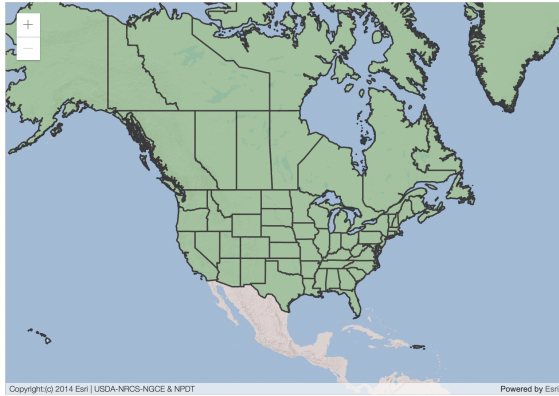


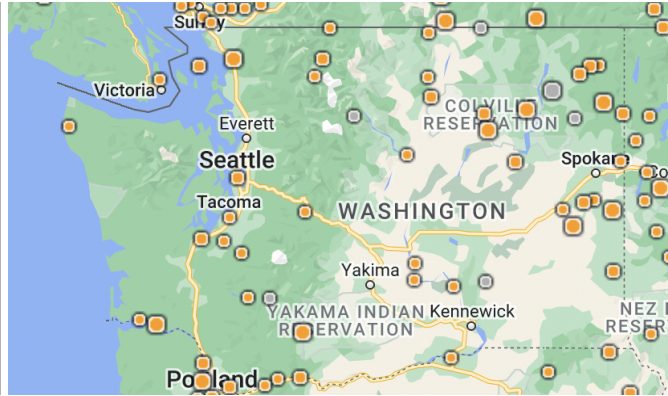
Plant Propagation Protocol for *Eleocharis acicularis*
 ESRM 412 – Native Plant Production
 Spring 2022

URL: <https://courses.washington.edu/esrm412/protocols/2022/ELAC.pdf>

North America Distribution



Washington Distribution



Source: USDA PLANTS database (left), Consortium of Pacific Northwest Herbaria (right)

TAXONOMY	
Plant Family	
Family Scientific Name	Cyperaceae
Family Common Name	Sedges
Species Scientific Name	
Genus	<i>Eleocharis</i>
Species	<i>acicularis</i>
Species Authority	(L.) Roem. & Schult.
Varieties	<i>acicularis</i>
Sub-species	n/a
Cultivar	n/a
Common Synonym(s)	<i>Eleocharis acicularis</i> var. <i>gracilescens</i> Svens. <i>Eleocharis acicularis</i> var. <i>occidentalis</i> Svens. <i>Eleocharis acicularis</i> var. <i>submersa</i> (Hj. Nilss.) Svens. <i>Eleocharis acicularis</i> var. <i>typica</i> Svens. <i>Eleocharis acicularis</i> var. <i>porcata</i> S.G. Sm.
Common Name(s)	needle spikerush, needle spike sedge, dwarf hairgrass
Species Code (as per USDA Plants database)	ELAC
GENERAL INFORMATION	
Geographical range	Europe, Asia, N. America and S. America. See maps above for distribution in North America and Washington State. ¹⁰
Ecological distribution	Wet lands, marshes, sloughs, mudflats, shallow water of lakes, ponds and streambeds. Establishes in disturbed areas. ¹¹
Climate and elevation range	Circumboreal. Arctic to cool-temperate N. America. ⁹

	Elevation: -234'' - 10562'' ¹² , with higher elevations in Southwest N. America. ⁹
Local habitat and abundance	Locally abundant and grows in lawn-like carpets in local marshes, muddy shores, and other wet places. Grows in looser mats in rocky gravelly shorelines. ¹¹
Plant strategy type / successional stage	Early seral, is adapted to contaminated or acidic environments with pH levels as low as 2.85 ⁸ Often occurs in disturbed areas and is indicative of terrestrialization ⁶
Plant characteristics	Grassy perennial herb with slender rhizomes, forming dense mats that are either rooted or floating. 3-12cm long needle-like leaves at stem base with basal sheaths. ¹¹ In shallow or emersed plants, short spikes of tiny flowers form on flat leaves. Submersed plants are strictly vegetative and lack spikes.
PROPAGATION DETAILS - Reproductive	
Ecotype	No literature found
Propagation Goal	Plants
Propagation Method	Seed
Product Type	No information available- congeneric species Eleocharis palustris is grown in plugs ⁷
Stock Type	No literature found
Time to Grow	No literature found
Target Specifications	Germinants
Propagule Collection Instructions	Flowering season during the summer, collect seed heads when ripe and place in paper bag ¹¹ Seed period begins in the summer and ends in the fall ¹
Propagule Processing/Propagule Characteristics	900000 seeds/ pound ¹ Storage: Orthodox, 1-5 years, not much about storage methods is known. ³
Pre-Planting Propagule Treatments	Pericarp-induced dormancy. Seeds should be scarified with sodium hypochlorite for 2 hours then cold stratified for 60 days at 4 degrees celcius ²
Growing Area Preparation / Annual Practices for Perennial Crops	40%-50% germination at 22 - 35 degrees celsius ² congeneric species, E. palustris, should be planted in consistently hot and moist greenhouse at 32- 38 degrees celsius. ⁵
Establishment Phase Details	No information available- congeneric species Eleocharis palustris: 1-2 weeks
Length of Establishment Phase	1-2 weeks
Active Growth Phase	No literature found

Length of Active Growth Phase	No literature found
Hardening Phase	No literature found
Length of Hardening Phase	No literature found
Harvesting, Storage and Shipping	Seeds can be collected by hand or hand shears. Seeds in the wild fall off plant and sink in water. With congeneric species, <i>E. palustris</i> , seeds are recalcitrant and must be stored in water at 3 degrees celsius to mimic the wild. ⁴
Length of Storage	No literature found
Guidelines for Outplanting / Performance on Typical Sites	Plant at a density of 4200 to 11900 plants per hectare. ¹
Other Comments	Seed spread rate is slow and seed abundance is low ¹
PROPAGATION DETAILS - Vegetative	
Ecotype	No literature found
Propagation Goal	Rhizomes
Propagation Method	Vegetative
Product Type	Rhizome cuttings
Stock Type	No literature found
Time to Grow	No literature found
Target Specifications	No literature found
Propagule Collection Instructions	No literature found
Propagule Processing/Propagule Characteristics	No literature found
Pre-Planting Propagule Treatments	No literature found
Growing Area Preparation / Annual Practices for Perennial Crops	No literature found
Establishment Phase Details	No literature found
Length of Establishment Phase	No literature found
Active Growth Phase	No literature found
Length of Active Growth Phase	No literature found
Hardening Phase	No literature found
Length of Hardening Phase	No literature found
Harvesting, Storage and Shipping	No literature found
Length of Storage	No literature found
Guidelines for Outplanting / Performance on Typical Sites	43% rhizome survival the first year, 25% survival the second year. Spreads extensively in wet areas. ¹¹
Other Comments	Vegetative spread rate is rapid. ¹ Vegetative propagation is possible because <i>Eleocharis acicularis</i> regenerate vegetatively, but there is no literature available that details propagule protocols.
INFORMATION SOURCES	
References	1. USDA NRCS, n.d. <i>Eleocharis acicularis</i> (L.) Roem. & Schult. needle spikerush. The

PLANTS Database. National Plant Data Center, Baton Rouge, Louisiana.

<http://plants.usda.gov/core/profile?symbol=ELAC> [Last accessed May 3, 2022].

2. Yeo, R.R., 1986. Dormancy in slender spikerush seed. *Journal of Aquatic Plant Management* 24: 11-16.
3. Royal Botanic Gardens Kew, 2008. *Eleocharis acicularis* (L.) Roem. & Schult. Seed Information Database.
<http://data.kew.org/sid/SidServlet?ID=8521&Num=Y9b> [Last accessed May 3, 2022].
<http://data.kew.org/sid/sidsearch.html>
4. Baskin, Carol C., and Jerry M. Baskin. 1998. *Seeds: ecology, biogeography, and evolution of dormancy and germination*. San Diego, Calif: Academic Press.
5. Hoag, J. Chris. May, 2006. "Plant Fact Sheet – Creeping Spikerush, *Eleocharis palustris* (L.) Roemer & J.A. Schultes." USDA NRCS Aberdeen PMC, Aberdeen, ID.
6. Bornette, G., C. Amoros, C. Castella and L. Beffy, 1994. Succession and fluctuation in the aquatic vegetation of two former Rhone River channels. *Vegetation* 110(2): 171-184.
7. USDA NRCS. *Wetland plant fact sheet – creeping spikerush (Eleocharis palustris)*. Interagency Riparian/Wetland Project, Plant Materials Center, Aberdeen, Idaho.
8. Rothrock, Paul E., and Richard H. Wagner. "Eleocharis Acicularis (L.) R. & S.: The Autecology of an Acid Tolerant Sedge." *Castanea*, vol. 40, no. 4, 1975, pp. 279–89, <http://www.jstor.org/stable/4032801>. Accessed 4 May 2022.
9. *Eleocharis Acicularis in Flora of North America @ Efloras.org*, http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242357729.
10. "Eleocharis Acicularis (Needle Spikerush)." *Minnesota Wildflowers*, <https://www.minnesotawildflowers.info/grass-s-edge-rush/needle-spikerush>.
11. *Scientific Name: Eleocharis Acicularis (L.) Roemer & J.A. Schultes*. https://accre.ualberta.ca/accre/wp-content/uploads/sites/45/2018/04/Eleocharis_acicularis.pdf.

	<p>12. "Spike Rush, Eleocharis Acicularis." <i>California Native Plant Society</i>, https://calscape.org/Eleocharis-acicularis-().</p>
<p>Other Sources Consulted</p>	<p>Nguyen, Ha T.H., et al. "Effect of Dissolved Silicon on the Removal of Heavy Metals from Aqueous Solution by Aquatic Macrophyte Eleocharis Acicularis." <i>Water</i>, vol. 11, no. 5, 2019, p. 940., https://doi.org/10.3390/w11050940.</p> <p>Hamel, K. and J. Parsons, 2001. An Aquatic Plant Identification Manual for Washington's Freshwater Plants. Washington State Department of Ecology, Olympia, Washington. http://www.ecy.wa.gov/programs/wq/plants/plantid2/SpeciesIndex.html</p> <p>N.J. McCreary, S.R. Carpenter, Density-dependent growth interactions between Eleocharis acicularis (L.) R. & S. and Juncus pelecarpus forma Submersus Fassett, <i>Aquatic Botany</i>, Volume 27, Issue 3, 1987, Pages 229-241., https://doi.org/10.1016/0304-3770(87)90043-X</p>
<p>Protocol Author</p>	<p>Jason Wong-Hua</p>
<p>Date Protocol Created or Updated</p>	<p>05/04/2022</p>