Plant Propagation Protocol for *Salix commutata*
ESRM 412 – Native Plant Production
Spring 2015
Protocol URL: https://courses.washington.edu/esrm412/protocols/SACO2.pdf

TAXONOMY	
Plant Family	
Scientific Name	Salicaceae
Common Name	Willow family
Species Scientific Name	
Scientific Name	*Salix commutata* Bebb
Varieties	
Sub-species	
Cultivar	
Common Synonym(s)	*Salix Barclayi* Andersson var. *commutata* (Bebb) L. Kelso[5] *Salix commutata* Bebb var. *denudata* Bebb[9] *Salix commutata* Bebb var. *mixta* Piper[9] *Salix commutata* Bebb var. *puberula* Bebb[9] *Salix commutata* Bebb var. *sericea* Bebb[9]
Common Name(s)	Undergreen willow
Species Code (as per USDA Plants database)	SACO2
GENERAL INFORMATION	
Geographical range	 3 Alaska through Oregon and Montana. Present in Alaska, British Columbia, Alberta, Yukon, NW Territories, Washington, Oregon, Idaho, and Montana[7]. It range is from Western North America – Alaska to California[1].
Ecological distribution	This species prefers wet environments and is normally found in wetlands, marshes, riparian areas and natural springs[2]. Mostly in the Olympic and Cascade mountains of Washington; Alaska and Yukon south to Oregon,

	occasionally east to Idaho and Montana[6].
Climate and elevation range	Prefers cool moist climates and can be found from sea level to 9000 feet[2]. It likes woodland garden sunny edges and dappled shade[6]. It succeeds in most soils including wet, ill-drained or intermittently flooded soils, though this species prefers a damp heavy soil in a sunny position. It requires mostly sun, part shade and regular shade but needs mostly sun to grow healthy[7]. Elevation can be from a minimum of 120 meters to 2435 meters max, slopes ranging from 0 to 78% gradient[5].
Local habitat and abundance	In Washington, this species can be found as a component of wet communities in higher elevations in the mountains[2]. This species likes the rocky alpine and subalpine slopes, glacial moraine, open spruce woods, streamsides, wet fens, and gravel benches along the streams[7].
Plant strategy type / successional stage	Medium tolerance to drought and restricted water conditions[10]. It is intolerant to shade and needs light, the vegetative spread is slow though the seed rate is fast when it comes to spreading. This species is also fire resistant [1] and is an early seral colonizer of areas with such disturbance (flooding or fire)[2].
Plant characteristics	Perennial shrub native to the US. Active growth period is during the spring and summer; fruit and seed production are in the early summer and continue until late. The commutata has a short life span and a moderate growth rate – at maturity a typical commutata will reach up to 6 feet high, and a max height of 9 feet at 20 years[1]. It has gray-green foliage and white flowers; the fruit and seed are brown. The flowers are dioecious – individual flowers are either male or female making this plant non-self-fertile[1]. A single crown is formed of the shape. Willows tend to grow in clumps and easily spread by layering – though they grow rapidly they are generally not very long lived[2].
PROPAGATION DETAILS	
Ecotype	Native Plant Nursery in Glacier National Park, Montana
Propagation Goal	Plants
Propagation Method	Vegetative
Product Type	Plug + container
Stock Type	800 ml containers
Time to Grow	1+ year
Target Specifications	Stock type: container cutting with a height of 15cm and a caliper of 1cm. the root system needs to be a firm plug in each container[4].
Propagule Collection Instructions	Pre-cutting in the spring for hardwood, or summer for softwood stem cuttings. This should be done in June to August[1]. Cuttings should be ½ to 1 inch thick and 16 inches long, also should be collected when the plant is dormant or when the leaves are removed[2].
Propagule Processing/Propagule Characteristics	Keep the cuttings moist and under refrigeration prior to treatment[4]. Cuttings can be stored for several months making sure that the cuttings are not wet and are in sawdust or other mediums[2].
Pre-Planting Propagule Treatments	Add moist mineral soil and water with mist. Cuttings should be treated with 1000 ppm IBA rooting hormone powder. After this is applied stick them in a mist bed with bottom heat for 2-4 weeks[4].
Growing Area Preparation /	The outdoor mistbed is applied at 6 second intervals for every 6 minutes. If there is too frequent misting it will result in leaf and stem rot. Depending on the

Annual Practices for Perennial Crops	outdoor temperature, the frequency can be increased or decreased. Bottom heat needs to be maintained at 21 degrees Celsius and the tables in a 12cm root medium. The root medium is 50% perlite and 50% sand. During rooting cover the mistbed with a shadecloth[4].
Establishment Phase Details	After the cuttings are ready to be potted, move them to an outdoor shadehouse for 4 weeks. The cuttings will later be moved to full sun exposure in the outdoor nursery and irrigated with an irrigation system once it hits the active growth phase[4].
Length of Establishment Phase	2-4 weeks.
Active Growth Phase	After cuttings are lifted from the shadehouse with adequate root systems, pot them in 800 ml containers. It is necessary to use 70% 6:1:1 sphagnum peat, perlite, and vermiculite with 30% sand of Osmocote fertilizer and Micromax[4]. The cuttings can be planted into the ground with approximately ¾ of the cutting below the soil surface[2] and should be spaced 1-2 feet apart.
Length of Active Growth Phase	8 weeks
Hardening Phase	During the hardening phase irrigation can gradually be reduced in September and October, and should be given one last final irrigation before winter.
Length of Hardening Phase	8 weeks
Harvesting, Storage and Shipping	Total time to harvest takes up to 1 year, between September to October. The storage conditions should be overwinter in outdoor nurseries, under insulating foam[4].
Length of Storage	5 months
Guidelines for Outplanting / Performance on Typical Sites	Oberlin Bend, Glacier National Park, MT. July and August after snowmelt[4].
Other Comments	1 year old cuttings were 34cm tall and 1.5 cm in caliper 1 year after rooting[4].
INFORMATION SOURCES	
References	1. Bebb. "Salix Commutata - Bebb." Salix Commutata Undergreen Willow PFAF Plant Database. Plants for A Future. Web. 20 May 2015. 2. Chi, Phillip. "Plant Data Sheet." Plant Data Sheet. 12 May 2006. Web. 20 May 2015. 3. "Distribution Map." Map: Salix Commutata. Flora of North America. Web. 20 May 2015. 4. Evans, Jeff; Hosokawa, Joy.; Wick, Dale. 2008. Propagation protocol for vegetative production of container *Salix commutata* Bebb plants (800 ml containers); USDI NPS - Glacier National Park, West Glacier, Montana. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 20 May 2015). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery. 5. 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: 5/20/2015 12:38:19 PM] 6. Knoke, Don, and David Giblin. "Salix Commutata." WTU Herbarium Image Collection - Burke Museum. WA Native Plant Society; Burke Museum of Natural History and Culture, 10 Feb. 2015. Web. 20 May 2015. 7. "NPIN: Native Plant Database." Lady Bird Johnson Wildflower Center. TWC Staff, 2007. Web. 20 May 2015. 8. "Plant Detail: Salix Commutata." Plant Detail: Salix Commutata (variable Willow, Undergreen Willow). Evergreen. Web. 20 May 2015. 9. "Salix Commutata Bebb Undergreen Willow." Plants Profile for Salix Commutata (undergreen Willow). USDA NRCS. Web. 20 May 2015. 10. "Undergreen Willow (Commutata)." Undergreen Willow Plant Guide. USDA, NRCS, PLANTS Database. Web. 20 May 2015.
Other Sources Consulted	
Protocol Author	Teresa Mizuki
Date Protocol Created or Updated	Created 05/20/2015