**Plant Propagation Protocol for *[Erythranthe washingtonensis]***
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/*2024/MIWA2.pdf*

| TAXONOMY | |
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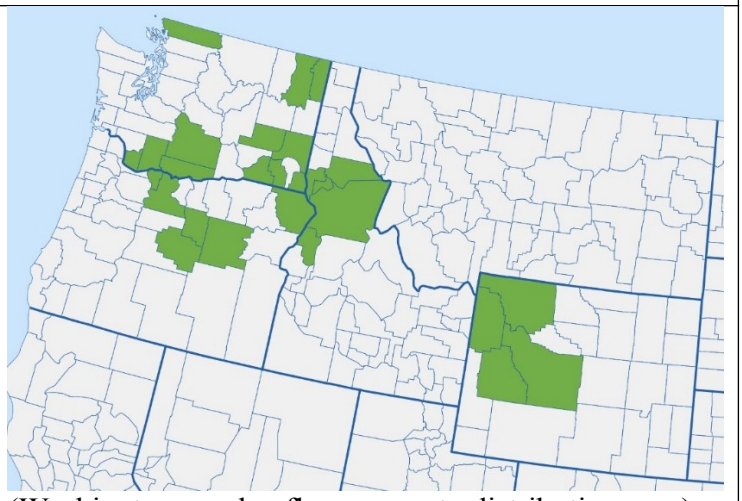
| Plant Family | |
| Scientific Name | Phrymaceae |
| Common Name | Lopseed family |
| Species Scientific Name | |
| Scientific Name | *Erythranthe washingtonensis* (Gand.) G.L. Nesom |
| Varieties | |
| Sub-species | |
| Cultivar | |
| Common Synonym(s) | *Mimulus washingtonensis* (Gand.) |
| Common Name(s) | Washington monkeyflower |
| Species Code (as per USDA Plants database) | MIWA2 |
| **GENERAL INFORMATION** | |
| Geographical range |  (Washington monkeyflower county distribution map) |

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| | Specimens collected from states: ID, OR, WA, WY<br><br>Map created from county distribution data from USDA Plants Database and Burke Herbarium, and from specimen report catalogs hosted by SEINet data portal. [2, 4, 7]<br><br>More discerning reviews of specimens collected have led scientists to limit the current distribution to northern OR and southern WA in the Columbia River basin. [6] |
| Ecological distribution | Found along damp/moist riverbanks, rocky cliffs and crevices, seepage/creek drainage areas, and open slopes. [2, 8] |
| Climate and elevation range | Grows in moist, sandy/gravelly soils in otherwise dry sites. [4, 8]<br><br>Historically found up to 8000(-10000) feet, current elevation range is 700-1300 meters. [2, 8] |
| Local habitat and abundance | Found at basaltic sites alongside Ponderosa pine, Douglas-fir, *Juniperus*, *Eriogonum*, and *Pentesmon deustus.* [2] |
| Plant strategy type / successional stage | Stress-tolerator, survives in dry and arid conditions.<br><br>While other *Erythranthe* and *Mimulus* species are considered weedy and spread rapidly after disturbance, *E. washingtonensis* needs an undisturbed basaltic substrate to succeed. Breeding barriers can develop in small areas and limit outbreeding. [8] |
| Plant characteristics | Annual forb with slender, erect stems 6-25 cm tall, glandular-pubescent or puberulent; leaves 4-16mm long, 2-11 cm wide, entire or denticulate margins, ovate to lanceolate, petioles 2-14mm long. [1, 4, 8]<br><br>Flower axillary, buds nodding, funnelform corolla are yellow, 1-2 cm long, scattered red dots on lower lip, 4 stamens. [1, 4, 8]<br><br>Seeds ovoid or oblong, brown, 0.2-0.5mm long. [8] |
| **PROPAGATION DETAILS [5, 10, 12, 14]** | |
| Ecotype | |
| Propagation Goal | plants |
| Propagation Method | seed |
| Product Type | Container (plug) |
| Stock Type | 164 ml (10in^3) containers |
| Time to Grow | 4 months [12] |

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| Target Specifications | Firm root plug in container |
| Propagule Collection Instructions | Collect seeds in early fall when seed capsules turn brown and begin to dehisce. Keep seeds dry and store in paper bags/envelopes in a refrigerator before treatment.[5] |
| Propagule Processing/Propagule Characteristics | Seed density unknown. Seeds shaken from capsules do not need cleaning. Seeds require chilling to break dormancy. [8] |
| Pre-Planting Propagule Treatments | Moist, cold stratification. [5]<br>Duration unknown. |
| Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc.) | Greenhouse.<br><br>Growth medium used is 40:20:20:20 peat:composted fir bark:perlite:pumice. Seeds surface sown into 164ml conetainers and covered lightly with growing medium. Water deeply. [10] |
| Establishment Phase Details | Germination usually begins after 6 days and can last 2-3 weeks. Seeds do not germinate preferentially under light or dark conditions. [12] |
| Length of Establishment Phase | 2-3 weeks [12] |
| Active Growth Phase | Water plants thoroughly every day.<br>Fertilize twice per week with a complete, water soluble fertilizer containing micro-nutrients. [12] |
| Length of Active Growth Phase | 2 months [12] |
| Hardening Phase | No information available. |
| Length of Hardening Phase | 2 weeks [12] |
| Harvesting, Storage and Shipping | No information available. |
| Length of Storage | 0 |
| Guidelines for Outplanting / Performance on Typical Sites | No information available. |
| Other Comments | This protocol is based on several protocols for other species in the *Mimulus/Erythranthe* genus (overlap exists due to taxonomic classification)[3, 8], as well as a protocol for species *Penstemon deustus*. *P. deustus* is a wildflower that is found at the same sites as *E. washingtonensis* and prefers a substrate that is closer to |

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| | the one preferred by *E. washingtonensis* than the substrates preferred by *M. guttatus*, *M. cardinalis*, and *M. lewisii*. [11] |
| **INFORMATION SOURCES** | |
| References | See below |
| Other Sources Consulted | https://www.fs.usda.gov/r6/icbemp/science/croft_3.pdf |
| Protocol Author | Derek Cullen |
| Date Protocol Created or Updated | 05/21/2024 |

## References:


[1] *Erythranthe Washingtonensis*. WA DNR, www.dnr.wa.gov/publications/amp_nh_erwax.pdf.

[2] "Erythranthe Washingtonensis." *SEINet Portal Network*, SEINet, swbiodiversity.org/seinet/taxa/index.php?taxon=mimulus+washingtonensis&formsubmit=Search+Terms#. Accessed 22 May 2024.

[3] "Erythranthe Washingtonensis (Gand.) G.L.Nesom." *Plants of the World Online*, Royal Botanic Gardens Kew, powo.science.kew.org/taxon/urn:lsid:ipni.org:names:77120197-1. Accessed 22 May 2024.

[4] Giblin, Dave, and Hattie Palmer. "Erythranthe Washingtonensis." *Burke Herbarium Image Collection*, Burke Museum, 2024, burkeherbarium.org/imagecollection/taxon.php?Taxon=Erythranthe%20washingtonensis. Accessed 22 May 2024.

[5] Luna, Tara; Evans, Jeff; Wick, Dale; Hosokawa, Joy. 2008. Propagation protocol for production of Container (plug) *Mimulus lewisii* Pursh. plants 800 ml containers; USDI NPS - Glacier National Park West Glacier, Montana. In: Native Plant Network. URL: https://NativePlantNetwork.org (accessed 2024/05/22). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.

[6] Meinke, Robert. *Systematic and Reproductive Studies of Mimulus (Scrophulariaceae) in the Pacific Northwest: Implications for Conservation Biology.* 1992, file:///C:/Users/Derek/Downloads/MeinkeRobertJames1992.pdf.

[7] "Mimulus Washingtonensis Gandog." *USDA Plants Database*, USDA, plants.usda.gov/home/plantProfile?symbol=MIWA2. Accessed 22 May 2024.

[8] Morton Eaton Peck. *A Manual of the Higher Plants of Oregon*. 1941, p. 652.

[9] Nesom, Guy L., and Naomi S. Fraga. "Erythranthe Washingtonensis." *Flora of North America*, Flora of North America Association, 2012, floranorthamerica.org/Erythranthe_washingtonensis. Accessed 22 May 2024.

[10] Riley, Lee E.; Klocke, Allison. 2018. Propagation protocol for production of Container (plug) *Penstemon deustus* Plants 164 ml (10 in3) container; USDA FS - Dorena Genetic Resource Center Cottage Grove, Oregon. In: Native Plant Network. URL: https://NativePlantNetwork.org (accessed 2024/05/22). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.

[11] Shock, Clint, et al. "Wildflower Seed Production." *Oregon State University College of Agricultural Sciences*, Oregon State University, 7 Mar. 2017, agsci.oregonstate.edu/mes/crops/wildflower-seed-production.

[12] Skinner, David M,. 2003. Propagation protocol for production of Container (plug) *Mimulus guttatus* DC plants USDA NRCS - Pullman Plant Materials Center Pullman, Washington. In: Native Plant Network. URL: https://NativePlantNetwork.org (accessed 2024/05/22). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.

[13] “Washington Monkeyflower - Erythranthe Washingtonensis.” *Fieldguide.mt.gov*, fieldguide.mt.gov/wa/?species=erythranthe%20washingtonensis. Accessed 22 May 2024.

[14] Young, Betty. 2002. Propagation protocol for production of Container (plug) *Mimulus cardinalis* Dougl. ex Benth. plants Deepot 40; San Francisco, California. In: Native Plant Network. URL: https://NativePlantNetwork.org (accessed 2024/05/22). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.