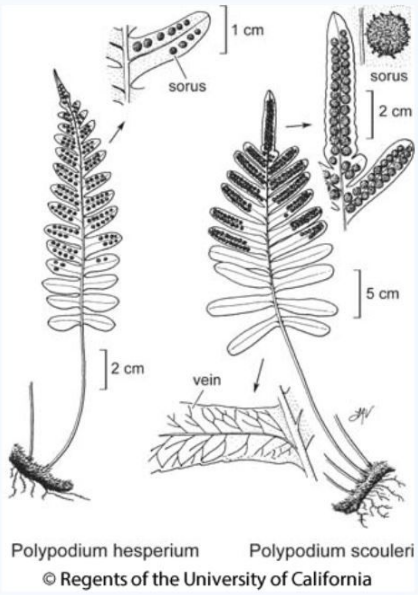
**Plant Propagation Protocol for Polypodium hesperium**
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/[POHE3.*pdf]*

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at:Tuasohttp://biology.burke.washington.edu/herbarium
/imagecollection.php?&Genus=Polypodium&Species=hesperium

| TAXONOMY | |
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| Plant Family | |
| Scientific Name | Polypodiaceae |
| Common Name | |
| Species Scientific Name | |
| Scientific Name | *Polypodium hesperium* Maxon |
| Varieties | |
| Sub-species | |
| Cultivar | |
| Common Synonym(s) | *Polypodium prolongilobum* Clute;<br>*P. vulgare* Linnaeus subsp. *columbianum* (Gilbert) Hultén;<br>*P. vulgare* var. *columbianum* Gilbert;<br>*P. vulgare* var. *hesperium* (Maxon) A. Nelson & J. F. Macbride |
| Common Name(s) | Western polypody |
| Species Code (as per USDA Plants database) | POHE3 |
| **GENERAL INFORMATION** | |

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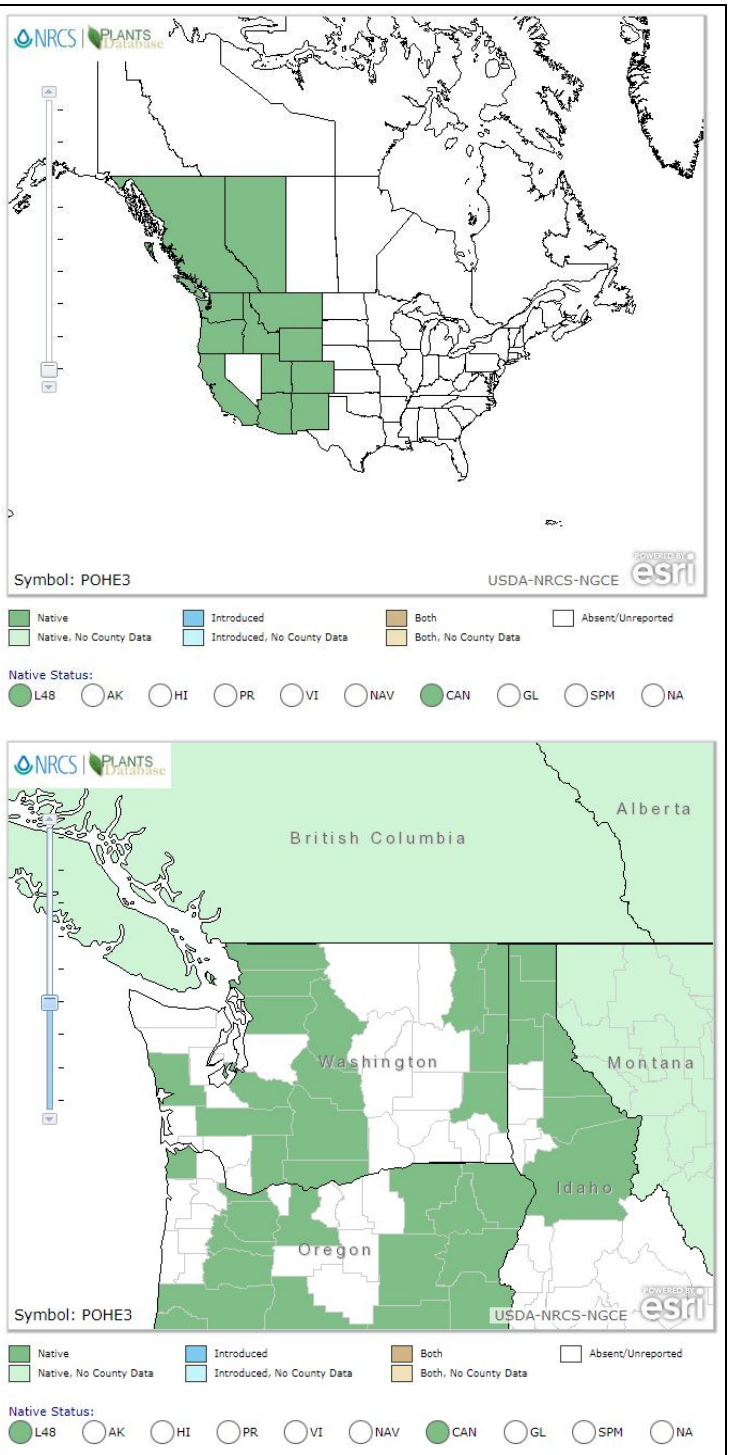
| Geographical range |  |
| Ecological distribution | Grows on both sides of the Cascade mountains from British Columbia down to California and west to Colorado and New Mexico (3,14) |
| Climate and elevation range | The elevation range is between 571'-8810' with annual precipitation between 9.2"-71.8". The hottest month |

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| | ranges between 53.8ºF - 73.0ºF, and the coldest month between 32.8ºF - 47.9ºF (4) |
| Local habitat and abundance | P. hesperium grows on moist cliffs, ledges and rock crevices, lowlands to mid-elevations in the mountains.(3) |
| Plant strategy type / successional stage | seral |
| Plant characteristics | P. hesperium is a perennial fern with deciduous growth. It has tough rhizomes up to 6 mm in diameter with drown or molten scales. The fronds are herbaceous to leathery, and grow up to 35cm. The blade is oblong to lanceolate-ovate and pinnate. The sori lie midway between the margin and midrib. They are oval when immature. (13) |
| **PROPAGATION DETAILS** | |
| Ecotype | Unknown |
| Propagation Goal | Plants |
| Propagation Method | Spores |
| Product Type | Spores |
| Stock Type | Unknown |
| Time to Grow | Exact time ranges are not available although growth is described as slow (11) |
| Target Specifications | Unknown |
| Propagule Collection Instructions | When ripe, spores will appear plump and red-brown to cinnamon-brown in colour. Cut fronds from the plant and place, sporangia side down, on a sheet of white shiny paper. Enclose this sheet in newspaper and place in a warm dry place until a fine brown powder can be seen on the paper. Collected spores can then be placed in a container, envelope or jar and placed in refrigerator. (7) |
| Propagule Processing/Propagule Characteristics | Information is not available for this species.<br><br>Information is taken from a similar species, Polypodium Glycrrhiza:<br>Collect spores when they are ripe. The spores will appear plump and and dark brownish red when they are ready to be harvested. Cut the fronds off and place them on a white paper to dry. When the spores fall of of the fonds store them in a container in a cool location, such as a fridge. should be reveal in Seed viability can be highly variable. |

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| | Immediately after collection the seed germinate at about 89.6%. After 4 years, germination declined to 53.7% (7) |
| Pre-Planting Propagule Treatments | Spores should be planted immediately. No pre-planting treatments are necessary to break dormancy. (7) |
| Growing Area Preparation / Annual Practices for Perennial Crops | Small amounts of organic matter can be place on a rocky surface or soil. Spores can be placed on a rocky soil or acidic rock faces. (5) |
| Establishment Phase Details | Place a small amount of organic material on a rocky soil or ledge and place spores. Increase moisture for propagation. (5) |
| Length of Establishment Phase | Unknown |
| Active Growth Phase | The growth phase continues throughout the whole summer and then enters domancy through the winter. Exact length or time frame is unknown. (14) |
| Length of Active Growth Phase | Unknown |
| Hardening Phase | Unknown |
| Length of Hardening Phase | Unknown |
| Harvesting, Storage and Shipping | Plants do not transport well. |
| Length of Storage | Plants should be directly outplanted. |
| Guidelines for Outplanting / Performance on Typical Sites | Plant should not be transplanted, but rather propagated on the desired site. |
| Other Comments | Plants do not grow well in nursery setting, and are rarely available. |
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| **PROPAGATION DETAILS** | |
| Ecotype | Unknown |
| Propagation Goal | Plants |
| Propagation Method | Vegetative, creeping rhizome can be divided |
| Product Type | Cuttings |
| Stock Type | Unknown |
| Time to Grow | Unknown |
| Target Specifications | Unknown |
| Propagule Collection Instructions | Creeping rhizome can be divided in early spring(5) |
| Propagule Processing/Propagule Characteristics | Unknown |
| Pre-Planting Propagule Treatments | Rhizome should be planted immediately.(5) |
| Growing Area Preparation / Annual Practices for Perennial Crops | P. Hisperaum will not propagate or grow in deep soils. They prefer a rocky soil or acidic rock faces. Require high humidity for propagation |
| Establishment Phase Details | Small amounts of organic matter can be place on a rocky surface or soil. Cutting can be placed on a rocky soil or acidic rock faces. (5) |

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| Length of Establishment Phase | Unknown |
| Active Growth Phase | Unknown |
| Length of Active Growth Phase | Unknown |
| Hardening Phase | Unknown |
| Length of Hardening Phase | Unknown |
| Harvesting, Storage and Shipping | Unknown |
| Length of Storage | Cuttings of rhizomes should be planted immediately. (5) |
| Guidelines for Outplanting / Performance on Typical Sites | Plant should not be transplanted, but rather propagated on the desired site. |
| Other Comments | Very little information is available about successful propagation of this species by rhizomes. Plants do not grow well in nursery setting, and are rarely available. They should not be collected from natural ecosystems. (12) |
| **INFORMATION SOURCES** | |
| References (full citations) | 1. Alan R. Smith 2012, *Polypodium hesperium*, in Jepson Flora Project (eds.) *Jepson eFlora*, http://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=39358<br>2. Arbury, Jim. *The Complete Book of Plant Propagation*. Mitchell Beazley, 2006.<br>3. Burke Museum. "Polypodium Hesperium." *Burke Museum of Natural History and Culture*, WA Native Plant Society, biology.burke.washington.edu/herbarium/imagecollection.php?&Genus=Polypodium&Species=hesperium<br>4. Calscape. "Western Polypody, Polypodium Hesperium." California Native Plant Society, calscape.org/Polypodium-hesperium-()<br>5. Cullina, William. *Native Ferns, Moss & Grasses*. Houghton Mifflin, 2008.<br>6. Foster, F. Gordon. *Ferns to Know and Grow*. Timber Press, 1984.<br>7. "GOERT: Garry Oak Ecosystems Recovery Team." *GOERT : for Gardeners & Restoration Practitioners : Propagation Guidelines*, www.goert.ca/propagation_guidelines/ferns_and_allies/polypodium_glycyrrhiza.<br>8. INaturalist. "Western Polypody (Polypodium Hesperium)."California Academy of Sciences, www.inaturalist.org/taxa/78693-Polypodium-hesperium |

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| | 9. Lellinger, David B. *A Field Manual of the Ferns & Fern-Allies of the United States & Canada*. Smithsonian Institution Press, 1993.<br>10. McVicar, Jekka, and Marianne Majerus. *Seeds: the Ultimate Guide to Growing Successfully from Seed*. Kyle Cathie LImited, 2008.<br>11. Mickel, John. *Ferns for American Gardens*. Timber Press, 2005.<br>12. Olsen, Sue. *Encyclopedia of Garden Ferns*. Timber Press, 2007.<br>13. "Polypodium hesperium" Flora of North America, vol. 2.http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=233500978<br>14. Robson, Kathleen A., et al. *Encyclopedia of Northwest Native Plants for Gardens and Landscapes*. Timber Press, 2008.<br>15. USDA. "Plants Profile for Polypodium Hesperium (Western Polypody)." *Plant Database*, USDA, plants.usda.gov/core/profile?symbol=POHE3. |
| Other Sources Consulted | ● Arbury, Jim. *The Complete Book of Plant Propagation*. Mitchell Beazley, 2006.<br>● "Polypodium Hesperium - Maxon." *NatureServe Explorer*, Nature Serve, 2017, explorer.natureserve.org/servlet/NatureServe?searchName=Polypodium%2Bhesperium.<br>● "Polypodium Hesperium." *Eastern Washington University*,web.ewu.edu/ewflora/Polypodiaceae/Polypodium%20hesperium.html.<br>● SEINet. "Polypodium Hesperium." *SEINet - Arizona Chapter*, National Science Foundation Grants, swbiodiversity.org/seinet/taxa/index.php?taxon=1929. |
| Protocol Author | Julia Bakke |
| Date | 05/16/18 |