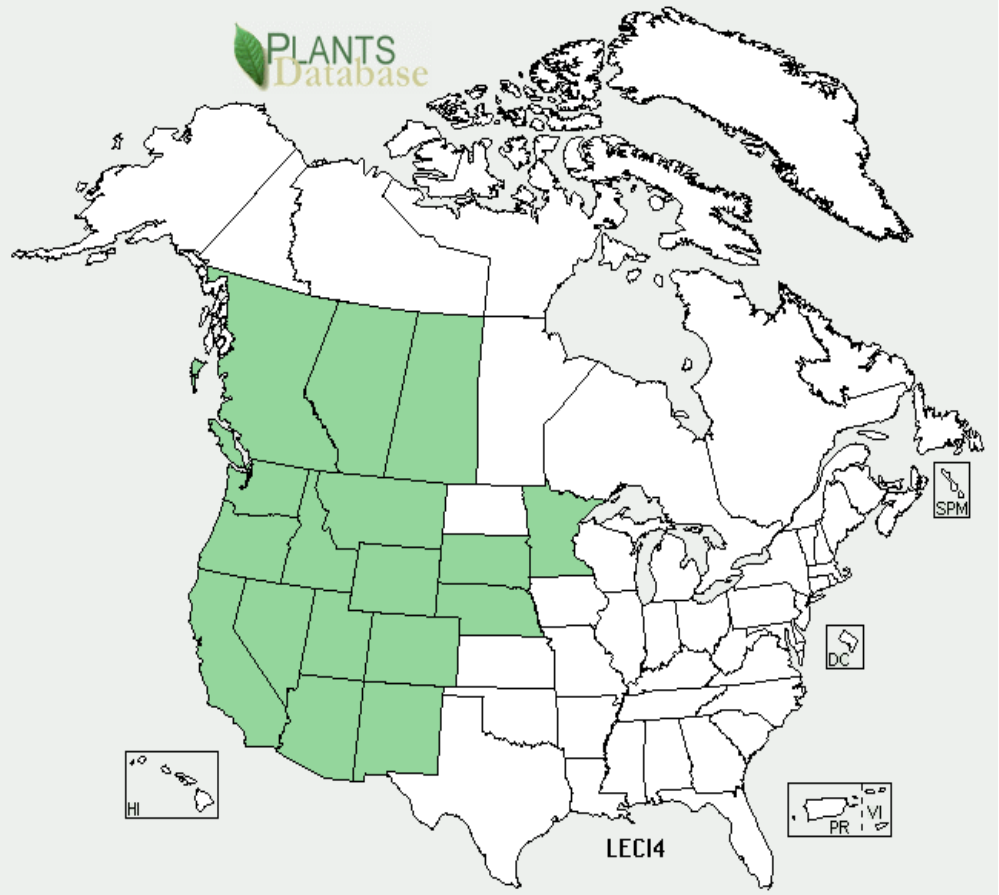
Plant Propagation Protocol for *[Leymus cinereus]*
ESRM 412 – Native Plant Production

TAXONOMY	
Family Names	
Family Scientific Name:	Poaceae
Family Common Name:	Grass
Scientific Names	
Genus:	Leymus
Species:	cinereus
Species Authority:	(Scribn. & Merr.) Á. Löve
Variety:	
Sub-species:	
Cultivar:	
Authority for Variety/Sub-species:	
Common Synonym(s) (include full scientific names (e.g., *Elymus glaucus* Buckley), including variety or subspecies information)	*Leymus cinereus* (Scribn. & Merr.) Á. Löve ANPI6 *Aneurolepidium piperi* (Bowden) Baum ELCI2 *Elymus cinereus* Scribn. & Merr. ELCIP *Elymus cinereus* Scribn. & Merr. var. *pubens* (Piper) C.L. Hitchc. ELCOP *Elymus condensatus* J. Presl var. *pubens* Piper ELPI2 *Elymus piperi* Bowden
Common Name(s):	Basin Wildrye
Species Code (as per USDA Plants database):	LECI4
GENERAL INFORMATION	

Geographical range (distribution maps for North America and Washington state)	 
Ecological distribution	Western United States and Canada- (AZ, CA, CO, ID, MN, MT, NE, NM, NV, OR, SD, UT, WA, WY), CAN (AB, BC, SK)

Climate and elevation range	Grows near streams, gravelly slopes, sand dunes and near sagebrush; both low and high elevations. (1) Generally requires a minimum of 8" of rain. (6) From low semi-deserts up to aspen and spruce belts. (4) 1,970'-9,840' general elevation; from 1000'-2000' in drainage basins and up to 10,000' in the mountains. (6)
Local habitat and abundance; may include commonly associated species	Common to floodplains, praries and foothills, along streams, gullies and roadsides; both on dry and moist areas. (6)
Plant strategy type / successional stage	"Basin wildrye is tolerant of partial shade in shrublands and woodlands .It grows on both disturbed and undisturbed soils. Basin wildrye occurs after disturbance, in secondary succession, and also in climax communities. It may be a major component of the dominant grass and forb stage that develops shortly after fire in pinyon-juniper communities and once established may dominate a site." (6)
Plant characteristics	Basin wildrye is the largest cool-season perennial bunchgrass native to the western United States. It forms large clumps with rhizomes. The base reaches 2 to 4 feet in diameter and grows up to 6 and a half feet tall. Its leaves grow approximately 2 cm wide and the seedheads grow 4-11 or more inches long. Flowers in early to mid summer. (6)
PROPAGATION DETAILS	
Ecotype Photo-(Matt Lavin, Flicker.)	
Propagation	Plants
Propagation	Seed (3)(1)(6) Rhizomal separation. (1) (6)

Method	
Product Type	Container (plug) (3)
Stock Type:	
Time to Grow	4 Months (3)
Target	Tight root plug. (3)
Propagule	Collect seed late summer or early fall. Plant directly into flats or garden to overwinter or store seeds in cool dry place for spring out-planting. (1) Collect when inflorescence begins to dry, when seed is in soft to hard dough stage prior to shattering from inflorescence. Strip from inflorescence or clip whole inflorescence from plant and store harvested seeds in paper bag at room temp for later cleaning. (3)
Propagule Processing/Propagule Characteristics	144,000 seeds/lb (3) or 95-166,000 seeds/lb (3) For small quantity, rub seed from inflorescence with air column separator. For large quantity, thresh with hammermill, and clean with air screen equipment. Store seed in 40% humidity at 40 degrees F.
Pre-Planting Propagule Treatments	Wild collections have low germination- 35-40%, there is a wide range of germination temperatures but one cultivar, 'Magnar', is optimal at 20 degrees Celcius. Another alpine source had 75% germination after 16 cool and moist stratification; with the addition of gibberellic acid and the 16 week stratification, a rate of 98% germination was achieved. (3)
Growing Area Preparation / Annual Practices for Perennial Crops	"No pretreatment is used. In January seed is sown in the greenhouse in 10 cu. in. Ray Leach Super cell conetainers filled with Sunshine #4 and covered lightly. Head space of ¼ to ½ inch is maintained in conetainers to allow deep watering. A thin layer of pea gravel is applied to prevent seeds from floating. Conetainers are watered deeply." (3)
Establishment Phase	Keep media moist through germination, which generally begins in 7 days. Full germination may take 3 weeks, after two it is around 60%. (3)
Length of Establishment Phase:	Three or more weeks. (3)
Active Growth Phase	Fertilize once per week and water thoroughly every other day. Use water soluble fertilizer with micro-nutrients. (3)
Length of Active Growth Phase:	Four months. (3)
Hardening Phase	Weather dependant, move plants to cold frame in late March or early April; watering every other day and more in hot weather. (3)
Length of Hardening Phase:	Between 2-4 weeks. (3)

Harvesting, Storage and Shipping Photo- (Matt Lavin, Flickr.)	
Length of	

Storage (of seedlings, between nursery and outplanting):	
Guidelines for Outplanting / Performance on Typical Sites	"Transplanting is done in early May by using an electric drill and portable generator to drill 1.5 inch diameter holes at the planting site. Survival in seed increase plantings without competing vegetation approaches 100%. Transplanting into sites with existing vegetation reduces survival and vigor depending on weather conditions following planting. Flowering and seed production occurs the year after transplanting." (3)
Other Comments (including collection restrictions or guidelines, if available):	Seed collection from native plants often garners few seeds, thus timing appears to be crucial as well as the need for seed increase beds. (2) Establishing from seed is a slow process with maturation occurring late in the season, increasing risk to young plants over winter. Additionally, Ergot, (Claviceps spp.) infestations have been found in the seed. (6)
INFORMATION SOURCES	
References (full citations):	1)Robson, Kathleen A., Alice Richter, and Marianne Filbert. *Encyclopedia of Northwest Native Plants for Gardens and Landscapes*. Portland, Or.: Timber, 2008. Print. 2) Young, James A., and Cheryl G. Young. *Collecting, Processing, and Germinating Seeds of Wildland Plants*. Portland, Or.: Timber, 1986. Print. 3)Skinner, David M. 2005. Propagation protocol for production of container *Leymus cinereus* (Scrib. & Merr.) A. Love plants; USDA NRCS - Pullman Plant Materials Center, Pullman, Washington. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 10 May 2012). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery. 4)*Range Plant Handbook*. New York: Dover Publications, 1988. Print. 5)"Welcome to the PLANTS Database | USDA PLANTS." *Welcome to the PLANTS Database | USDA PLANTS*. PLANTS Profile Leymus Cinereus (Scribn. & Merr.) Á. Löve Basin Wildrye. Web. 15 May 2012. <http://plants.usda.gov/java/>. 6)"Species: Leymus Cinereus." *Species: Leymus Cinereus*. Web. 15 May 2012. <http://www.fs.fed.us/database/feis/plants/graminoid/leycin/all.html>.
Other Sources Consulted (but that contained no pertinent information) (full citations):	1)Johnson, Lorraine. *100 Easy-to-grow Native Plants: For American Gardens in Temperate Zones*. New York: Firefly, 2009. Print. 2)Leigh, Michael. *Grow Your Own Native Landscape: A Guide to Identifying, Propagating & Landscaping with Western Washington Native Plants*. Olympia, WA: Native Plant Salvage Project, Washington State University Cooperative Extension, Thurston County, 1999. Print. 3)Hartmann, Hudson Thomas, and Dale E. Kester. *Plant Propagation: Principles and Practices*. 8th ed. New Delhi: Prentice-Hall, 2011. Print. 4) Kruckeberg, Arthur R. *Gardening with Native Plants of the Pacific Northwest: An Illustrated Guide*. Seattle: University of Washington, 1982.

	Print. 5)Arbury, Jim, Richard Bird, and Mike Honour. *The Complete Book of Plant Propogation*. Newtown: Taunton, 1997. Print.
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