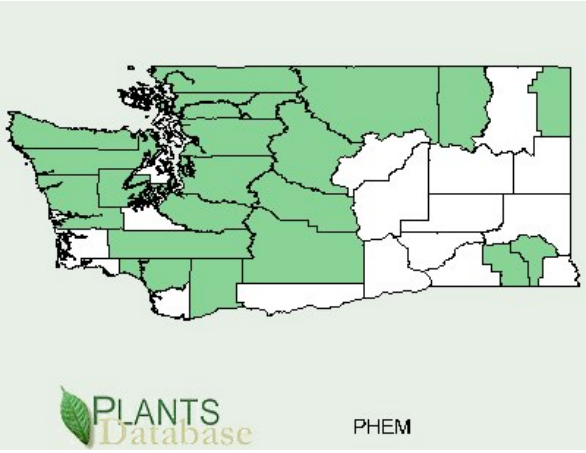
Plant Propagation Protocol for *Phyllodoce empetriformis (Sm.) D. Don*

ESRM 412 – Native Plant Production



TAXONOMY	
Family Names	
Family Scientific Name:	Ericaceae
Family Common Name:	Heath Family
Scientific Names	
Genus:	*Phyllodoce* (Salib.)
Species:	*empetriformis*
Species Authority:	(Sm.) D. Don
Variety:	
Sub-species:	
Cultivar:	
Authority for Variety/Sub-species:	
Common Synonym(s)	*Menziesia empetriformis* Smith[1]
Common Name(s):	Pink Mountainheath,[2,13] Pink Mountain-Heath,[4,9] Pink Mountain-Heather,[10] Klamath Mountain Heather[2]
Species Code:	PHEM
GENERAL INFORMATION	
Geographical range	**USA** (AK, AZ, CA, ID, MT, OR, WA, WY) **CAN** (AB, BC, NT, YT)[13]
Ecological distribution	*P. empetriformis* is found in alpine communities most notably in alpine tundra, subalpine boreal forests, high elevation parkland forests and heath communities.[4]

Climate and elevation range	Canadian sources state that *P.* empetriformis can be found between 6 and 2630 meters though the average elevation which this species is found is around 1776 meters[4]. Other sources site this species as moist slopes above 5000 feet[12] and between 8000 and 9000 feet [11].
Local habitat and abundance; may include commonly associated species	*P. empetriformis* is associated with its close relative *P. glanduflora* where it can form a natural hybrid know as *P. x intermedia*[2,12]. *P. empetriformis* has also been noted as a dominate undergrowth species along with *Luzula hitchcockii* in *Larix lyalli-Abies lasiocarpa* communities and with *Vaccinium scoparium* and *Antennaria lanata* in *Pinus albicaulis-Abies lasiocarpa* communities in Montana[11].
Plant strategy type / successional stage	No Source with conforming information was attained.
Plant characteristics (life form (shrub, grass, forb), longevity, key characteristics, etc)	*P. empetriformis* has been generally described as an evergreen mat shrub with a many branched low spreading habit and erect stems.
PROPAGATION DETAILS	
The primary propagation protocol information has been interpreted from Luna, et al.[9]	
Ecotype:	Subalpine meadow, Logan Pass, 2032m elevation,Glacier National Park, Flathead Co., MT.[9]
Propagation Goal:	Plants
Propagation Method:	Vegetative
Product Type:	Container (plug)
Stock Type:	800 ml containers
Time to Grow:	2 Years
Target Specifications:	Stock type: Container Cutting Height: 4.6 cm Caliper: 7mm Root: firm plug in 800ml (4.5 inch) pot.
Propagule Collection:	Vegetative Propagation Method: Pre-Rooting Type of Cutting: Semi-Hardwood Cuttings can be taken as early as late June but September through October seems ideal.
Propagule Processing/Propagule Characteristics:	Before treatment, cuttings should be stored in a moist condition under refrigeration.
Pre-Planting Propagule Treatments:	8000 ppm of IBA with talc should be used on heel cuttings rather than 1000 ppm which does not have as high of a level of root yield.

Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	Luna, et al used an outdoor nursery setting. The outdoor mistbed used automatically mists in 6 second intervals every 6 minutes (anymore may cause rot) but is subject to change according to climate conditions. 21C underhead is used 12cm below the root media (which is a 50-50 mix of peat and perlite) although the container was not specified.
Establishment Phase:	10 weeks is the expected period from treatment to rooting.
Length of Establishment Phase:	
Active Growth Phase:	Plants are potted in 800ml containers with a 6:1:1 peat, perlite and vermiculite media and are treated with 1 gram of 13-13-13 Osmocote control released fertilizer and .5 grams of Micromax fertilizer per container.
Length of Active Growth Phase:	6 weeks.
Hardening Phase:	Cuttings were irrigated thoroughly prior to winterization.
Length of Hardening Phase:	4 weeks 1st year, 16 weeks 2nd year
Harvesting, Storage and Shipping (of seedlings):	Total Time to Harvest: 2 years. Harvest Date: July of the second year. Storage Conditions: Overwinter in outdoor nursery under insulating foam cover and snow.
Length of Storage:	5 months
Guidelines for Outplanting / Performance on Typical Sites):	Luna, et al did not specify survival or growth rates after harvesting.
Other Comments (including collection restrictions or guidelines, if available):	It appears that a yet explored propagation method still exists: namely seed propagation. However Luna, et al does specify that seeds may be collected in early September with 29,280,000 seeds/kg by hand rubbing the capsules. The latter sources also states that procedures are expected to be similar to the related genera *Erica* and *Calluna*.
INFORMATION SOURCES	
References:	See Below
Other Sources Consulted:	See Below
Protocol Author:	Jason Ceralde
Date Protocol Updated:	4/20/2011 (original by Matthew Ramsay 4/21/2003 below)

Note: This template was modified by J.D. Bakker from that available at:
http://www.nativeplantnetwork.org/network/SampleBlankForm.asp

References

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9. Luna, Tara; Wick, Dale.; Evans, Jeff. 2008. Propagation protocol for vegetative production of container *Phyllodoce empetriformis* (SW.) D. Don plants (800 ml containers); USDI NPS - Glacier National Park, West Glacier, Montana. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 20 April 2011). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.

10. MacKinnon, A., Jim Pojar, and Paul B. Alaback. *Plants of Coastal British Columbia including Washington, Oregon & Alaska*. Edmonton: Lone Pine Pub., 2004. Print.

11. Pfister, Robert D. *Forest Habitat Types of Montana*. Ogden, UT: Intermountain Forest and Range Experiment Station, Forest Service, U.S. Dept. of Agriculture, 1977. Print.

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Plant Data Sheet

Species:

Red Heather, *Phyllodoce empetriformis*

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Range:

Pacific Northwest region east to Idaho and Montana. Also found in Arizona, California and Wyoming.

Climate, elevation:

Mostly cool temperate, subalpine to alpine, generally between 1,400 to 2,000 meters elevation in Washington
(Franklin and Dyrness, 1988)

Local occurrence:

Common within subalpine habitat

Habitat preferences:

Moist, moderately well drained to well drained slopes.
Open high elevation forests or subalpine meadows with moderately late lying snowpack
(Franklin and Dyrness, 1988)

Plant strategy type/successional stage:

Stress tolerator, climax to near climax succesional stage, (although occasionally subject to invasion by trees in warmer climatic periods) (Franklin and Dyrness, 1988)

Associated species:

Leutkea pectinata, Vaccinium deliciosum, Cassiope mertensiana,
Deschampsia atropurpurea, Antennaria lanata (Franklin and Dyrness, 1988)

May be collected as:

Cuttings: in late summer or fall
Seeds: September to late fall (Potash and Aubry, 1997)

Collection restrictions or guidelines:

Seed is ripe when capsule swells and becomes dark purple or black
Clip entire inflorescence, hang upside down in paper bag for few weeks in dry environment until capsules dehise
(Potash and Aubry, 1997)

Seed germination:

Cold/moist stratification may improve germination, but is not necessary. (Potash and Aubry, 1997)
It is important to sow seeds on surface of seedling media because seeds are very small. (49,280,000 seeds/kg) (Luna et al 2001)
Olympic National Park uses;
3 parts fine sphagnum, 3 parts #3 horticultural vermiculite, 1-2 parts propagation grade perlite, and 1 part #4 washed sand
(Potash and Aubry, 1997)

Seed life:

not available

Recommended seed storage conditions:

not available

Propagation recommendations:

The following protocol for cuttings is from, Olympic National Park in Potash and Aubry, (1997):
Slice 1/8" off base of 3-5" cutting
Remove leaves within 1/2 " of basal end and keep cuttings in bucket of cold water
Make a solution of 1 tablespoon "Dip 'n Grow : 1 quart water
Suspend basal end of cuttings in solution and soak for 24 to 72 hours
Use 10 x 20" flats with 3 part fine sphagnum, 3 part horticultural perlite and 1 part #4 washed sand. 50 cuttings per flat
Place on mist bench with bottom heat at 55-65 °F in winter and 65°Fin spring/summer
Shade from full sun
Fertilize every 2 weeks with 9-45-15 plant starter diluted to 1/2 strength and Maxicrop liquid kelp at 1/4 recommended strength
Transplant to shallow pots after 3-4 months or when roots fill-out flat

The following additional notes come from Glacier National Park in Luna et al (2001)
Better results from stem heel semi-hardwood cuttings than stem tip semi-hardwood cuttings, higher rooting and higher vigor
8,000 PPM IBA is recommended
1:1 peat/perlite rooting media with soil from stock plant site used for mycorrhizal innoculum
10 weeks in rooting flats, transplanted to 800 ml containers with 6:1:1 sphagnum peat: perlite:vermiculite
Hardened in full sun and overwintered
Out planted 2 years after collection of cuttings

Soil or medium requirements:

See details above

Installation form:
800 ml containers (Luna et al. 2001)

Recommended planting density:
15-20 cm

Care requirements after installed:
Water once daily first summer following transplanting into containers (Luna et al. 2001, Potash and Aubry, 1997)

Normal rate of growth or spread; lifespan:
Slow. Grows to 15-45 cm tall, can layer to form broad clones

Sources cited:
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Data compiled by:
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