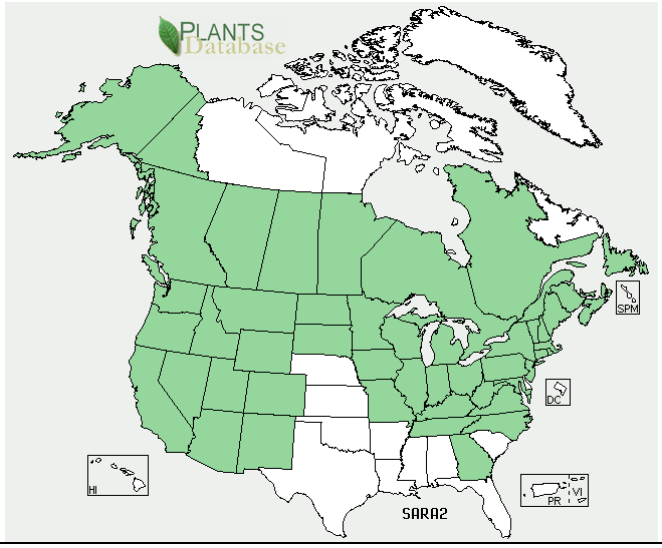
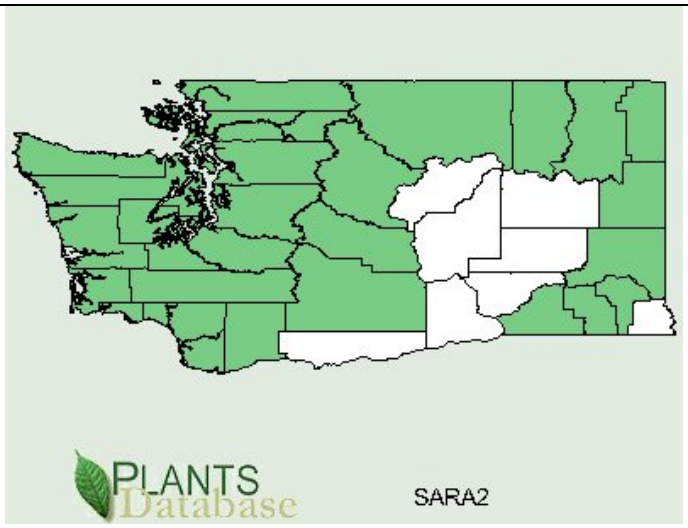
Plant Propagation Protocol for Red Elderberry
ESRM 412 – Native Plant Production

TAXONOMY	
Family Names	
Family Scientific Name:	Caprifoliaceae
Family Common Name:	Honeysuckle
Scientific Names	
Genus:	*Sambucus*
Species:	*racemosa*
Species Authority:	L.
Variety:	
Sub-species:	
Cultivar:	
Authority for Variety/Sub-species:	

Common Synonym(s) (include full scientific names (e.g., *Elymus glaucus* Buckley), including variety or subspecies information)	*Sambucus racemosa* L. red elderberry *Sambucus racemosa* L. ssp. *kamtschatica* (E.L. Wolf) Hultén red elder *Sambucus racemosa* L. ssp. *sibirica* (Nakai) H. Hara *Sambucus racemosa* L. ssp. *sieboldiana* (Miq.) H. Hara *Sambucus racemosa* L. var. *melanocarpa* (A. Gray) McMinn Rocky Mountain elder *Sambucus racemosa* L. var. *racemosa* red elderberry *Sambucus racemosa* L. var. *arborescens* (Torr. & A. Gray) A. Gray *Sambucus racemosa* L. var. *leucocarpa* (Torr. & A. Gray) Cronquist *Sambucus racemosa* L. var. *laciniata* W.D.J. Koch ex DC. SARAM5 *Sambucus racemosa* L. var. *microbotrys* (Rydb.) Kearney & Peebles *Sambucus racemosa* L. ssp. *pubens* (Michx.) House *Sambucus racemosa* L. var. *pubens* (Michx.) Koehne
Common Name(s):	Red elderberry, scarlet elder, stinking elderberry, stinking elder, red-berried elder, bunchberry elder, and red elder (15).
Species Code (as per USDA Plants database):	SARA2
GENERAL INFORMATION	
Geographical range (distribution maps for North America and Washington state)	

	
Ecological distribution (ecosystems it occurs in, etc):	A facultative wetland species with a preference for disturbed moist sites in riparian zones, wetlands and moist forests. (1, 10). Moist, open, lowland forest – grows as large spreading shrub. Mountain meadows – medium-sized shrub (14).
Climate and elevation range	Shade tolerant but prefers sun. Prefers moist sites where it can become a dominant or co-dominant species. Elevation distribution: Sea level to 9500 ft (15).
Local habitat and abundance; may include commonly associated species	Common throughout Puget Sound in moist clearings, open forests, stream banks, and wetlands (1, 10). Associated plants include (*Alnus rubra*), big-leaf maple (*Acer macrophyllum*), Oregon ash (*Fraxinus latifolia*), Douglas-fir (*Pseudotsuga menziesii*), western red cedar (*Thuja plicata*), black cottonwood (*Populus balsamifera*) and western hemlock (*Tsuga heterophylla*). Often found associated with willows (*Salix* spp.), salmonberry (*Rubus spectabilis*), thimbleberry (*Rubus parviflorus*), and snowberry (*Symphoricarpos albus*) (3, 7, 10).
Plant strategy type / successional stage (stress-tolerator, competitor, weedy/coloniz er, seral, late successional)	Early to mid successional species. Associated with disturbance indicating it may be a seral species reliant on regular disturbance to persist in a community and therefore possibly ruderal (1, 10, 15).
Plant characteristics	Perennial, deciduous shrub or small tree (3-6 m) with weak spreading, sprawling hollow branches. Leaves opposite 15-30 cm long with pinnately-

(life form (shrub, grass, forb), longevity, key characteristics, etc)	compound with 5-7 lanceolate leaflets. W. Cascade variety pubescent under leaflets. Large, deciduous shrub or small tree with weak spreading, sprawling branches. Flowers are tiny, white to cream, saucer-shaped in pyramidal inflorescence. Fruit is bright red, astringent berry-like drupe (1, 10, 12, 13, 14).
PROPAGATION DETAILS	
Ecotype (this is meant primarily for experimentally derived protocols, and is a description of where the seed that was tested came from):	N/A
Propagation Goal (Options: Plants, Cuttings, Seeds, Bulbs, Somatic Embryos, and/or Other Propagules):	Plants
Propagation Method (Options: Seed or Vegetative):	Seed – possible. Vegetative – preferable.
Product Type (options: Container (plug), Bareroot (field grown), Plug + (container-field grown	Container, Bareroot

hybrids, and/or Propagules (seeds, cuttings, poles, etc.))	
Stock Type:	
Time to Grow (from seeding until plants are ready to be outplanted):	(From seed) Usually large enough for outplanting after one year (12).
Target Specifications (size or characteristics of target plants to be produced):	Germinants
Propagule Collection (how, when, etc):	Collect hardwood cuttings between August and September (8). Collect seeds in early autumn (17).
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	Seed –200,000 to 300,000 clean seeds/lb (15). Dry fruit and macerate with water to float off pulp (12).
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	Cuttings –Require at least two nodes with basal cut just below lower node. Rooting hormone may be beneficial (IBA or IBA-talc). Cuttings kept in cold storage lose vigor. Cuttings can either be potted or installed directly in the field early enough to allow for rooting before winter (4, 8, 11, 12, 15). Seed –Hard to germinate because of dormant embryos and hard seed. Requires 30-60 day warm, moist (20-30^{o}C) stratification followed by at least 90-150 days cold stratification (5^{o}C). Other methods include 10-15 minutes soaking in acid folloed by 2 months of prechilling (11, 12, 15, 17).
Growing Area Preparation /	For cuttings, flats work well. Cuttings can be placed very close together for rooting (4).

Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	
Establishment Phase (from seeding to germination):	Information not available
Length of Establishment Phase:	Not available
Active Growth Phase (from germination until plants are no longer actively growing):	Moderately fast grower of unspecified length (15).
Length of Active Growth Phase:	Not available
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):	Not available
Length of Hardening Phase:	Not available
Harvesting, Storage and	Not available

Shipping (of seedlings):	
Length of Storage (of seedlings, between nursery and outplanting):	Not available
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	Not available
Other Comments (including collection restrictions or guidelines, if available):	Propagation from seed possible but much more difficult. Standard conservative collection methods apply for genetic integrity and minimal ecosystem impact. There are cyanide-producing glycosides in bark, wood, leaves, and roots of *Sambucus racemosa* rendering them toxic if consumed before proper processing. The berry fruit (skins and pulp) and the seeds are also toxic (9).
INFORMATION SOURCES	
References (full citations):	1) Cooke, Sarah Spear. A Field Guide to the Common Wetland Plants of Western Washington and Northwest Oregon. 1997. Seattle Audubon Society, Seattle WA. 2) Cornell University. Department of Horticulture. 2010. http://www.fruit.cornell.edu/mfruit/elderberries.html 3) Franklin, Jerry F. & C. T. Dyrness. Natural Vegetation of Oregon and Washington. 1988. Oregon State University Press, Corvallis OR. 4) Hartman, Hudson et al. Plant Propagation Principles. 2002. Prentice-Hall, Inc., Upper Saddle River, NJ.

5) Hitchcock, C Leo & Chouglus, Arthur. Flora of the Pacific Northwest. 1976. University of Washington Press, Seattle, WA.

6) Kozloff, Eugene. Plants and Animals of the Pacific Northwest. 1978. University of Washington Press, Seattle and London.

7) Kunze, Linda M. Preliminary Classification of Native, Low Elevation, Freshwater Wetland Vegetation in Western Washington. 1994. Washington State Department of Natural Resources, Olympia WA.

8) Leigh, Michael. Grow your own Native Landscape. 1999. Washington State University Cooperative Extension, Olympia, WA.

9) Losey, R.J. Stenholm, N. Whereat-Phillips, P. and Vallianatos, H. *Exploring the use of red elderberry (Sambucus racemosa) fruit on the southern Northwest Coast of North America*, Journal of Archaeological Science 30 (2003) 695e707.

10) Pojar, Jim and McKinnon, Andy, eds. Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia and Alaska. 1994. Lone Pine Press, British Columbia.

11) Potash, Laura and Aubry, Carol. Mt. Baker-Snoqualmie National Forest Native Plant Notebook. 1997. North Cascades Institute. Sedro-Woolley WA.

12) Rose, Robin. Propagation of Pacific Northwest Native Plants. 1998. Oregon State University Press, Corvallis, OR.

13) Spurr, Joy. Wild Shrubs – Finding and Growing your own. 1978. Pacific Search Press, Seattle, WA.

14) Taylor, Ronald J., & Douglas, George, W. Mountain Plants of the Pacific Northwest. 1995. Mountain Press Publishing Company. Missoula, MT.

15) USDA, NRCS. 2002. The PLANTS Database, National Plant Database Center, Baton Rouge, LA. (http://plants.usda.gov).

16) USDA- Forest Service. Fire Effects Information System (FEIS) database. http://www.fs.fed.us/database/feis/plants/

	17) Young, James A, & Young, Cheryl G. Seeds of Woody Plants in North America. 1992. Dioscorides Press. Portland, OR.
Other Sources Consulted (but that contained no pertinent information) (full citations):	Buckingham, Nelsa M. et al., Flora of the Olympic Peninsula. 1995. Northwest Interpretive Association, Seattle, WA. Johnson, Charles G. Common Plants of the Inland Pacific Northwest. 1998. USDA – Forest Service.
Protocol Author (First and last name):	Jon Klacik
Date Protocol Created or Updated (MM/DD/YY):	06/06/11

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

~Original (2003) Protocol~

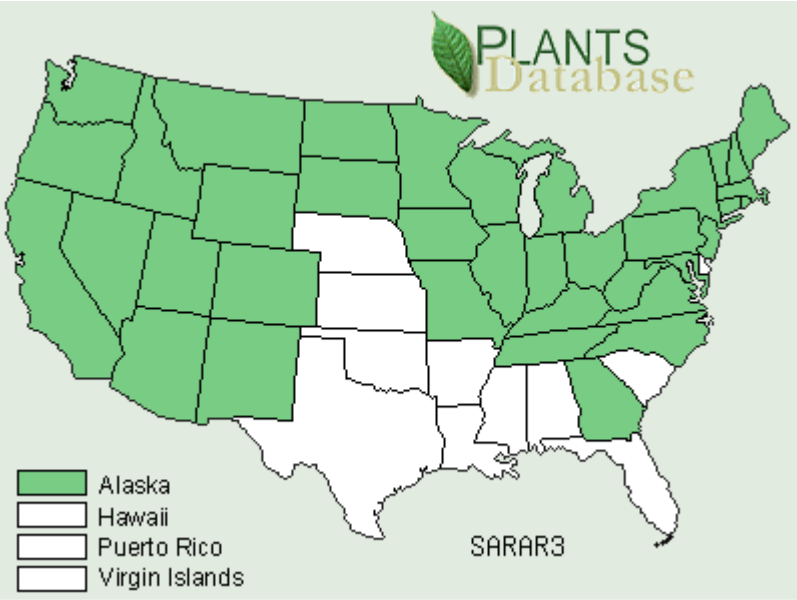
Species

Red elderberry, *Sambucus racemosa* L. ssp. *pubens* (Michx.) House var. *arborescens* (T. & G.) Gray

Perennial shrub to small tree, up to 6 m tall, leaves opposite, 15-30 cm long, deciduous, pinnately compound divided into 5-7 lanceolate leaflets. W. Cascade variety pubescent under leaflets. Flowers white to cream born in pyramidal panicles. Fruit red, three-seeded drupes. (3, 7)

Range

Circumboreal, found throughout the west cascades in riparian zones, wetlands and moist forests. (1, 3, 9)



Climate, elevation

Pacific maritime climate from sea level to 1000 m (sometimes up to 3500 m). (3, 7, 9)

Local occurrence

Common throughout Puget Sound in moist clearings, open forests, stream banks, and wetlands (1, 7)

Habitat preferences

A facultative wetland species with a preference for disturbed moist sites in riparian zones, wetlands and moist forests. (1, 7)

Plant strategy type/successional stage

Not specifically noted in literature however most reference red elderberry as associated with disturbance indicating it may be a seral species reliant on regular disturbance to persist in a community and therefore possibly ruderal. (1, 7)

Associated species

Widely associated with both broadleaf deciduous and coniferous forests throughout its range. Commonly found locally beneath red alder (*Alnus rubra*), big-leaf maple (*Acer macrophyllum*), Oregon ash (*Fraxinus latifolia*), Douglas-fir (*Pseudotsuga menziesii*), western red cedar (*Thuja plicata*), black cottonwood (*Populus balsamifera*) and western hemlock (*Tsuga heterophylla*). Often found associated with willows (*Salix* spp.), salmonberry (*Rubus spectabilis*), thimbleberry (*Rubus parviflorus*), and snowberry (*Symphoricarpos albus*). (2, 5, 7)

May be collected as:

Seed – (400,000 to 800,000 seed/kg) ripens June-September, dry fruit and macerate with water to float off pulp or crush and dry fruit for same season seeding. (8, 9, 10)

Cuttings – one year old cuttings with 30-40% of their leaves retained taken after new wood is mature from summer through late winter. Cuttings kept in cold storage lose vigor. Cuttings can either be potted or installed directly in the field early enough to allow for rooting before winter. (8, 9, 10)

Collection restrictions or guidelines

Typical conservative collection methods for genetic integrity and minimal ecosystem impact apply.

Seed germination

Seed sown in fall after collection may not germinate until the second spring. Greenhouse germination increased by 5 minute sulfuric acid treatment followed by 48 hour water soak then warm and cold stratification. (8, 9)

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

Can be stored for several years at 5 degrees Celsius (8)

Recommended seed storage conditions

Typical low temp, low humidity conditions

Propagation recommendations

Sow seed in media filled flats then cover with light perlite layer. Cover flats with plastic or glass to maintain high humidity. Once germinated raise cover slightly to allow for circulation. Once germination is complete remove cover and pot up seedlings. Germinants are ready for outplanting after the first year. Cuttings should be treated with root hormone and planted in pots with ample enough room for root growth. Rooting can be accelerated by keeping them in hot, humid conditions. Rooted cuttings are ready for installation after the first year. (8, 9, 10)

Soil or medium requirements

1:1 peat:perlite or regular potting soil for cuttings, peat:sand:perlite mix for germination. (8)

Installation form

Seed can be directly sown into the field. Freshly collected cuttings can also be directly installed. Greenhouse raised germinants and rooted cuttings are ready for outplanting after one year. (8, 9)

Recommended planting density

Not noted in literature. Red elderberry takes on a sprawling tree-like form in favorable conditions therefore wide spacings of 2 m or more might be appropriate.

Care requirements after installed

Not noted in literature. Red elderberry has been noted to tolerated dry to wet soils. If installed in persistently moist sites favored by red elderberry watering may not be necessary. At dryer sites during the summer or during drought in wetter sites weekly watering may be needed. (7, 8, 11)

Normal rate of growth or spread; lifespan

Red elderberry is a moderately fast grower with a moderate lifespan of unspecified length (10)

Sources cited

(1) Cooke, Sarah Spear. A Field Guide to the Common Wetland Plants of Western Washington and Northwest Oregon. 1997. Seattle Audubon Society, Seattle WA.

(2) Franklin, Jerry F. & C. T. Dyrness. Natural Vegetation of Oregon and Washington. 1988. Oregon State University Press, Corvallis OR.

(3) Hitchcock, C. Leo and Cronquist, Arthur. Flora of the Pacific Northwest. 1998. University of Washington Press, Seattle and London.

(4) Kozloff, Eugene. Plants and Animals of the Pacific Northwest. 1978. University of Washington Press, Seattle and London.

(5) Kunze, Linda M. Preliminary Classification of Native, Low Elevation, Freshwater Wetland Vegetation in Western Washington. 1994. Washington State Department of Natural Resources, Olympia WA.

(6) Leigh, Michael. Grow Your Own Native Landscape. 1999. Washington State University Cooperative Extension – Thurston County, WA.

(7) Pojar, Jim and McKinnon, Andy, eds. Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia and Alaska. 1994. Lone Pine Press, British Columbia.

(8) Potash, Laura and Aubry, Carol. Mt. Baker-Snoqualmie National Forest Native Plant Notebook. 1997. North Cascades Institute. Sedro-Woolley WA.

(9) Rose, Robin, Chachulski, Caryn and Haase, Diane. Propagation of Pacific Northwest Native Plants. 2000. Oregon State University Press, Corvallis.

(10) USDA, NRCS. 2002. The PLANTS Database, Version 3.5 (http://plants.usda.gov) National Plant Database Center, Baton Rouge, LA 70874-4490 USA.

(11) USDA Forest Service Fire Effects Information System (FEIS) database. http://www.fs.fed.us/database/feis/plants/

Data compiled by

Rodney Pond 04.19.03