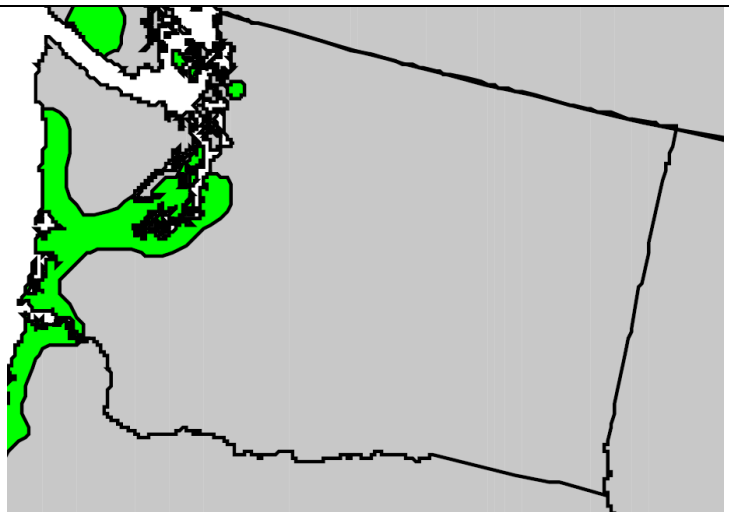
Plant Propagation Protocol for *Salix hookeriana* Barret ex Hook

ESRM 412 – Native Plant Production

Protocol URL: https://courses.washington.edu/esrm412/protocols/*[SAHO.pdf]*

TAXONOMY	
Plant Family	Salicaceae
Scientific Name	*Salix hookeriana* Barret ex Hook
Common Name	Hooker's Willow, Dune Willow, Coast Willow
Species Scientific Name	
Scientific Name	*Salix hookeriana* Barret ex Hook
Varieties	*Salix hookeriana* Barret ex Hook var. *laurifolia* J.K. Henry. *Salix hookeriana* Barret ex Hook var. *tomentosa* J.K. Henry ex C.K. Schneid
Sub-species	
Cultivar	*Salix hookeriana* Barret ex Hook "Clatsop"
Common Synonym(s)	*Salix amplifolia* Coville *Salix piperi* Bebb
Common Name(s)	Hooker's Willow, Dune Willow, Coast Willow
Species Code (as per USDA Plants database)	SAHO
GENERAL INFORMATION	
Geographical range	 North America (USDA 2015)

	 Washington State (Little 1976) Southern Alaska through Northern California along coastal areas.
Ecological distribution	Wetlands in the coastal fog belt. Most commonly occurs in deflation plains, on stabilized dunes, near lagoons, or along streams within 5 miles of the coast. (Darris and Lambert 1993)
Climate and elevation range	Plant hardiness zone 7a to 9b. (Darris and Lambert 1993) Elevation from 2' to 600' above sea level. Cool mesothermal. (Klinkenburg 2014)
Local habitat and abundance	Common in wetlands along the Washington coast and in the Puget Sound.
Plant strategy type / successional stage	Early primary and secondary succession. Shade intolerant. Soils very moist to wet.
Plant characteristics	Medium to large shrub .6-8 m tall, twigs yellow to red-brown and sometimes pubescent. Leaves are also somewhat to very pubescent. Ovaries also sometimes pubescent. (Klinkenburg 2014)
PROPAGATION DETAILS	
Ecotype	
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container
Stock Type	Seed
Time to Grow	1 year
Target Specifications	18" plants in gallon pots
Propagule Collection Instructions	Willow seeds are produced in capsules that split when the seed is ripe in May to early June. Bags can be placed around female catkins before they open to capture seeds as they release.

Propagule Processing/Propagule Characteristics	Seeds are small and are surrounded by a cottony material when the capsules split. Seeds are only viable for a few days. To remove the cotton a two layered sieve is used (250 µm and 500 µm). The cotton and seeds are placed in the center layer (500 µm) and compressed air is blown through the top sieve (250 µm). The seeds pass down into a collection basin and the cotton is retained in between the two sieves.
Pre-Planting Propagule Treatments	Seeds are ready to germinate immediately after harvest. Seeds can be stored at 0 degrees C for up to two weeks.
Growing Area Preparation / Annual Practices for Perennial Crops	Sow seeds into mini-plugs (.5 in x .5 in. x 1.1 in.) containing a mix of coarse peat moss and perlite.
Establishment Phase Details	Germination will occur within 3 weeks.
Length of Establishment Phase	Root system will develop in 3-6 weeks after germination. They can then be up-planted into SC-10 conetainers (1.5 in x 1.5 in. x 8.5 in). These are then up potted into 1 gallon pots by late summer of the first growth year or in the early spring in the second year. After transplanting into gallon pots, seedlings are grown in full sun outdoors irrigated to keep moisture high.
Active Growth Phase	Germination to September.
Length of Active Growth Phase	3 months
Hardening Phase	
Length of Hardening Phase	
Harvesting, Storage and Shipping	Willow seedlings can be stored in a pot yard over winter.
Length of Storage	Willow seedlings can be planted from fall to early spring the year they were started.
Guidelines for Outplanting / Performance on Typical Sites	Plant seedlings at 3'+ spacing. In the field seedlings can grow 6'-10' in the year of out planting.
Propagation sources	Warren-Wren, S. C. "Willows" David & Charles 1972 Dreesen, D. R. "Propagation Protocols for Container Willows in the Southwest Using US Seeds" Native Plants Journal 4:(2) 118-124. 2003
PROPAGATION DETAILS	
Ecotype	
Propagation Goal	Hardwood cuttings
Propagation Method	Vegetative
Product Type	Hardwood cuttings
Stock Type	Field stock (wild or nursery)
Time to Grow	Cuttings are ready to be planted immediately.
Target Specifications	1.5 feet to 10 foot hardwood cuttings. Diameter should be between ½ inch and 1.5 inches.
Propagule Collection Instructions	During the dormant season, cuttings are taken from long straight shoots at the desired length.
Propagule	Hardwood cuttings should have an angled cut made at both the top and

Processing/Propagule Characteristics	bottom of the stake. The angle of the cut should be shallower than 45 degrees.
Pre-Planting Propagule Treatments	Cuttings can be stored in a cold, moist area. The cold is necessary to maintain dormancy until cuttings are planted. Cuttings can be stored for up to two weeks. After two weeks, viability decreases.
Growing Area Preparation / Annual Practices for Perennial Crops	Before cuttings are planted, nearby vegetation should be controlled through scalping the site or herbicide application.
Establishment Phase Details	Stakes planted in the winter or early spring will establish over the course of the next year.
Length of Establishment Phase	N/A (Planted in restoration site directly)
Active Growth Phase	April to October
Length of Active Growth Phase	7 months
Hardening Phase	N/A
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	See collection instructions for harvesting. See Pre-Planting Propagule Treatments for storage. Cuttings need to be kept moist during transport.
Length of Storage	Up to two weeks before viability declines.
Guidelines for Outplanting	In soft soils, cuttings can be pushed into the soil or hammered into the soil. For coarser substrates a pilot hole can be formed using a pry bar. Plant 50% or more of the cutting under the ground and firm the soil around the cutting to eliminate air pockets.
Propagation sources	Newsholme, C. "Willows, The Genus Salix" Timber Press 1992 Sound Native Plants "Live Stakes & Cuttings" 2005 http://soundnativeplants.com/wp-content/uploads/Live_stakes.pdf Accessed 4/25/2015 USDA-NRCS. 2013. Release brochure for 'Clatsop' Hooker willow (Salix hookeriana). USDA-Natural Resources Conservation Service, Corvallis Plant Materials Center, Corvallis, OR Darris, D.C., Lambert, S.M., "Native Willow Varieties of the Pacific Northwest" 1993 http://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/orpmcrb560.pdf Accessed 4/25/2015
PROPAGATION DETAILS	
Ecotype	
Propagation Goal	Plants
Propagation Method	Vegetative
Product Type	Container
Stock Type	Micro cuttings
Time to Grow	6 Months

Target Specifications	16 inch seedlings.
Propagule Collection Instructions	In January and February cuttings are taken of 1 year old wood.
Propagule Processing/Propagule Characteristics	They are cut to lengths of 3 inches, .25 to .38 inches in diameter, with at least 2 buds.
Pre-Planting Propagule Treatments	Cuttings are stored at 1 degree C in a cooler until striking. Prior to striking, cuttings they are soaked for 3 days in a room temperature running water bath in a shaded area.
Growing Area Preparation / Annual Practices for Perennial Crops	Striking occurs in May. Growth medium is a 1 part sphagnum peat moss : 1 part vermiculite mixture. Cuttings are struck into 6 inch deep pots with 20.5 cubic inches of volume. The medium is then soaked.
Establishment Phase Details	Cuttings are grown at ambient temperature and watered to keep the soil moist. Cuttings are pruned when they reach 8-10 inches to 6-8 inches. Then they are allowed to grow another 6 inches before being pruned back half the new growth. This continues as needed until early September. In early September they are cut to 16 inches.
Length of Establishment Phase	May to September
Active Growth Phase	May to September
Length of Active Growth Phase	May to September
Hardening Phase	None (grown outside)
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	In November, rooted cuttings are extracted and 5 are placed together in a plastic bag. 25 bags of seedlings are stored in a stack and nest tote box. These are stored at 1 degree centigrade. These are shipped in cardboard boxes.
Length of Storage	November to April.
Guidelines for Outplanting / Performance on Typical Sites	Rooted seedlings are planted in the field from winter to early spring.
Protocol Citations	Dumroese, K., Wenny, D. L., Morrison, S. J. "Propagation Protocol for Willows and Poplars Using Mini-Cuttings" USDA NRCS 2002.

INFORMATION SOURCES

References	Darris, D.C., Lambert, S.M., "Native Willow Varieties of the Pacific Northwest" 1993 http://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/orpmcrb560.pdf Accessed 4/25/2015 Dreesen, D. R. "Propagation Protocols for Container Willows in the Southwest Using US Seeds" Native Plants Journal 4:(2) 118-124. 2003 Dumroese, K., Wenny, D. L., Morrison, S. J.

	"Propagation Protocol for Willows and Poplars Using Mini-Cuttings" USDA NRCS 2002. In Klinkenberg, Brian. (Editor) 2014. E-Flora BC: Electronic Atlas of the Plants of British Columbia [eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. [Accessed:4/26/2015 10:40:23 AM] Little, E.L., Jr., 1976, Atlas of United States trees, volume 3, minor Western hardwoods: U.S. Department of Agriculture Miscellaneous Publication 1314, 13 p., 290 maps. Newsholme, C. "Willows, The Genus Salix" Timber Press 1992 Sound Native Plants "Live Stakes & Cuttings" 2005 http://soundnativeplants.com/wp-content/uploads/Live_stakes.pdf Accessed 4/25/2015 USDA, NRCS. 2015. The PLANTS Database (http://plants.usda.gov, 26 April 2015). National Plant Data Team, Greensboro, NC 27401-4901 USA USDA-NRCS. 2013. Release brochure for 'Clatsop' Hooker willow (Salix hookeriana). USDA-Natural Resources Conservation Service, Corvallis Plant Materials Center, Corvallis, OR Warren-Wren, S. C. "Willows" David & Charles 1972
Other Sources Consulted	Calflora: Information on California plants for education, research and conservation, with data contributed by public and private institutions and individuals, including the Consortium of California Herbaria. 2015. Berkeley, California: The Calflora Database [a non-profit organization] http://www.calflora.org/ Acessed: Apr 26, 2015 Giblin, D. "Salix hookeriana" 2015 http://biology.burke.washington.edu/herbarium/imagecollection.php?Genus=Salix&Species=hookeriana Accessed 4/25/2015

Protocol Author	Zachary Mallon
Date Protocol Created or Updated	4/26/2015