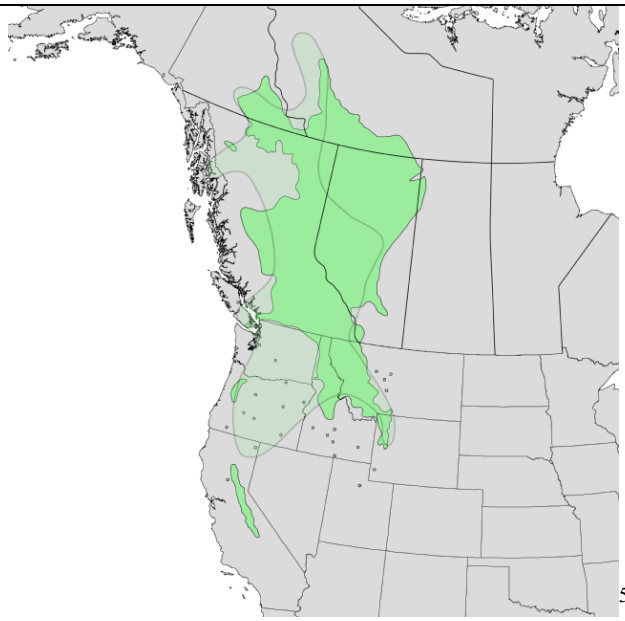
Plant Propagation Protocol for *Salix prolixa*
ESRM 412 – Native Plant Production

TAXONOMY	
Plant Family	Salicaceae
Scientific Name	Salix prolixa
Common Name	Mackenzie's Willow
Scientific Name	Salix prolixa Andersson
Varieties	MacKenzieana hook[3] Macrogemma[3]
Sub-species	Salix eriocephala[3] Salix rigada[3]
Cultivar	
Common Synonym(s	*Salix cordata* Muhl.[4] *Salix cordata* Muhl. var. *mackenzieana* Hook. [4] *Salix eriocephala* Michx. ssp. *mackenzieana* (Hook.) Dorn[4] *Salix eriocephala* Michx. var. *mackenzieana* (Hook.) Dorn[4] *Salix mackenzieana* (Hook.) Barratt ex Anderss. [4] *Salix mackenzieana* (Hook.) Barratt ex Anderss. var. *macrogemma* Ball[4] *Salix rigida* Muhl. [4] *Salix rigida* Muhl. ssp. *mackenzieana* (Hook.) E. Murr. [4] *Salix rigida* Muhl. var. *mackenzieana* (Hook.) Cronq. [4] *Salix rigida* Muhl. var. *macrogemma* (Ball) Cronq. [4]
Common Name(s)	MacKenzie's Willow
Species Code (as per USDA Plants database)	SAPR3[3]
GENERAL INFORMATION	

Geographical range	 [5] Southern AK south to California and as far east as Saskatchewan, Montana, Wyoming, Utah and Nevada[2]
Ecological distribution	It is found in riparian areas (streambanks) and also in wetland areas[7]
Climate and elevation range	The Salix prolixa can be foundin areas with at least 16 in, but no more than 86 in. of rain a year and between 350-7300m of elevation.[6]
Local habitat and abundance	It can be found in abundance in areas that have ready access to water such as rivers and marshes. It will be found with other types of willows generally. Along streams it can be found with cottonwoods and Alder (Alnus rubra) In the marshes/swamps it is commonly associated with things like horse tail, other willows and native shrubs.[2]
Plant strategy type / successional stage	It is an early successional species that takes advantage of the frequent disturbance.[10]
Plant characteristics	A perennial shrub or small tree, 2-5m tall. It has reddish-brown bark that greys with age. The flowers are singular and white in color. It has a short lifespan, due to its short stature and shade intolerance.[8]
PROPAGATION DETAILS	
Ecotype	
Propagation Goal	Plants and cuttings[10]
Propagation Method	Vegetative[10]
Product Type	Container (plug)[1]
Stock Type	336 ml containers[1]
Time to Grow	1 growing season (Spring) [1]
Target Specifications	Height: 41 cm and a firm root plug[1]
Propagule Collection Instructions	After 1 growing the cuttings will have vegetative reproduced to increase the number of plants that were

	originally planted in the stooling bed. [1]
Propagule Processing/Propagule Characteristics	The cuttings (whips) are brought back from the field and cut into 3-in pieces, anything over a diameter of .5 inches has to be thrown away, along with diseased or pathogenic specimens. All the viable cuttings are then put in a sealed plastic bag and placed in a fridge for storage at 34 degrees Fahrenheit. [1]
Pre-Planting Propagule Treatments	The cuttings are generally struck in late may and into June. 3-days before the striking happens begin soaking the cuttings in a running tap water bath and keeping them in the shade. In order for the cutting to be acceptable it must have a bud within 1 inch of the top, other buds tend to die or end up rotting. [1]
Growing Area Preparation / Annual Practices for Perennial	Cuttings are put in 336-ml pots that are filled with a 1:1 ratio of Sphagnum and vermiculite. The medium is then saturated and the container drains to field capacity. Cuttings are then put into a plastic roofed growing structure. [1]
Establishment Phase Details	Once leaves begin to establish use fertilizer twice a week to provide N, B and MgSO4. [1]
Length of Establishment Phase	2 weeks[1]
Active Growth Phase	Apply fertilizer (15N:5P2O5:15KO2) after two weeks and repeat twice a week through out growing season. Prune the cuttings 3-4 times during active growing phase. The first prune happens when the cuttings are 8-10 in and they are reduced to 6-8 in. Let them grow another 6 in and prune half of the new growth. Repeat this as necessary. On the 3rd-4th prune, cut back to 16 in. [1]
Length of Active Growth Phase	4 weeks[1]
Hardening Phase	Every other week fertilize with 4N:25PO5:35K2O until mid August, when switch to CAN-17 twice a week. The growing structure is open-sided which exposes the leaves to normal temperatures so leaves will drop in October. [1]
Length of Hardening Phase	12 weeks[1]
Harvesting, Storage and Shipping	In later November the cuttignгs are ready for harvesting and transporting in need be. The cuttings will be removed from the soil and placed in a plastic band (5 per bag). Only acceptable plants are bagged, these are plants that have a diameter > 6mm and a healthy looking stem. [1]
Length of Storage	4-5 months depending on spring time conditions[1]
Guidelines for Outplanting / Performance on Typical Sites	n/a
Other Comments	Hardwood cuttings will readily establish without any pretreatment. Seeds however are short lived and need proper storage during germination. Will reproduce sexually through seed and vegetative through its rhizomes, and stems easily root when struck in

	moist soil. [6]
INFORMATION SOURCES	
References	1. Dumroese RK, Wenny DL, Morrison SJ. 2003. Propagation protocol for container willows and poplars using mini-cuttings. Native Plants Journal 4: 137–139. 2. Staff, TWC. "NPIN: Native Plant Database." *Lady Bird Johnson Wildflower Center*. N.p., 2007. Web. 23 Apr. 2015. 3. USDA NRCS National Plant Data Team, Plants Profile: Salix prolixa Andersson, plants.usda.gov, 2009 4. "Flora of North America." Salix prolixa, vol. 7 (n.d.): pg. 125. FNA. Web. 2015. 5. Gibland, David. "WTU Herbarium Image Collection." WTU Herbarium Image Collection - Burke Museum. Burke Museum, n.d. Web. 23 Apr. 2015. 6. "Palouse Prairie Foundation Native Plant Database." *Palouse Prairie Foundation Native Plant Database*. Palouse Praire Foundation Plant Database, n.d. Web. 15 Apr. 2015. 7. Jepson Flora Project (eds.) 2013. *Jepson eFlora*, http://ucjeps.berkeley.edu/IJM.html, accessed on Apr 26 2015 8. Argus, George W. 2004. A Guide to the Identification of Salix (Willows) in Alaska, the Yukon Territory, and Adjacent Regions. Online at http://aknhp.uaa.alaska.edu/willow/pdfs/GuideSalixAK-YT11May05.pdf Accessed 4/26/15 9. Darris, Dale C., and Scott M. Lambert. 1993. Native Willow Varieties for the Pacific Northwest. USDA, Soil Conservation Service, Corvallis Plant Materials Center. Corvallis, OR. 10. McCreary, Douglas D., and Jerry Tecklin. 2000. Homemade Dibble Facilitates Planting Willow and Cottonwood Cuttings. Native Plant Journal 1(1):59-60
Other Sources Consulted	
Protocol Author	Dean Freundlich
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