 2006.



Figure 2. PMC summer intern, Henri Compaore, collecting seed on Hurricane Ridge, August 7, 2006.

Table 2. Native seed and plant collection for the Hurricane Ridge Road Cooperative Agreement in 2006 at the Corvallis Plant Materials Center.

<b>Species</b>	<b>Symbol</b>	<b>Accession Number</b>	<b>Collection dates</b>	<b>Amt</b>
<b>High elevation</b>				
<i>Elymus glaucus</i>	ELGL	9079356	8/22-8/25	100 g
<i>Bromus sitchensis</i>	BRSI	9079357	8/12-8/22	0
<i>Eriophyllum lanatum</i>	ERLA6	9079358	8/22-9/6	0.5 lbs
<i>Lupinus latifolius</i>	LULA4	9079351	8/1-8/22	2 lbs
<i>Artemisia ludoviciana</i>	ARLU	9079359	9/6-9/8	100 g
<i>Achillea millefolium</i>	ACMI2	9079402	9/6-9/8	100 g
<i>Anaphalis margaritacea</i>	ANMA	9079403	9/6-9/8	150 g
<i>Heracleum maximum</i>	HEMA80	9079413	8/22-9/6	1 lb
<i>Chamerion angustifolium</i>	CHAN9	9079404	9/6-9/8	240 g
<b>Low elevation</b>				
<i>Elymus glaucus</i>	ELGL	9079352	8/10-8/25	0
<i>Bromus vulgaris</i>	BRVU	9079353	8/10-8/25	4 lbs
<i>Eriophyllum lanatum</i>	ERLA6	9079405	9/6-9/8	0
<i>Achillea millefolium</i>	ACMI2	9079407	9/6-9/8	0
<i>Anaphalis margaritacea</i>	ANMA	9079408	9/6-9/8	0
<i>Heracleum maximum</i>	HEMA80	9079414	8/10-8/25	0
<i>Chamerion angustifolium</i>	CHAN9	9079409	9/6-9/8	0



### III. Field Seed Increase

The winter of 2005/2006 was very wet and cold. Fields often had standing water. *Lupinus latifolius*, *Eriophyllum lanatum*, and *Artemesia ludoviciana* fields were inundated with water for two weeks continuously in December. Even though the plants and seeds were covered with water for at least 30 days during the winter, existing plants survived, and seedlings emerged in the spring with very minimal damage.

As soon as the water receded in the spring, slugs, snails, and cucumber beetles were pests in the *L. latifolius*, and *A. ludoviciana* plantings. “Slug-go” was sprinkled over the plot to control slugs and snails, “Bio-neem” oil & soap was applied as a foliar spray on plants to prevent predation from cucumber beetles. Sulfur dust was applied to plants that exhibited powdery mildew. Weed control in the fields was performed by hand.

All of the grass fields, except the *Bromus vulgaris*, survived the winter. The *B. vulgaris* field was severely damaged. Few plants survived, and those that did were very weak and flowered late.



Figure 3. *Lupinus latifolius* plant flowering (left) and LULA4 plot, May 30, 2006 (right).

### IV. Field Production Activities

Weed control was primarily performed by hand (mainly to remove exotic perennial grasses) and spraying borders and spot-spraying with glyphosate. Broadleaf herbicides (Bison and Banvel) were applied to grass fields in February and May. Forb fields were weeded entirely by hand multiple times throughout the growing season.

Seed was harvested from new and established stands of *B. vulgaris*, *Bromus sitchensis*, and the low ecotype of *Elymus glaucus*. Only the established section of the high elevation of *E. glaucus* flowered in 2006; the new section did not. The *L. latifolius*, *E. lanatum* and *A. ludoviciana* fields that were over one year old (established in the fall of 2004) flowered in 2006. The newer sections of the fields (ones that were seeded the in the fall

of 2005) did not flower. Harvest areas presented in Table 4 (below), include only areas that flowered and do not represent total field sizes.

Table 4. Field production at Corvallis Plant Material Center in 2006 for the Hurricane Ridge Rd. Project.

Species	Area (ac)	Date(s)	Method	Yield	Comments
ELGL (LO)	0.25	July 3/ July 17	swath/ combine	106 lbs	Excellent stand, high vigor
BRVU	0.25	10-Jul	hand	152 g	Poor stand, low vigor
BRSI	0.2	26-Jun	moon rover	3 lbs	Good stand, good vigor
ELGL (HI)	0.06	7-Jul	moon rover	9 lbs	Good stand, good vigor
ARLU	0.02	5-Jul	hand	160 g	Fair stand, high vigor
LULA4	0.04	July5 - Aug 3	hand	1 lb	Good stand, good vigor
ERLA	0.046	18-Jul	moon rover	8 lbs	Excellent stand, high vigor

A new harvester, informally named the “moon rover” was used this year. It is a hand-built, self propelled swather. It has a conveyer belt that moves all material after it is cut and loads it into bags. Two people operate the machine with one person driving and the other helping feed the material into bags. The machine has all the benefits of hand harvesting without the labor. Once material was bagged it was emptied out on to tarps to dry and cure. It was then fed through a plot thresher, and cleaned as usual.



Figure 4. PMC staff harvesting a seed increase field using the “moon rover.”

After harvest, all grass fields were mowed with a Brady flail-chopper to remove post-harvest residue. Forb fields were not mowed. The flail chopper was able to remove most of the residue on the grass fields. Because the fields were quite clean, a new pre-emergent herbicide, Outlook®, was applied to the grass fields. Initial results look very promising. Volunteer seedlings and weed seedlings are very sparse and the crops do not appear any less vigorous.

Seed lots larger than five pounds were sampled and sent to the Oregon State University Seed Laboratory for germination and purity testing. Excess seed was returned by the lab and is being stored at the Corvallis PMC until delivery is requested. Lots that are less than five pounds will be bulked with 2007 production and sent in for testing in the fall of 2007.

Table 5. Test results for seed lots produced in 2006 by the Corvallis Plant Materials Center for the Hurricane Ridge Rd. Project.

<b>Species</b>	<b>% Germination</b>	<b>% Purity</b>	<b>Bulk Amt</b>	<b>PLS Amt</b>
ELGL (LO)	97	99.41	106 lbs	102 lbs
BRVU <sup>1</sup>	N/A	N/A	N/A	N/A
BRSI <sup>1</sup>	N/A	N/A	N/A	N/A
ELGL (HI)	91	98.49	9 lbs	8 lbs
ERLA	91 (TZ)	96.31	8 lb	7 lbs

1-seed lot is less than five pounds and was not tested at OSU seed lab.

## VII. Delivery of Plant Materials

No deliveries were made in 2006. Current seed in storage is listed below.

Table 6. Current seed inventory for the Hurricane Ridge Rd. Project held by the Corvallis Plant Materials Center

<b>Species (High Elevation)</b>	<b>Accession Number</b>	<b>2005 wild</b>	<b>2005 field</b>	<b>2006 wild</b>	<b>2006 field</b>	<b>Total</b>
<i>Elymus glaucus</i>	9079356	.5 lb	1 lb	0	9 lbs	<b>10.5 lbs</b>
<i>Bromus sitchensis</i>	9079357	46g	1 lb	0	1242g	<b>4 lbs</b>
<i>Eriophyllum lanatum</i>	9079358	64 g	107g	0	8 lbs	<b>8.5 lbs</b>
<i>Lupinus latifolius</i>	9079351	3170g	0	708 g	524g	<b>10 lbs</b>
<i>Artemisia ludoviciana</i>	9079359	1lbs	0	100 g	160 g	<b>1.5 lbs</b>
<i>Achillea millefolium</i>	9079402	107g	0	100 g	0	<b>0.5 lbs</b>
<i>Anaphalis margaritacea</i>	9079403	260g	0	150g	0	<b>1 lb</b>
<i>Heracleum maximum</i>	9079413	1700g	0	1 lb	0	<b>4 lbs</b>
<i>Chamerion angustifolium</i>	9079404	50g	0	250g	0	<b>0.5 lbs</b>

Table 6. Current seed inventory for the Hurricane Ridge Rd. Project held by the Corvallis Plant Materials Center (Cont')

<b>Species (Low Elevation)</b>	<b>Accession Number</b>	<b>2005 wild</b>	<b>2005 field</b>	<b>2006 wild</b>	<b>2006 field</b>	<b>Total</b>
<i>Elymus glaucus</i>	9079352	53g	13.5	0	106 lbs	<b>119.5lbs</b>
<i>Bromus vulgaris</i>	9079353	292g	7	1956 g	152g	<b>5 lbs</b>
<i>Eriophyllum lanatum</i>	9079405	10g	0	0	0	<b>10 g</b>
<i>Achillea millefolium</i>	9079407	25g	0	0	0	<b>25 g</b>
<i>Anaphalis margaritacea</i>	9079408	50g	0	0	0	<b>50 g</b>
<i>Heracleum maximum</i>	9079414	1450g	0	250g	0	<b>3 lbs</b>
<i>Chamerion angustifolium</i>	9079409	40g	0	0	0	<b>40 g</b>