Plant Propagation Protocol

http://oregonstate.edu/dept/ldplants/gash3.htm

http://oregonstate.edu/dept/ldplants/gash6.htm

Family Scientific Name:	**Ericaceae**
Family Common Name:	**Heath Family**
Scientific Names	
Genus:	**Gaultheria**
Species:	**shallon**
Species Authority:	**Pursh**
General Information	
Common Name:	Salal
Species Code (as per USDA Plants database):	GASH
Date Entered or Updated: MM/DD/YY	04/11/07
Range:	Pacific Coast inland to west slope of the Cascades from southeast Alaska and central British Columbia south to southern California. (FEIS database)
Climate, elevation	Cool, humid, mesothermal climate. Snow accumulation can limit plant. In California, occurs at elevations below 763 m; in northern British Columbia occurs below 200 m. (FEIS database) Is frost sensitive, so found in mild lowland climates. (Rose et al. 1998)
Ecotype/Habitat Notes	A colonizer. Salal grows as an understory dominant in coastal and montane coniferous forests commonly dominated by Douglas-fir, western hemlock. Cool to warm, moist to dry, sun or shade. (FEIS database)

	Soil and drought tolerant. (Leigh 1999) Best development in moist acidic soils. (Young et al 1992)
Propagation Method:	Vegetative or Seed
Product Type:	Container (plug)
Stock Type:	1 gallon container
Time to Grow:	1 year (cutting), 2-3 years (seed)
Target Specifications:	Container seedling; height ~20-30cm (cutting), 8-13cm (seed)
Propagule Collection:	15cm-long cuttings should be taken from new/current year wood in late summer. (Rose et al. 1998; Potash et al. 1997) Seeds can be collected by mashing fruits, then floation, and filtering through pantyhose. (Potash et al. 1997)
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	Seeds/gram- 7100/gram (Young and Young 1992) Seeds/pound- 4 mill/lb (Potash et al. 1997) Under cool, dry storage, seed maintains viability for moderate periods/couple years (Young and Young 1992; Rose et al. 1998) Seeds have been found to be viable (73% germination rate) after storage for 3 years at 40 degrees F. (Huffman et al)
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	Make two 2.5cm-long scars at base of cutting, then dip in rooting hormone. (Rose et al.1998) Seeds initially dormant and require chilling to 35-40 degrees F for 30-60 days. Also need light for germination. (Young and Young 1992) Seeds do not require stratification, but do require at least 8 hours of light for germination. Some evidence suggests that acid wash treatment might be beneficial as digestion by bears seems to increase germination rates. (FEIS database; Huffman, et al)
Growing Area Preparation / Annual Practices for Perennial Crops:	Sprinkle seeds onto surface of 1:1 peat-perlite flats in fall. (Rose et al.1998)
Establishment Phase:	= 8 hours of light for germination. (Rose et al.1998)
Length of Establishment Phase:	Cuttings should root within 4-7 weeks. Seedlings germinate 3-5 weeks. Keep at 40-50 degrees F during winter, with some bottom heat. (Rose et al. 1998; Potash et al. 1997)
Active Growth Phase:	Transplant seedlings to containers when large enough to handle (~ 1year). Roots are sensitive and fibrous—be careful!
Length of Active Growth Phase:	1-2 years
Hardening Phase:	
Length of Hardening Phase:	

Harvesting, Storage and Shipping:	
Length of Storage:	
Guidelines for Outplanting / Performance on Typical Sites:	In Spring. Must be well established (target height).
Other Comments:	Very slow to establish from seed. Rhizome cutting propagation is also possible.
References:	FEIS database: Accessed on 4/8/03, www.fs.fed.us/database/feis/plants/shrub/gausha Huffman, David W., John C. Zasada, and William I. Stein. Gaultheria, L.: Winterberry. Accessed on 4/8/03 from USDA Woody Plants Seed Manual: http://wpsm.net Leigh, Michael. 1999. Grow Your Own Native Landscape. Native Plant Salvage Project – WSU Extension Thurston County. Potash, Laura L. and Carol A. Aubry. 1997. Mt. Baker – Snoqualmie National Forest Native Plant Notebook: Second Edition. North Cascades Institute: Sedro-Woolley. pp.125-126. Rose, Robin, Caryn E.C. Chachulski and Diane L. Haase. 1998. Propagation of Pacific Northwest Native Plants. Oregon State University Press: Corvallis. pp. 118-119. Young, James A. and Cheryl G. Young. 1992. Seeds of Woody Plants in North America. Dioscorides Press: Portland. pp. 162-163.
Propagator (Author) That Developed This Protocol	Brian Bragg Revised from Anne Andreu, 04/09/03

Appendix: Original Plant Protocol

Plant Data Sheet

Species (common name, Latin name): Salal, *Gaultheria shallon*, Pursh

Range

Pacific Coast inland to west slope of the Cascades and Coast Ranges, from southeast Alaska and central British Columbia south to southern California. (FEIS database)

Climate, elevation

Cool humid, mesothermal climate. Snow accumulation can limit plant.

In California, occurs at elevations below 763 m; in northern British Columbia occurs below 200 m.

(FEIS database)

Local occurrence (where, how common)

Locally, salal grows as an understory dominant in coastal coniferous forests commonly dominated by western hemlock, western redcedar, Port-Orford cedar, Sitka spruce, lodgepole pine, and Alaska cedar. (FEIS database)

Habitat preferences

Warm, moist to dry, montane to lowland conifer forests, sun or shade.

Habitats include:

Coastal shrub communities

Shore pine and spruce woodlands

Western hemlock forest communities (warm, dry)

Coastal Douglas-fir forest communities (dry to wet)

Silver fir forests communities (warm, dry)

(FEIS database)

Plant strategy type/successional stage (stress-tolerator, competitor,

weedy/colonizer, seral, late successional)

Colonizer, aggressively spreads by vegetative reproduction in openings. Persistent in mature communities also. (FEIS database)

Associated species

Common associates are douglas-fir, western hemlock, red alder, salmonberry, swordfern, deerfern, dwarf Oregon grape, pacific dogwood, oceanspray, and rhododendrons in western hemlock forest communities and douglas-fir forests. (FEIS database)

May be collected as: (seed, layered, divisions, etc.)

May be collected as seed, divisions, cuttings, young sprouts or layered. (Huffman, et al)

Collection restrictions or guidelines

Fruit ripens from August through October. Strip or comb seeds from branches. (Huffman, et al)

Seed germination (needs dormancy breaking?)

Begin germinating within 30-45 days after sowing. Seeds do not require stratification, but do require at least 8 hours of light for germination. Some evidence suggests that acid wash treatment might be beneficial as digestion by bears seems to increase germination rates. (FEIS database; Huffman, et al)

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

Seed are viable for moderate periods in storage; seeds have been found to be viable (73% germination rate) after storage for 3 years at 40 degrees F (4 C). (Huffman, et al)

Recommended seed storage conditions

Store in cool, dry conditions (some success at 40 degrees F (4 C). (Huffman, et al)

Propagation recommendations (plant seeds, vegetative parts, cuttings, etc.)

Separate seeds after drying collected fruits. Seeds can be sown in the fall without stratification in outdoor nursery beds under shadecloth. In the Northwest, salal is primarily propagated by rhizome cuttings.

(Huffman, et al)

Soil or medium requirements (inoculum necessary?)

Prefers rich, acidic, moist soils, but will grow in shallow rocky soils, sandy soils, glacial till, and peat.

(Huffman, et al)

Installation form (form, potential for successful outcomes, cost)

Seedling survival under natural conditions is limited, therefore, growing from seed and planting containerized material is recommended. Layering and planting established divisions, sprouts, or cuttings are other options.

(Huffman, et al)

Recommended planting density

2’ to 3’ centers depending on final cover desired.

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

Regular watering in summer months until established. (FEIS database)

Normal rate of growth or spread; lifespan

Slow early growth; 3 years to reach 3-5 inches (5-10 cm). Seedlings begin to spread vegetatively by age 4-6. Rhizome expansion rates of 44 cm (17 in) per year have been reported for salal. (Huffman, et al)

Sources cited

FEIS database: Accessed on 4/8/03, www.fs.fed.us/database/feis/plants/shrub/gausha

Huffman, David W., John C. Zasada, and William I. Stein. Gaultheria, L.: Winterberry. Accessed on 4/8/03 from USDA Woody Plants Seed Manual: http://wpsm.net

Data compiled by (student name and date): Anne Andreu, 4/9/03