Plant Propagation Protocol for *Elymus glaucus* Buckley
ESRM 412 – Native Plant Production

TAXONOMY	
Family Names	
Family Scientific Name:	Poaceae
Family Common Name:	Grasses
Scientific Names	
Genus:	*Elymus*
Species:	*glaucus*
Species Authority:	Buckley
Variety:	
Sub-species:	*Elymus glaucus* subsp. *mackenziei, Elymus glaucus* subsp. *Virescens* (USDA, 2012)
Cultivar:	
Authority for Variety/Sub-species:	
Common Synonyms	*Elymus glaucus* Buckley var. *breviaristatus* Burtt Davy
Common Name(s):	Blue Wildrye
Species Code:	ELGL
GENERAL INFORMATION	
Geographical Range	Western North America and around the Great Lakes. Occurs from Alaska to Mexico, and East of Ontario.(Knoke, 2012)(USDA, 2012)
Ecological distribution :	Prairies, open woods, temperate grasslands, open subalpine environments. Soil moisture is an important factor, does not occur in central Washington or the central United States.
Climate and elevation range	Cool temperature and cool mesothermal climes, decreasing at higher elevations and precipitation levels. It can be found from sea level to subalpine elevations of 11,000 ft.(WolframAlph, 2012)
Local habitat and abundance; may include commonly associated species	Blue wildrye occurs the length of the Pacific Northwest, mostly west of the Coast-Cascade Mountain crest in prairies, open woods, thickets, and moist or dry hillsides. Typically occurring in grasslands in northern and southern portions of the Puget Lowland and the adjacent Georgia Depression of B.C.(two subspecies are found in B.C.)
Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)	Blue wildrye is a common early seral species. While sometimes locally abundant, it rarely forms dense, pure stands. Merrill and others report this species in early successional stands in the Mount St. Helens "blast zone" as a common component of elk diets 5 years post-eruption. Although blue wildrye rapidly

	establishes and increases under early seral conditions, numbers may decline dramatically after 3 to 4 years without further disturbance.(Pojar, 1994)
Plant characteristics :	Tufted perennial, forming clumps up to 10 cm. wide, hollow culms 5-10 dm. tall.
PROPAGATION DETAILS	
Ecotype:	Mt. Rainier at 2,000-5,400 ft elevation and Crater Lake at 6,400 to 7,000 ft elevation.
Propagation Goal:	Seeds
Propagation Method:	Seed, can also be propagated vegetatively using crown division
Product Type :	Propagules (seeds, cuttings, poles, etc.)
Stock Type:	Seeds
Time to Grow:	
Target Specifications:	Seed free of noxious weeds with germination >80% for revegetative purposes.
Propagule Collection (how, when, etc):	Harvest seed by hand in early July in foothills, to late August at higher elevations. Care should be taken to not over harvest areas and to source locally for restoration projects to preserve genetic integrity of product. Additionally the later in the season the more fragile the seed is, and is sensitive to smut and ergot in the wild which may impact the amount of healthy available seeds in the natural population. (Evans & Luna, 2008)
Propagule Processing/Propagule:	Awns must be removed from seeds. Thoroughly dry seeds, then use a brush machine, debearder, or hammer mill with a 3/16" screen. Next air screen twice, with #14 and 1/14 x ¼ inch screens at med-high airflow. Seeds density ranges from 124,000 to 155,000 seeds/pound. Seeds remain viable for 2 to 5 years, but a study showed germination of mature seeds stored at 59-86°F dropped sharply after 2 years. (Evans & Luna, 2008)
Pre-Planting Propagule Treatments:	None
Growing Area Preparation / Annual Practices for Perennial Crops:	Plantings should be at least ¼ mile from other accessions to isolate from other species. Plant between 50-60 pure live seeds/ft or if using unpure seeds, 100-160/ft. For plugs deeply till moderately moist soil for mechanical transplanter to operate. Plant seeds at shallow depths, .6-1 cm. The soil should be moist, fine textured, very firm and weed free. Mulch does not help establishment.If using plugs, use Ray Leach :stubby" super cells. (Evans & Luna, 2008)
Establishment Phase (from seeding to germination):	Seeds may be Spring or Fall soown, with irrigation supplied to keep soil moist and prevent crusting on soil

	surface. After a crown is established irrigiation is needed to maintain soil moisture. If using plugs, remove cones and cover with a wet cloth while planting in rows 28" apart. Not efficient for planting larger populations.
Length of Establishment Phase:	14 days to germination, total length 2 months
Active Growth Phase (from germination until plants are no longer actively growing):	In early Spring fertilize with 50 lbs N and 15 lbs S/acre on established plantings only. Apply propiconazole and chlorothalonil fungicides at label rates in May-March. Use broadleaf herbicides and manual weeding techniques to prevent competition. Remove plantings infested with finagle disease. (Evans & Luna, 2008)
Length of Active Growth Phase:	March-June
Hardening Phase:	Plants not outplanted in the first year can be hardened off in September and October
Length of Hardening Phase:	4 weeks
Harvesting, Storage and Shipping (of seedlings):	Harvesting seeds by hand is best because it prevents as much shatter-loss as possible in mature seeds.
Length of Storage:	3-4 years, PMC is about 50%, and declines rapidly thereafter.
Guidelines for Outplanting / Performance on Typical Sites :	Fall-sown at 35 PLS/sq ft with 9-month slow release N-P-K fertilizer and erosion control blanketing led to good emergence, but success after was determined by weed presence.
Other Comments:	None
INFORMATION SOURCES	
References (full citations):	
Other Sources Consulted (but that contained no pertinent information) (full citations):	"blue wild rye." *WolframAlpha*. Wolfram Alpha, 5-15-2012. Web. 16 May 2012. <http://www.wolframalpha.com/entities/species/blue_wild_rye/4p/eo/fh/>. Flessner, Theresa R.; Trindle, Joan D.C. 2003. Propagation protocol for production of *Elymus glaucus* Buckl. seeds (Seed); USDA NRCS - Corvallis Plant Materials Center, Corvallis, Oregon. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 30 December 2009). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery. Evans, Jeff; Luna, Tara.; Wick, Dale. 2008. Propagation protocol for production of container *Elymus glaucus* Buckl. plants (172 ml conetainers); USDI NPS - Glacier National Park, West Glacier, Montana. In: Native Plant Network. URL:

	http://www.nativeplantnetwork.org (accessed 16 May 2012). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery. Pojar, Jim and Andy MacKinnon 1994. Plants of the Pacific Northwest Coast. Lone Pine Publishing Knoke, Don. "Elymus glaucus." *Burke Museum of Natural History and Culture*. Burke Museum, n.d. Web. 16 May 2012. Lambert, Amy. "Blue Wildrye (Elymus glaucus)." *ESRM 412 Plant Propagation*. Univeristy of Washington, 4-29-2003. Web. 13 May 2012. <http://depts.washington.edu/propplnt/Plants/Blue wildrye.htm>.
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