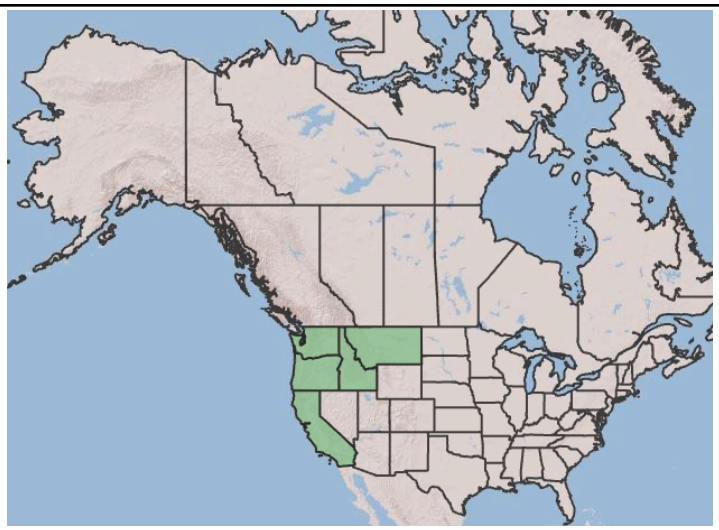
Plant Propagation Protocol for *Campanula scabrella*

ESRM 412 – Native Plant Production

URL: https://courses.washington.edu/esrm412/protocols/2024/CASC6.pdf

	
Figure 1: © 2020 Richard Ramsden | Burke Herbarium Image Collection[6]	Figure 2: ©2014 Neal Kramer | CalPhotos[7]

TAXONOMY	
Plant Family	
Scientific Name	Campanulaceae[3]
Common Name	Bellflower or Harebells family
Species Scientific Name	
Scientific Name	*Campanula scabrella* Engelm.[3, 5]
Varieties	none
Sub-species	none
Cultivar	none
Common Synonym(s)	none
Common Name(s)	Rough bellflower, rough harebell
Species Code (as per USDA Plants database)	CASC6[3]
GENERAL INFORMATION	
Geographical range	Distribution Map for North America[3]

	 Distribution Map for Washington and Oregon[3] 
Ecological distribution	Alpine boulder and open rocky areas (serpentinite, volcanic)[2, 6]
Climate and elevation range	Subalpine at 2285 - 2800m[2]
Local habitat and abundance	Mid-latitude montane and alpine habitats such as unprotected, full sun, rocky slopes in the Cascades.[9] Found in screes and between rocks at dry, exposed, subalpine levels. Other species commonly found with *C. scabrella* include other members of the Campanulaceae family

	such as *C. rotundifolia* and *C. scouleri,* and other subalpine wildflowers.[9]
Plant strategy type / successional stage	*C. scabrella* is capable of tolerating subalpine conditions and associated stresses and is generally hardy.
Plant Characteristics	Perennial rhizomatous herb is typically found with long taproot.[2, 11] Key Identifiers[6, 9]: - Branched with several stems emerging from a cluster of basal, entire leaves (0.5-4 cm) - Stems pubescent with stiff hairs - Solitary, terminal, bell-shaped flowers with purple-blue petals, 5 stamens, and inferior ovary Blooms June - September[2, 6]
PROPAGATION DETAILS: FROM SEED	
Ecotype	N/A
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	Container seedling
Time to Grow	14 weeks[10]
Target Specifications	Established root system
Propagule Collection Instructions	After flowering and fruiting, remove the seed capsules by hand and place them in a seed envelope to dry; alternatively, open the capsules and turn them upside down to allow the seeds to fall into the envelope.[8]
Propagule Processing/Propagule Characteristics	Seeds of similar species *C. rotundifolia* are ~0.03 to 0.06 g/1,000 seeds.[1] Each fruit may yield 54 - 108 seeds.[1]
Pre-Planting Propagule Treatments	Scalping is sometimes necessary to separate chaff from seeds. This can be done using a shaker screen and/or a fan. Recommended screen size is 1/25 inch round top screen and 45 x 45 mesh bottom screen.[1] Cleaned seeds can be stored in plastic bags and then refrigerated and kept moist at 1 to 3 °C for 90 days to fulfill cold-moist stratification requirements.[10]
Growing Area Preparation / Annual Practices for Perennial Crops	Because the seeds are very fine, they may first be sown on trays containing stabilized medium plugs (Q-plugs).[10] Recommended growing media once moved to the growth container plug is a 40:20:20:20 peat:composted fir bark:perlite:pumice blend.[10] Other

	options include loamy soil with high drainage capacity and sand content to simulate rocky alpine soils.[11] Using fertilizer is not recommended as propagules may exhibit unnatural growth habits.[8, 11]
Establishment Phase Details	Seeds will typically need light to germinate so care should be taken to ensure that they are not completely covered with grit.[8] Germination is fairly uniform.
Length of Establishment Phase	2 weeks[10]
Active Growth Phase	Plants are fast-growing and will need sufficient daylight periods and plenty of moisture, especially during high temperatures.[11] Circulating fresh air will be necessary in order to reduce the risk of powder mildew accumulation.[8]
Length of Active Growth Phase	12 weeks[10]
Hardening Phase	*C. scabrella* is acclimated to subalpine habitats, so dormancy should be induced by moving propagules outdoors in early autumn (if grown in a greenhouse environment).[10]
Length of Hardening Phase	2 weeks
Harvesting, Storage and Shipping	Harvesting can be done in October following the hardening phase.[1, 10]
Length of Storage	Seedlings are typically not stored for long periods of time due to them usually being outplanted in the fall.
Guidelines for Outplanting / Performance on Typical Sites	No information found
Other Comments	A similar species, *Campanula scouleri* Hook. ex A. DC. (pale bellflower), grows in similar habitats but at lower elevations.[4] Some of the above information has been adapted from a protocol written for this similar species.[10]
PROPAGATION DETAILS: VEGETATIVE	
Ecotype	N/A
Propagation Goal	Plants (Clonal Propagules)
Propagation Method	Vegetative
Product Type	Propagules - Cuttings - Divisions
Stock Type	N/A
Time to Grow	Weeks to years[8]
Target Specifications	Rooted propagules

Propagule Collection Instructions	If producing propagules via the cuttings method, cut rooted pieces from the outside edge of the plant from spring to early autumn.[8] Short stolons may also be treated as cuttings but will require a couple of years in their own containers to successfully root and enter the active growth phase.[8] If producing propagules via the division method, dig up the root clump and divide it into multiple pieces, and repot into individual containers in early spring.[8]
Propagule Processing/Propagule Characteristics	N/A
Pre-Planting Propagule Treatments	N/A
Growing Area Preparation / Annual Practices for Perennial Crops	Recommended growing media is a loamy soil with high drainage capacity and sand content to simulate gritty alpine soils.[11] Using fertilizer is not recommended as propagules may exhibit unnatural growth habits.[8, 11]
Establishment Phase Details	Once pieces are potted, place them in a closed frame or closed greenhouse environment for the first few weeks following planting.[8] If the cuttings method was used and the collection of pieces without roots occurred in spring, the pieces may start rooting within a few weeks.[8]
Length of Establishment Phase	Five to six weeks[8]
Active Growth Phase	Repotting may be required if vegetative propagation is used and plants are encouraged to resume growth in the following growing season.[8]
Length of Active Growth Phase	N/A
Hardening Phase	Vegetative propagules are typically grown outdoors in pots so dormancy will naturally be induced starting in early fall.[8, 10, 11]
Length of Hardening Phase	0-2 weeks depending on growing environment (indoor versus outdoor).
Harvesting, Storage and Shipping	No information found
Length of Storage	No information found
Guidelines for Outplanting / Performance on Typical Sites	No information found
Other Comments	Most of the information available regarding vegetative propagation for the Campanulaceae family is intended for home gardeners and does not have the desired details for nursery propagation.
INFORMATION SOURCES	
References	See attached appendix

Other Sources Consulted	Morin, Nancy. "Campanula Scabrella." *Ucjeps.berkeley.edu*, The Jepson Herbarium, 2012, ucjeps.berkeley.edu/eflora/eflora_display.php?name=Campanula+scabrella. Accessed 21 May 2024. Serkanic, Steven, and Aaron Sims. "Plant Species Evaluation Form: Campanula Scabrella Engelm." 26 Sept. 2018.
Protocol Author	Nova Moss Ravenscroft
Date Protocol Created or Updated	5/22/24

Appendix - References

[1]"Campanula Rotundifolia L." University of Alberta, era.library.ualberta.ca/items/c31c008f-1633-43be-bf19-6452cca21ad1/view/1db5c323-1bbb-483d-8436-c7c50c18795e/Campanula-20rotundifolia.pdf. Accessed 22 May 2024.

[2]"Campanula Scabrella." *Rareplants.cnps.org*, CNPS Rare Plant Inventory, rareplants.cnps.org:443/Plants/Details?taxon=Campanula+scabrella. Accessed 21 May 2024.

[3]"Campanula Scabrella Engelm." *Plants.usda.gov*, USDA NRCS, plants.usda.gov/home/plantProfile?symbol=CASC6. Accessed 21 May 2024.

[4]"Campanula Scouleri Hook. Ex A. DC." *Plants.usda.gov*, USDA NRCS, plants.usda.gov/home/plantProfile?symbol=CASC7. Accessed 21 May 2024.

[5]"ITIS - Report: Campanula Scabrella." *Itis.gov*, 2023, www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=34498#null. Accessed 21 May 2024.

[6]Knoke, Don, and David Giblin. “Campanula Scabrella - Burke Herbarium Image Collection.” *Burkeherbarium.org*, 2020, burkeherbarium.org/imagecollection/taxon.php?Taxon=Campanula%20scabrella. Accessed 21 May 2024.

[7]Kramer, Neal. “CalPhotos: Campanula Scabrella; Rough Harebell.” *Calphotos.berkeley.edu*, 2014, calphotos.berkeley.edu/cgi/img_query?enlarge=0000+0000+1214+2618. Accessed 21 May 2024.

[8]Nicholls, Graham. *Alpine Plants of North America*. Timber Press, 2002.

[9]Pojar, Jim, et al. *Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia & Alaska*. 1994. Edited by Andy MacKinnon, Revised ed., Vancouver, B.C., Lone Pine Publishing, 2014, pp. 194–195.

[10]Riley, Lee. “Protocol Information - Campanula (Scouleri).” *Npn.rngr.net*, Native Plant Network — Reforestation, Nurseries and Genetics Resources, 2018, npn.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=campanulaceae-campanula. Accessed 21 May 2024.

[11]Schenk, George. *How to Plan, Establish, and Maintain Rock Gardens*. 1964. Sunset.