


Plant Propagation Protocol for [*Asyneuma prenanthoides*]
 ESRM 412 – Native Plant Production

TAXONOMY	
Plant Family	
Scientific Name	Campanulaceae
Common Name	Bellflower family
Species Scientific Name	
Scientific Name	<i>Asyneuma prenanthoides</i> (Durand) McVaugh
Varieties	
Sub-species	
Cultivar	
Common Synonym(s)	<i>Campanula prenanthoides</i> <i>Smithiastrum prenanthoides</i>
Common Name(s)	California harebell
Species Code (as per USDA Plants database)	ASPR10
GENERAL INFORMATION	

Geographical range	<p>Found in Southwest Oregon and Northwest California¹, with additional populations found in areas around the Californian Central Valley²</p>  <p><i>North America distribution¹</i></p>
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	 <p><i>Pacific Northwest distribution¹</i></p>
Ecological distribution	Redwood forests and other conifer-dominated habitats ³
Climate and elevation range	Coastal oceanic and maritime Mediterranean climate, with moderate rainfall in the winter ⁴ . Elevation from 5 – 2000 meters ⁵
Local habitat and abundance	Locally uncommon, although found mostly in communities of Redwood, Yellow Pine, Red Fir, and Mixed Evergreen forests ⁶ , indicating increased abundance in coniferous forests ⁷ . Found in damp soils in well shaded areas ⁸
Plant strategy type / successional stage	More of a stress-tolerator, and a late successional strategy indicated by its most common habitat of late seral stage forests.
Plant characteristics	Herbaceous perennial forb with ovate, toothed leaves. Has nodding blue-purple flowers in the early summer followed by ribbed seed capsules ⁹ , blue corollas ¹⁰ .
PROPAGATION DETAILS: FROM SEED	
Ecotype	Seeds harvested from naturally occurring populations in shaded and moist Redwood forests in Southwest Oregon and Northwest California with minimal recent disturbance.
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	Container-grown seedling plug, greenhouse-grown
Time to Grow	12 to 18 months
Target Specifications	10 to 15 cm tall
Propagule Collection Instructions	Collect seeds when they are fully mature, when they begin to dry but before they split. Cut the stems that have bulbs and collect the seeds from the capsules
Propagule Processing/Propagule Characteristics	Seed density is unknown and would have to be measured, and seed longevity is also unknown but similar species would indicate fairly high reliability within 1-2 years
Pre-Planting Propagule Treatments	Seeds should be cleaned of any other plant debris by gently sifted through a screen before being stored in a cool, dry, dark environment. Before germination, cold stratification by keeping the

	seeds at 5-10°C to mimic winter conditions of its natural environment is needed.
Growing Area Preparation / Annual Practices for Perennial Crops	Media of 70% potting soil, 15% perlite, and 15% coconut fiber to maintain good drainage while retaining high levels of moisture. Media should be slightly acidic at a pH of 6.5-7. Plug containers with 5 cm diameter and large drainage holes should be used to avoid waterlogged soil. Indirect sunlight should be used to mimic lower sunlight levels of natural environment and a temperature of around 18°C.
Establishment Phase Details	Seeds should be sown in early spring after the cold stratification into loose media in a greenhouse maintaining indirect sunlight and a temperature of 18°C. Soil should be kept moist with a cover used to retain high moisture levels.
Length of Establishment Phase	Potentially 2 weeks to 1 month
Active Growth Phase	Full sun to partial shade for sunlight should be set in the greenhouse, and an increase in temperature to around 20-22°C, continuing to maintain constantly damp soil. Humidity can be reduced, and good airflow should be promoted. A 10:10:10 NPK fertilizer could also be added to mimic high nutrient balance of natural environment, and plants should be managed for pests and weeds. Reduce amount of water to mimic reducing precipitation towards the summer.
Length of Active Growth Phase	Potentially 2-5 months
Hardening Phase	Incrementally decrease temperature to around 5-10°C, and change light amounts to indirect, and lower amounts of sunlight. Stop any fertilization of the media and reduce watering frequency. If possible introduce exposure to small amounts of wind and continue removing pests and weeds.
Length of Hardening Phase	Potentially around 1 month
Harvesting, Storage and Shipping	Loosen soil around the root plug and remove from the container without disturbing the roots. Store in cool humid environment and keep the roots moist. For shipping make sure the environment for the plants is cool and sufficiently moist.
Length of Storage	Potentially around 2 weeks
Guidelines for Outplanting / Performance on Typical Sites	Planting should be done in the early spring if possible in shaded areas. Survival should be fairly high and growth should continue in natural conditions. Flowering would likely happen in 2-3 months in the early summer if outplanted into a sufficiently shady, moist area.
Other Comments	Some aspects of this protocol are based on collective information of many other bellflower species where information on this specific species could not be found.

INFORMATION SOURCES	
References	See below
Other Sources Consulted	<p><i>Plant database entry for Bellflower (Smithiastrum prenanthoides) with 21 data details.</i> (2025). Garden.org. https://garden.org/plants/view/153048/Bellflower-Smithiastrum-prenanthoides/</p> <p><i>Propagation Protocols — Reforestation, Nurseries and Genetics Resources.</i> (n.d.). Npn.rngr.net. https://npn.rngr.net/propagation/protocols</p> <p>Burke, H. (2022). <i>Burke Herbarium Image Collection.</i> Burkeherbarium.org. https://www.burkeherbarium.org/</p> <p><i>Retiring the Museum Informatics and Interactive University projects / Research IT.</i> (2015). Berkeley.edu. https://research-it.berkeley.edu/news/retiring-museum-informatics-and-interactive-university-projects</p>
Protocol Author	Jack McKenzie
Date Protocol Created or Updated	5/7/2025

¹ Burke, H. (2021). *CPNWH Search Results.* Pnwherberaria.org. <https://www.pnwherberaria.org/data/results.php>

² *USDA Plants Database.* (2025). Usda.gov. <https://plants.usda.gov/plant-profile/ASPR10>

³ The American Southwest. (2025). *Southwest USA Wildflowers: California Harebell, Smithiastrum Prenanthoides.* Americansouthwest.net. <https://www.americansouthwest.net/plants/wildflowers/asyneuma-prenanthoides.html>

⁴ *Western Regional Climate Center.* (n.d.). Wrcc.dri.edu. https://wrcc.dri.edu/Climate/narrative_or.php

⁵ *Smithiastrum prenanthoides.* (2020). Berkeley.edu. https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=84760

⁶ Calscape. (2025). *California Harebell.* Calscape.org. [https://calscape.org/Asyneuma-prenanthoides-\(California-Harebell\)](https://calscape.org/Asyneuma-prenanthoides-(California-Harebell))

⁷ *Asyneuma prenanthoides Calflora.* (2015). Calflora.org. <https://www.calflora.org/app/taxon?crn=10784>

⁸ *Lady Bird Johnson Wildflower Center - The University of Texas at Austin.* (2018). Wildflower.org.
https://www.wildflower.org/plants/result.php?id_plant=ASPR10

⁹ Morin, N. (2020). *Taxonomic changes in North American Campanuloideae (Campanulaceae).*
<https://www.phytoneuron.net/2020Phytoneuron/49PhytoN-Campanuloideae.pdf>

¹⁰ *OregonFlora - Occurrence Profile.* (2023). Oregonflora.org.
<https://oregonflora.org/collections/individual/index.php?occid=4519187>