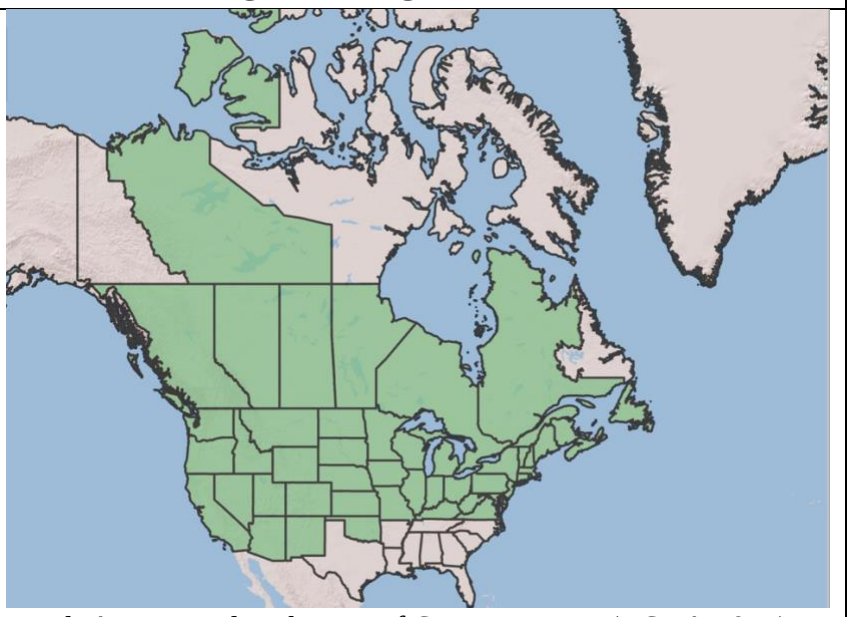
Plant Propagation Protocol for *Sparganium eurycarpum*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/2022/SPEU.pdf

Sparganium eurycarpum at Loomis Lake, WA (Parsons 2004)

TAXONOMY	
Plant Family	
Scientific Name	Sparganiaceae
Common Name	Bur-reed
Species Scientific Name	
Scientific Name	*Sparganium eurycarpum* Engelm.
Varieties	Not applicable for *S. eurycarpum*.
Sub-species	Not applicable for *S. eurycarpum*.
Cultivar	Not applicable for *S. eurycarpum*.
Common Synonym(s)	*Sparganium californicum* Greene (USDA 2022) *Sparganium eurycarpum* Engelm. ssp. *eurycarpum* (USDA 2022) *Sparganium greenei* Morong (Knoke 2022)
Common Name(s)	broadfruit bur-reed (USDA 2022)
Species Code (as per USDA Plants database)	SPEU

GENERAL INFORMATION	
Geographical range	 North American distribution of *S. eurycarpum* (USDA 2022)  Pacific Northwest county-level distribution of *S. eurycarpum* (USDA 2022)
Ecological distribution	Wet meadows to shallow marshes, mostly emersed (Knocke 2022).
Climate and elevation range	Lowlands (eFloras 2008)

Local habitat and abundance	Locally common to abundant in fresh to somewhat brackish waters across the continent but is less frequent toward its northern and southern limits (eFloras 2008).
Plant strategy type / successional stage	Grows mostly in neutral-to-alkaline, hard, and even brackish waters on mud, sand, or gravel, sometimes among boulders on wave-washed shores, tolerant of some desiccation (eFloras 2008).
Plant characteristics	Dioecious, aquatic perennial from rhizomes, stems erect 0.6–1.2 m tall. Leaves flat, slightly keeled beneath, 0.3–0.8 m long and 8–15 mm broad. Flowers (May–October) in globose clusters toward the tip of the main stem; inflorescence branched, branches with 5–12 staminate heads and 1–2 pistillate heads. 2 linear stigmas 2 mm long. Fruit a nutlet-like achene, 2-seeded, rounded up to 10 mm long, narrowed very abruptly to the stylar beak (Knoke 2022).
PROPAGATION DETAILS	
Ecotype	Not applicable.
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (pot)
Stock Type	No specific information found for *S. eurycarpum*.
Time to Grow	From sowing (soon after seed ripening) until planting in the following summer (Favorite & Anderson 2017).
Target Specifications	No specific information found for *S. eurycarpum*. *S. emersum*: well-developed crowns, roots, and rhizomes filling soil profile in container (Bartow 2015).
Propagule Collection Instructions	No specific information found for *S. eurycarpum*.
Propagule Processing/Propagule Characteristics	1,468 seeds/pound (USDA 2022).
Pre-Planting Propagule Treatments	Seeds should be sown as soon as they are ripe and collected. The seeds lose viability quickly if they are allowed to dry out. If immediate sowing is inconvenient, store seeds in moist peat, or substitute in a plastic bag and keep frost-free (Favorite & Anderson 2017). *S. emersum*: 45 days cool (38ºF)/moist stratification best facilitated germination (Bartow 2015).
Growing Area Preparation / Annual Practices for Perennial Crops	No specific information found for *S. eurycarpum*.
Establishment Phase Details	Plants should be sown in pots standing in 2–3 cm of water (Favorite & Anderson 2017).

Length of Establishment Phase	No specific information found for *S. eurycarpum*.
Active Growth Phase	Place the seedlings into individual pots when they are large enough to handle and gradually increase the depth of water with plant growth (Favorite & Anderson 2017).
Length of Active Growth Phase	No specific information found for *S. eurycarpum*.
Hardening Phase	Smaller potted divisions should be allowed to grow in a cold frame until they are well established and ready for summer out-planting (Favorite & Anderson 2017).
Length of Hardening Phase	No specific information found for *S. eurycarpum*.
Harvesting, Storage and Shipping	No specific information found for *S. eurycarpum*.
Length of Storage	From end of growing season to the following summer for out-planting (Favorite & Anderson 2017).
Guidelines for Outplanting / Performance on Typical Sites	Large divisions can be planted directly into their permanent positions (Favorite & Anderson 2017).
Other Comments	Some of the propagation details were supplemented with propagation details from *S. emersum*. This is not to say those would result in successful propagation but instead to provide additional context and possibilities. USDA PLANTS Database suggests that propagation by sprigs is possible (USDA 2022). Further research and experimentation may be beneficial for the enhancement of propagation methods.
INFORMATION SOURCES	
References	Bartow A. 2015. Propagation protocol for production of Container (plug) *Sparganium emersum* plants USDA NRCS - Corvallis Plant Materials Center Corvallis, Oregon. In: Native Plant Network. US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources; [accessed 2022 May 25]. https://NativePlantNetwork.org. eFloras. 2008. St. Louis, MO: Missouri Botanical Garden; Cambridge, MA: Harvard University Herbaria. http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=222000366. Favorite J, Anderson MK. 2017. Plant Guide – broadfruit bur-reed. United States Department of Agriculture, Natural Resources Conservation Service; [accessed 2022 May 25]. https://plants.sc.egov.usda.gov/DocumentLibrary/plantguide/pdf/cs_speu.pdf.

	Knoke D. Burke Herbarium Image Collection – Sparganium eurycarpum. Seattle, WA: Burke Museum Herbarium; 2022; [accessed 2022 May 25]. https://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Sparganium%20eurycarpum. Parsons J. 2004. *Sparganium eurycarpum*. Loomis Lake, Pacific County, WA. USDA, NRCS. 2022. The PLANTS Database, 05/25/2022. National Plant Data Team, Greensboro, NC USA; [accessed 2022 May 25]. https://plants.usda.gov/home/plantProfile?symbol=SPEU.
Other Sources Consulted	Belyakov EA, Lapirov AG. 2020. Seed Productivity and Peculiarities of Floating of Generative Diaspores of Some European Species of the Genus *Sparganium* L. Inland water biology. 12(Suppl 2):42–48. doi:10.1134/S199508291906004X. Chapman JA, Blickenderfer MM, Wilson BN, Gulliver JS, Missaghi S. 2013. Competition and Growth of Eight Shoreline Restoration Species in Changing Water Level Environments. Ecological Restoration. 31(4):359–367. https://www.jstor.org/stable/43443332. Fournier M, Glennon R, Miller C. 1901. Vegetative propagation and establishment techniques for perennial wetland plant species. Soil and Water Conservation Society. Ankeny, IA. Leif JW III, Oelke EA. 1990. Growth and Development of Giant Burred (*Sparganium eurycarpum*). Weed Technology. 4(4):849–854. doi: 10.1017/S0890037X0002652X. Neely RK, Davis CB. 1985. Nitrogen and phosphorus fertilization of *Sparganium eurycarpum* Engelm. and *Typha glauca* Godr. Stands. I. Emergent plant production. Aquatic Botany. 22(3–4):347–361. doi:10.1016/0304-3770(85)90009-9. Zhansheng N. 2020. Rapid propagation method for *Sparganium stoloniferum* tissue culture.
Protocol Author	Shaheen Page
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