



Plant Propagation Protocol for *Prosartes hookeri* Torr.

ESRM 412 – Native Plant Production

Protocol URL: <https://courses.washington.edu/esrm412/protocols/PRHO2.pdf>

TAXONOMY	
Plant Family	
Scientific Name	Liliaceae (USDA 2016)
Common Name	Lily family (USDA 2016)
Species Scientific Name	
Scientific Name	<i>Prosartes hookeri</i> Torr. (USDA 2016)
Varieties	<i>Prosartes hookeri</i> Torr. var. <i>hookeri</i> <i>Prosartes hookeri</i> var. <i>oregana</i> (S. Watson) Kartesz <i>Prosartes hookeri</i> var. <i>parvifolia</i> (S. Watson) Kartesz <i>Prosartes hookeri</i> var. <i>trachyandra</i> (Torr.) Kartesz (USDA 2016)
Sub-species	None noted in USDA PLANTS database
Cultivar	None noted in literature
Common Synonym(s)	<i>Disporum hookeri</i> (Pojar 1994,)
Common Name(s)	Drops-of-gold (USDA 2016) Oregon drops of gold, Hookers fairybells (Pojar 1994)
Species Code (as per USDA Plants database)	PRHO2
GENERAL INFORMATION	
Geographical range	

	 <p>(USDA 2016)</p>
Ecological distribution	Occurs on both sides of the Cascades, from BC south to Bakersville CA, east to Alta UT, north ID and west MT (Pojar 1994, Hitchcock 1976, Calflora 2016). Oddly, a limited population has also been found in Ontonagon County, Michigan (Larson 2000).
Climate and elevation range	Found in areas with 24 to 127 inches of rain annually over a 5-10 month wet season, and a general temperature range of 26° F to 98° F. Found in hardiness zones 7b to 10a (Calflora 2016). Found at fairly low elevations - <2070 m (Calflora 2016) or <1600 m (Jepson Herbarium 1993).
Local habitat and abundance	Found in moist and shaded coniferous or mixed hardwood-coniferous forest (Pojar 1994, Hitchcock 1976). Common in the western United States, but the small, isolated populations in Michigan is endangered and considered critically imperiled due to extreme rarity (Larson 2000).
Plant strategy type / successional stage	Larson notes that it is often found in wooded areas to highly shaded mesic old growth forests (2000), which indicates that <i>P. hookeri</i> is a fairly late successional species.
Plant characteristics	Perennial spring growth, generally from slender rhizomes. Forb in forest understory. Plant structure is arching stems with few branches up to 1 m in height. Creamy white hanging flowers from tips of branch in groups of 1-3 (usually 2), turn into yellow and then orange-red berries with 4-6 seeds. Stem and berries often hairy. (Pojar 1994).
PROPAGATION DETAILS	
Ecotype	Unable to find specific site information
Propagation Goal	Root cuttings (Kruckeberg 1996) to form a greater quantity of bulbs and individual plants
Propagation Method	Vegetative
Product Type	Propagules (rhizomes/bulbs)
Stock Type	N/A
Time to Grow	At least 1 year, may be longer if larger bulbs or a greater quantity are desired (Jefferson-Brown & Howland 1995) – inadequate information available

Target Specifications	Rhizomes/bulbs to outplant
Propagule Collection Instructions	Propagators may responsibly collect root cuttings from healthy, adequately sized native populations of <i>P. hookeri</i> . Root division should occur as soon as the foliage has faded (at the end of the growing season) (Macfie 1947). Rhizomatous lily roots of North America, such as <i>P. hookeri</i> , grow on a horizontal axis, extending several inches each year and forming new bulbs at the ends of stolons. Large and small bulbs along a root system may be cut apart and replanted to establish new, separate plants (Rockwell et al 1961).
Propagule Processing/Propagule Characteristics	The divided roots should be replanted immediately (Macfie 1947).
Pre-Planting Propagule Treatments	Macfie notes that root division will be easier if the root clumps are dipped into a bucket of water to clean them before replanting (1947).
Growing Area Preparation / Annual Practices for Perennial Crops	At time of initial harvest (late summer, early fall) the root cuttings should be planted in beds. They will be dormant through the winter, and will continue growing in the beds over the following summer. Root cuttings may be taken from the bed at the end of the summer of growth and up-planted (Rockwell et al 1961). More bulblets will form with greater rooting. Rooting may be encouraged by planting rhizome cuttings in open, humus-rich soil with 4-6 inches of soil above the bulbs. The media should be kept moist but not overly wet (Jefferson-Brown & Howland 1995).
Establishment Phase Details	N/A
Length of Establishment Phase	N/A
Active Growth Phase	Spring to late summer. Plant dies back entirely to bulb in the winter (Pojar 1994).
Length of Active Growth Phase	The growing season is 3-9 months long (Calflora 2016).
Hardening Phase	No information found
Length of Hardening Phase	No information found
Harvesting, Storage and Shipping	Rhizomes need to remain in soil (Macfie 1947).
Length of Storage	Rhizomes may be divided and kept in bed for multiple years, expanding in size naturally (Fox 1985).
Guidelines for Outplanting / Performance on Typical Sites	No information found, though they typically flower in May/June. May reproduce vegetatively or via seeds once established (Larson 2000).
Other Comments	Little is known about seed dispersal mechanisms, germination requirements, pollination requirements or population density required for

adequate genetic diversity (Larson 2000).
 Propagation from seed is an option (Kruckeberg 1996), but so little has been published about propagation methods from seed that I focused on vegetative propagation.
 Seed and root cutting collection from the endangered Michigan population would not be allowed without government permission.
 Banana slugs may play a role in *Prosartes* seed dispersal – one study found that *P. smithii* (a closely related species in similar habitats of the PNW) seeds germinated readily after being passed through a banana slug (Wilson 2016).

INFORMATION SOURCES

References	<p>Calflora. (n.d.). Drops of gold Plant/Location Suitability Online Database. Retrieved May 03, 2016, from http://www.calflora.org/entry/compare.html?crn=10263</p> <p>Hitchcock, C. L., & Cronquist, A. (1973). <i>Flora of the Pacific Northwest: An illustr. manual. Illustr. by Jeanne R. Janish</i>. Seattle: Univ. of Washington Press.</p> <p>Jefferson-Brown, M. J., & Howland, H. (1995). <i>The gardener's guide to growing lilies</i>. Portland, Or.: Timber Press.</p> <p>Jepson Herbarium. (1993). UC/JEPS: Jepson Manual treatment for Liliaceae. Retrieved May 03, 2016, from http://ucjeps.berkeley.edu/cgi-bin/get_JM_treatment.pl?8349,8543,8544</p> <p>Jones, S.B. Jr. and L.E. Foote. 1990. Gardening with Native Wild Flowers. Timber Press, Portland, OR. pp. 61-62.</p> <p>Kruckeberg, A. R. (1996). <i>Gardening with Native Plants of the Pacific Northwest</i> (2nd ed.). Seattle, WA: University of Washington Press.</p> <p>Larson, N. (2000, September). <i>Conservation Assessment for Fairy Bells (Disporum hookeri)</i> (Rep.). Retrieved May 3, 2016, from USDA Forest Service, Eastern Region website: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm91_054139.pdf</p> <p>Macfie, D. T. (1947). <i>Lilies for the garden and greenhouse</i> (2nd ed.). London: W.H. & L. Collingridge.</p> <p>Pojar, J., MacKinnon, A., & Alaback, P. B. (1994). <i>Plants of the Pacific Northwest coast: Washington, Oregon, British Columbia & Alaska</i>. Redmond, WA: Lone Pine Pub.</p> <p>Rockwell, F. F., Grayson, E. C., & Graaf, J. D. (1961). <i>The complete</i></p>
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	<p><i>book of lilies: How to select, plant, care for, exhibit, and propagate lilies of all types.</i> Garden City, NY: Doubleday.</p> <p>USDA NRCS National Plant Data Team. (n.d.). Plants Profile for <i>Prosartes hookeri</i> (drops-of-gold). Retrieved May 03, 2016, from http://plants.usda.gov/core/profile?symbol=PRHO2</p> <p>Gervais, J., Traveset, A., and Wilson, M. F. (1998). <i>The Potential for Seed Dispersal by the Banana Slug (Ariolimax columbianus)</i> The American Midland Naturalist, 140(1), 103–110.</p>
Other Sources Consulted	<p>Franklin, J. F., & Dyrness, C. T. (1988). <i>Natural vegetation of Oregon and Washington</i> (2nd ed.). Portland, Or.: Pacific Northwest Forest and Range Experiment Station, Forest Service, U.S. Dept. of Agriculture.</p> <p>Hartmann, H. T., & Kester, D. E. (1975). <i>Plant propagation: Principles and practices</i> (8th ed.). New Delhi: Prentice-Hall.</p> <p>Leigh, M. (1999). <i>Grow your own native landscape: A guide to identifying, propagating & landscaping with western Washington native plants.</i> Olympia, WA: Native Plant Salvage Project, Washington State University Cooperative Extension, Thurston County.</p> <p>Potash, L. L., & Aubry, C. A. (1997). <i>Native plant notebook: Mt. Baker-Snoqualmie National Forest</i> (2nd ed.). Sedro-Woolley, WA: North Cascades Institute.</p> <p>Rose, R., Chachulski, C. E., & Haase, D. L. (1998). <i>Propagation of Pacific Northwest native plants.</i> Corvallis: Oregon State University Press.</p> <p>Young, J. A., & Young, C. G. (1986). <i>Collecting, processing, and germinating seeds of wildland plants.</i> Portland, Or.: Timber Press.</p>
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