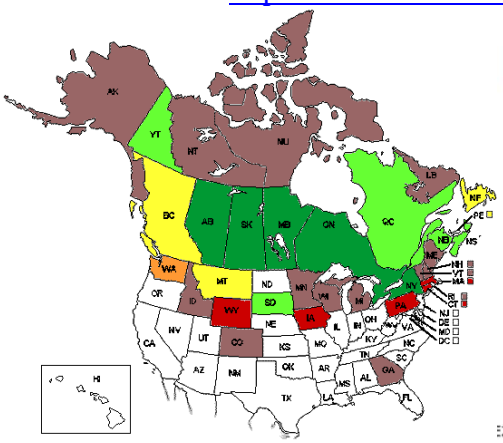
Plant Propagation Protocol for *Viola renifolia*
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/*VIRE2.pdf*



TAXONOMY	
Plant Family	
Scientific Name	Violaceae
Common Name	Violets
Species Scientific Name	
Scientific Name	*Viola renifolia* A. Gray
Varieties	*Viola renifolia* A. Gray var. *brainerdii* (Greene) Fernald
Sub-species	None
Cultivar	None
Common Synonym(s)	None
Common Name(s)	White Violet, Kidney-Leaf Violet, Kidney-Leaf White Violet, Northern White Violet, Violette Réniforme
Species Code (as per USDA Plants database)	VIRE2
GENERAL INFORMATION	
Geographical range	Throughout Canada, AK,WA, South through the Rocky Mountains to CO, and East through to the Northeastern United States. (USDA, Britton and Brown) (See maps under heading) (USDA)
Ecological distribution	Mesic to moist woodlands, open forests, streambanks, swamps, and meadows. Lowlands to subalpine slopes. (E-Flora BC) (DNR.WA)
Climate and elevation range	In Washington State, 2000-4360 ft. (DNR.WA) As low as 43 ft. BC, possibly lower further north. (E-Flora BC) As high as 9100 ft. in CO. (FS)
Local habitat and	In WA it is associated with *Thuja plicata*, *Tsuga heterophylla*, *Picea*

abundance	*engelmannii, Alnus incana ssp tinuifolia* (DNR.WA). In CO it is associated with *Abies lasiocarpa, Picea engelmannii,* and *Picea contorta* (FS). With such a large range, multiple sets of species associations exist.
Plant strategy type / successional stage	Seral to Late Successional (DNR.WA).
Plant characteristics	Perennial forb. Lacking stems, horizontal rhizomes, and stolons. Leaves 2-6 cm, kidney shaped, pubescent, with small toothed margins. Flower petals are white with 3 purple streaks on the lower petal. Blooms May through August. (DNR.WA)
PROPAGATION DETAILS **Propagation by Seed. General propagation protocol for Violets (Fuller 1990)**	
Ecotype	N/A
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container
Stock Type	Seed
Time to Grow	8 weeks
Target Specifications	4” pots
Propagule Collection Instructions	Flowering occurs from May to August, so harvesting of appropriate amounts of seed will need to happen over a similar length of time. Identifying mature seed capsules is essential to harvesting viable seed. Mature capsules are a pale green to straw color. When developing they will hang down from their stem. As the capsule matures it will become raised toward the sun. It then dries and begins to split into three segments. Maturity can be tested by applying gentle pressure to a pod’s tip. If it splits, then it is mature. Capsules should be picked as they begin to split with a portion of the stem attached. Picked capsules should be placed in a paper bag and the bag should then be stored in a cool ventilated area. Seed release should occur within 2 weeks of harvesting.
Propagule Processing/Propagule Characteristics	Healthy mature seeds will be smooth, brown to mahogany in color, and shiny.
Pre-Planting Propagule Treatments	Seeds should be sifted to remove the stems and capsule. The most closely related Viola species for which a protocol could be found was *Viola palustris*. *Viola palustris* seeds were cold stratified for 90 days. If germination without stratification does not occur, 90 days of cold stratification should be attempted (Baskin 2003).
Growing Area Preparation /	A seedling mix with a high organic material mix should be used for planting. Plug trays are appropriate for starting seedlings. If planting in

Annual Practices for Perennial Crops	open trays rather than plugs, seeds should be planted .5 inches apart. Seeds should be sown on the surface of the soil and then covered with a very thin layer of sand, grit, or compost mulch. Plugs or trays should be bottom watered and the soil should be moist, but not saturated. Maintain the temperature between 64 and 68 degrees F.
Establishment Phase Details	Sow seeds in Spring. Seedlings should be grown to about 1" tall. At this point pot seedlings up in the same growth medium into the 4" pots.
Length of Establishment Phase	2-3 weeks.
Active Growth Phase	Grow seedlings in the 4" pots until they become dormant for the winter. Seedlings can be grown outside of a greenhouse at this stage, but should be kept under shade.
Length of Active Growth Phase	The active growth phase will end in the fall. This timing will vary depending on when seeds were sown in the spring.
Hardening Phase	If grown outdoors during the active growth phase, an additional hardening phase should be unnecessary.
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	Plants can be shipped after they have gone dormant for the winter.
Length of Storage	N/A
Guidelines for Outplanting / Performance on Typical Sites	No information is available at this time on *V. renifolia* plantings in the field.
Other Comments	While harvesting seed, be sure to only take 25% of the seed capsules available on site. This species is ranked G5/S2 by the USDA, USFS, and Washington DNR. This means the population is considered globally secure, but local populations are sensitive due to relative rarity. It is important that propagation efforts do not damage the viability of wild populations.
INFORMATION SOURCES	
References	Baskin, Carol C. 2003. Propagation protocol for production of container *Viola palustris* L. plants; University of Kentucky, Lexington, Kentucky. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 5 June 2015). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery. Britton, N and Brown, A. "An Illustrated Flora of the Northern United States, Canada, and the British Possessions." C Scribner's Sons 1913 Fuller, R. "Pansies, Violas, and Violettas. The Complete Guide." Crowood Press, 1990

	Klinkenberg, B. "E-Flora BC: Electronic Atlas of the Plants of British Columbia. *Viola renifolia*." Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver 2014. http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Viola%20renifolia Accessed 5/16/2015 United States Forest Service "USDA-Forest Service R2 Sensitive Species Evaluation Form" http://www.fs.fed.us/r2/projects/scp/evalrationale/evaluations/dicots/violarenifolia.pdf Accessed 5/17/2015 USDA, NRCS. 2015. The PLANTS Database (http://plants.usda.gov, 26 April 2015). National Plant Data Team, Greensboro, NC 27401-4901 USA Washington Department of Natural Resources "*Viola renifolia"* http://www1.dnr.wa.gov/nhp/refdesk/fguide/pdf/vire2.pdf Accessed 5/16/2015
Other Sources Consulted	Kartesz, J.T. 1994. A synonymized checklist of the vascular flora of the United States, Canada, and Greenland. 2nd edition. 2 vols. Timber Press, Portland, OR. Klaber, D. "Violets" A. S. Barnes & Co. Inc 1976 Marcussen, T., Jakobson, K., Danihelka, J., et al. "Inferring Species Networks from Gene Trees in High-Polyploid North American and Hawaiian Violets (Viola, Violaceae)" Systematic Biology 2011 http://sysbio.oxfordjournals.org/content/early/2011/09/12/sysbio.syr096.full.pdf Accessed 6/5/2015
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Date Protocol Created or Updated	06/05/2015