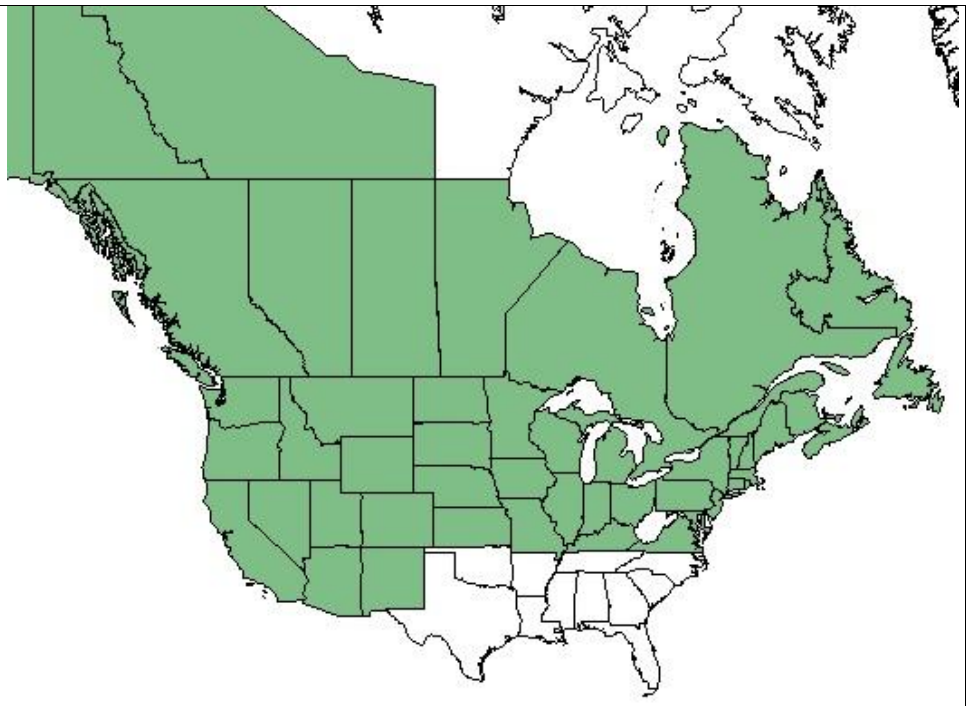
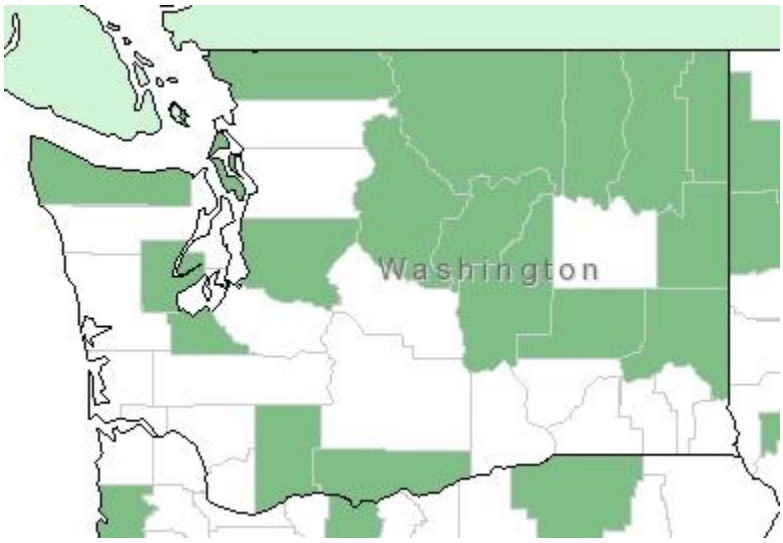
Plant Propagation Protocol for *Polygonum amphibium* L.
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/*POAM8.pdf*

TAXONOMY	
Plant Family	
Scientific Name	Polygonaceae (USDA 2016)
Common Name	Buckwheat (USDA 2016)
Species Scientific Name	
Scientific Name	*Polygonum amphibium* L. (USDA 2016)
Varieties	*Polygonum amphibium* var. *emersum* Michx. *Polygonum amphibium* var. *stipulaceum* Coleman (USDA 2016)
Sub-species	N/A
Cultivar	N/A
Common Synonym(s)	*Persicaria amphibia* (L.) Gray var. *stipulaceae* (N. Coleman) H. Hara *Persicaria mesochora* Greene *Polygonum amphibiaum* L. subsp. *Laevimarginatum* Hulten *Polygonum amphibiaum* L. var. hartwrightii (A. Gray) Bissell *Polygonum coccineum* Muhl. Ex Willd. Var. *rididulum* (Sheldon) Stanford *Polygonum fluitans* Eaton *Polygonum hartwrightii* A. Gray *Polygonum inundatum* Raf. *Polygonum natans* Eaton (USDA 2016)
Common Name(s)	Water smartweed (USDA 2016) Longroot smartweed Water knotweed Amphibious bistort Water persicaria Willow-grass (U.S. National Plant Germplasm System 2016) Western ladysthumb (Hitchcock 1976)
Species Code (as per USDA Plants database)	POAM8
GENERAL INFORMATION	

Geographical range	  (USDA 2016)
Ecological distribution	P. *amphibium* is freshwater aquatic or semi-aquatic and cosmopolitan (Hitchcock 1976, Pojar 1994).
Climate and elevation range	Preferred conditions are moist soil or up to 20” deep water (Mengler 1997).
Local habitat and abundance	Fairly common in aquatic systems (Pojar 1994).
Plant strategy type / successional stage	No specific information could be located.
Plant characteristics	Aquatic or amphibious non-woody perennial with rhizomes or stolons, prostate or ascending form, floating when aquatic, 50-100 cm long. Alternate numerous leaves usually floating along stem, narrowly elliptic to oblong-lance shaped to 15 cm long. Bright pink small showy flowers

	in upright spikes. Fruits are lens-shaped, dark brown, smooth achenes (Pojar 1994).
PROPAGATION DETAILS	
Ecotype	Unable to find specific site information.
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Plug
Stock Type	N/A
Time to Grow	Approximately 12-15 months (seeds collected in the summer and plugs planted in the fall). No more specific information could be located.
Target Specifications	Plugs with adequately root system to survive planting in moist soil or aquatic site. No more specific information could be located.
Propagule Collection Instructions	Collect seeds from plant populations in aquatic systems when achenes are mature in July-September (Mengler 1997). As described above, fruits are lens-shaped, dark brown smooth achenes (Pojar 1994).
Propagule Processing/Propagule Characteristics	If desired, instead of growing plugs, *P. amphibium* seeds may be spread on restoration sites at a rate of .5-1.5 lbs/acre (Mengler 1997). No more specific information regarding seed longevity could be located.
Pre-Planting Propagule Treatments	Both cold stratification in lighted conditions and scarification. *P. amphibium* seeds have a physiological dormancy that must be broken by cold stratification. According to Baskin and Baskin, optimal cold stratification treatment is 210 days at 30/20° C in light conditions (2014). The seeds should be stratified in water or in a moist medium (Justice 1944). Higher percentages of seeds were found to germinate at 30/15° C than at 20/10° C (Hogenbirk and Wein 1992). Although *P. amphibium* has a permeable seed coat, Crocker found that scarifying the seed coat by rupturing the seed coat near where the cotyledons push out increased their germination from 0 to 85% (1907, Baskin and Baskin 2014).
Growing Area Preparation / Annual Practices for Perennial Crops	After stratification, seeds may be planted in outdoor capillary beds or emergent beds set in the ground. Beds must contain adequate soil and water to imitate wetland/aquatic conditions (Kimpo et al 1998).
Establishment Phase Details	No specific information could be located.
Length of Establishment Phase	No specific information could be located.
Active Growth Phase	*P. amphibium* will grow throughout the spring and summer. No more specific information could be located.
Length of Active Growth Phase	No specific information could be located.
Hardening Phase	No specific information could be located
Length of Hardening Phase	No specific information could be located
Harvesting, Storage	No specific information could be located

and Shipping	
Length of Storage	No specific information could be located
Guidelines for Outplanting / Performance on Typical Sites	No specific information could be located
Other Comments	Though it is possible to spread seed on site in the spring, it is likely that seed sowed in wetland sites will float away or be consumed by waterfowl – thus, planting plugs is preferable (Ewing 2016). Deno noted that only 3-5% seed germination had been achieved with *P. orientale* (1998), a species in the same genus as *P. amphibium* which is considered invasive in the southeast (USDA 2016).
INFORMATION SOURCES	
References	Baskin, J. M., & Baskin, C. C. (2014). *Seeds: Ecology, Biogeography, and Evolution of Dormancy and Germination* (2nd ed.). San Diego, CA: Academic Press. Crocker, W. (1907). Germination of Seeds of Water Plants. Botanical Gazette, 44(5), 375–380. Deno, N. C. (1998). *Second supplement to Seed germination theory and practice*. State College, PA: N.C. Deno. Ewing, K. (2016). *Restoration of North American Ecosystems: Wetlands*. Lecture presented at ESRM 473 in University of Washington, Seattle. Hitchcock, C. L., & Cronquist, A. (1976). *Flora of the Pacific Northwest; an illustrated manual*. Seattle: University of Washington Press. Hogenbirk, J., & Wein, R. (1992). Temperature effects on seedling emergence from boreal wetland soils: implications for climate change. Aquatic Botany, 42, 361–373. Justice, O. L. (1944). Viability and Dormancy in Seeds of Polygonum amphibium L ., P . coccineum Muhl . and P . hydropiperoides Michx. American Journal of Botany, 31(7), 369–377. Kimpo, A., Castle, B., & Bloom, J. (1998). *The wetland handbook: A community guide to growing native plants*. Renton, WA: King Conservation District. Mengler, J. L. (1997). *Native plant guide for streams and stormwater facilities in Northeastern Illinois*. Chicago: USDA Natural Resources Conservation Service's Chicago Metro Urban and Community Assistance Office.

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