**Plant Propagation Protocol for *Salix interior***
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/*2023/SAIN3.pdf*


Source: Lady Bird Johnson Wildflower Center[4]


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| TAXONOMY | |
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| Plant Family | |
| Scientific Name | Salicaceae |
| Common Name | Willow family |
| Species Scientific Name | |
| Scientific Name | *Salix interior* Rowlee |
| Varieties | N/A |
| Sub-species | N/A |
| Cultivar | N/A |
| Common Synonym(s) | *Salix exigua* auct. non. Nutt.<br>*Salix exigua* Nutt. var. *exterior* (Fernald) C.F. Reed<br>*Salix exigua* Nutt. ssp. *interior* (Rowlee) Cronquist<br>*Salix exigua* Nutt. var. *pedicellata* (Andersson) Cronquist<br>*Salix exigua* Nutt. var. *sericans* (Nees) Dorn<br>*Salix fluviatilis* Nutt. var. *sericans* (Nees) B. Boivin<br>*Salix interior* Rowlee var. *exterior* Fernald<br>*Salix interior* Rowlee var. *pedicellata* (Andersson) C.R. Ball<br>*Salix interior* Rowlee var. *wheeleri*<br>*Salix longifolia* Muhl., non Lam.<br>*Salix longifolia* Muhl. var. *interior* (Rowlee) M.E. Jones<br>*Salix longifolia* Muhl. var. *pedicellata* Andersson<br>*Salix longifolia* Muhl. var. *sericans* Nees<br>*Salix longifolia* Muhl. var. *wheeleri* (Rowlee) C.K. Schneid.<br>*Salix rubra* Richardson, non Huds.<br>*Salix wheeleri* (Rowlee) Rydb. |
| Common Name(s) | sandbar willow |

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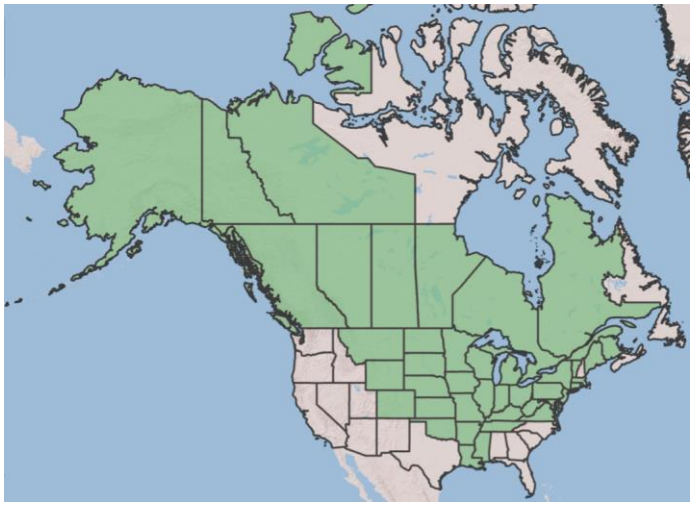
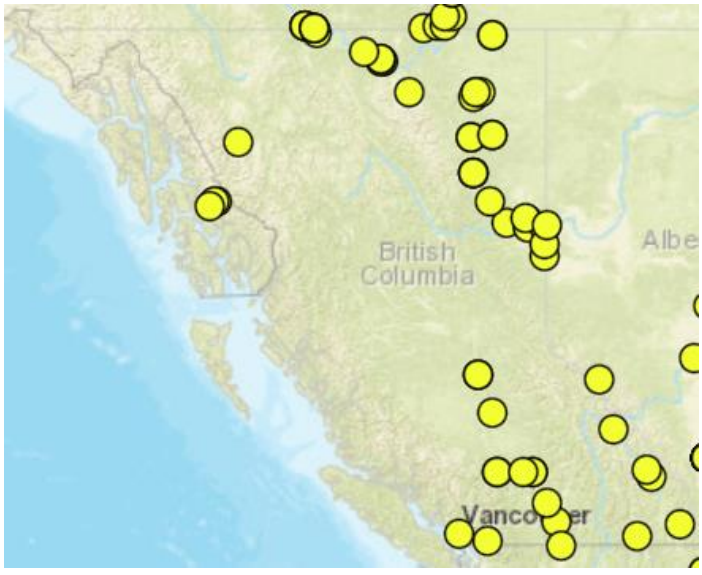
| Species Code (as per USDA Plants database) | SAIN3 |
| **GENERAL INFORMATION** | |
| Geographical range | The sandbar willow is native to most of the eastern and central United States, western Canada and Alaska.[5] In the Pacific Northwest, the sandbar willow is native to British Columbia.[6]<br>  <br>This map shows the distribution of the sandbar willow in North America.[5]<br>  <br>This map shows the distribution of the sandbar willow in British Columbia.[6] |
| Ecological distribution | Can be found growing in wet places near wooded edges, floodplains, marshes, lake shores and low-lying prairie.[7] |

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| Climate and elevation range | Typically found in lowlands at low elevations and in wet places with high precipitation.[8] |
| Local habitat and abundance | Grows in relative abundance across British Columbia, occurring most commonly along shorelines, river banks, and other wet sites.[11] |
| Plant strategy type / successional stage | The sandbar willow is a colonizer of disturbed riparian habitats.[3] It spreads aggressively and may become weedy or invasive in some regions or habitats and may displace desirable vegetation if not properly managed.[8] |
| Plant characteristics | Sandbar willow is a slender, upright shrub forming thickets by spreading roots, or a small tree. Leaves are simple, alternate, very narrow, 2–6 inches long, about ¼ inch wide, thin, with scattered and unevenly spaced, gland-tipped small teeth. Young leaves silky-hairy beneath. Bark is green to gray or brown, smooth; on older trunks furrowed and broken into closely flattened scales. Flowering occurs in May–June, after leaves develop. Male and female flowers are in separate catkins in axils on twigs, borne on separate plants.[10] |
| **PROPAGATION DETAILS** | |
| Ecotype | N/A |
| Propagation Goal | Plants |
| Propagation Method | Vegetative |
| Product Type | Bareroot (field grown) |
| Stock Type | 1+0 |
| Time to Grow | 1 year[1] |
| Target Specifications | The target height is 6 feet and the target caliper is 0.5 inches. The root system must be strong enough to balance the top growth.[1] |
| Propagule Collection Instructions | Cuttings should be harvested in winter during the dormant season, between leaf fall and bud break.[2] Select stems ½ to 1¼ inches in diameter and harvest cuttings in 8-10 inch lengths.[1] |
| Propagule Processing/Propagule Characteristics | N/A |
| Pre-Planting Propagule Treatments | Cuttings can be wrapped, bundled, and stored in a cooler until they are stuck into field beds.[1] |
| Growing Area Preparation / Annual Practices for Perennial Crops | Field Bed Preparation:<br>Beds are marked out and formed as needed. Beds are prepared with a rototiller/seedbed former and are typically 4 to 6 inches high and 4 ft wide. Fields are cultivated for weeds as needed throughout the growing season.[1] |
| Establishment Phase Details | Cuttings are stuck by hand in prepared field beds during early spring to a depth of 6 inches. Soil is firmed around stems after sticking to remove air pockets and irrigated after planting. Beds are irrigated as surface begins to dry. Rooting occurs when field soils warm in later spring and rapidly produce root growth.[1] |
| Length of Establishment Phase | 1 month after rooting in the spring.[1] |

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| Active Growth Phase | Fertilization:<br>Ammonium sulfate 21-0-0-24 is applied with a mechanical spreader. The first application occurs on the last week of May, and fertilizer is only applied to cuttings that have been established for at least 5 or 6 weeks. The last application occurs during the last week of July. Frequency of application depends on the species and how they look that season. Beds are irrigated for at least 45 minutes following all fertilizer applications. This ensures that foliage will not burn and incorporates fertilizer into the root zone.[1]<br><br>Root Pruning Procedures:<br>Seedlings are root pruned during June. Pruning depth is at least 10 inches for 1+ 0 stock. Irrigate heavily for 2 to 3 days prior to pruning to saturate the root zone. Set pruning blade to slightly wrench seedlings as they are pruned. Check pruning depth frequently and adjust as needed. Irrigate for a minimum of 2 hours following root pruning to settle soil back around roots. This step is critical to eliminate post root pruning mortality. Irrigate field heavily for 2 to 3 days to further settle the soil.[1]<br><br>Top Pruning Procedures:<br>Top pruning keeps seedlings from being damaged by the mechanical lifter.[1] |
| Length of Active Growth Phase | 4-5 months[1] |
| Hardening Phase | Hardening begins during August. No fertilizer is applied after August. Irrigation frequency and duration is shortened and applied only when needed.[1] |
| Length of Hardening Phase | 3 months[1] |
| Harvesting, Storage and Shipping | Plants are typically lifted from late November to April. Plants can be lifted when there is a large root mass and when most of the leaves have dropped. The lifted nursery stock is immediately stored in a cooler until graded and bundled. The majority of plants are graded, bundled and shipped during February.[1] |
| Length of Storage | 3 months[1] |
| Guidelines for Outplanting / Performance on Typical Sites | Rooted cuttings will establish and spread quickly, so they do not need to be planted at a very high density.[3] Rooted cuttings will tolerate less water than unrooted cuttings, but they should still be planted at very moist sites.[8] Once planted, the bareroot plants will grow up to a height of 5-10 feet[9] and they will require little to no care.[8] |
| Other Comments | Sandbar willow is an aggressive spreader and this should be considered when selecting plant materials for a given site. It can spread from streambanks into other sites.[8] |

| INFORMATION SOURCES | |
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| References | 1) Hoss, Gregory. 2005. Propagation protocol for production of Bareroot (field grown) *Salix interior* Rowlee plants 1+0; George O. White State Forest Nursery Licking, Missouri. In: Native Plant Network. URL: https://NativePlantNetwork.org (accessed 2023/05/22). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.<br><br>2) Lezberg, Ann, and John Giordanengo. "A Guide for Harvesting, Storing, and Planting Dormant Willow Cuttings." *Colorado Riparian Association*, 20 June 2008, coloradoriparian.org/2008/06/20/a-guide-for-harvesting-storing-and-planting-dormant-willow-cuttings-2/.<br><br>3) Mosseler, Alex, and John E. Major. "Clonal Variation in Coppiced and Uncoppiced Growth, Root Sprout Stem Formation, and Biomass Partitioning in Salix Interior on Two Highly Disturbed Site Types." Canadian Journal of Forest Research, vol. 52, no. 2, 2022, pp. 148–57, https://doi.org/10.1139/cjfr-2021-0025.<br><br>4) "Salix Interior." *Lady Bird Johnson Wildflower Center - The University of Texas at Austin*, www.wildflower.org/plants/result.php?id_plant=SAIN3. Accessed 22 May 2023.<br><br>5) "Salix interior Rowlee." *USDA Plants Database*, plants.usda.gov/home/plantProfile?symbol=SAIN3. Accessed 22 May 2023.<br><br>6) "Salix Interior Rowlee." *Flora BC: Electronic Atlas of the Flora of British Columbia*, Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Salix+interior. Accessed 22 May 2023.<br><br>7) "Sandbar Willow." *Iowa State University Natural Resource Stewardship*, naturalresources.extension.iastate.edu/forestry/iowa_trees/trees/sandbar_willow.html. Accessed 22 May 2023.<br><br>8) "Sandbar Willow." *USDA NRCS Plant Fact Sheet*, plants.usda.gov/DocumentLibrary/factsheet/pdf/fs_sain3.pdf. Accessed 23 May 2023.<br><br>9) "Sandbar Willow ." *North Dakota State University*, www.ag.ndsu.edu/trees/handbook/th-3-65.pdf. Accessed 23 May 2023. |

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| | 10) “Sandbar Willow.” *Missouri Department of Conservation*, mdc.mo.gov/discover-nature/field-guide/sandbar-willow. Accessed 22 May 2023.<br><br>11) “Sandbar Willow - Salix Interior.” *University of Minnesota: The UFOR Nursery & Lab*, trees.umn.edu/sandbar-willow-salix-interior. Accessed 22 May 2023. |
| Other Sources Consulted | “Salix interior Rowlee.” *Maine Natural Areas Program Rare Plant Fact Sheet for Salix Interior*, www.maine.gov/dacf/mnap/features/salixint.htm. Accessed 22 May 2023.<br><br>“Sandbar Willow (Salix Interior).” *Carleton College Cowling Arboretum*, www.carleton.edu/arboretum/about/species/flora/shrub-guide/sandbar-willow/. Accessed 22 May 2023. |
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| Date Protocol Created or Updated | 05/23/23 |