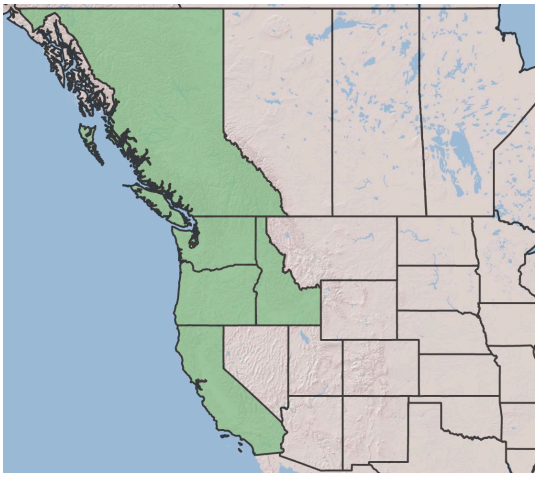
Plant Propagation Protocol for *Cornus nuttallii*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/2022/CONU4.pdf

Ben Legler, n.d.



USDA Plants Database, n.d.

TAXONOMY	
Plant Family	
Scientific Name	Cornaceae (USDA Plants Database, n.d.)
Common Name	Dogwood family (USDA Plants Database, n.d)
Species Scientific Name	
Scientific Name	*Cornus nuttallii* Audubon ex Torr. & A. Gray
Varieties	No current recognized varieties (USDA Plants Database, n.d.).
Sub-species	No current recognized subspecies (USDA Plants Database, n.d.).
Cultivar	No current recognized cultivars (USDA Plants Database, n.d.).

Common Synonym(s)	*Benthamidia nuttallii* (Audubon) Moldenke, plant code BENU (USDA Plants Database, n.d.)
Common Name(s)	Pacific dogwood (USDA Plants Database, n.d.), mountain dogwood, mountain flowering dogwood (Gucker, 2005), Canadian dogwood (Riley et al, 2020).
Species Code (as per USDA Plants database)	CONU4 (USDA Plants Database, n.d.)
GENERAL INFORMATION	
Geographical range	*C. nuttallii* ranges from southern British Columbia to western Washington, Oregon and California, as well as small sections of Idaho (U.S. Forest Service, n.d.).
Ecological distribution	According to the Fire Effects Information System of the USDA (n.d.) *C. nuttallii* commonly occurs in *Pseudotsuga menziesii* (Douglas fir), *Pinus ponderosa* (ponderosa pine), *Pinus monticola* (western white pine), Fir-Spruce, Hemlock-Sitka spruce, western hardwood and redwood ecosystems (FEIS USDA, n.d).
Climate and elevation range	*C. nuttalli* occurs from sea level to a maximum of 833 meters, but generally is found at an elevation of 194 meters. (E-Flora BC, n.d.). According to the Electronic Atlas of the Flora of British Columbia, *C. nuttallii* "[o]ccurs in maritime to submaritime cool mesothermal climates" (E-Flora BC, n.d.).
Local habitat and abundance	In the small areas of Idaho where *C. nuttallii* is found, it is threatened, but is otherwise common in the other states in is present. (Gucker, 2005) It can commonly be found growing along stream banks, and in moist forests both coniferous and hardwood, in open to dense areas. (Burke Herbarium, 2013) (Turner and Kuhlmann, 2014). It has minimal frost and cold tolerance, but is shade and flood tolerant (U.S. Forest Service, n.d.). Associated plant species include *Gaultheria shallon* (salal), P*olystichum munitum* (sword fern), *Acer circinatum* (vine maple), *Vaccinium ovatum* (evergreen hucklberry) and *Symphoricarpos albus* (snowberry), depending on the characteristics of the site. (FEIS USDA, n.d.).

Plant strategy type / successional stage	*C. nuttallii* is "[c]haracteristic of young-seral mesothermal forests" (E-Flora BC, n.d.). However, *C. nuttallii* can be found in early mid and late seral stage systems (FEIS USDA, n.d.).
Plant characteristics	*C. nuttallii* is a deciduous, perennial tree-shrub that can grow to between 2-20 meters (Burke Herbarium, 2013). It is long lived, and produces pink to pale green to white flowers from April-June and produces small red berries from summer to fall. (USDA Plants Database, n.d.) (U.S. Forest Service, n.d.)
PROPAGATION DETAILS	
Ecotype	Oregon, Umpqua National Forest (Riley et al, 2020).
Propagation Goal	Plants (Riley et al, 2020).
Propagation Method	Seed (Riley et al, 2020).
Product Type	Container (plugs) (Riley et al, 2020).
Stock Type	262 ml (16 in3) containers (Riley et al, 2020)
Time to Grow	Length of 20 weeks (Riley et al, 2020)
Target Specifications	The target stock type was container seedlings, with root systems that were firm plugs in the containers (Riley et al, 2020).
Propagule Collection Instructions	No information available (Riley et al, 2020).
Propagule Processing/Propagule Characteristics	No information available (Riley et al, 2020).

Pre-Planting Propagule Treatments	In the propagation experiment performed by Riley et al (2020), comparable germination rates were achieved through two different processes. In the first treatment, the harvested seeds were soaked for 24 hours in a 3:1 water/3%hydrogen peroxide 1% hydrogen peroxide mixture (3:1 water / 3% hydrogen peroxide), followed by a water rinse and a 24 hour soak in water, before being put into peat covered mesh bags inside a container where they were refrigerated for 100 days at between 1 and 3 degrees Celsius. (Riley et al, 2020). The second treatment included seeds being soaked in the same 1% hydrogen peroxide solution while inside a mesh bag for 24 hours, before rinsing and a 48 hour soak in water before being put into a container for 10 day stratification at 10 degrees celsius, then 90 day stratification at 1 to 3 degrees celsius (Riley et al, 2020). Seeds, especially those in the warm 10 degree warm stratification may be checked weekly for mold, and if mold is found the 1% hydrogen peroxide mixture may be applied (Riley et al, 2020).
Growing Area Preparation / Annual Practices for Perennial Crops	The growing area was a greenhouse growing facility. Seedlings may be sown into the container, then covered with the medium. In the propagation experiment by Riley et al, "[g]rowing medium used is 40:20:20:20 peat:composted fir bark:perlite:pumice with Nutricote controlled release fertilizer (18N:6P2O5:8K2O with minors; 180-d release rate at 21C) at the rate of 1.5 gram Nutricote per 262 ml container." (Riley et al, 2020) Seedlings may stay for 18 weeks in the greenhouse before being moved to a outdoor holding space so that dormancy may begin. Mid-March to early October is typically the growing season (Riley et al, 2020).
Establishment Phase Details	The establishment phase may take between 3 to 4 weeks, and may be germination may be low, dependent on the quality of the seed. (Riley et al, 2020).
Length of Establishment Phase	Length of 3 weeks (Riley et al, 2020).

Active Growth Phase	The seedlings may be slow to grow in the initial active growth phase. Roughly 3 weeks post germination, once secondary leaves have grown, fertilizer may be applied, "[s]oluble 20-9-20 NPK, 20-18-18 NPK, or 17-5-24 NPK at a range of 100 to 150 ppm […]" (Riley et al, 2020), application being weekly, and weather dependent during the growing season. (Riley et al, 2020).
Length of Active Growth Phase	Length of 16 weeks (Riley et al, 2020).
Hardening Phase	The seedlings may be moved to an outdoor growing space in early September. In the propagation performed by Riley et al (2020), dry-down was not done in order to induce dormancy. (Riley et al, 2020).
Length of Hardening Phase	Length of 3 weeks (Riley et al, 2020).
Harvesting, Storage and Shipping	Harvest may be done in mid-October. No storage besides the outdoor growing space, and plants may be watered before shipping gin containers. In fall to early winter, seedlings may be outplanted. (Riley, 2020).
Length of Storage	No information available on length of storage (Riley et al, 2020).
Guidelines for Outplanting / Performance on Typical Sites	No guidelines for outplanting included. (Riley et al, 2020).
Other Comments	Additional comments on the *C. nuttallii* propagation process include "USDA hardiness zones 7 to 9 Wetland classification: FACU Perennial, deciduous When stressed, it is susceptible to a range of diseases, most notably dogwood anthracnose. Can sprout from root crown following fire. New sprouts are grazed relatively heavily by large ungulates." (Riley et al, 2020).
INFORMATION SOURCES	

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Other Sources Consulted	None
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