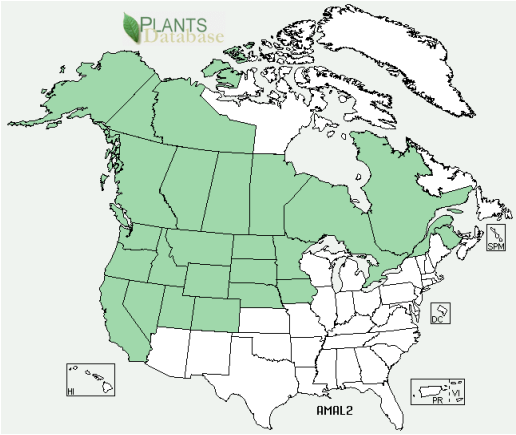
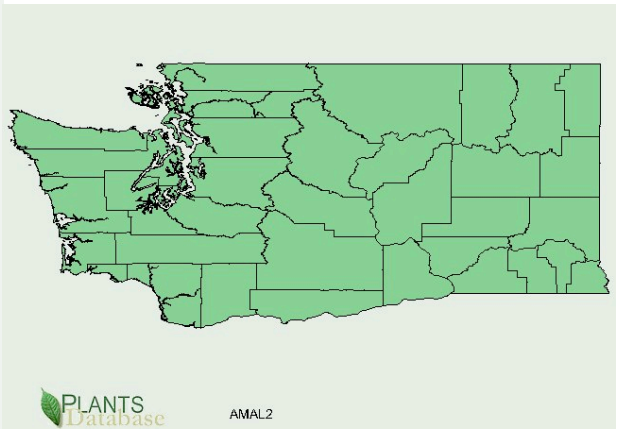
Plant Propagation Protocol for *Amelanchier alnifolia*
ESRM 412 – Native Plant Production
Spring 2012

North American Distribution



Washington Distribution



TAXONOMY	
Family Names	
Family Scientific Name:	Roseaceae
Family Common Name:	Rose family
Scientific Names	
Genus:	*Amelanchier*
Species:	*alnifolia*
Species Authority:	(Nutt.) Nutt. ex M. Roem.
Variety:	*alnifolia* *cusickii* *humptulipensis* *semiintergrifolia*
Sub-species:	
Cultivar:	
Authority for Variety/Sub-species:	(Fernald) (G.N. Jones) (Hook.) C.L.Hitchc.
Common Synonym(s) (include full scientific names (e.g., *Elymus glaucus* Buckley), including variety or subspecies information)	*Amelanchier alnifolia* (Nutt.) Nutt. ex M. Roem. var. *alnifolia* *Amelanchier alnifolia* (Nutt.) Nutt. ex M. Roem. var. *cusickii* (Fernald) C.L.Hitchc. *Amelanchier alnifolia* (Nutt.) Nutt. ex M. Roem. var. *humptulipensis* (G.N. Jones) C.L. Hitchc. *Amelanchier alnifolia* (Nutt.) Nutt. ex M. Roem. var. *semiintergrifolia* (Hook.) C.L. Hitchc.[4]
Common Name(s):	Saskatoon serviceberry, Pacific serviceberry, juneberry, shadbush[4], western serviceberry[3]
Species Code (as per USDA Plants database):	AMAL2
GENERAL INFORMATION	
Geographical range (distribution maps for North America and Washington state)	Its range extends from Alaska south to California, New Mexico, northeast to the Dakotas, Michigan, and into western Ontario[2]. See maps above for distribution in North America and Washington state.
Ecological distribution (ecosystems it occurs in, etc):	Can be found either individually or in a thicket[2]. Also common in lower-elevation coniferous forests but grows sporadically up to timberline. Occurs

	in montane chaparral, mountain shrub, and the upper limits of pinyon-juniper communities. In grasslands, it mostly occurs in wooded draws, woodland interfaces, and riparian zones. It occurs in open to lightly shaded disturbed sites such as thickets, fencerows, clearings, and edges of woods, and it is conspicuous after disturbances such as fire, logging, or insect outbreak[4].
Climate and elevation range	It grows from near sea level to over 2750 m[2].
Local habitat and abundance; may include commonly associated species	It prefers sunny or partially shaded areas with moist to dry soils, often in open conifer forests[2, 4].
Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)	Fire-dependent and drought tolerant[4]
Plant characteristics (life form (shrub, grass, forb), longevity, key characteristics, etc)	Deciduous shrub ranging from single stems 20 cm tall to treelike clumps up to 6 m tall. Leaves are alternate, oval shaped, serrated at the margin, and have distinct veins from the midrib to the teeth, and are 2.5-5 cm long. Flowers are white with five long petals, and the small fruit is a dark blue pome[2].
PROPAGATION DETAILS	
Propagation by Seeds at Sound Native Plants[3]	
Propagation Goal (Options: Plants, Cuttings, Seeds, Bulbs, Somatic Embryos, and/or Other Propagules):	Plants
Propagation Method (Options: Seed or Vegetative):	Seed
Product Type (options: Container (plug), Bareroot (field grown), Plug + (container-field grown hybrids, and/or Propagules (seeds, cuttings, poles, etc.))	Container (plug)
Stock Type:	10 cublic inch tubes, 1-gallon pots
Time to Grow (from seeding until plants are ready to be outplanted):	6 months
Propagule Collection (how, when, etc):	Seed crop is produced every 3-5 years and should be collected in late summer. The best method of collection is to knock the fruit onto a canvas or directly into hoppers[2]. These seeds were collected from ripe fruit in July/August in western Washington
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	Macerate fruit in water overnight. Further separate pulp from seed using a food processor with either duct-tape wrapped or plastic blades and screens. Store clean, dry seed in the refrigerator. Seeds can be stored in a sealed container at 5C for no more than five years[2].
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	Soak in water for 24 hours then cold, wet stratification for 3 months beginning in January
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	Sow into 10 cubic inch tubes filled with Sunshine Mix #1 in March. Sow 3-5 seeds per tube.
Establishment Phase (from seeding to	Tubes will be fully rooted in 3 months. The tubes can then be potted into 1-

germination):	gallon containers and will be fully rooted by September.
Length of Establishment Phase:	N/A
Active Growth Phase (from germination until plants are no longer actively growing):	N/A
Length of Active Growth Phase:	N/A
Hardening Phase (from end of active growth phase to end of growing season; primarily related to the development of cold-hardiness and preparation for winter):	N/A
Length of Hardening Phase:	N/A
Harvesting, Storage and Shipping (of seedlings):	N/A
Length of Storage (of seedlings, between nursery and outplanting):	N/A
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	N/A
Other Comments (including collection restrictions or guidelines, if available):	Success rate of tubes: 60%, success rate of 1-gallons: 90%
PROPAGATION DETAILS	
Propagation by Vegetation at Glacier National Park[1]	
Ecotype (this is meant primarily for experimentally derived protocols, and is a description of where the seed that was tested came from):	Subalpine forest margin, Two Medicine, 1550 m elevation, Glacier National Park, Glacier Co., MT.
Propagation Goal (Options: Plants, Cuttings, Seeds, Bulbs, Somatic Embryos, and/or Other Propagules):	Plants
Propagation Method (Options: Seed or Vegetative):	Vegetative
Product Type (options: Container (plug), Bareroot (field grown), Plug + (container-field grown hybrids, and/or Propagules (seeds, cuttings, poles, etc.))	Container (plug)
Stock Type:	800 ml containers
Time to Grow (from seeding until plants are ready to be outplanted):	1 year
Target Specifications (size or characteristics of target plants to be produced):	Stock type: container cutting Height: 10 cm Caliper: 7mm Root system: Firm plug in 800 ml containers
Propagule Collection (how, when, etc):	Vegetative propagation: pre-rooting Type of cutting: summer semi-hardwood stem cutting collected in late July Take root cuttings during the dormant season, optimally December to February.[1]

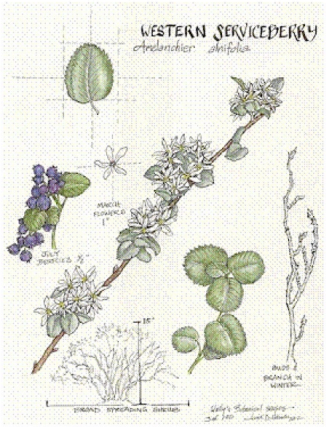
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	Cuttings are kept moist and under refrigeration prior to pre-treatment
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	The semi-hardwood stem cuttings were 12 to 17 cm in length, 6 mm in diameter, and were treated with 4000 ppm Hormex rooting powder Cuttings were placed in 50:50 sand and perlite rooting medium under mist and bottom heat maintained at 21C for 8 weeks
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	The outdoor mistbed has automatic intermittent mist that is applied at 6-second intervals every 6 minutes. Misting frequency is increased or decreased according to daily outdoor temperature and wind. Bottom heat is maintained at 21 C with heating cables buried 12 cm beneath rooting medium. Mistbed is covered with shadecloth during rooting. After cuttings are potted, they are moved to an outdoor shadehouse for 4 weeks. They are later moved to full sun exposure in the outdoor nusery and are irrigated with Rainbird automatic irrigation system in early morning until containers are thoroughly leached. Average growing season of nursery is from late April after snowmelt until October 15th.
Establishment Phase (from seeding to germination):	Time to transplant: 8 weeks. Cuttings that were pre-rooted were lifted out of mistbed after adequate root systems were formed. Roots generate from the basal cut below the surface of the rooting media. Rooting %: 22%
Length of Establishment Phase:	8 weeks
Active Growth Phase (from germination until plants are no longer actively growing):	After cuttings were lifted from the mistbed, they were potted into 800 ml containers. Growing medium used is 70% 6:1:1 milled sphagnum peat, perlite, and vermiculite and 30% sand with Osmocote controlled release fertilizer and Micromax fertilizer at the rate of 2 grams of Osmocote and 1 gram of Micromax per container. Cuttings were irrigated after potting and placed in the shadehouse for 4 weeks. After establishment in the shadehouse, plants were moved to full sun exposure in the outdoor nursery.
Length of Active Growth Phase:	8 weeks
Hardening Phase (from end of active growth phase to end of growing season; primarily related to the development of cold-hardiness and preparation for winter):	Irrigation is gradually reduced in September and October. Plants were given one final irrigation prior to winterization.
Length of Hardening Phase:	4 weeks
Harvesting, Storage and Shipping (of seedlings):	Total Time to Harvest: 1 year from cuttings. Harvest Date: September Storage Conditions: Overwinter in outdoor nursery under insulating foam cover and snow.
Length of Storage (of seedlings, between nursery and outplanting):	5 months
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	Outplanting Site: Two Medicine, Glacier National Park, MT. Outplanting Date: September
Other Comments (including collection restrictions or guidelines, if	Rooting success is very dependent on correct timing. Cuttings taken late May into June when the cuttings are at the softwood stage and well before

available):	the terminal bud has set have been successful using 3000 ppm IBA talc under mist with bottom heat.
INFORMATION SOURCES	
References (full citations):	[1]Hosokawa, Joy; Luna, Tara. 2008. Propagation protocol for vegetative production of container *Amelanchier alnifolia* Nutt. plants (800 ml containers); USDI NPS - Glacier National Park, West Glacier, Montana. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 15 May 2012). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery. [2]Rose, Robin, Caryn E. C. Chachulski, and Diane L. Haase. *Propagation of Pacific Northwest Native Plants*. Corvallis: Oregon State University Press, 1998, pp. 94-95 [3]Sound Native Plants, 2007. Propagation protocol for production of container *Amelanchier alnifolia* plants; Sound Native Plants, Olympia, Washington. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 15 May 2012). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery. [4]"U.S. Department of Agriculture." Plants profile. NCRS. Web. 15 May 2012. <http://plants.usda.gov/java/profile?symbol=AMAL2>.
Other Sources Consulted (but that contained no pertinent information) (full citations):	[5]Cooksey, Mike. "Amelanchier Alnifolia." *Plant Data Sheet*. University of Washington, 14 Apr. 2003. Web. 15 May 2012. <http://depts.washington.edu/propplnt/Plants/amelanchier.htm>. [6]Dirr, Michael, and Charles W. Heuser. *The Reference Manual of Woody Plant Propagation: From Seed to Tissue Culture: a Practical Working Guide to the Propagation of Over 1100 Species, Varieties, and Cultivars*. Cary, NC: Varsity Press, 2006, pp. 117. [7]Dumroese, R K, Tara Luna, and Thomas D. Landis. *Nursery Manual for Native Plants: A Guide for Tribal Nurseries*. Washington, D.C.: U.S. Dept. of Agriculture, Forest Service, 2009. [8]Hitchcock, C L. *Vascular Plants of the Pacific Northwest*. Seattle: University of Washington Press, 1955, pp. 312. [9]Kozloff, Eugene N. *Plants of Western Oregon, Washington & British Columbia*. Portland, Or: Timber Press, 2005, pp. 312 [10]Leigh, Michael. *Grow Your Own Native Landscape: A Guide to Identifying, Propagating & Landscaping with Western Washington Native Plants*. Olympia, Wash: Native Plant Salvage Project, Washington State University Cooperative Extension, Thurston County, 1999. Print. [11]Pojar, Jim, A MacKinnon, and Paul B. Alaback. *Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia & Alaska*. Redmond, Wash: Lone Pine Pub, 1994. Print.
Protocol Author (First and last name):	Napha Nammathao
Date Protocol Created or Updated (MM/DD/YY):	05/16/2012

Appendix:
Original protocol

Amelanchier alnifolia

(Western serviceberry, Saskatoon serviceberry, Juneberry)



Range
Extends from northern Alaska south to California and east to Ontario, Minnesota, Iowa, Colorado, and New Mexico.

Climate, elevation
Range from dry rocky slopes in full sunlight to partial shade of conifers and in moist, deep, and fertile soils. Moisture is a limiting factor; plants not usually present in areas with less than 14" annual precipitation.

Local occurrence (where, how common)
Common throughout the Northwest, frequently in thickets.

Habitat preferences
Found on forested slopes, open rocky woods, cliff edges, wide prairies, or along side streams or lakes; also bogs and wet sites. It likes to follow fence rows and to meander along the edges of woods.

Plant strategy type/successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)
Very cold hardy (to –20° C) and draught tolerant. Not invasive.

Associated species
Vine maples, all manner of wild roses and other shrubby plants or small trees. Companions are often windbreak members or woodland plants.

May be collected as: (seed, layered, divisions, etc.)
Seed, division, layering; or dig up 2 - 3 year old suckers in the winter; these suckers will generally start to produce within a couple of years.

Collection restrictions or guidelines

Collect fruit when ripe, in late summer.

Seed germination (needs dormancy breaking?)
Needs to be cold-stratified for 3-6 months to break seed dormancy. Expect a germination rate of less than 50%.

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

Recommended seed storage conditions
Seeds not sown in the fall should not be allowed to dry out.

Propagation recommendations (plant seeds, vegetative parts, cuttings, etc.)
Propagate from seed easily, but division most successful method. Expect a germination rate of less than 50%, and the seedlings will grow about 1 foot per year.

Soil or medium requirements (inoculum necessary?)
Favorite soil is a rich loamy mix, but they will grow in just about any kind of soil as long as good drainage is provided. Coarse to medium texture, well to moderately well drained. Soil moisture moist to average; pH: 6.1 - 6.5.

Installation form (form, potential for successful outcomes, cost)
Seeds: Expect a germination rate of less than 50%;
Suckers/Cuttings: Most successful method.

Recommended planting density
Can be grown with a single trunk or a multiple trunked grove. They make an excellent windbreak when planted fairly close together so the branches can intertwine to form a living fence.

Care requirements after installed (water weekly, water once etc.)
No special requirements if planted in moist, well-drained soil.

Normal rate of growth or spread; lifespan
Seedlings will grow about 1 foot per year; to 6 meters with 4-5 m spread; live about 60 years.

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.
- http://www.nwplants.com/plants/shrubs/rosaceae/amelanchier_alnifolia/
- http://www.rook.org/earl/bwca/nature/shrubs/amelanchier.html

Data compiled by Mike Cooksey; 14 April 2003.

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