**Plant Propagation Protocol for *Polemonium pulcherrimum***
ESRM 412 – Native Plant Production

North America Distribution Map

[Image of North America Distribution Map]

Washington State Distribution Map

[Image of Washington State Distribution Map]

Source: USDA PLANTS Database

### TAXONOMY

<table>
<thead>
<tr>
<th><strong>Family Names</strong></th>
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<tbody>
<tr>
<td><strong>Family Scientific Name:</strong></td>
<td>Polemoniaceae</td>
</tr>
<tr>
<td><strong>Family Common Name:</strong></td>
<td>Phlox[^6]</td>
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<tbody>
<tr>
<td><strong>Genus:</strong></td>
<td><em>Polemonium</em></td>
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<tr>
<td><strong>Species:</strong></td>
<td><em>Pulcherrimum</em></td>
</tr>
<tr>
<td><strong>Species Authority:</strong></td>
<td>Hook[^10]</td>
</tr>
<tr>
<td><strong>Variety:</strong></td>
<td>N/A</td>
</tr>
</tbody>
</table>
| **Sub-species:** | *Polemonium pulcherrimum* ssp. *delicatum* (Rydb.) Brand[^10]  
*Polemonium pulcherrimum* ssp. *lindleyi* (Wherry) V.E. Grant[^10]  
*Polemonium pulcherrimum* ssp. *pulcherrimum* (Hook)^[10] |
| **Cultivar:** | N/A |

<table>
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<tr>
<th><strong>Authority for Variety/Sub-species:</strong></th>
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</table>
| *P. pulcherrimum* ssp. *pulcherrimum* Hook[^10]  
*P. pulcherrimum* ssp. *delicatum* (Rydb.) Brand[^10]  
*P. pulcherrimum* ssp. *lindleyi* (Wherry) V.E. Grant[^10] |

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<thead>
<tr>
<th><strong>Common Synonym(s)</strong></th>
<th>General Synonyms of <em>Polemonium pulcherrimum</em></th>
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<tbody>
<tr>
<td><em>P. californica</em>[^14]</td>
<td></td>
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<tr>
<td><em>P. delicaturn</em>[^14]</td>
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<tr>
<td><em>P. humile</em>[^14]</td>
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<tr>
<td><em>P. pulchelum</em>[^14]</td>
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<tr>
<td><em>P. scopulinum</em>[^14]</td>
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</tr>
</tbody>
</table>
Subspecies Synonyms

*Polemonium pulcherrimum* Hook. ssp. *delicatum* (Rydb.) Brand
  - PODE4 *Polemonium delicatum* Rydb.  
  - PODES2 *Polemonium delicatum* Rydb. ssp. *scopulinum* (Greene) Wherry  
  - PODET *Polemonium delicatum* Rydb. ssp. *typicum* Wherry  
  - POPUD2 *Polemonium pulcherrimum* Hook. var. *delicatum* (Rydb.) Cronquist  
  - *P. delicatum* Rydb.; Bull.  
  - *P. pulcherrimum* ssp. *delicatum* Brand  
  - *P. pulcherrimum* var. *delicatum* Cronquist  
  - *P. pterospernum* Nels. and Cockerell  
  - *P. nevadense* Wherry  
  - *P. scopulinum* Greene ex Rydb.  

*Polemonium pulcherrimum* Hook. ssp. *lindleyi* (Wherry) V.E. Grant
  - POFA3 *Polemonium fasciculatum* Eastw.  
  - POHU2 *Polemonium humile* Lindl.  
  - POLI6 *Polemonium lindleyi* Wherry  
  - POPUL4 *Polemonium pulcherrimum* Hook. var. *lindleyi* (Wherry) J.P. Anderson  
  - *P. rotatum* Eastw  

*Polemonium pulcherrimum* Hook. ssp. *pulcherrimum*
  - POBE6 *Polemonium berryi* Eastw.  
  - POHA12 *Polemonium haydenii* A. Nelson  
  - POP17 *Polemonium pilosum* (Greenm.) G.N. Jones  
  - POPUP2 *Polemonium pulcherrimum* Hook. var. *pilosum* (Greenm.) J.F. Davids.  
  - POPUP8 *Polemonium pulcherrimum* Hook. var. *pulcherrimum*  
  - *P. caeruleum* var. *pulcherrimum* Hooker  
  - *P. mexicanum* Nutt.  
  - *P. parvifolium* Nutt. ex Rydb.  
  - *P. pulcherrimum* var. *parvifolium* Nels.  
  - *P. haydenii* A. Nels.  
  - *P. pulcherrimum* ssp. *parvifolium* var. *haydenii* Brand  
  - *P. viscosum* var. *pilosum* Greenman  
  - *P. viscosum* ssp. *pilosum* Piper  
  - *P. pulcherrimum* ssp. *parvifolium* var. *pilosum* Brand  
  - *P. shastense* f. *pilosum* Wherry  
  - *P. pulcherrimum* ssp. *parvifolium* var. *berryi* Brand  
  - *P. tevisii* Eastw  
  - *P. montrosensis* A. Nels.  
  - *P. orbiculare* Gandoger  
  - *P. haydeni* f. *orbiculare* Wherry

**Common Name(s):** Jacob’s-ladder, Showy Jacob’s-ladder, Blue Skunkleaf

**Species Code:** POPU3
**GENERAL INFORMATION**

| Geographical range | P. pulcherrimum ssp. lindleyi – USA (AK, ID, WA), CAN (BC, NT, YT) \(^{12}\)  
| | P. pulcherrimum ssp. delicatum – USA (AZ, CO, NM, NV, UT, WY) \(^{11}\)  
| | P. pulcherrimum ssp. pulcherrimum – USA (AK, CA, ID, MT, NV, OR, WA, WY), CAN (AB, BC, YT) \(^{13}\) |

| Ecological distribution: | Widespread cordilleran species \(^{4}\)  
| | Grows in scattered clumps \(^{14, 5}\)  
| | Commonly found in dry to moist, often gravelly or sandy soils, open forests, meadows, roadsides, exposed and/or grassy slopes, alpine ridges, canyon bottoms and parks \(^{5, 6, 7, 14}\)  
| | Grows in full sun, part shade or dappled light though more common in partial shade. Only grows in full sun in moist soils \(^{7}\)  
| | Mostly absent from the outer coast and rare on the Queen Charlotte Islands \(^{6}\) |

| Climate and elevation range | Found in a wide range of elevation and moisture regimes. Found at lower elevations at its northern extent though progressively higher altitudes further south. \(^{6, 7}\)  
| | Grows in hardiness zones 3b to 9b \(^{7}\) |

| Local habitat and abundance | No information available |

| Plant strategy type | No information available |

| Plant characteristics | Perennial Forb  
| | General Characteristics: Grows 5-35 cm tall, possessing several erect to ascending/sprawling stems from branched, thick stem bases. Ill smelling when bruised \(^{6}\)  
| | Leaves: Mostly basal, pinnate compound leaves (ladder like). Each leaf possess 11-25 leaflets, less than 1 cm long and 5 cm wide either opposite or offset, egg shaped to circular which are often glandular-hairy when young. \(^{6, 15}\)  
| | Flowers: Blue (though occasionally white) with yellow centers. The flowers are bell shaped, composed of 5 petals, 7-15 mm long and as wide, fused into a tube at the base and expanding to five petal lobes. The petals are rounded at the tip and grow in crowded clusters \(^{6, 7}\). Flowers typically posses 1 style, and generally 3 stigmas \(^{3}\)  
| | Fruits: Produces 3-chambered capsules with several seeds per chamber. Seeds become mucilaginous when moistened \(^{6}\)  
| | Roots- Taproot, woody, extensive and underground \(^{14}\) |

**PROPAGATION DETAILS**

| Propagation Goal | Plants |
| Propagation Method | Seeds |
| Product Type | Container (plug) |
| Stock Type: | 172 ml cone-tainers |
| Time to Grow | 6 months |
| Target Specifications | Stock Type: Container seedling  
| | Height: 6 to 10 true leaves, ~5 cm tall  
| | Width: Not applicable |
| **Root System:** Firm plug in container.  
**Propagule Collection:** Collect seeds in late June/ early July \(^9,^{14}\) when the capsules turn brown and begin to dehisce. Seeds are black at maturity. Collect seeds in paper bags and store in a well-ventilated drying shed prior to cleaning. \(^4\) |
|---|
| **Propagule Processing:** Clean seeds with a hammermill and a 1/16” screen. \(^4\)  
Seed longevity: unknown  
Seed dormancy: physiological  
Seeds/kg: 704,000  
% Purity: 100%  
% Germination: 75% |
| **Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):** Dormancy Treatment\(^4\)  
Cold Stratification  
60 day cold moist stratification in refrigerator at 3C  
Place seeds in a fine mesh bag and bury in moist peat moss in ventilated containers.  
Note:  
Seeds might require after ripening (research not on *P. pulcherimum*).\(^1\) |
| **Growing Area Preparation / Annual Practices for Perennial Crops:** For a greenhouse and outdoor nursery\(^4\)  
Sowing Method:  
Direct Seeding- cover seeds with media  
The growing media used is 6:1:1 milled sphagnum peat moss, perlite, and vermiculite mix with Osmocote controlled release fertilizer (13N: 13P\(_2\)O\(_5\): 13K\(_2\)O; 8-9 month release rate at 21°C) and Micromax fertilizer (12% S, 0.1% B, 0.5% Cu, 12% Fe, 2.5% Mn, 0.05% Mo, 1% Zn) at the rate of 1 gram of Osmocote and 0.20 gram of Micromax per 172 ml container.\(^4\)  
Maintain greenhouse temperatures of 21-25 °C during the day and 16-18 °C at night. Hand water seedlings and keep them in the greenhouse until mid May or June or when average day temp is ~18-20°C. Move seedlings to outdoor nursery for remainder of the growing season.\(^4\)  
Irrigate the seedlings every day in the early morning until the containers are thoroughly soaked.\(^4\) |
| **Establishment Phase:** Seedlings emerge 8 days after sowing\(^4\)  
Germination was found slightly higher in other species of Polemonium in light regimes of more light hours then dark.\(^1\) |
| **Length of Establishment Phase:** 4 weeks\(^4\) |
| **Active Growth Phase:** Plants are root tight 12 weeks following germination. Plants do not produce flowers in the first year.\(^4\) |
| **Length of Active Growth Phase:** 12 weeks |
| **Hardening Phase:** Fertilize plants with a 10-20-20 liquid NPK at 200 ppm during August and September. Gradually reduce irrigation in September and Octobers. Give plants one final irrigation prior to winterization.\(^4\) |
| **Length of Hardening Phase:** 4 weeks\(^4\) |
### Hardening Phase:

### Harvesting, Storage and Shipping:
- **Total Time to Harvest:** 6 weeks
- **Harvest Date:** June
- **Storage Conditions:** Overwinter in outdoor nursery under insulating foam and snow cover in snow prone areas.  

### Length of Storage
- ~5 months

### Guidelines for Outplanting
- **No information available**

### Other Comments
- Root division in the late summer has been suggested as a possible method of propagation.  
- No additional information about this method can be found.

### INFORMATION SOURCES

**References:**


Other Sources Consulted:

<table>
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<tr>
<th>Protocol Author</th>
<th>Andrew Fraser</th>
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<tbody>
<tr>
<td>Date Protocol Created</td>
<td>04/17/12</td>
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Note: This template was modified by J.D. Bakker from that available at: http://www.nativeplantnetwork.org/network/SampleBlankForm.asp