**Plant Propagation Protocol for *Carex Douglasii***
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/*2023/CADO2.pdf]*

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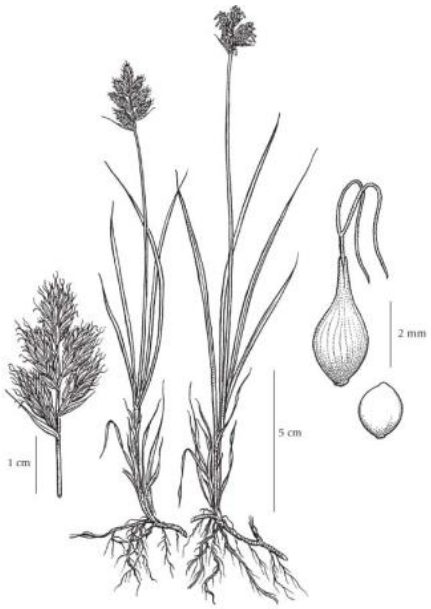


*Carex douglasii*

Source: The Illustrated Flora of British Columbia[2]

| TAXONOMY | |
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| Plant Family | |
| Scientific Name | *Cyperaceae*[3] |
| Common Name | Sedge[3] |
| Species Scientific Name | |
| Scientific Name | *Carex douglasii* Boot |
| Varieties | NA |
| Sub-species | NA |
| Cultivar | NA |
| Common Synonym(s) | NA |
| Common Name(s) | Douglas sedge moist meadow; Douglas' sedge, Douglas sedge[3] |
| Species Code (as per USDA Plants database) | CADO2 |
| **GENERAL INFORMATION** | |

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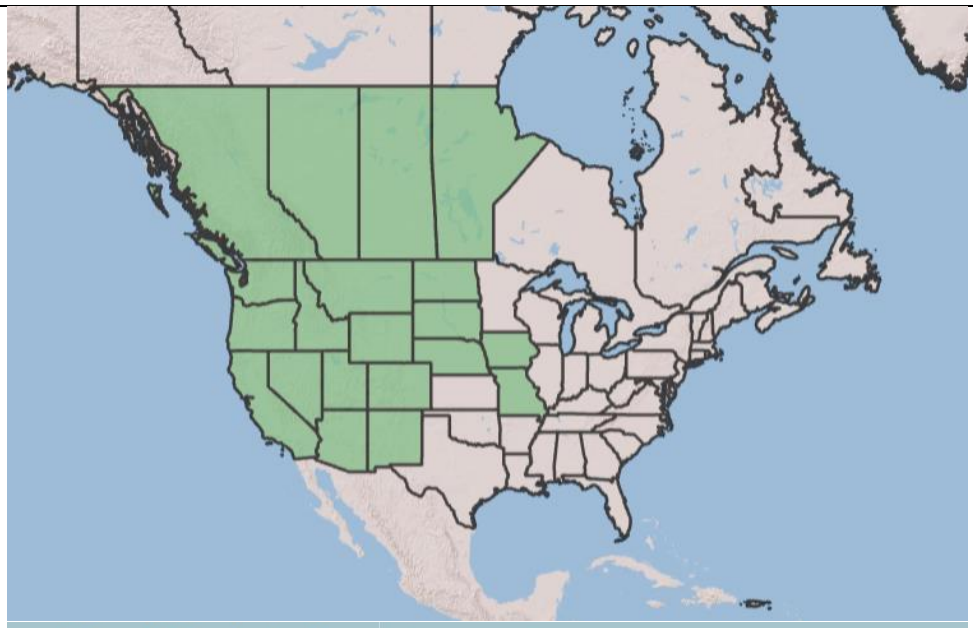
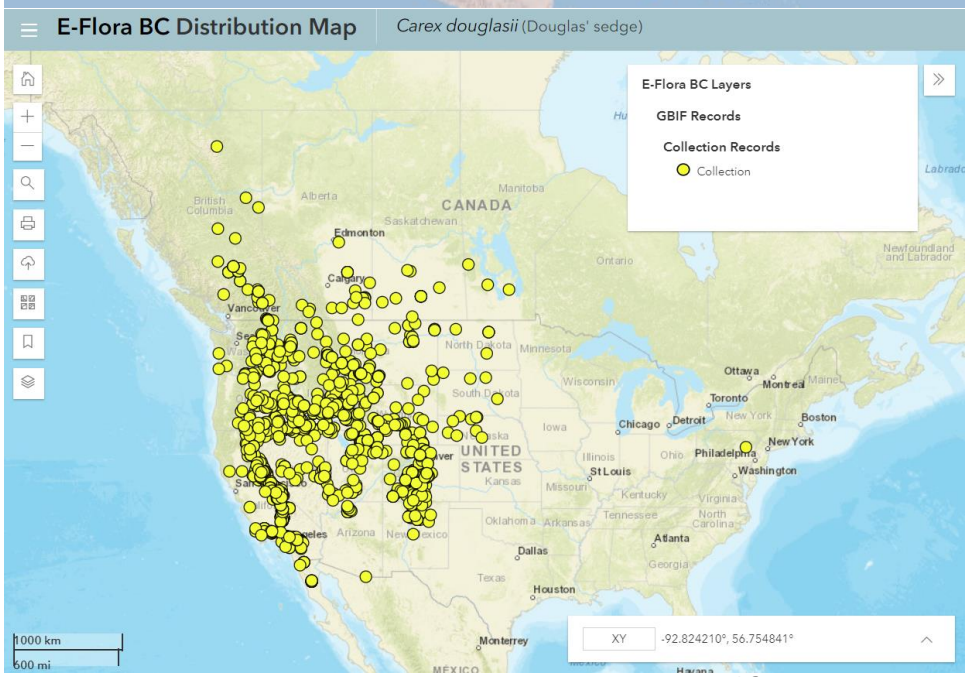
| Geographical range |  <br>  <br>This plant is native to western United States and Canada.[2,3] |
| Ecological distribution | This plant grows in moist to dry meadows and grassy slopes in the steppe and montane zones.[2] |
| Climate and elevation range | Elevation range for this species is 537-1450m. This plant grows in areas with temperatures that range from 17.4-78.3 degrees Fahrenheit and annual precipitation values of 5.2”-72.2”.[4] |
| Local habitat and abundance | USDA plant list recognizes *Carex douglasii* as a hydrophite or facultative (FAC) species, which occurs in wetlands and non-wetlands. *Carex douglasii* grows in dry, wet and seasonally moist habitat.[4] It is adapted to grow in coarse, fine, and medium textured soils. It has medium tolerance for anerobic conditions and medium tolerance for drought, but can tolerate sandy and alkaline substrates.[4] It’s tolerance for fire is high. It’s pH maximum is 8.5 |

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| | and pH minimum is 6.0. Soil moisture regime (0-very xeric, 4 – mesic, 8 – hyrdric) is 1-8, with an average of 5. [2] |
| Plant strategy type / successional stage | *Carex douglasii* can be a major competitor in meadow systems as it is able to spread via rhizomes, giving it an advantage over plants that are dependent on seed germination.[5] Burning can be a successful method to restore Douglas sedge systems in restoration sites.[6] |
| Plant characteristics | *Carex douglasii* is a slow growing grass that grows with long-creeping rhizomes[2]. It reaches 6 to 30 cm in height[7]. It blooms in the late spring with the fruit period beginning in the summer.[4] The plant is diecious, with male and female flowers on different individuals, and is distinctive for its pistillate flower cluster, "with female flowers bearing long, protruding, persistent stigmas that tangle together into a wide mass."[4]<br><br>The leaves of the plant are tight sheaths that are brown or black at the bases.[2] There generally are 3 to 8 blades per stem, with gradual tapering to the tips, 1-2.5 mm wide.[2] |
| **PROPAGATION DETAILS**<br>**Please note:** the following propagation details are based on *Carex athrostachya,* which grows in similar ranges to *Carex douglasii* and is also facultative wetland species. These are only recommendations for Carex douglasii and should be taken as a starting point. Information on *Carex douglasii* propagation specifically was not found. | |
| Ecotype | Glacier National Park |
| Propagation Goal | Seed |
| Propagation Method | Seed |
| Product Type | Propagules (seeds, cuttings, poles, etc) |
| Stock Type | Seeds |
| Time to Grow | 1 year |
| Target Specifications | Not available. |
| Propagule Collection Instructions | Seeds can be gathered via hand harvesting or mechanically harvested with a swather.[8] With the swather method, one must hand harvest lateral seeds after.[8] Fruiting is June-Aug.[9] |
| Propagule Processing/Propagule Characteristics (seed density (# per pound), seed longevity, etc) | To process seeds, first spread out the seeds on a tarp in a warm dry area for them to ripen. Through this process, ripe seeds will shatter or shake out of seed head. To finish, clean seed over a fanning mill with moderate wind. This will separate seed from chaff.[8] Work with Carex athrostachya showed that 1-0 plants yielded 5 g of seed at the end of the first field season, 1.271 kg the second year and .674 kg seed the third year.[8] |
| Pre-Planting Propagule Treatments | Cold mist chilling of 60 to 90 days functions for fresh seed.[8] |
| Growing Area Preparation / Annual Practices for Perennial Crops | Other *Carex* propagation methods suggest sowing seeds into fine textured commercial peat-lite mix with high water holding capacity.[10] |
| Establishment Phase Details | Resources for *Carex athrostachya* Olney suggest moistening seeds and media to imbibe water overnight in a warm location.[10] You can then move the containers to a cool area (34 to 37 degrees) and/or leave the seeds in cold moist chilling for 75 days. There is general support for cold most chilling of this species for 60 to 90 days.[10] |
| Length of Establishment Phase | Not available. |
| Active Growth Phase | Not available. |

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| Length of Active Growth Phase | Not available. |
| Hardening Phase | Not available. |
| Length of Hardening Phase | 60 days of hardening off prior to out planting is suggested. Acclimation in less than 30 days to an outdoor hoop house was achieved.[10] |
| Harvesting, Storage and Shipping | No artificial storage was tried, but there is presumed ease for storage and shipping of *Carex athrostachya.*[8] |
| Length of Storage | No information available. |
| Guidelines for Outplanting / Performance on Typical Sites | Prior to container planting, the soil should be loosened with a rototiller. Many options can be tried for planting, such as digging a trench, digging individual holes or drilling holes. Recommended spacing is 3 feet by 1 foot apart. Irrigation should be thorough in order to eliminate air pockets.[8] |
| Other Comments | *Carex athrostachya* was said to be easy to propagate but unclear whether *Carex douglasii* will have same traits.[8] |
| **INFORMATION SOURCES** | |
| References | 1. Calflora: Information on California plants for education, research and conservation. *The Calflora Database [a non-profit organization]* https://www.calflora.org/.<br>2. E-Flora BC Distribution Map. https://linnet.geog.ubc.ca/eflora_NewFullMap/index.html?sciname=Carex%20douglasii&BCStatus=yellow&commonname=Douglas%27%20sedge&PhotoID=53032&mapservice=Vascular.<br>3. USDA Plants Database. https://plants.usda.gov/home/plantProfile?symbol=CADO2.<br>4. California Native Plant Society: Calscape. *Douglas' Sedge, Carex douglasii* https://calscape.org/Carex-douglasii-(Douglas'-Sedge)?srchcr=sc59752e476df9e.<br>5. Wehking, P. M. The role of the seedbank in the restoration of a basin big sagebrush-dominated riparian ecosystem to a dry meadow. (ProQuest Dissertations Publishing, 2002).<br>6. Blank, R. R., Chambers, J. C. & Zamudio, D. Restoring riparian corridors with fire: effects on soil and vegetation. *J. Range Manag.* **56**, 388–396 (2003).<br>7. UCJEPS: Jepson Interchange: Carex douglasii Boott. https://ucjeps.berkeley.edu/cgi-bin/get_cpn?Carex%20douglasii.<br>8. Native Plant Network — Reforestation, Nurseries and Genetics Resources. *Carex athrostachya* https://npn.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=cyperaceae-carex-2768.<br>9. Carex douglasii in Flora of North America @ efloras.org. http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242357166.<br>10. Native Plant Network — Reforestation, Nurseries and Genetics Resources. *athrostachya Olney* https://npn.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=cyperaceae-carex-2769. |
| Other Sources Consulted | Native Plan Network was consulted for *Carex Douglasii* but not information was found on that species. Full reference for that site, for the other species, is shown above. |
| Protocol Author | Stacey Dixon |
| Date Protocol Created or Updated | 5/1/2023 |