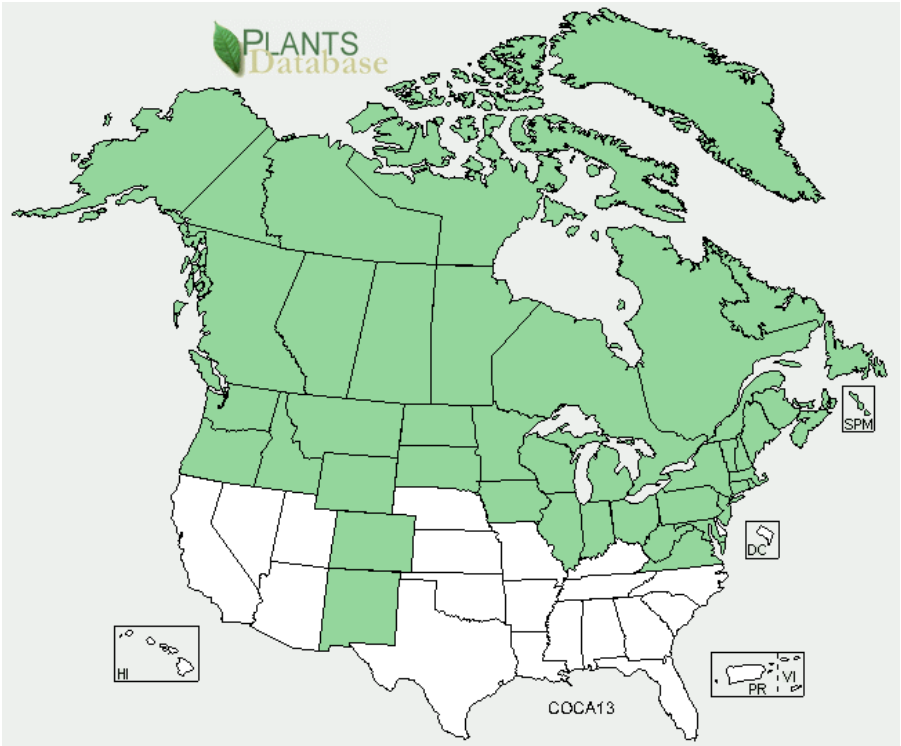
Plant Propagation Protocol for *Cornus canadensis*
ESRM 412 – Native Plant Production
Spring 2011

TAXONOMY	
Family Names	
Family Scientific Name:	Cornaceae
Family Common Name:	Dogwood
Scientific Names	
Genus:	Cornus
Species:	Canadensis
Species Authority:	L.
Variety:	
Sub-species:	
Cultivar:	
Authority for Variety/Sub-species:	
Common Synonym(s)	Chamaepericlymenum canadense (L.) Aschers. & Graebn. *Cornella canadensi (L.)* Rydb. *Cornus canadensis* L. var. *dutillyi* (Lepage) B. Boivin Cornus *florida*
Common Name(s):	Bunchberry dogwood, Dwarf dogwood, Dwarf cornel, bear bearry, bear grape, kinnikinick, bunches of berries, Crakerberry, creeping dogwood,

	puddingberry
Species Code	COCA 13
GENERAL INFORMATION	
Geographical range (distribution maps for North America and Washington state)	Alaska, south to mid latitudes of the Rockies, east to Atlantic Canada. 
Ecological distribution	USDA Zone 2-6 Moist forests, bogs and streambanks, circumboreal [2] FRES10 White - red - jack pine FRES11 Spruce – fir FRES15 Oak - hickory FRES18 Maple - beech - birch FRES19 Aspen - birch FRES20 Douglas-fir FRES21 Ponderosa pine FRES22 Western white pine FRES23 Fir - spruce FRES24 Hemlock - Sitka spruce FRES25 Larch FRES26 Lodgepole pine FRES27 Redwood[9]
Climate and elevation range	Wide range.
Local habitat and abundance; may include commonly	Often grows on tree trunks, logs and stumps.[6] Grows with a group of Cornus-Linnaea synusia. Commonly found species with Cornus include *Galium triflorum, Petasites palmatus, Coptis groenlandica, …* [9]

associated species	
Plant strategy type / successional stage	The species is intolerance of warm temperatures. Likes acid soils that can be as low as 4.0 pH and gritty.[1] They can tolerate considerable sun. Prefer cool, moist soil and chilly nights. Grow well in the shade, but growth is more sparse and patchy. Respond well to light fertilizing. [2,3] Extremely sensitive to root disturbance. [6] Increases in frequency after logging without fire and with piling and burning. May become dominant species on moist microsites the first 3 years of secondary succession on disturbed Sitka spruce-western hemlock forest sites.[9]
Plant characteristics (life form (shrub, grass, forb), longevity, key characteristics, etc)	Carpeting woodland plant. Leaves in whorls, crowded toward the shoot tips. Flowers: 3-6 inches, bracts are white, flowers yellow or green, clusters dense, solitary and terminal, blooms from late spring to early summer. Fruit: cluster of berries, bright shiny red when ripe. [2,4] Slender and shallow rhizome.[9]
PROPAGATION DETAILS	
Ecotype	No information found.
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plugs)
Stock Type:	
Time to Grow (from seeding until plants are ready to be outplanted):	6 months
Target Specifications	
Propagule Collection (how, when, etc):	As soon as the fruits are ripened (August), they should be collected by stripping or shaking from the branches. Don't collect from isolated trees since they have high numbers of fruits without seeds. [1,7,8]
Propagule Processing / Propagule Characteristics	Seeds stored for 7 years by the Georgia Forestry Commission at -7^{0}C and lost 1% viability.[9] 1 hour sulfuric acid treatment followed by 2 to 3 months cold stratification resulted in 70% germination.[5] 50 stones/100 kg fruit and 35 stones/gram. [1]
Pre-Planting	Harvest of fresh fruit and immediate removal of the pulp. Mix about half a

Propagule Treatments (cleaning, dormancy treatments, etc):	cup of fruit in 2 cups of water in a blender. Some seeds will result in being destroyed by blender process. Or soak the fruit in a bucket of water overnight. If cleaning cannot be done right after collection, spread the fruit in shallow layers to prevent excessive heating but slight fermentation to facilitate the removal of the pulp. [1] Requires scarification prior to stratification with a 60-min. soak in concentrated sulfuric acid sitting in an ice bath. After scarification, the seeds require about 90 to 120 days of cold, moist stratification. The longer the stratification, the more uniform the germination. 48 hours in 1% solution for TZ incubation. [1,8]
Growing Area Preparation / Annual Practices for Perennial Crops	Collect soil and duff from a native stand to provide mycorrhizal inoculum. Usually sown in drills and covered with ¼ to ½ inch of soil. The beds are usually given a mulch of leaves or straw, remove right after signs of germination for those will be sown in the fall. Sown in the fall or stratified and sown in April or early May. [7,8]
Establishment Phase	No information was found.
Length of Establishment Phase:	No information was found.
Active Growth Phase	No information was found.
Length of Active Growth Phase:	No information was found.
Hardening Phase	Place the seeds in a seed flat and leave outdoors in a cold frame.[3]
Length of Hardening Phase:	No information was found.
Harvesting, Storage and Shipping	Cleaned stones store in sealed containers at 3 to 5^0C.[8]
Length of Storage	From collection time (in August) until next spring. [1]
Guidelines for Outplanting / Performance on Typical Sites	The species can be planted immediately after collection without removal of pulp but has more result if cleaned. [1] Plants bloom the second or third year from sowing.[3,6]
Other Comments	Is used medicinally and has properties that neutralize acid rain due to the calcium present in the trichomes of its leaves.[5] Defoliated by leaf spot. [7]
INFORMATION SOURCES	

References (full citations):	• [1] Cappiello, Paul. *Dogwoods: The Genus Cornus*. Timber Press, Incorporated, 2005. Print. • [2] Cullina, William. *Wildflowers: A Guide to Growing and Propagating Native Flowers of North America*. Houghton Mifflin Harcourt, 2000. Print. • [3] Armitage, Allen. *Armitage's Native Plants for North American Gardens* . Timber Press, 2006. Print. • [4] Grey-Wilson, Christopher. *The Rock Garden Plant Primer: Easy, Small Plants for Containers, Patios, and the Open Garden*. Timber Press, 2009. Print. • [5] Dirr, Michael. *The Reference Manual of Woody Plant Propagation: From Seed to Tissue Culture*. 2nd. Timber Press, 2006. Print. • [6] Pettinger, April. *Native Plants in the Coastal Garden*. Rev. ed. Whitecap Books, 2002. Print. • [7] The Forest Service, US Department of Agriculture. Miscellaneous Publication No. 654. "Woody-Plant Seed Manual." • [8] Brinkman, Kenneth, and Victor Vankus. "Cornus L.." *Woody Plant Seed Manual*. USDA Forest Service, n.d. Web. 17 Apr 2011. <http://www.nsl.fs.fed.us/wpsm/Cornus.pdf>. • [9] Crane, M. F. 1989. Cornus canadensis. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer).: http://www.fs.fed.us/database/feis/ [2011, April 20].
Other Sources Consulted	• Wyman, Donald. "Wyman's Gardening Encyclopedia ." 2 Exp Sub ed. Scribner, 1997. Print. • Hogdson, Larry. *Making the Most of Shade: How to Plan, Plant, and Grow a Fabulous Garden that Lightens up the Shadows*. Rodale Books, 2005. Print. • "Appendix B—Propagation and Establishment of Requirements for Selected Plant Species." *United States Forest Service*. Wilderness and Backcountry Site Restoration Guide, 2006. Web. 18 Apr 2011. <http://www.fs.fed.us/t-d/pubs/htmlpubs/htm06232815/documents/pdf06232815dpi72pt17.pdf> . • Schmid, George. *An Encyclopedia of Shade Perennials*. Timber Press, Incorporated, 2002. Print.
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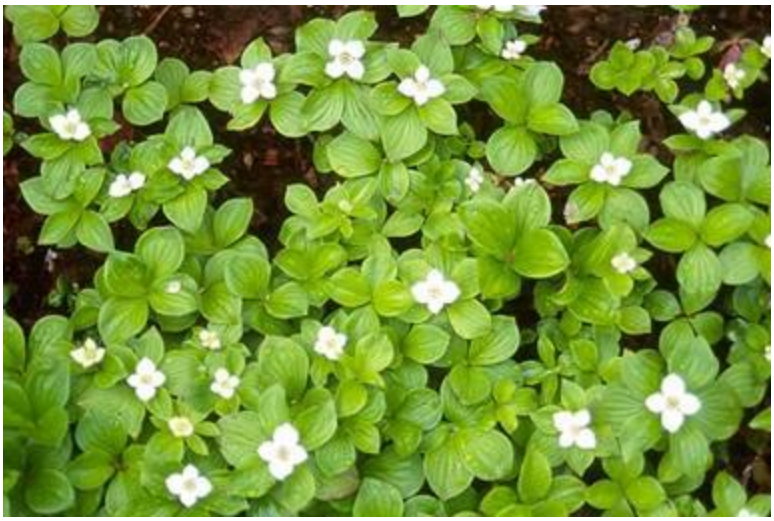
Date Protocol Created or Updated (MM/DD/YY):	04/18/2011



Cornus unalaschkensis **Bunchberry**
(formerly known as *Cornus canadensis var. intermedia)*

Range
C. Canadensis is native from southern Greenland to Alaska, south to Maryland, west to South Dakota, New Mexico, and California.
C. unalaschkensis is found in Northwest North America and Northeast Asia, south in mountains. Southern limit of range may be due to its preference for cool, acidic soils and its inability to survive in summer soils warmer than 65º F.

Climate, elevation
Valley bottoms to subalpine.

Local occurrence (where, how common)
Very common in shady, moist forested wetlands in Pacific northwest. Plants sold as simply *Cornus canadensis* (without the label "*var. intermedia"*) are often from the East Coast and are not native to the Pacific Northwest.

Habitat preferences
Moist coniferous forests; bogs; grows on stumps and logs in maritime forests; Growth most vigorous in partial shade; Moist, well drained sites preferred. It is considered a facultative wetland plant.

Plant strategy type/successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)
C. unalaschkensis is a clonal perennial that relies heavily on vegetative regeneration to maintain itself and spread. Responds vigorously to disturbance**;** *C. unalaschkensis* had sprouted from rhizomes in previously clearcut areas, blowdown, and scorched sites.

Associated species
Montane Coniferous Wetlands; Montane Mixed Conifer Forest ;Cornus-Linnaea synusia.

May be collected as: (seed, layered, divisions, etc.)
Division most successful method, but can be collected by seed.

Collection restrictions or guidelines
Salvage must be done while leaves are still on so you can see them; collect seeds August to October, as soon as the fruit are ripe.

Seed germination (needs dormancy breaking?)
If seeds are sown right away, you don't need to remove the flesh. Some seeds may not germinate until the second spring, or possibly the third spring; need cold stratification.

Seed life (can be stored, short shelf-life, long shelf-life)
Information unavailable

Recommended seed storage conditions
Information unavailable

Propagation recommendations (plant seeds, vegetative parts, cuttings, etc.)
Seedlings grown from seed have a greater chance of survival, but division is the most successful method.

Soil or medium requirements (inoculum necessary?)
Prefers acid soils (pH 3.0 to 7.9) that are somewhat damp most of the year. Cannot survive in summer soils warmer than 65º F.

Installation form (form, potential for successful outcomes, cost)
Division most successful method; most regeneration is by rhizome. Low fruit set, low germination and survival rates, and slow early growth limit reproduction by seed.

Recommended planting density
No information found.

Care requirements after installed (water weekly, water once etc.)
Requires frequent watering until well established.

Normal rate of growth or spread; lifespan
Early growth and clonal development are slow and survival is low (13 percent by the fourth year). After 3 years, seedlings averaged 1 inch (25 mm) in height.

Sources cited

- Leigh, M. 1999. Grow You Own Native Landscape. Native Plant Salvage Project ; WSU Cooperative Extension—Thurston County.
- Pojar, J. and A. MacKinnon. 1994. Plants of the Pacific Northwest Coast Washington, Oregon British Columbia & Alaska. BC Ministry of Forests and Lone Pine Publishing, Vancouver, British Columbia, Canada 527 p.

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- http://www.fs.fed.us/database/feis/plants/shrub/corcan/index.html
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Data compiled by Mike Cooksey, 5 May 2003.