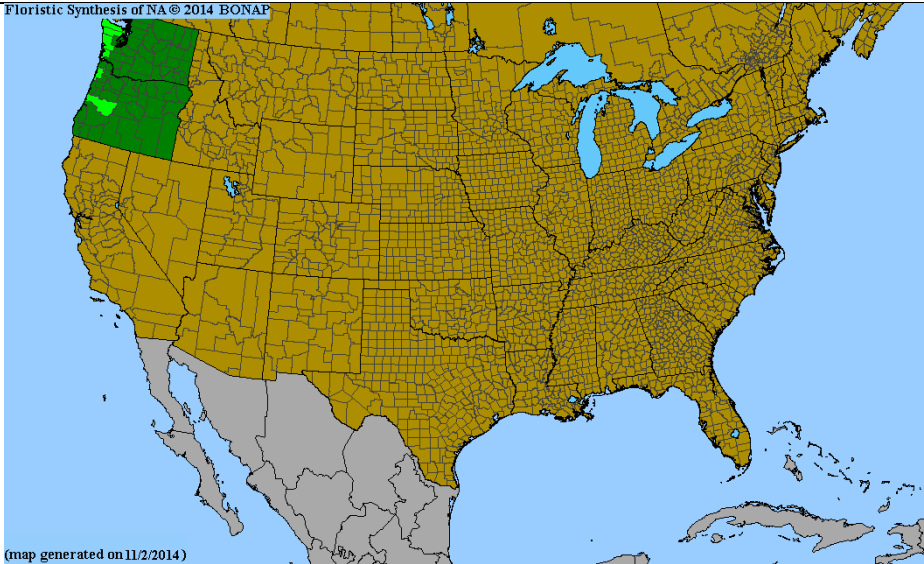



Plant Propagation Protocol for *Boykinia intermedia*

ESRM 412 – Native Plant Production

URL: <https://courses.washington.edu/esrm412/protocols/2024/BOIN4.pdf>

TAXONOMY	
Plant Family	
Scientific Name	Saxifragaceae ¹ .
Common Name	Saxifrage Family ¹ .
Species Scientific Name	
Scientific Name	<i>Boykinia intermedia</i> (Piper) G.N. Jones ¹
Varieties	N/A
Sub-species	N/A
Cultivar	N/A
Common Synonym(s)	<i>Boykinia major</i> A. Gray var. <i>intermedia</i> Piper [HC] ¹ <i>Therofon intermedium</i> (Piper) A. Heller ² <i>Therofon major subsp. intermedium</i> (Piper) Piper ²
Common Name(s)	Greater boykinia, Sierran brookfoam ¹
Species Code (as per USDA Plants database)	BOIN4 ³
GENERAL INFORMATION	
Geographical range	 <p>Floristic Synthesis of NA © 2014 BONAP (map generated on 11/2/2014)</p> <p>Map sourced from the Biota of North America Program (BONAP)⁴. Dark green indicates that species is present in state; bright green indicates that species is present in county.</p>
Ecological distribution	Temperate rainforest on the coast of the Olympic Peninsula and northwestern Oregon. ¹

Climate and elevation range	Entire range is situated in mild coastal climate between the central Olympic Peninsula and northwestern Oregon. ¹ All known sites are situated within USDA Hardiness Zones 8B-9A, corresponding to winter average lows of 15-20 degrees Fahrenheit with only exceptional dips below. ⁵ Summer temperatures average between 70 and 75 degrees Fahrenheit, with occasional heat waves; <i>Boykinia intermedia</i> occurs in a climate with low summer rainfall, wherein precipitation peaks in the early winter ⁶ . This species has been recorded between 10 – 700 meters in elevation ² .
Local habitat and abundance	Moist woods, meadows, streambanks, roadside ditches; generally, partly shaded sites where year-round soil moisture remains. ¹ The species is also regularly associated with bogs in the vicinity of Humptulips, Washington ⁷ . Associated species include <i>Pseudotsuga menziesii</i> ⁷ , <i>Thuja plicata</i> ⁷ , <i>Tsuga heterophylla</i> ⁷ , <i>Gaultheria shallon</i> ⁷ , <i>Rubus spectabilis</i> ⁷ , <i>Blechnum spicant</i> ⁷ , <i>Pteridium aquilinum</i> ⁷ , <i>Lysichiton americanus</i> ⁷ , <i>Maianthemum dilatatum</i> ⁷ , <i>Cornus unalaschensis</i> ⁷ , <i>Linnaea borealis</i> ⁷ , <i>Spiraea douglasii</i> ⁷ , <i>Anemone oregana</i> var. <i>felix</i> ⁷ , <i>Alnus rubra</i> ⁸ , <i>Tolmiea menziesii</i> ⁸ . Occasionally, <i>Boykinia intermedia</i> occurs sympatrically with <i>Boykinia occidentalis</i> ⁹ .
Plant strategy type / successional stage	<i>Boykinia intermedia</i> is a rhizomatous species that colonizes disturbed and late-successional sites wherever there is moisture ^{1,7,8} .
Plant characteristics	<p>Perennial, herbaceous saxifrage with slender, glandular-hairy stems. Alternate leaves are heavily toothed on 3-7 lobes; plants grow to a height of 30-70cm. Inflorescences are pyramidal sprays of small and white 5-petaled flowers¹. This species is distinguished from <i>Boykinia major</i> – which does not occur near the range of <i>B. intermedia</i> and is absent entirely from the state of Washington – by the more stoloniferous habit of <i>B. intermedia</i>, more slender stems in <i>B. intermedia</i>, pyramidal inflorescences of <i>B. intermedia</i> vs. flat-topped in <i>B. major</i>, and longer petals in <i>B. intermedia</i> that taper less sharply at the base¹.</p> 





Boykinia intermedia in situ (own photos).

PROPAGATION DETAILS: FROM SEED

Ecotype	N/A
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug).
Stock Type	Firm, well-rooted plug in 10in ³ Ray Leach Super cell.
Time to Grow	[NOTE: This information is based on <i>Boykinia occidentalis</i> , a closely-related species growing in similar conditions] 16-17 weeks ¹⁰ .
Target Specifications	Germinants are ready to plant as soon as their roots fill out in their plug container.
Propagule Collection Instructions	Collect seeds at the end of summer from capsules at the end of flowering stalks ² . Seed collection is possible by shaking dehisced seed pods into bag, or by crushing capsules and separating chaff.
Propagule Processing/Propagule Characteristics	Small black, tuberculate seeds ² .
Pre-Planting Propagule Treatments	[NOTE: This information is based on <i>Boykinia occidentalis</i> , a closely-related species growing in similar conditions.]

	Clean seeds in a fine-mesh bag suspended in an aerated 1% hydrogen peroxide solution for 24 hours, rinse, then submerge in aerated water for another 24 hours; no stratification is required, sow right away into container ¹⁰ .
Growing Area Preparation / Annual Practices for Perennial Crops	[NOTE: This information is based on <i>Boykinia occidentalis</i> , a closely-related species growing in similar conditions.] Moisture-retentive soil with good aeration via pumice or perlite ¹⁰ .
Establishment Phase Details	[NOTE: This information is based on <i>Boykinia occidentalis</i> , a closely-related species growing in similar conditions.] Germination is mostly uniform and largely completes by the end of a 14-day time period. Fertilization boosts establishment ¹⁰ .
Length of Establishment Phase	[NOTE: This information is based on <i>Boykinia occidentalis</i> , a closely-related species growing in similar conditions.] 2-3 weeks ¹⁰ .
Active Growth Phase	[NOTE: This information is based on <i>Boykinia occidentalis</i> , a closely-related species growing in similar conditions.] Seedlings grow rapidly in first growing season; flowering can occur in first year if seeds are sown early enough in growing season ¹⁰ .
Length of Active Growth Phase	[NOTE: This information is based on <i>Boykinia occidentalis</i> , a closely-related species growing in similar conditions.] 14 weeks ¹⁰ .
Hardening Phase	[NOTE: This information is based on <i>Boykinia occidentalis</i> , a closely-related species growing in similar conditions.] Plants can be moved outside in September at the end of growing season, dormancy will be triggered by onset of late fall weather ¹⁰ .
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	[NOTE: This information is based on <i>Boykinia occidentalis</i> , a closely-related species growing in similar conditions.] Harvest in October, outplant in fall, no storage necessary; adequate irrigation crucial before shipping containers ¹⁰ .
Length of Storage	N/A
Guidelines for Outplanting /	As a species dependent on a moderate moisture level for establishment, fall outplanting of seedlings in places is likely ideal for this species, allowing it to develop a fine root hair system by the time

Performance on Typical Sites	local rain patterns diminish for the growing season in late spring; however, care should be taken to select sites that are not completely waterlogged in winter, to prevent rot before a proper root system is established to accommodate saturated moisture levels during dormancy ¹⁰ .
Other Comments (including collection restrictions or guidelines, if available)	Many of the known localities are within Olympic National Forest and Olympic National Park; proper collection permits are a prerequisite for these sites ¹¹ . It should be easily possible to propagate <i>Boykinia intermedia</i> through rhizome division early in the growing season. However, data on commercial-scale vegetative propagation for this genus is not available, and this method may not be economically viable for restoration efforts, especially as compared to the ease of seed propagation for <i>Boykinia intermedia</i> .
INFORMATION SOURCES	
References	<ol style="list-style-type: none"> 1. Giblin, D., Legler, B. (n.d.). <i>Boykinia intermedia</i> – Burke Herbarium Image Collection. Retrieved April 22, 2024, from https://burkeherbarium.org/imagecollection/taxon.php?Taxon=Boykinia%20intermedia 2. Gornall, R. J. (n.d.). <i>Boykinia intermedia</i> – Flora of North America. Retrieved April 22, 2024, from http://dev.semanticfna.org/Boykinia_intermedia 3. United States Department of Agriculture, Natural Resources Conservation Service. (n.d.). <i>Boykinia intermedia</i> – USDA Plants Database. Retrieved April 22, 2024, from https://plants.usda.gov/home/plantProfile?symbol=BOIN4 4. Kartesz, J.T., The Biota of North America Program (BONAP). (2015). <i>Boykinia intermedia</i> – North American Plant Atlas. Retrieved April 22, 2024 from https://bonap.net/Napa/TaxonMaps/Genus/County/Boykinia 5. United States Department of Agriculture. (n.d.). <i>2023 USDA Plant Hardiness Zone Map</i>. Retrieved April 22, 2024 from https://planthardiness.ars.usda.gov/ 6. National Oceanic and Atmospheric Administration, National Weather Service. (n.d.). <i>NOWData – NOAA Online Weather Data</i>. Retrieved April 22, 2024 from https://www.weather.gov/wrh/climate?wfo=sew 7. Herbarium specimen. U.S.A., Washington, Grays Harbor County: To the west side of Route 101, about 5.8 miles north of the bridge over the Humptulips River. Elev. 400 ft. 47° 17' 56.4" N, 123° 54' 33" W; UTM Zone 10, 431261E, 5238791N. Datum: WGS 84. Doug Goldman 3524, 9 Jul 2005. WTU

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