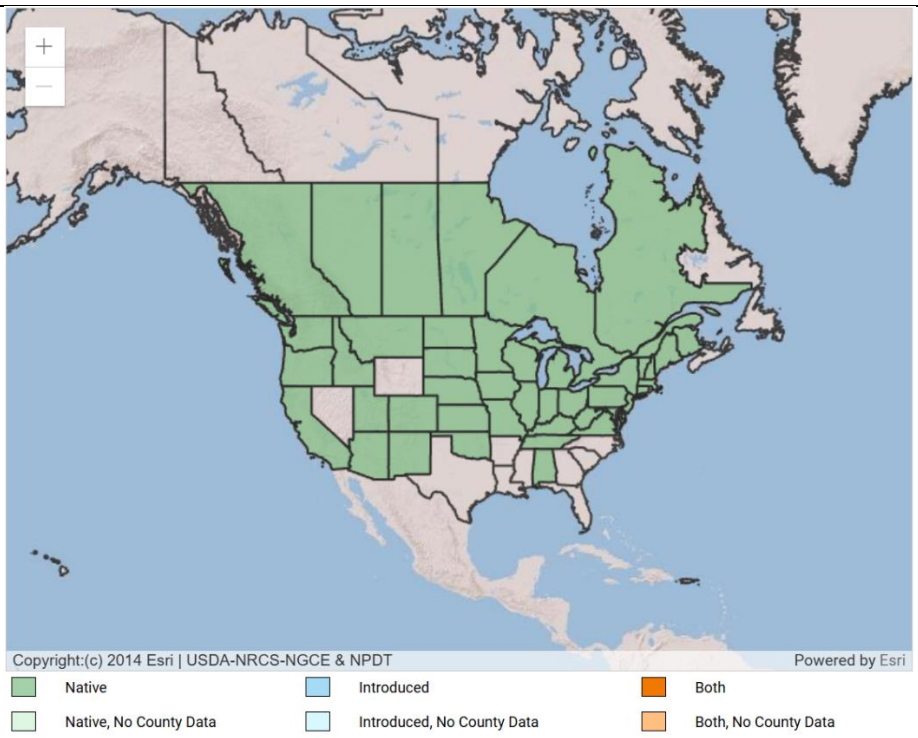
Plant Propagation Protocol for *Bolboschoenus fluviatilis*

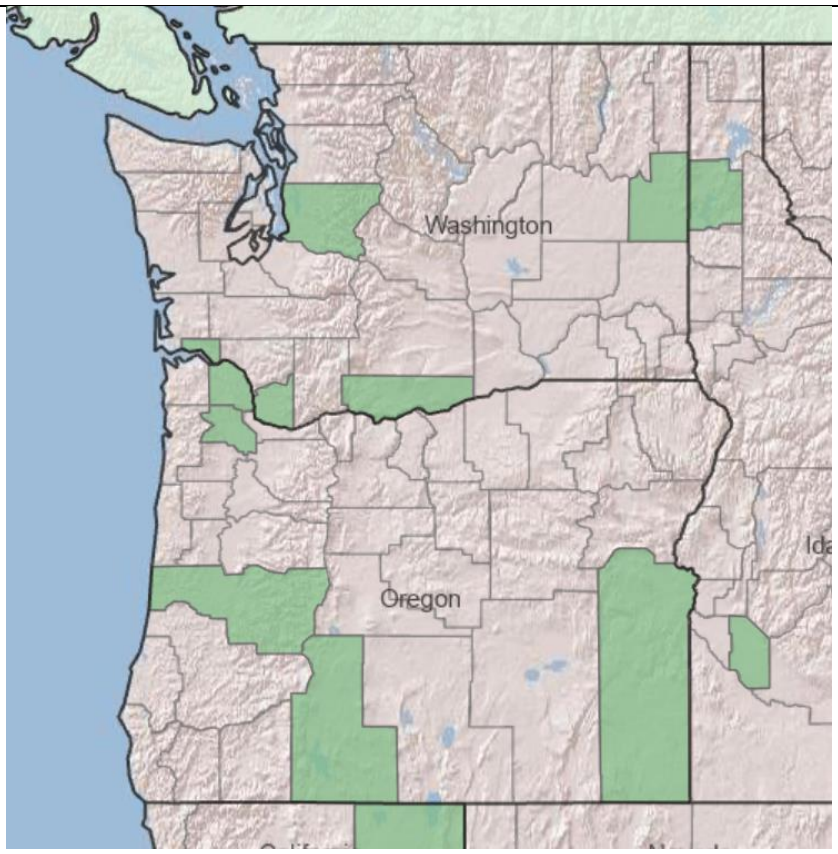
ESRM 412 – Native Plant Production

URL: https://courses.washington.edu/esrm412/protocols/2024/BOFL3.pdf

TAXONOMY	
  *Bolboschoenus fluviatilis.* Left image from (7), right image from (4), copyright Jonathan Coddington.	
Plant Family	
Scientific Name	Cyperaceae Juss.
Common Name	Sedge family
Species Scientific Name	
Scientific Name	*Bolboschoenus fluviatilis* (Torr.) Soják
Varieties	N/A
Sub-species	N/A
Cultivar	N/A
Common Synonym(s)	- *Bolboschoenus maritimus* (L.) Palla ssp. *fluviatilis* (Torr.) Á. Löve & D. Löve - *Scirpus fluviatilis* (Torr.) A. Gray - *Schoenoplectus fluviatilis* (Torr.) M.T. Strong - *Scirpus maritimus* L. var. *fluviatilis* Torr. (1)
Common Name(s)	River bulrush, river tuber-bulrush (4), alkali bulrush (10)
Species Code (as per USDA Plants database)	BOFL3
GENERAL INFORMATION	



Distribution of *Bolboschoenus fluviatilis* in North America. Legend applies to map below. Maps from (1).



Geographical range	In Washington, occurs on both sides of the Cascades, ranges from southern British Columbia to California, and mostly distributed throughout North America to the Atlantic Coast. (2)
Ecological distribution	Wetlands, freshwater marsh, wetland-riparian. (3) Aquatic; shores of rivers and lakes. (4) Fresh or brackish marshes, quiet waters, sometimes growing in water up to a meter deep. (2)
Climate and elevation range	0 – 2100 m (6) Adapted to various climates because of its wide distribution across North America, can withstand temperatures well below freezing (1)
Local habitat and abundance	Sources say *B. fluviatilis* grows in full sun sites and wet soil. (5, 7, 8) Commonly associated species include *Xanthium strumarium, Phalaris arundinacea, Typha latifolia, Schoenoplectus acutus.* (9)

Plant strategy type / successional stage	Competitor plant strategy type because of its rhizomatic spreading and tendencies to form dense stands. In waterways with fertilizer runoff, *B. fluviatilis* can be outcompeted by non-native plants. (4) Found in emergent marsh/wetland habitats (9).
Plant characteristics	Grass/grasslike, obligate wetland species. Maximum height is six feet tall; roots are fibrous/rhizomatous; blooms in June, July, and August and blooms are brown with inconspicuous flowers. (5) Often grows in dense, monospecific vegetative stands because of its rhizomatic growth. In California, *B. fluviatilis* often hybridizes with *B. maritimus* naturally, and is known to hybridize with at least one other species, *B. robustus* (6)

PROPAGATION DETAILS: FROM SEED*

***Information is taken from a protocol for *Bolboschoenus maritimus* (10), a close species to *B. fluviatilis*, because very little propagation information can be found for the latter. However, missing information from will be indicated as such or supplied from sources pertaining to *B. fluviatilis,* especially (7) for germination information.**

Ecotype	Boulder County, Parks and Open Space, Sombrero Marsh, Colorado
Propagation Goal	Seeds
Propagation Method	Seeds
Product Type	Propagules (seeds, cuttings, poles, etc.)
Stock Type	No information could be found on stock type.
Time to Grow	No information in protocol about time to grow.
Target Specifications	No information in protocol about target specifications.
Propagule Collection Instructions	No information for how to collect seeds. Seeds should be collected in August, after blooms have matured. (4)
Propagule Processing/Propagule Characteristics	59,200 seeds per lb (7)

Pre-Planting Propagule Treatments	From Barner's protocol: "Seed lot is first processed using a Westrup Model HA 400 brush machine, with 3 row brushes, a #14 mantel, at a speed of 4. Seeds are then air-screened using an office Clipper, with a top screen: 7 round and a bottom screen: 1/16 round, medium speed, medium air." (10) Requires cold stratification for 90 days at 33-38F. There is a note that also states *S. fluviatilis* (*B. fluviatilis* synonym) is best planted outdoors in the fall. (7)
Growing Area Preparation / Annual Practices for Perennial Crops	No information in Barner's protocol about growing area preparation. *B. fluviatilis* requires full sun and medium-wet to wet soils to grow (7), and is not drought tolerant (1). Adapted to medium and fine textured soils/growing mediums (1), but grows in just about any soil type (8).
Establishment Phase Details	No information found about establishment phase details.
Length of Establishment Phase	No information found about length of establishment phase.
Active Growth Phase	No information found about active growth phase.
Length of Active Growth Phase	No information about length of active growth phase, but seeds require 90 days of cold stratification; seeds may also be planted outside in the fall, around September (7); if planted outdoors in fall, seeds likely germinate in January and grow until July-August.
Hardening Phase	No information found about hardening phase.
Length of Hardening Phase	No information found about length of hardening phase.
Harvesting, Storage and Shipping	No information found about harvesting, storage, and shipping.
Length of Storage	No information found about length of storage.
Guidelines for Outplanting / Performance on Typical Sites	No information found about guidelines for outplanting.
Other Comments	Seeds should be cold stored at 33-38F. (10)
INFORMATION SOURCES	
References	See below.

Other Sources Consulted	
Protocol Author	Jillian Rogers
Date Protocol Created or Updated	May 21, 2024

References

1. "*Bolboschoenus fluviatilis* (Torr.) Sojak." *USDA Plants Database,* United States Department of Agriculture, https://plants.sc.egov.usda.gov/home/plantProfile?symbol=BOFL3. Accessed May 21, 2024.
2. "*Bolboschoenus fluviatilis."* Burke Herbarium Image Collection, https://burkeherbarium.org/imagecollection/taxon.php?Taxon=Bolboschoenus%20fluviatilis. Accessed May 21, 2024.
3. "Bolboschoenus fluviatilis." Calflora, https://www.calflora.org/app/taxon?crn=11419. Accessed May 21, 2024.
4. "*Bolboschoenus fluviatilis* – river tuber-bulrush." *Go Botany*, Native Plant Trust, Bolboschoenus fluviatilis (river tuber-bulrush): Go Botany (nativeplanttrust.org). Accessed May 21, 2024.
5. "*Bolboschoenus fluviatilis.*" *Ladybird Johnson Wildflower Center*, University of Texas Austin, https://www.wildflower.org/plants/result.php?id_plant=BOFL3. Accessed May 21, 2024.
6. Smith, S. Galen. "Bolboschoenus fluviatilis." Flora of North America, last updated 5 Nov 2020, treatment first appeared in FNA Vol. 23: 42, http://floranorthamerica.org/Bolboschoenus_fluviatilis. Accessed May 21, 2024.
7. "Scirpus fluviatilis." Prairie Moon Nursery, https://www.prairiemoon.com/scirpus-fluviatilis-river-bulrush#panel-planting. Accessed May 21, 2024.
8. "Bolboschoenus fluviatilis." New Zealand Plant Conservation Network, https://www.nzpcn.org.nz/flora/species/bolboschoenus-fluviatilis. Accessed May 21, 2024.
9. Query: Genus = bolboschoenus, Species = fluviatilis, 98 matching records found, consulted records 1-28, Consortium of Pacific Northwest Herbaria, https://www.pnwherbaria.org/data/results.php?DisplayAs=WebPage&ExcludeCultivated=Y&GroupBy=ungrouped&SortBy=Year&SortOrder=DESC&SearchAllHerbaria=Y&QueryCount=1&Genus1=bolboschoenus&Species1=fluviatilis&IncludeSynonyms1=Y&Zoom=4&Lat=55&Lng=-135&PolygonCount=0. Accessed May 21, 2024.
10. Barner, Jim. 2009. Propagation protocol for production of Propagules (seeds, cuttings, poles, etc.) *Bolboschoenus maritimus* (L.) Palla seeds USDA FS - R6 Bend Seed Extractory Bend, Oregon. In: Native Plant Network. https://npn.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=cyperaceae-bolboschoenus-3774. US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources. Accessed May 21, 2024.