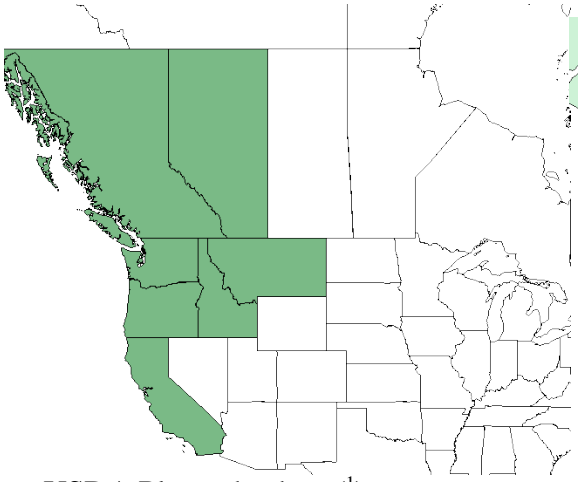
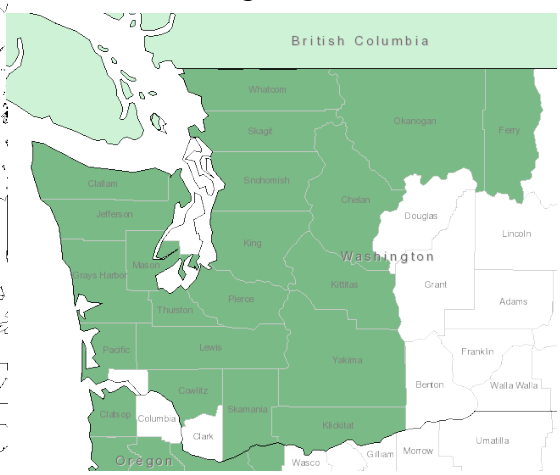
Plant Propagation Protocol for *Carex mertensii*
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/*[USDASpeciesCode.pdf]*

North American Distribution



Washington Distribution



Source: USDA Plants database([1])

TAXONOMY	
Plant Family	
Scientific Name	*Cyperaceae*
Common Name	Sedge
Species Scientific Name	
Scientific Name	*Carex mertensii* J.D. Prescott ex Bongard[3]
Varieties	
Sub-species	
Cultivar	
Common Synonym(s)	*Carex columbiana* Dewey[4]
Common Name(s)	Merten's Sedge[2]
Species Code (as per USDA Plants database)	CAME6[1]
GENERAL INFORMATION	
Geographical range	Southern Alaska through British Columbia and Alberta, down the West Coast of the United States in Washington, Oregon and California. East throughout Idaho and Western Montana (see map above). In Washington, throughout the Western half of the state, as far east as Ferry County in the north and Klickitat county in the south.[1] It is also found in Eastern Asia.[5]
Ecological distribution	Wet, sunny or shaded sites from lowlands to forest edges,[4] rocky slopes, ditches and roadsides.[5]
Climate and elevation range	Common from low to high elevations, not as far as alpine elevations.[2]

Local habitat and abundance	Occurs in fresh to moist nitrogen rich soils.[5] Often grows in open areas with *Lupinus latifolius* and other forbs.[7] After volcanic eruption of Mt. St. Helens, it appeared in mudflows with *Juncus bufonius, J. ensifolius, Equisetum arvense, Salix* sp., *Populus trichocarpa, Alnus rubra and Stachys cooleyae*.[9]
Plant strategy type / successional stage	Occurs on high elevation clear cuts, roadsides and other disturbed areas.[5] Pioneer species, population decreases as other species move in.[10] Early succession species, among the first to appear in mud flows around Mt. St. Helens after the eruption.[9]
Plant characteristics	Graminoid,[6] perennial sedge.[4.] Densely tufted, forming large clumps with stems as tall as 120 cm, whitish, oval perigynia.[2]
PROPAGATION DETAILS	
Propagation by Flessner and Trindle	
Ecotype	Mt. Rainier National Park, 4,200 to 4,400 feet elevation.[7]
Propagation Goal	Seeds[7]
Propagation Method	Seed[7]
Product Type	Propagules (seeds, cuttings, poles, etc.)[7]
Stock Type	Seed[7]
Time to Grow	2 years[7]
Target Specifications	Cleaned seed with no noxious weeds; seed weights averaged 1,565,500 seeds per lb.[7]
Propagule Collection Instructions	Seeds hand-stripped from individual plants into cloth or paper sacks or seed heads clipped with hand pruners where plants were more abundant[7]
Propagule Processing/Propagule Characteristics	Dried seed heads very chaffy; if whole heads are collected, seed can be threshed using a geared-down hammermill with 1/16th screen, run through an oat dehuller one or more times, then through and office clipper with #8 top screen, 1/20" round bottom screen, medium air flow. Chaff may irritate skin and eyes and gloves, goggles and dust masks are needed.[7]
Pre-Planting Propagule Treatments	None – this lot showed 53-63% germination[7]
Growing Area Preparation / Annual Practices for Perennial Crops	Fine, weed-free seed bed. Without herbicides to suppress weedy grasses, best results obtained by carbon-banding: seeds was sown in spring with a Hege precision seeder at 30" rows, 100 seeds/ft row; overspraying the seeds with an activated charcoal slurry followed by a field application of Karmex broad spectrum pre-emergent herbicide at 2.2 lbs ai/acre.
Establishment Phase Details	Irrigation applied in May through July of the first year. Weed control can be provided by hand-hoeing, shallow rototilling between rows, and spot applications of

	herbicide. Seedling emergence is slow and spotty, initial vigor is fair.[7]
Length of Establishment Phase	3 months[7]
Active Growth Phase	Continued weed control as needed-in subsequent years, early spring weed control is important to reduce competition from weedy grasses and broadleaves. Low rates of ammonium nitrate (25 lb N/ac) and Tilt fungicide for rust control before flowering.[7]
Length of Active Growth Phase	April to June; seeds ready to harvest in June of 2nd year[7]
Hardening Phase	Fields become summer-dormant after harvest[7]
Length of Hardening Phase	
Harvesting, Storage and Shipping	Seed heads are hand-clipped into sacks or pails and dried in a warm, dry poly greenhouse on tarps. Mechanical harvesting for larger plots.[7]
Length of Storage	Undetermined. Seeds store well for at least a few years at 40 degrees F in dry conditions.[7]
Guidelines for Outplanting / Performance on Typical Sites	Seeds that are fall sown at 35 PLS/sq ft onto bare native soil have ten times more percent cover and are much denser, larger and vigorous after three years if the soil is amended with organic matter such as peat moss, slow release N-P-K fertilizer and erosion control blanketing.[7]
Other Comments	This species is fairly easily collected in small to moderate amounts from native stands. Field seed increase is feasible if larger amounts are needed.[7]
Propagation by Hunt and More	
Ecotype	Wet meadows and streambanks, Hatcher Pass, Alaska[8]
Propagation Goal	Plants[8]
Propagation Method	Seed[8]
Product Type	Container (plug)[8]
Stock Type	
Time to Grow	
Target Specifications	Multiple leaves, firm root plug[8]
Propagule Collection Instructions	By hand when seeds start to shatter in late August, September. Seeds are brown.[8]
Propagule Processing/Propagule Characteristics	Air dry. Brush clean, air separate, hand screen. Store in freezer. Approximately 1,800 seeds per gram.[8]
Pre-Planting Propagule Treatments	Wash seeds for 12 hours in cold, running water before planting.[8]
Growing Area Preparation / Annual Practices for Perennial Crops	Soil type: Fac/wet. Plant in spring in root trainer with 1 to 2 seeds per cell. Cover seeds very lightly with sifted soil. Initial propagation site is the greenhouse.[8]
Establishment Phase Details	Germination occurs between 15 and 30 days after planting with a uniform maintenance of warm, moist and light environmental conditions. Plants moved to

	lathhouse to harden off after last frost. Fertilize minimally after true leaves appear.[8]
Length of Establishment Phase	2 months[8]
Active Growth Phase	
Length of Active Growth Phase	
Hardening Phase	
Length of Hardening Phase	
Harvesting, Storage and Shipping	
Length of Storage	
Guidelines for Outplanting / Performance on Typical Sites	
Other Comments	
INFORMATION SOURCES	
References	See below
Other Sources Consulted	See below
Protocol Author	Joe Neumann
Date Protocol Created or Updated	May 13, 2015

References:

[1]USDA Plant database. Plants.usda.gov. Accessed May 6, 2015.

[2]Pojar J., McKinnon A.,1994. *Plants of the Pacific Northwest: Washington, Oregon, British Columbia and Alaska*. 2004 Edition. B.C. Ministry of Forests and Lone Publishing, Canada.

[3]Flora of North American. http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242357328 Accessed May 10, 2015.

[4]Burke Museum of Natural History and Culture. http://biology.burke.washington.edu/herbarium/imagecollection.php?SciName=Carex%20mertensii. Accessed May 10, 2015.

[5]Burton, Carla M. and Burton, Philip J. A Manual for Growing and Using Seed from Herbaceous Plants Native to the Northern Interior of British Columbia. 2003. Symbious Research and Restoration, Smithers, British Columbia, Canada.

[6]Four Corner Nurseries. http://fourthcornernurseries.com/plant/carex-mertensii/. Accessed May 13, 2015.

[7]Flessner, Theresa R.; Trindle, Joan D.C. 2003. Propagation protocol for production of *Carex mertensii* Prescott ex Bong. seeds (seed); Natural Resources Conservation Service - Corvallis Plant Materials Center, Corvallis, Oregon. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 13 May 2015). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.

[8]Hunt, Peggy; Moore, Nancy. 2003. Propagation protocol for production of container *Carex mertensii* J.D. Prescott ex Bongard plants; Alaska Plant Materials Center, Palmer, Alaska. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 13 May 2015). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.

[9]Halpern, Charles B. and Harmon, Mark E. Early Plant Succession on the Muddy River Mudflow, Mount St. Helens, Washington. *The American Midland Naturalist.* Page 97-110.

[10]del Moral, Roger. Increasing deterministic control of primary succession of Mount St. Helens, Washington. *Journal of Vegetation Science.* 2009. 20, Page 1145-1154.