

Plant Propagation Protocol for *Equisetum sylvaticum* L.

ESRM 412 – Native Plant Production

URL: <https://courses.washington.edu/esrm412/protocols/2021/EQSY.pdf>



Figure 1

TAXONOMY

Plant Family

Scientific Name Equisetaceae

Common Name Horsetail

Species Scientific Name

Scientific Name *Equisetum sylvaticum* Linnaeus, Carl

Varieties
 var. sylvaticum – with scabrous branches
 var. pauciramosum Midle – smooth branches, slightly branched
 var. multiramosum (Fernald) Wherry – smooth branches, copiously branched

Sub-species Wood horsetail is a highly variable species with many varieties and forms that have little taxonomic significance. [2]

Cultivar --

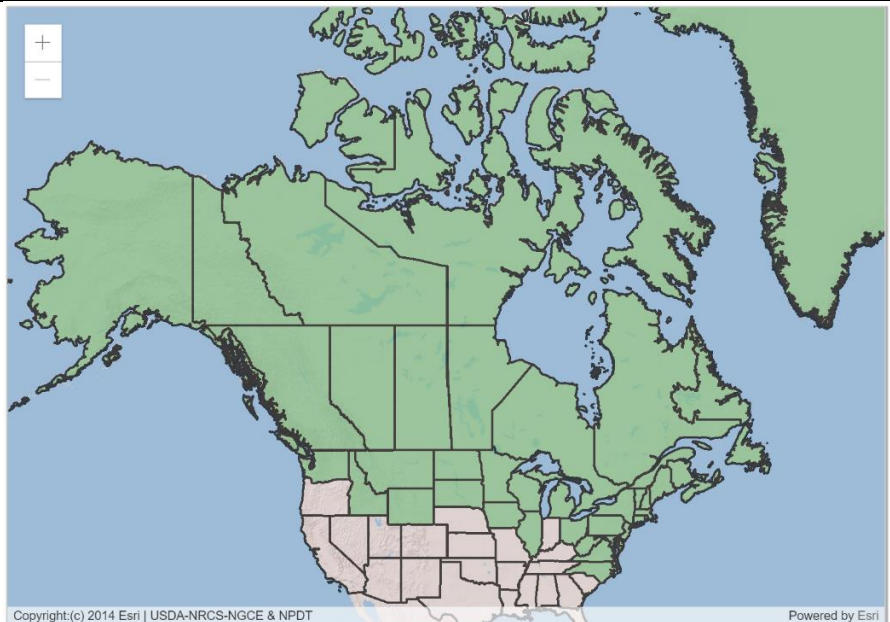
Common Synonym(s) --

Common Name(s)
 Wood horsetail
 Woodland horsetail
 Sylvan horsetail

Species Code EQSY

GENERAL INFORMATION

Geographical range



- Native Status:
- L48
 - AK
 - HI
 - PR
 - VI
 - NAV
 - CAN
 - GL
 - SPM
 - NA

Ecological distribution	Woodland horsetail is a circumboreal species distributed throughout Alaska and Canada, and as far south as North Carolina, the Great lakes states, Wyoming and the Pacific Northwest. [2, 5]
Climate and elevation range	Prefers cool, moist, shaded to somewhat open forests. [5]
Local habitat and abundance	Most prevalent in lowland wet conifer forests but is also common in mixed upland, dry conifer, and deciduous forest habitats. It prefers moist open woods, wet banks, swamps, bogs and meadows. [5]
Plant strategy type / successional stage	Often found in large dominant stands, Wood horsetail is considered to be a colonizer species invading newly exposed mud, streambanks, floodplains, and recently burned areas but can also be found in stable climax forests. [4, 1]
Plant characteristics	Wood horsetail is classified as a geophyte and commonly propagates with an extensive creeping system of rhizomes that can outweigh arial shoots by 100:1. It is a perennial, deciduous, homosporous pteridophyte that has a narrow spore dispersal period. Gametophytes reach sexual maturity at 3-5 weeks and produce a constant supply of gametes until death. [4, 1]
PROPAGATION DETAILS	
Ecotype	The spores should be harvested from a similar location and close to the target planting location due to its high variability and ability to hybridize with other species. [2, 3]
Propagation Goal	Plant
Propagation Method	Rhizome cutting – Propagation method inferred from the natural history and biology of the species.
Product Type	Container plant
Stock Type	164ml cone-tainer
Time to Grow	Gametophytes reach sexual maturity at 3-5 weeks. [5]
Target Specifications	Emergent sterile shoot
Propagule Collection Instructions	Collect rhizomes in the spring when fertile shoots begin to emerge from the soil. Almost any piece of the rhizome can propagate new plants so dig down deep and collect as much material as desired while practicing sustainable harvesting techniques. [1, 7]
Propagule Processing/Propagule Characteristics	Cut the rhizomes into 1-2in sections and plant directly into moist soil. [2]

Pre-Planting Propagule Treatments	Wood horsetails require moist soil environments to thrive so do not let the rhizome cuttings dry out. When harvesting rhizomes, in spring, transplant as soon as possible to stimulate new growth. [2]
Growing Area Preparation / Annual Practices for Perennial Crops	Wood horsetail thrive in poorly drained to moderately drained, nitrogen-poor soils and can be found on substrates with lower pH than other horsetail species. Due to its extensive, deeply buried, and long-lived rhizome system, it is recommended to plant rhizome starts in cone-tainers and transplant them into larger pots once plants are established. [1, 2, 3]
Establishment Phase Details	Unknown
Length of Establishment Phase	Unknown
Active Growth Phase	Unknown
Length of Active Growth Phase	Unknown
Hardening Phase	Unknown
Length of Hardening Phase	Unknown
Harvesting, Storage and Shipping	Unknown
Length of Storage	Unknown
Guidelines for Outplanting / Performance on Typical Sites	Unknown
Other Comments	Due to the success of the rhizome systems, established Woodland horsetail plants can out compete many other plants and persist for a long time. It is extremely difficult to manage this species as a weed and is recommended that they remain in containers unless outplanting to a natural area. [1, 2]
INFORMATION SOURCES	
References	<p>[1] Beasleigh, W. J., Yarranton G. A., 1974. <i>Ecological strategy and tactics of Equisetum sylvaticum during a postfire succession</i>. Canadian Journal of Botany, from: https://doi.org/10.1139/b74-299</p> <p>[2] Cody, William J., Donald M. Britton., 1989. <i>Ferns and Fern Allies of Canada</i>. Research Branch, Agriculture Canada, from: https://gardening.usask.ca/documents/outside-source-pdf/Ferns and Fern Allies of Canada.pdf</p> <p>[3] Duckett, Jeffrey G., 1985. <i>Wild Gametophytes of Equisetum Sylvaticum</i>. American Fern Journal, vol. 75, no. 4, pp. 120–127. From: www.jstor.org/stable/1547730</p> <p>[4] Duckett, J. G., Duckett, Anther R., January 1980. <i>Reproductive biology and population dynamics of wild gametophytes of Equisetum</i>. Botanical Journal of the Linnean Society, Volume 80, Issue 1, from:</p>

	<p>https://doi.org/10.1111/j.1095-8339.1980.tb01655.x</p> <p>[5] Matthews, Robin F., 1993. <i>Equisetum sylvaticum</i>. Fire Effects Information System. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, from: https://www.fs.fed.us/database/feis/plants/fern/equsyl/all.html</p> <p>[6] National Plant Data Team. <i>Equisetum Sylvaticum L</i>. United States Department of Agriculture Natural Resources Conservation Service, from: https://plants.usda.gov/home/plantProfile?symbol=EQSY</p> <p>[7] Olsen, Suzanne. 2007. <i>Encyclopedia of Garden Ferns</i>. Timber Press, from: http://www.agrifs.ir/sites/default/files/Encyclopedia%20of%20Garden%20Ferns%20%7BSue%20Olsen%7D%20%5B9780881928198%5D%20%28Timber%20Press%20-%202007%29%207.pdf</p> <p>[8] Wilkinson, Kim M. 2014. <i>Tropical Nursery Manual: a Guide to Starting and Operating a Nursery for Native and Traditional Plants</i>. U.S. Department of Agriculture, Forest Service, from: https://www.fs.fed.us/rm/pubs_series/wo/wo_ah732.pdf</p> <p>Figure 1: Garden, Meise Botanic (2019): <i>Equisetum sylvaticum L</i>. (BR0000012616886). Zenodo. https://doi.org/10.5281/zenodo.2873393</p>
Other Sources Consulted	<p>Meidinger, Dellis V., Jim P., 1991. <i>Ecosystems of British Columbia</i>. Research Branch, Ministry of Forests, from: https://www.for.gov.bc.ca/hfd/pubs/docs/srs/srs06.pdf</p> <p>Aldhous, J. R., Mason W. L., <i>Forest Nursery Practice</i>. H.M.S.O., 1994, from: https://www.forestresearch.gov.uk/documents/6578/FCBU111.pdf</p> <p>Dumroese, R. Kasten., et al. 2002. <i>National Proceedings: Forest and Conservation Nursery Associations 1999, 2000, and 2001</i>. USDA, Rocky Mountain Research Station, from: https://www.fs.fed.us/rm/pubs/rmrs_p024.pdf</p> <p>Verlinde, Sarah, 2018. <i>Starflower Habitat Education Activities and Resources</i>. Starflower Foundation, from: https://www.wnps.org/files/136/Starflower-Image-Herbarium/510/Ferns-and-Horsetails.pdf</p>
Protocol Author	Russell Botulinski
Date Protocol Created	05/24/2021