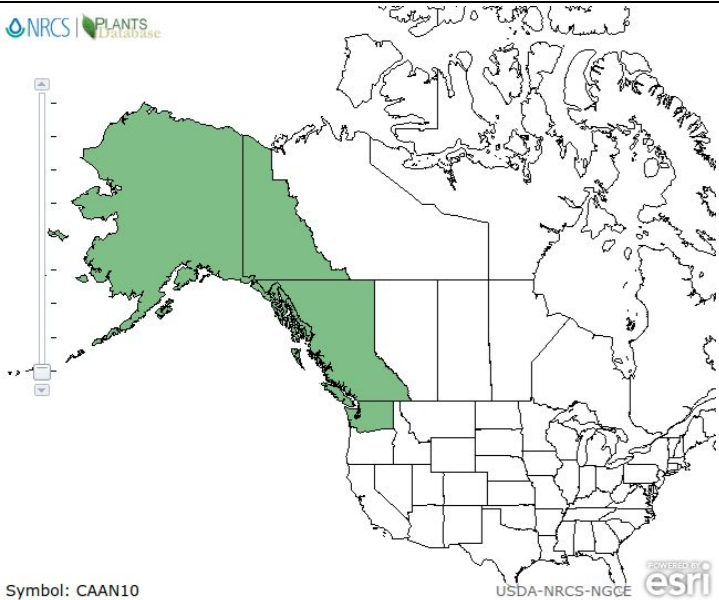



## Plant Propagation Protocol for *Carex anthoxanthea*

ESRM 412 – Native Plant Production

Protocol URL: <https://courses.washington.edu/esrm412/protocols/CAAN10.pdf>

TAXONOMY	
Plant Family	
Scientific Name	<i>Cyperaceae</i> <sup>1</sup>
Common Name	Sedge <sup>1</sup>
Species Scientific Name	
Scientific Name	<i>Carex anthoxanthea</i> J. Presl & C. Presl <sup>1</sup>
Varieties	N/A
Sub-species	N/A
Cultivar	N/A
Common Synonym(s)	N/A
Common Name(s)	Grassy-Slope Arctic Sedge, Yellow-Flowered Sedge <sup>2</sup>
Species Code (as per USDA Plants database)	CAAN10 <sup>1</sup>
GENERAL INFORMATION	
Geographical range	 <p>Symbol: CAAN10</p> <p>USDA-NRCS-NGCE esri</p>

	 <p>A circumboreal species.<sup>5</sup> In North America, it is native along the coast of Alaska, British Columbia, and Washington.<sup>2</sup></p>
Ecological distribution	Mainly coastal, growing in open areas on grassy slopes, and in wet meadows, bogs, and boggy forests. <sup>3, 4</sup>
Climate and elevation range	Prefers moist, cool to cold environments and full sun to partial sun. Elevation range is low to middle (10 to 1000m) <sup>5, 8</sup>
Local habitat and abundance	<p>-Local distribution is limited to a solitary population in a thickly vegetated, open wet meadow at 850m in Grays Harbor County.<sup>4, 5, 6</sup></p> <p>-Listed as a sensitive species in the State of Washington.<sup>2, 5</sup></p> <p>-Associated species include <i>Chamaecyparis nootkatensis</i>, <i>Salix scouleriana</i>, <i>Parnassia palustris</i> var. <i>tenuis</i>, <i>Athyrium filix-femina</i>, <i>Gymnocarpium dryopteris</i>, <i>Equisetum arvense</i>, <i>Carex</i> spp., <i>Arnica lanceolata</i> spp. <i>prima</i>, <i>Caltha leptosepala</i> spp. <i>howellii</i>, and <i>Delphinium glaucum</i>.<sup>4, 6</sup></p>
Plant strategy type / successional stage	N/A
Plant characteristics	Perennial rhizomatous sedge growing 5-40 cm tall. <sup>4, 9</sup> Flowers from June to August. <sup>2, 4</sup> Sedges are generally wind-pollinated and capable of self-pollination. <sup>7</sup> In seed production fields, <i>Carex</i> spp. tend to live about 4-5 years when in full sun. <sup>7</sup>
<b>PROPAGATION DETAILS</b>	
Ecotype	N/A

Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	10 cubic inch Conetainer
Time to Grow	6-7 months
Target Specifications	A well developed crown and root system. Roots should fill the container but not be pot bound. <sup>10</sup>
Propagule Collection Instructions	Seeds should be collected in the fall as seed heads turn from green to yellow. Use rice knives or pruners to collect the seed head and store in brown paper bag until fully dry. <sup>7, 10</sup> <i>Carex</i> tends to mature uniformly within individual species. <sup>7</sup>
Propagule Processing/Propagule Characteristics	-Seeds per pound is unknown. -Seed viability is unknown.
Pre-Planting Propagule Treatments	-Cleaning: Use a thresher or stationary combine to shatter seeds from heads, and then run through an air-screening machine to remove separate seeds from chaff. <sup>7</sup> -Store seeds in cool (38F), dry conditions until ready for production. <sup>10</sup> -Stratification: Dormancy is unknown. Many species of <i>Carex</i> , but not all, have no dormancy period. <sup>7</sup>
Growing Area Preparation / Annual Practices for Perennial Crops	-Sow 2-3 seeds in 10 cubic inch. Conetainers filled with a high water retention soilless germination mix. Lightly cover seeds with germination mix or vermiculite. <sup>10</sup> -Propagation environment: Greenhouse, 65-80F day/ 60F night. Use of propagation domes and heating mats may increase germination timing and consistency. <sup>10</sup>
Establishment Phase Details	- <i>Carex spp.</i> seeds generally need warm conditions and light to germinate. <sup>7</sup> -Sow seeds in mid-spring. <sup>7, 10</sup> -Time to germinate: Unknown -Thin seedlings to one per cell after first true leaves fully develop. <sup>10</sup>
Length of Establishment Phase	2-4 weeks <sup>10</sup>
Active Growth Phase	-After establishment, move plants to an area with full sun to partial sun and begin fertilizing with Fish and Poop Organic Fertilizer at a rate of 100-200 ppm nitrogen on a biweekly basis. <sup>10</sup> -Late spring through summer. <sup>10</sup>
Length of Active Growth Phase	3-4 months <sup>10</sup>
Hardening Phase	Late summer through mid fall <sup>10</sup>
Length of Hardening Phase	1-2 months <sup>10</sup>

Harvesting, Storage and Shipping	N/A
Length of Storage	N/A
Guidelines for Outplanting / Performance on Typical Sites	-Outplanting survival rate: High <sup>7</sup> -Size at maturity: 30-40cm tall <sup>8</sup> -Plants will generally flower during the late summer or fall of the first year <sup>7</sup>
Other Comments	Much of the production related information in this document was extrapolated from similar wetland <i>Carex spp.</i>

### INFORMATION SOURCES

References	<p>1. USDA, Natural Resources Conservation Service. 2017. The PLANTS Database. <a href="http://plants.usda.gov">http://plants.usda.gov</a>. Accessed 23 May 2017.</p> <p>2. University of Washington Herbarium, Burke Museum of Natural History and Culture. Seattle, WA. 2017. <a href="http://biology.burke.washington.edu/herbarium">http://biology.burke.washington.edu/herbarium</a>. Accessed 23 May 2017.</p> <p>3. Pojar, J., A. Mackinnon, and P.B. Alaback. 1994. Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia and Alaska. Redmond, WA: Lone Pine Publishing.</p> <p>4. Washington Department of Natural Resources. Adapted from <i>Field Guide of Rare Plants of Washington</i>. 2017. <a href="http://file.dnr.wa.gov/publications/amp_nh_caan10.pdf">http://file.dnr.wa.gov/publications/amp_nh_caan10.pdf</a>. Accessed 23 May 2017.</p> <p>5. Washington Department of Natural Resources, Washington Natural Heritage Project, and U.S.D.I. Bureau of Land Management. Cooperative Project. 2005. <a href="http://citeseerx.ist.psu.edu/viewdoc/download?rep=rep1&amp;type=pdf&amp;doi=10.1.1.214.493">http://citeseerx.ist.psu.edu/viewdoc/download?rep=rep1&amp;type=pdf&amp;doi=10.1.1.214.493</a>. Accessed 23 May 2017.</p> <p>6. International Union for Conservation of Nature and Natural Resources. 2016. <a href="http://www.iucnredlist.org/details/64270123/0">http://www.iucnredlist.org/details/64270123/0</a>. Accessed 23 May 2017.</p> <p>7. Native Seed Production Manual for the Pacific</p>
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Other Sources Consulted	N/A
Protocol Author	Derek Allen
Date Protocol Created or Updated	05/23/17