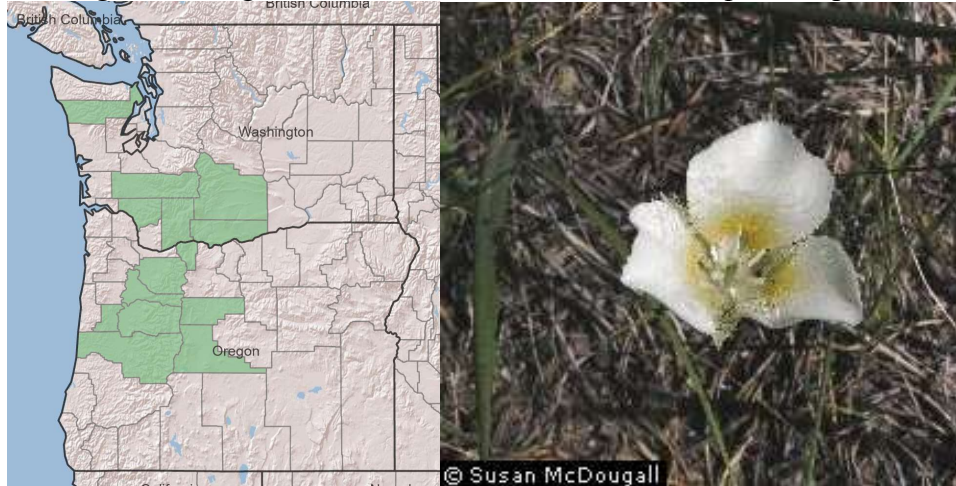


Plant Propagation Protocol for *Calochortus subalpinus*

ESRM 412 – Native Plant Production

URL: <https://courses.washington.edu/esrm412/protocols/2022/CASU2>

Washington & Oregon distribution *Calochortus subalpinus* Piper



Source: USDA Plant Database¹⁰

TAXONOMY

Plant Family	
Scientific Name	Liliaceae ¹⁰
Common Name	Lily family ¹⁰
Species Scientific Name	
Scientific Name	<i>Calochortus subalpinus</i> Piper ¹⁰
Varieties	None found
Sub-species	None found
Cultivar	None found
Common Synonym(s)	<i>Calochortus lobbii</i> sensu Purdy ¹⁰
Common Name(s)	subalpine mariposa-lily ¹⁰ mountain mariposa ⁴ Lobb's cat's ear ⁶
Species Code (as per USDA Plants database)	CASU2 ¹⁰

GENERAL INFORMATION

Geographical range	In the Cascade Mountains of south-central Washington and north-west Oregon. ^{2,3,4,6,9,10} See maps above ¹⁰
Ecological distribution	Found in very dry loamy soils, forest duff, even pumice ^{3,7} Open forests in loose volcanic soils ^{1,4}

Climate and elevation range	Found at elevations of 1000-2500m ³ Temperate Mediterranean receiving as much as 200cm (80") of precipitation per year ⁶
Local habitat and abundance	Found in mountain meadows on the windward side of the Cascades in Oregon, more on the leeward side of the Cascades in Washington where it's more wet ^{3,6} Can be found in open meadows and pine woodlands of the Cascades ⁶ Found in a number of habitats including dry meadows, alpine meadows, coniferous woodlands, open screes ³
Plant strategy type / successional stage	Perennial flowering forb/herb with deep-seated bulb ^{4,10} Long establishing alpine flower
Plant characteristics	Erect to flexuous, glaucous stem with 1-7 upright 1.5-3cm open, bell-shaped flowers with 3 cream-white pubescent petals and 3 shorter green to white sepals between each petal. ³ Upward facing flowers with petals completely covered in silky hairs and colors ranging from cream to pale yellow or buff. ²
PROPAGATION DETAILS Most information offered is for the general <i>Calochortus spp.</i>	
Ecotype	Not found
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Seed, seedlings (meant to be outplanted into their permanent position) ⁷
Stock Type	Pots, Field grown, small containers
Time to Grow	5-7 years ⁷
Target Specifications	Not found
Propagule Collection Instructions	Flowers from June – August ⁴ but can stay in flower until September ⁷ Collect seed capsules in early fall
Propagule Processing/Propagule Characteristics	Seeds viable for 5-6 years; viability may be extended if stored in refrigerator ⁸
Pre-Planting Propagule Treatments	Cold stratify the seeds in small containers of UC Davis mix for three months at near freezing for 3 months ⁶ (offered specifically for <i>C. subalpinus</i>) Providing an atmosphere which hovers around 32 °F (0°C) during moist stratification of seeds for 3 months will achieve good results. Place the entire pot in a refrigerator, keeping it covered with ice as it slowly melts; or the seeds can be mixed with moistened vermiculite or peat in a Ziploc bag, squeezing out the excess moisture to avoid

	<p>mold and mildew. Place bag into vegetable crisper of the refrigerator for four to six weeks. Fungicide can be added (e.g., Physan) be sure to add a small amount of additional water during cold-stratification period so the peat doesn't dry out.^{3,5} (more general for cold climate <i>Calochortus spp</i>).</p>
<p>Growing Area Preparation / Annual Practices for Perennial Crops</p>	<p>UC Davis Mix: ½ part sand, ½ part peat moss UC Davis Soilless Mix: 1 part vermiculite, 1 part perlite, 1 part sphagnum moss³</p> <p>A mixture of sand and loam with a lot of red serpentine soil (metamorphic rock common in coastal ranges of Oregon and California, high in magnesium and other metals) added.⁷</p> <p>Grown in pots^{3, 5, 7, 8}, but <i>Calochortuses</i> do not like pots, transplant them outside in a nursery bed after 2nd season when they go dormant⁷</p>
<p>Establishment Phase Details</p>	<p>After germinating (in small containers of UC Davis mix), seedlings should be drowned at least once a week (simulate spring snowmelt), then placed in at least partial shade at low altitudes or considerable sun at high altitudes.⁶</p> <p>After stratification, remove the seeds from the peat and throw out the peat, washing the seeds with fungicide water mix, diluted as per manufacturer's instructions. Next, plant the seeds in soilless planting mix in a 0.6-1.3cm depression at least 1.3-2.5cm apart in the potting mix, made with your finger or a small stick, then cover the depression. Keep the potting mix evenly wet but not sopping wet.³</p>
<p>Length of Establishment Phase</p>	<p>3 months of cold stratifying^{3,6} "Several weeks" from seeding³</p>
<p>Active Growth Phase</p>	<p>After several weeks, seedlings will be large enough to transplant into larger pots, medium should contain some sand so that it drains well.³</p>
<p>Length of Active Growth Phase</p>	<p>May take 3-5 years before blooming plants are obtained from seeds³</p>
<p>Hardening Phase</p>	<p>None specified</p>
<p>Length of Hardening Phase</p>	<p>None specified</p>
<p>Harvesting, Storage and Shipping</p>	<p>None specified</p>
<p>Length of Storage</p>	<p>None specified</p>
<p>Guidelines for Outplanting / Performance on Typical Sites</p>	<p>Outplant/transplant after they go dormant (around mid-summer to late winter)⁵ to permanent positions. Fully mature plants do not require any shade⁷</p> <p>Water until the flower buds begin to show color, then let plants dry out completely.⁷</p>

Other Comments	All <i>Calochortus</i> bulbs divide slowly over time, and certain spp. Produce bulbils or small bulblets; vegetative propagation may be possible but has not been tested with <i>C. subalpinus</i> . ⁵
INFORMATION SOURCES	
References	<p>¹<i>Calochortus lobbii</i>. Alpine Garden Society. (n.d.). Retrieved May 23, 2022, from http://encyclopaedia.alpinegardensociety.net/plants/Calochortus/lobbii</p> <p>²Chapman, D. (2004, November 10). <i>Calochortus High Elevation Species</i>. Pacific Bulb Society. Retrieved May 24, 2022, from https://www.pacificbulbsociety.org/pbslist/2004-November/odij8qtavq27nuh5lngp2c9c4.html</p> <p>³Gerritsen, M. E., & Parsons, R. (2007). <i>Calochortus: Mariposa Lilies & Their relatives</i>. Timber Press.</p> <p>⁴Giblin, D. (n.d.). <i>Calochortus subalpinus</i>. Burke Herbarium Image Collection. Retrieved May 21, 2022, from http://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Calochortus+subalpinus</p> <p>⁵Ittner, M. S., Mace, M., & Piling, D. (2019, May 17). <i>How to grow calochortus</i>. How To Grow Calochortus. Retrieved May 24, 2022, from https://www.pacificbulbsociety.org/pbswiki/index.php/HowToGrowCalochortus</p> <p>⁶Mcdonald, H. P., & Stokkink, K. (Eds.). (1997, January). The Calochortus Society newsletter. Retrieved May 24, 2022, from https://www.pacificbulbsociety.org/pbswiki/files/Mariposa/Mariposa_vol_8-3.pdf.</p> <p>⁷McGary, M. J. (1996). Calochortus: Why Not Try Them? In <i>Rock Garden Plants of North America: An anthology from the bulletin of the north american rock garden society</i> (pp. 46–48). essay, Timber Press in association with the North American Rock Garden Society.</p> <p>⁸Pilling, D., & Ittner, M. S. (2021, July 29). <i>Calochortus</i>. Calochortus . Retrieved May 24, 2022, from https://www.pacificbulbsociety.org/pbswiki/index.php/Calochortus</p>

	<p>⁹Piper, C. V. (1906). Notes on Calochortus. <i>Bulletin of the Torrey Botanical Club</i>, 33(10), 538–539. https://doi.org/10.2307/2479395</p> <p>¹⁰USDA. (n.d.). <i>Calochortus subalpinus</i> Piper. USDA plants database. Retrieved May 21, 2022, from https://plants.usda.gov/home/plantProfile?symbol=CASU2</p>
Other Sources Consulted	
Protocol Author	Stephen Hao
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