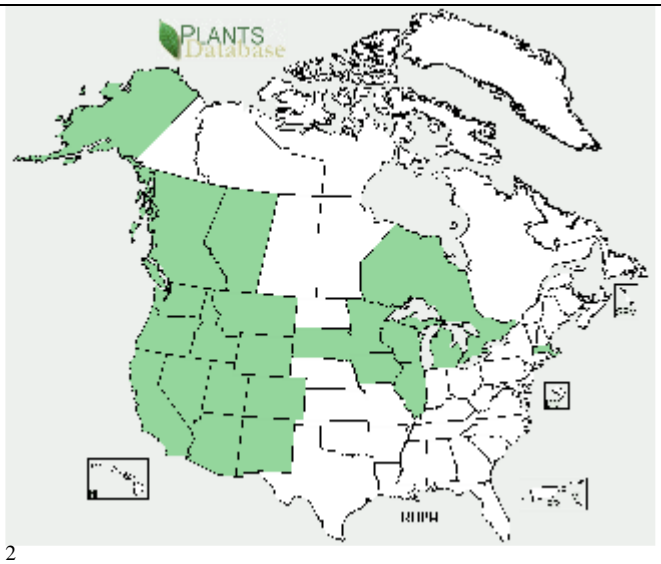
Plant Propagation Protocol for *Rubus parviflorus* Nutt.
ESRM 412 – Native Plant Production
Spring 2008


Photo by Jim Popenoe

TAXONOMY	
Family Names	
Family Scientific Name:	Rosaceae
Family Common Name:	Rose Family
Scientific Names	
Genus:	*Rubus*
Species:	*parviflorus*
Species Authority:	Nutt.
Variety:	*parviflorus*
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)	*Rubacer parviflorum* (Nutt.) Rydb. *Rubus parviflorus* Nutt. *f. adenius* Fassett *Rubus parviflorus* Nutt. *f. bifarius* (Fernald) Fassett *Rubus parviflorus* Nutt. *f. glabrifolius* Fassett *Rubus parviflorus* Nutt. *f. heteradenius* (Fernald) Fassett *Rubus parviflorus* Nutt. *f. hypomalacus* (Fernald) Fassett *Rubus parviflorus* Nutt. *f. micradenius* Fassett *Rubus parviflorus* Nutt. *f. trichophorus* Fassett *Rubus parviflorus* Nutt. var. *bifarius* Fernald *Rubus parviflorus* Nutt. var. *genuinus* Fernald *Rubus parviflorus* Nutt. var. *grandiflorus* Farw. *Rubus parviflorus* Nutt. var. *heteradenius* Fernald *Rubus parviflorus* Nutt. var. *hypomalacus* Fernald *Rubus parviflorus* Nutt. var. *parviflorus (*Common in NW*)* *Rubus parviflorus* Nutt. var. *parvifolius* (A.Gray) Fernald[1]
Common Name(s):	Thimbleberry
Species Code (as per USDA Plants	RUPA

database):	
GENERAL INFORMATION	
Geographical range (distribution maps for North America and Washington state)	 2 AK, AZ, CA, CO, ID, MI, MN, MT, NM, NV, OR, SD, UT, WA, WI, WY
Ecological distribution (ecosystems it occurs in, etc):	AK to CA, inland to Great Lakes through Rockies.[3]
Climate and elevation range	Up to 2700m but more common up to 2100m in the PNW.[4]
Local habitat and abundance; may include commonly associated species	Moist to dry, wooded to open areas, near sea-level to subalpine[3], avalanche tracks, along streams;[4]
Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)	Prefers sandy loam soil that is rich in humus but also grows on rocky sites with thin soils.[5] Excellent choice for steep slopes because of its good soil binding abilities.[6] Browsed by deer and elk; flowers attract butterflies; fruit eaten by birds and mammals (incl humans.)[6]
Plant characteristics (life form (shrub, grass, forb), longevity, key characteristics, etc)	2-10' tall shrub with cane-like stems; shreddy brown bark.[6] Underground sends up many leggy shoots. Unlike other Seattle brambles, is free of prickles.[7] Edible fruits are bright red, flowers showy white, leaves are palmately lobed and with soft pubescence.[8]
PROPAGATION DETAILS	
Ecotype (this is meant primarily for experimentally derived protocols, and is a description of where the seed that was tested came from):	Seed protocol collected from Saint Mary, Glacier National Park, Glacier County, MT. 1575 meters. Vegetative Protocol collected from Muir Woods, California.[3,9.]
Propagation Goal (Options: Plants,	Seeds and vegetative.

Cuttings, Seeds, Bulbs, Somatic Embryos, and/or Other Propagules):	
Propagation Method (Options: Seed or Vegetative):	Seeds and vegetative: Thimbleberry can be propagated by cuttings and rhizomes.[4]
Product Type (options: Container (plug), Bareroot (field grown), Plug + (container-field grown hybrids, and/or Propagules (seeds, cuttings, poles, etc.))	Container (plug) for both seed and vegetative.[3,9.]
Stock Type:	A seed protocol used 160mL conetainers;[3] A vegetative protocol used Deepot 40.[9]
Time to Grow (from seeding until plants are ready to be outplanted):	Seeds: 7 months.[3]
Target Specifications (size or characteristics of target plants to be produced):	Seeds: Seedling to firm plug in container, 15cm height x 4mm caliper; Vegetative: firm plug in container. [3,9.]
Propagule Collection (how, when, etc):	Seed was collected late August when fruit bright red and easily pulled from hypantheum disk. Seeds tan at maturity. Fruits collected in plastic bags and kept under refrigeration prior to cleaning.[3] Semi-hardwood cuttings were collected between June 1 and July 31st, cutting length 5 inches.[9]
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	Seeds were separated from fruit using a macerator and were washed and cleaned. Seed longevity is 5-10 years at 3-5° C and low humidity in sealed containers. Dormancy is classified as physiological. 450,000 seeds/kg; 100% purity; 90-100% germination.[3] Cuttings were kept moist and cool prior to treatment.[9]
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	Seeds: cleansed with 1:3 water + 3% hydrogen peroxide rinse for 15 minutes, running water soak 24-48 hours, to cold moist strat for 90 days. (Seeds were then placed in fine mesh bags and buried in moist peat moss in ventilated containers at 3°C.)[3] Cuttings: dipped in mild bleach solution for 30 seconds, dusted with Hormex (1000ppm IBA) rooting powder and struck in flats containing 4:1 Perlite/Vermiculite. 60% rooting.[9]
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	Greenhouse and outdoor nursery. Seeds were sown by hand and lightly covered with 6:1:1 sphagnum peat moss, perlite, vermiculite; Greenhouse T 21-25° C during day and 15-18°C at

	night (each 12 hours.)[3] Cuttings in flats were kept in greenhouse and watered with automatic mist until roots fully developed. Bottom heat used.[9]
Establishment Phase (from seeding to germination):	Seeds: germination uniform and usually complete in 2 weeks, cotyledons emerged 5 days after sowing. True leaves appeared 10 days after sowing and seedlings thinned at this stage.[3] Cuttings transplanted at 60 days to individual containers 2 x 10" tubes (Deepot 40) containing standard potting mix of peat moss, fir bark, perlite and sand. Cuttings placed in shade house.[9]
Length of Establishment Phase:	Seeds 4 weeks. Cuttings 2 months to transplant.[3,9.]
Active Growth Phase (from germination until plants are no longer actively growing):	Seedling growth rapid once established, 4-6 true leaves at 5 wks, seedlings fertilized 20-10-20 liquid NPK at 100ppm during growing season. Seedlings fully root tight in 160ml conetainers 90 days after sowing. Up-potted to 800ml and fertilized (Osmocote and Micromax) and fully root tight again at end of growing season.[3]
Length of Active Growth Phase:	Seeds: 20 weeks.[3] Cuttings: 60 days.
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):	Seeds: plants were fertilized with 10-20-20 liquid NPK at 200ppm during September. Irrigation is gradually reduced in September and October. Plants given one final irrigation prior to winterization.[3]
Length of Hardening Phase:	8 weeks.[3]
Harvesting, Storage and Shipping (of seedlings):	Total time to harvest seedlings: 7 months; Harvest date: September; Overwinter in outdoor nursery under insulating foam cover and snow.[3]
Length of Storage (of seedlings, between nursery and outplanting):	Seedlings: 20 weeks;[3]
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	Cuttings: Transplant survival averages 30%. High mortality after transplanting; recommend a well drained media.[9]
Other Comments (including collection restrictions or guidelines, if available):	Small plants salvage well but are somewhat slow to establish.[6] Easily planted from rooted runners.[10] Leafy softwood cuttings can be made in early spring from young sucker shoots just emerging from soil. These should have 2.5-5cm etiolated section below the surface.[11]
INFORMATION SOURCES	
References (full citations):	References: 1. Robert W Freckmann Herbarium – University of

	Wisconsin, Steven's Point. Wildflowers of Wisconsin and the Upper Midwest; U. Wisconsin 2008. http://wisplants.uwsp.edu/index.html. 2. USDA, NRCS. 2008. The PLANTS Database (http://plants.usda.gov, 12 May 2008). National Plant Data Center, Baton Rouge, LA 70874-4490 USA. http://plants.usda.gov/java/profile?symbol=RUPA 3. Wick, Dale; Corey, Susan; Luna, Tara. 2008. Propagation protocol for production of container *Rubus parviflorus* Nutt. plants (160 ml conetainers); USDI NPS - Glacier National Park, West Glacier, Montana. In: Native Plant Network. URL: http://www.nativeplantnetwork.org. Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery. 4. Rose, Robin; Chachulski, Caryn EC; Haase, Diane L; Propagation of Pacific NW Native Plants. 1998 Oregon State University. 5. Pojar, Jim; MacKinnon, Andy; Plants of the Pacific Northwest Coast. 2004. B.C. Ministry of Forests and Lone Pine Publishing. 6. Leigh, Michael; Grow Your Own Native Landscape. Rev 1995. Reprinted 2005. WSU Extension – Thurston County. 7. Jacobson, Arthur Lee; Wild Plants of Greater Seattle, 2nd Ed.; 2008. Arthur Jacobson Publishing. 8. Hitchcock, CL; Croquist, Arthur; Flora of the Pacific Northwest. 1973. UW Press. 9. Young, Betty. 2001. Propagation protocol for vegetative production of container *Rubus parviflorus* Nutt. plants (Deepot 40); USDI NPS - Golden Gate National Parks, San Francisco, California. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 12 May 2008). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery. 10. Kruckeberg, Arthur R; Gardening with Native Plants of the Pacific Northwest, 2nd Ed. 2000. University of Washington Press. 11. Hartmann, Hudson T; Kester, Dale E; Davies, Jr., Fred T; Geneve, Robert L; Plant Propagation Principles and Practices, 7th Ed.; 2002. Prentice Hall. Pearson Education Inc.
Other Sources Consulted (but that contained no pertinent information) (full citations):	1. http://depts.washington.edu/propplnt/Plants/thimbleberry.htm; 2. Dirr, MA and Heuser, JR, CW; The Reference Manual of Woody Plant Propagation: From seed to Tissue Culture. 1987. Varsity Press, Athens, GA 3. http://biology.burke.washington.edu/herbarium/ima

	gecollection.php?Genus=Rubus&Species=parviflorus ; 4. Toogood, Alan; Editor in Chief; American Horticulture Society: Plant Propagation; 1999, Dorling Kindersley Ltd.; London; DK Publishing Inc. NY, NY. 5. Link, E; Native Plant Propagation Techniques for National Parks: Interim Guide. 1993. East Lansing, MI: Rose Lake Plant Material Center. 6. USDA Forest Service Range Handbook. 1988; Dover Publishing, NY.
Protocol Author (First and last name):	Pamela Peterson
Date Protocol Created or Updated (MM/DD/YY):	05-12-08 updated; Created 04/07/03 by Scott Olmstead.

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

Plant Data Sheet

Species (common name, Latin name)
Thimbleberry, *Rubus parviflorus*

Range
Alaska to California and into northern Mexico; east to the Great Lakes States. (Rook, 2002)

Climate, elevation
Low elevations in the north, low to sub-alpine elevations in the south. (Pojar and MacKinnon, 1994); up to 2000-2700m (Rose et al., 1998)

Local occurrence (where, how common)
Open sites (clearings, road edges, shorelines, avalanche tracks) or open forest-often red alder (Pojar and MacKinnon, 1994); 2100m in P.N.W. (Rose et al., 1998)

Habitat preferences
Moist to dry, wooded to open sites. Along streamsides and canyons, on borders and roadsides. Abundant on disturbed sites within forest canopy as scattered individuals; although some areas of dense stands. (Rook, 2002)

Plant strategy type/successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)
Persitent succesional species, dominates understory during first several decades after disturbance, especially fire. (Rook, 2002)

Associated species
Populus tremuloides, Linnaea borealis, Ribes oxyacanthoides, Salix spp., Chamerion angustifolium, Lupinus spp., Pteridium aquilinum. (Rook, 2002)

May be collected as: (seed, layered, divisions, etc.)
Seed, vegetatively-cuttings or rhizomes (Rook, 2002)

Collection restrictions or guidelines
Fruit/seed production= spring to summer-especially August- (VegSpec, 2003); collect seed before or as soon as berries are ripe (Rose et al., 1998)

Seed germination (needs dormancy breaking?)
Seeds have hard, impermeable endocarp and dormant embryo-germination is often slow. Exposure to sulfuric acid solutions or sodium hyperchlorite prior to cold stratification increases germination. (Rook, 2002)

Recommended seed storage conditions
Store damp in refrigerator over winter, sow in February-low humidity for longer storage periods. (Rose et al., 1998)

Propagation recommendations (plant seeds, vegetative parts, cuttings, etc.)
Specific germination requirements have not yet been documented. Warm (68-86°) and cold (36-41°F for an additional 90 days) stratification recommended. Vegetatively propagated by stem cuttings or dormant rhizome fragments. (Rook, 2002); hardwood cuttings easily establish (Leigh, 1999).

Soil or medium requirements (inoculum necessary?)
In standard potting mix. (Rose et al., 1998)

Installation form (form, potential for successful outcomes, cost)
6”-18”, 2-gallon. (4th Corners Nurseries, 2003)

Recommended planting density
Per acre=1200 (min.) to 4800(max.) (VegSpec, 2003)

Care requirements after installed (water weekly, water once etc.)
Adequate soil moisture on loam or clay-loam, nitrogen demanding. (Rook, 2002)

Normal rate of growth or spread; lifespan
2-10 ft. (Leigh, 1999)

Sources cited
1) Fourth Corner Nurseries. www.4th-corner-nurseries.com; April 7, 2003

2) Leigh, Michael. Grow Your Own Native Landscape. Native Plant Salvage Project, WSU Cooperative Extension-Thurston County. Revised ed. June 1999.

3) Pojar, Jim and Andy MacKinnon. Plants of the Pacific Northwest Coast-Washington, Oregon, British Columbia and Alaska. B.C. Minisrty of Forest and Lone Pine Publishing. 1994.

4) Rook, Earl. Plants of the North. http://www.rook.org/earl/bwca/nature/flora.html. September 27, 2002.

5) Rose, Robin, Caryn Chachulski, and Diane Haase. Propagation of Pacific Norhtwest Native Plants. Oregon State University Press, Corvallis, OR. 1998.

6) VegSpec. Phil Smith, Project Manager. http://ironwood.itc.nrcs.usda.gov/Netdynamics/Vegspec/pages/HomeVegspec.htm, USDA, Natural Resource Conservation Service. April 7, 2003.

Data compiled by (student name and date)
Scott Olmsted; 040703