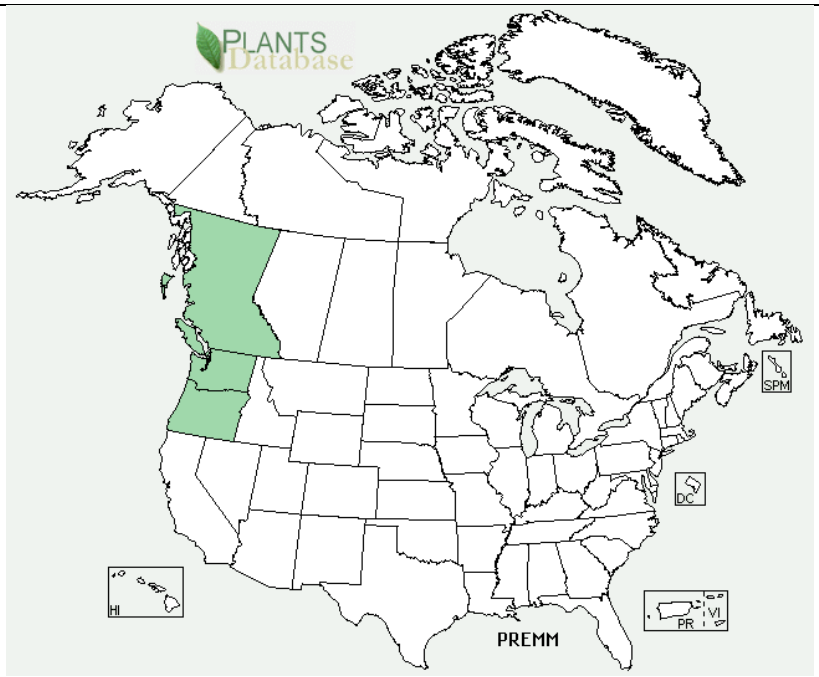
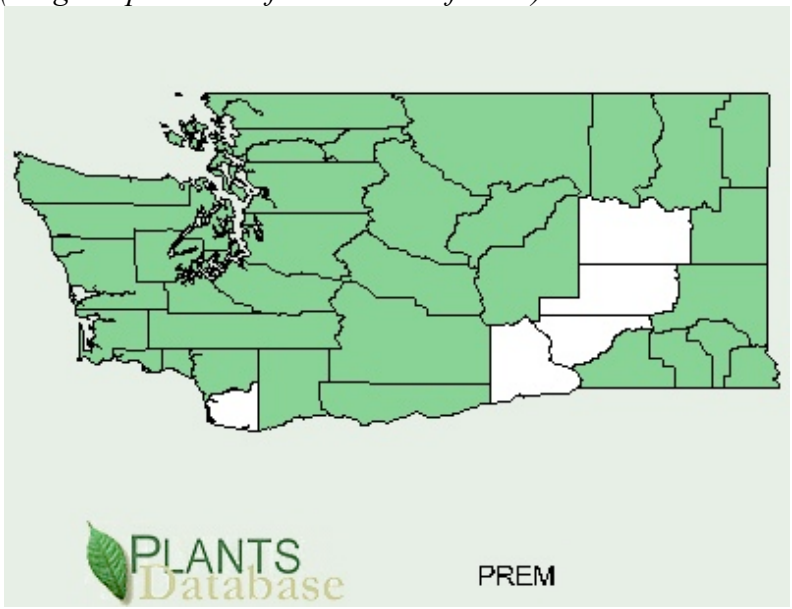
Plant Propagation Protocol for *Prunus emarginata*
ESRM 412 – Native Plant Production
Spring 2009

TAXONOMY	
Family Names	
Family Scientific Name:	Rosaceae
Family Common Name:	Rose family
Scientific Names	
Genus:	Prunus
Species:	emarginata
Species Authority:	(Douglas ex Hook.) D. Dietr (1).
Variety:	Prunus emarginata var. emarginata (1). Prunus emarginata var. mollis (1).
Sub-species:	
Cultivar:	
Authority for Variety/Sub-species:	(Douglas ex Hook.) D. Dietr (1). (Douglas ex Hook.) W.H. Brewer (1).
Common Synonym(s)	
Common Name(s):	Bitter Cherry (2). Narrow-Leaved Cherry (3).
Species Code:	PREM
GENERAL INFORMATION	
Geographical range:	 http://plants.usda.gov/java/stateSearch?searchTxt=Prunus+emarginata&searchType=Sciname&stateSelect=US53&searchOrder=1&imageField.x=54&imageField.y=10

	This species is native to the Pacific Northwest; Washington, Oregon, California and British Colombia. South BC to southern CA (4,6,8). Also native to Montana, Wyoming, Utah, and New Mexico (5,6,8). *(Original protocol information confirmed).*  http://plants.usda.gov/java/county?state_name=Washington&statefips=53&symbol=PREM Found in Washington State on the Northern Pacific Border, Southern Pacific Border, and in the Cascade Mountains (5). *Information found in references 6,7:* The two varieties of this species grow on separate sides of the Cascades; Var. *emarginata* is east side growing, and is often shrubbier. Var. *mollis* is west side growing and more tree like.
Ecological:	*Information in the next few sentences found in reference 8:* The species likes areas that are open-wooded or along streams. Areas where trees have been cut-over or burned-over are also good spots. *(Original protocol information confirmed).*
Climate and elevation range	Range of elevation is from sea level to 2400 m (8). *(Original protocol information confirmed).*
Local habitat and abundance; may include commonly associated species	*Information in the next few sentences found in references 6,8:* This species likes full sun or part shade. Soil can be moist to dry. Groups that eat the fruit are birds, deer, elk, bears, squirrels, rabbits, and rodents (8). Commonly associated species are *Salix scouleriana, Prunus virginiana, Amelanchier alnifolia, Rubus parviflorus,* and *Holodiscus discolor* (5). *(Original protocol information unconfirmed. Consulted*

	resources listed at end).
Plant strategy type / successional stage:	*Information in the next few sentences found in reference 5:* The species is a colonizer on logged areas, but can be displaced by red alder rather quickly. Also can be seral following clearcutting, burning, or grazing, and in second growth forest. *(Original protocol information unconfirmed. Consulted resources listed at end).*
Plant characteristics:	*Information in the next paragraph found in reference 3:* The tree form of bitter cherry is commonly found in westside, lowland, wooded habitats. Older trees have reached heights of fifty feet, can be more than one foot in diameter, and have a preference for growing in second-growth conifer forests. The bark is thin, red-brown in color, and has lenticels, horizontal stripes. The shrub form of this species is more robust and grows in eastside forests, on upper open slopes. It's suggested that this form should be used in more challenging garden environments that are on the east side of the Cascades. *Information in the next paragraph found in references 6,7:* Var. *emarginata,* the shrub variety, grows on the eastside of the Cascades and has very little hair or glabrous. Var. *mollis*, the tree variety, grows on the westside of the Cascades and is hairier, particularly on the bottom of the leaves. The trees or shrubs are deciduous and can be multi-trunked, although it's more likely that var. *mollis* will have only one trunk. *Information in the next paragraph found in references 3,4,6,7,8:* Leaves are broad shaped, rounded to acute, crenulate to serrate. Leaves have a length that is 2 to 4 in. long and are alternate. The leaves are also rounded at the tip and the margins are finely toothed. In autumn they turn yellow. The flowers are small, white or pink in color. They bloom from early to mid spring with flat top clusters of around 10. The flowers are 0.5 in. across. Fruit is an inedible drupe, can be red to black in color, and 0.5 in. long. The stems have side branches that are sharp and act like thorns. Plants only live forty to sixty years, a relatively short time (5,10).
PROPAGATION DETAILS	
Ecotype:	USFS, Umpqua National Forest, Diamond Lake Ranger District, Mud Lake, Oregon; 5000 ft (9).
Propagation Goal:	Seeds (9,10).
Propagation Method:	Seed, vegetative (8).
Product Type:	Propagules (9).
Stock Type:	
Time to Grow:	Seedlings take one to two years to develop before they can be out planted (8).

Target Specifications:	
Propagule Collection:	To collect in a small lot, of 24.5 pounds, you can hand collected into plastic bucket (9). In the tree form propagation is by seed sown in autumn. Germination can be low (3), sometimes taking 18 months to germinate (11). *Information in the next paragraphs found in references 5,8,10,11:* To collect seeds from trees by hand, a sheet can be placed under the tree and then shake or beat the tree to loosen the fruits. The time that this is done is between July and September when the fruit is ripe or when it turns bright red. Softwood cuttings can be done and are best if taken early spring through early summer. The Propagules should be treated with a rooting hormone with mist and heat from the bottom. The plant reproduces vegetatively by root crown and root sprouts. *(Original protocol information confirmed).*
Propagule Processing/Propagule Characteristics:	Number of Seeds per Pound: 7,260, Purity: 99% (9).
Pre-Planting Propagule Treatments:	Clean by crushing using a Dybvig Separator, seeds are dried on mesh trays. To separate the seeds use a gravity separator, Oliver Model 30, speed 8, feed 2 or 3 (9). *Information in the next paragraphs found in references 5,8,9,10:* To clean the seeds the fruit needs to be mashed in water and the pulp is removed by floating off. The process for sowing seeds immediately does not require drying. In wanted to wait a year to sown, the surface of the seed need be dried but not the inside of the seed. The moisture and storage requirements for a year or more, *(Original protocol information confirmed),* of storage are that the content of the seed be kept below the surface-dry conditions and kept between 1-5 degrees C. The containers must be sealed. Once its time to sown the seed there must be a stratification time. The seed has embryo dormancy and must after ripen with moisture and oxygen to get good germination. Cold stratification at 5degrees C for 90-126 days is necessary. *(Original protocol information confirmed).* The media must be sand and peat mixture. This is for spring sowing. If intending to sow in autumn time must be allowed for after ripening before the first ground freeze.
Growing Area Preparation / Annual Practices for Perennial Crops:	*Information in the next paragraphs found in references 5,8:* The soil media needs to be moist with good drainage, best with loam and sandy loam soils. Areas where growing need to be semi-shaded and on dry, exposed hillsides.

Establishment Phase:	
Length of Establishment Phase:	
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 (full citations):	1. United States Department of Agriculture (USDA). http://plants.usda.gov/ 2. 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. p. 48. 3. Kruckeberg, Arthur R. 1996. Gardening with Native Plants of the Pacific Northwest. Greystone Books, Douglas & McIntyre Ltd., Vancouver, British Columbia, Canada. p. 78. 4. Flora of the Pacific Northwest, Hitchcock, C.,and Cronquist, A., University of Washington Press, Seattle and London, 1973. p.221. 5. Esser, Lora L. 1995. Prunus emarginata. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (2003, April). Fire Effects Information System, [Online]. (Accessed 4/27/09): http://www.fs.fed.us/database/feis/plants/tree/pruema/all.html 6. Robson, Kathleen A., Richter, Alice, Filbert, Marianne. 2008. Encyclopedia of Northwest Native Plants. Timber Press, Inc. Portland, Oregon. p. 452. 7. Kozloff, Eugene N. 2005. Plants of Western Oregon, Washington & British Columbia. Timber Press, Inc. Portland, Oregon. p. 317.

	8. Rose, Robin, Chachulski, Caryn E.C., Haase, Diane L. 1998. Propagation of Pacific Northwest Native Plants. Oregon State University Press, Corvallis, Oregon. pp. 213-214. 9. Native Plant Network. Barner, Jim. (Accessed 4/29/09) http://www.nativeplantnetwork.org/network/view.asp?protocol_id=3250 10. Leigh, Michael. 1996. Grown Your Own Landscape: A Guide to Identifying, Propagating, and Landscaping with Western Washington Native Plants. WSU Cooperative Extension, Native Salvage Project. Olympia, Washington. p. 60. 11. UK Plants for the Future: Database Accessed (4/49/09): http://www.ibiblio.org/pfaf/cgi-bin/arr_html?Acer+macrophyllum&CAN=LATIND
Other Sources Consulted:	Consulted Native Plant Network. They had one protocol with very little information on it. http://www.nativeplantnetwork.org/network/view.asp?protocol_id=3250 Hill, Lewis.1985. Secrets of Plant Propagation. Storey Communications Inc., Pownal, Vermont. Arbury, Jim, Bird, Richard, Honour, Mike, Innes, Clive, Salmon, Mike. 1997. The Complete Book of Plant Propagation. The Taunton Press, Newtown, CT. Macdonald, Bruce. 1986. Practical Woody Plant Propagation for Nursery Growers. Timber Press, Portland, Oregon. Dirr, Michael A., Heuser, Charles W. Jr. 2006. The Reference Manual of Woody Plant Propagation. Varsity Press, Inc., Cary, North Carolina.
Protocol Author (First and last name):	Victoria Burgess
Date Protocol Created or Updated:	04/29/09

Note: This template was modified by J.D. Bakker from that available at:
http://www.nativeplantnetwork.org/network/SampleBlankForm.asp

Orignial Protocol:

Plant Data Sheet

Bitter cherry / Prunus emarginata

Range
British Columbia and Vancouver Island south to southern California and east to Montana, Wyoming, Utah and New Mexico (1)

Climate, Elevation
Cool, moist foothill, montane, or canyon habitats (2), low to middle elevations (3), from 45 m in the northern part of it's range to 2700 m in southern California (4)

Local occurrence
Moist forest and along streams (2) disturbed sites

Habitat preferences
Open sandy or gravelly sites and stream banks, shade intolerant (5), sparse woods (2)

Plant strategy type/successional stage
Pioneer on logged areas (2), soon displaced by red alder (5), seral following clearcutting, burning, or grazing, and in second growth forest (2)

Associated species
Salix scouleriana, Prunus virginiana, Amelanchier alnifolia, Rubus parviflorus, Holodiscus discolor (1)

Collection restrictions or guidelines
Flowers bloom in April/May (5), fruit ripening occurs from July to September and seed dispersal from August through September (2)

Seed germination
Has embryo dormancy, an after-ripening period in the presence of oxygen and moisture necessary for germination, cold stratification at 5 C for 90-160 days helps germination (2)

Vegetative regeneration
Reproduces vegetatively by root crown and root sprouts (2)

Seed life
Remain viable in soil and duff for many years, can be stored for up to 1 year

Recommended seed storage conditions

Dry conditions (2)

Propagation recommendations
Bitter cherry should be propagated from seed for best results but will also establish if propagated from softwood stem or root cuttings. Bitter cherry should be planted in the fall or late winter to early spring as bare root, balled, or burlapped specimens (6)

Soil or medium requirements
Moist soils with good drainage, also on semi-shaded areas and on dry, exposed hillsides, grows best on loam and sandy loam soils (2)

Installation form
Young plants from seed

Recommended planting density

Care requirements after installed (water weekly, water once etc.)

Normal rate of growth or spread; lifespan
Roots may spread up to 15 m from the parent plant sending up adventitious shoots along their length, short lived, 30-40 years (2)

Sources cited
(1) Esser, Lora L. 1995. Prunus emarginata. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (2003, April). Fire Effects Information System, [Online]. Available:
http://www.fs.fed.us/database/feis/plants/tree/pruema/distribution_and_occurrence.html

(2) Esser, Lora L. 1995. Prunus emarginata. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (2003, April). Fire Effects Information System, [Online]. Available:

http://www.fs.fed.us/database/feis/plants/tree/pruema/botanical_and_ecological _characteristics.html

(3) Pojar, J. and MacKinnon, A. 1994. Plants of the Pacific Northwest Coast. Lone Pine Publishing, Redmond, WA, USA.

(4) Breen, P. 1999. Oregon State University, Horticulture, Landscape Plants, Images, Identification and Information. http://oregonstate.edu/dept/ldplants/prema.htm

(5) Washington State Department of Transportation. 2001. Environmental Affairs, Prunus emarginata, Bitter Cherry. http://www.wsdot.wa.gov/environment/eao/culres/ethbot/m-p/PrunusE.htm

(6) Esser, Lora L. 1995. Prunus emarginata. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (2003, April). Fire Effects Information System, [Online]. Available:
http://www.fs.fed.us/database/feis/plants/tree/pruema/management_considerations.html

Data compiled by: Lizbeth Seebacher May 6, 2003