

## Plant Propagation Protocol for *Calochortus greenei*

ESRM 412 – Native Plant Production

URL: <https://courses.washington.edu/esrm412/protocols/2021/CAGR.pdf>



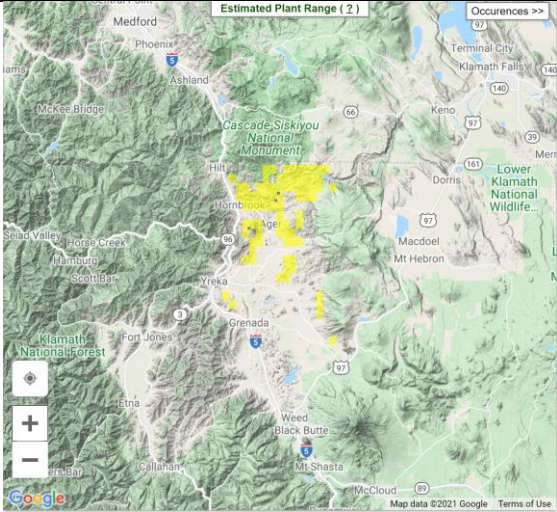
(USDA, 2021)

<b>TAXONOMY</b>	
<b>Plant Family</b>	
Scientific Name	Liliaceae
Common Name	Lily
<b>Species Scientific Name</b>	
Scientific Name	<i>Calochortus greenei</i> S. Watson
Varieties	No varieties recognized.
Sub-species	No sub-species recognized.
Cultivar	No information found.
Common Synonym(s)	No common synonyms.
Common Name(s)	Greene's mariposa lily

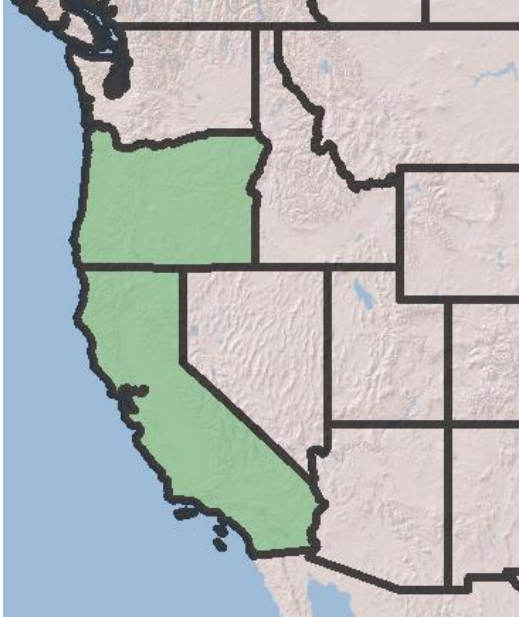
Species Code (as per USDA Plants database)	CAGR (USDA, 2021)
--	-------------------

**GENERAL INFORMATION**

Geographical range



(California Native Plant Society, 2021)



(USDA, 2021)

Ecological distribution	Open woodlands, shrubby hillsides, dry slopes/soils (Fiedler, P.L. & Zebell, R.K., 2021)
Climate and elevation range	Prefers an annual precipitation level of 39.1-58.2cm, sun and partial shade, 700-1100m (KSWild, 2021)
Local habitat and abundance	Upper montane coniferous forests, pinyon and juniper woodlands, cismontane woodlands. Found within Oregon and California (Rare Plants, 2021). Commonly associates with native grasses <i>Festuca roemerii</i> and <i>Achnatherum lemmonii</i> , as well as trees <i>Quercus garryana</i> and <i>Juniperus occidentalis</i> (Frost, 2009).

Plant strategy type / successional stage	Stress tolerant, flowers June-August (Rare Plants, 2021).
Plant characteristics	Perennial herb, 20 cm long basal leaf, 30cm long branching stem, 1-5 bell-shaped flowers, each flower has 3 sepals and 3 lavender petals, petals are 3-4cm long with long hairs, fruit is winged capsule 2cm in length (California Native Plant Society, 2021).
<b>PROPAGATION DETAILS</b>	
Ecotype	No information found.
Propagation Goal	Bulbs (General information for <i>Calochortus</i> ) (RNGR, 2006).
Propagation Method	Seed (General information for <i>Calochortus</i> ) (RNGR, 2006).
Product Type	Container (plug) (Pacific Bulb Society 2019).
Stock Type	Potted nursery stock (General information for <i>Calochortus</i> ) (RNGR, 2006).
Time to Grow	Seedlings should grow for 2 years, be re-potted, then grow for 2 more years (Ravenscroft, 2021).
Target Specifications	First year bulb, ranging 3-8mm diameter (General information for <i>Calochortus</i> ) (RNGR, 2006).
Propagule Collection Instructions	Collect seeds when capsule is completely dry and open, around mid July-mid August. Store in paper bags until cleaned (General information for <i>Calochortus</i> ) (Skinner, 2007).
Propagule Processing/Propagule Characteristics	Seeds last 5-6 years, longevity can be extended if kept in refrigerator (General information for <i>Calochortus</i> ) (Pacific Bulb Society, 2020).
Pre-Planting Propagule Treatments	Crush seed capsules with hands to release seeds, remove detritus with screen. Use air column separator to clean further (Skinner, 2007). Plants should go dormant by June or early July (RNGR, 2006). Dormancy is shown by browning and withering of first-year leaf (Pacific Bulb Society, 2019). (All general information for <i>Calochortus</i> ).
Growing Area Preparation / Annual Practices for Perennial Crops	Prefers ½ sand ½ pilled peat moss media. Water once a week at ¼” planting depth. Needs cold, moist stratification. Seeds can be transferred into 1-gallon pots (General information for <i>Calochortus</i> ) (Skinner, 2007).
Establishment Phase Details	Important to control weeds nearby while in seedling phase (Skinner, 2007). Sow seeds thinly in a box that drains well, watch for crowding as that reduces success. Seeds typically germinate in less than 6 weeks. Sow seeds in spring if in temperate climates (Pacific Bulb Society, 2020). If growing outdoors, sow seeds in autumn. If growing indoors, sow seeds either in late summer or early spring (Ravenscroft, 2021) (All general information for <i>Calochortus</i> ).
Length of Establishment Phase	3-4 weeks (General information for <i>Calochortus</i> ) (RNGR, 2006).

Active Growth Phase	Active growth can be extended by watering after the last of the spring rains. Keep seeds watered and actively pull nearby weeds (Skinner, 2007). Provide seeds with low nitrogen, high phosphorous fertilizer (Pacific Bulb Society, 2020). (Both sources are general information for <i>Calochortus</i> ).
Length of Active Growth Phase	3-4 years (General information for <i>Calochortus</i> ) (Skinner, 2007).
Hardening Phase	No information available.
Length of Hardening Phase	No information available.
Harvesting, Storage and Shipping	Dormancy occurs following the spring and summer seasons and then the plant dies. Place dormant individuals in dry storage at 60-70 degrees Fahrenheit (General information for <i>Calochortus</i> ) (RNGR, 2006).
Length of Storage	3-5 months (General information for <i>Calochortus</i> ) (RNGR, 2006).
Guidelines for Outplanting / Performance on Typical Sites	Make sure the plants have good drainage systems and are located in sunny/partially shaded areas. They prefer sandy, acidic soil and should flower about 6 years after initial seed sowing (General information for <i>Calochortus</i> ) (Ravenscroft, 2021). Stems will grow to 10-40cm (Information specific to <i>Calochortus greenei</i> ) (Jepson Herbarium, 2012).
Other Comments	<i>Calochortus greenei</i> has very little information available. USDA has no propagation information available for this species as well. Most of the above information is general to the <i>Calochortus</i> genus and not specific to <i>Calochortus greenei</i> . If that is the case, it is noted as “(General information for <i>Calochortus</i> )”.
<b>INFORMATION SOURCES</b>	
References	<p>California Native Plant Society. (2021). <i>Greene's Mariposa Lily, Calochortus greenei</i>. California Native Plant Society. <a href="https://calscape.org/loc-california/Calochortus%20greenei().">https://calscape.org/loc-california/Calochortus%20greenei()</a>.</p> <p>California Native Plant Society, Rare Plant Program (RarePlants). (2021). <i>Calochortus greenei</i>. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). <a href="http://www.rareplants.cnps.org">http://www.rareplants.cnps.org</a></p> <p>Fiedler, P.L. &amp; Zebell, R.K. (2021). <i>Calochortus greenei</i>. Flora of North America. <a href="http://beta.floranorthamerica.org/Special:Browse/:Calochortus-20greenei">http://beta.floranorthamerica.org/Special:Browse/:Calochortus-20greenei</a></p> <p>Frost. (2009). <i>Habitat and Landscape Distribution of Calochortus greenei</i> S. Watson (Liliaceae) Across the Cascade-Siskiyou National Monument, Southwest Oregon. Researchgate. <a href="https://www.researchgate.net/publication/265868249_Habitat_and_Lands">researchgate.net/publication/265868249_Habitat_and_Lands</a></p>

cape\_Distribution\_of\_Calochortus\_greenei\_S\_Watson\_Lilia  
ceae\_Across\_the\_Cascade-  
Siskiyou\_National\_Monument\_Southwest\_Oregon

Jepson Herbarium. (2012). *Calochortus greenei*: Greene's  
*mariposa lily*. University of California, Berkeley.  
[https://ucjeps.berkeley.edu/eflora/eflora\\_display.php?tid=16729](https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=16729)

Klamath-Siskiyou Wildlands Center (KSWild). (2021). *Greene's  
mariposa lily*. KS Wild. <https://www.kswild.org/imperiled-species-profiles/2017/6/12/greenes-mariposa-lily>

Pacific Bulb Society. (2019). *How to Grow Calochortus*. Pacific  
Bulb Society.  
<https://www.pacificbulbsociety.org/pbswiki/index.php/HowToGrowCalochortus>

Pacific Bulb Society. (2020). *Calochortus*. Pacific Bulb Society.  
[https://www.pacificbulbsociety.org/pbswiki/index.php/Calochortus#:~:text=Seeds%20of%20Calochortus%20can%20last,the%20refrigerator%20\(Michael%20Mace\).](https://www.pacificbulbsociety.org/pbswiki/index.php/Calochortus#:~:text=Seeds%20of%20Calochortus%20can%20last,the%20refrigerator%20(Michael%20Mace).)

Ravenscroft. (2021). *How to Grow Calochortus Plants in your  
Garden*. Gardener's HQ.  
<https://www.gardenershq.com/Calochortus-Mariposa-Lily.php#:~:text=Bulbs%3A%203%20to%204%20inches,or%20the%20start%20of%20spring.>

Reforestation, Nurseries, & Genetic Resources (RNGR). (2006).  
*Liliaceae: Calochortus*. RNGR.  
<https://rngr.net/npn/propagation/protocols/liliaceae-calochortus-3098>

Skinner. (2007). *Propagation protocol for production of  
Calochortus nitidus Dougl seeds (field grown)*. Pullman  
Plant Materials Center. In: Native Plant Network.  
[https://www.nrcs.usda.gov/Internet/FSE\\_PLANTMATERIALS/publications/wapmcot7114.pdf](https://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/wapmcot7114.pdf)

United States Department of Agriculture (USDA). (2021).  
*Calochortus greenei* S. Watson: *Greene's mariposa lily*.  
USDA. <https://plants.usda.gov/core/profile?symbol=CAGR>

Other Sources Consulted	<p>Blanke, T. &amp; Woodruff, H. (2011). <i>Propagation protocol for production of Calochortus nuttallii plants</i>. Upper Colorado Environmental Plant Center. In: Native Plant Network.  <a href="http://www.nativeplantnetwork.org">http://www.nativeplantnetwork.org</a></p> <p>Calochortus Society. (2001). <i>Mariposa: the newsletter of the Calochortus Society Vol. XIII, No. 1</i>. Pacific Bulb Society.  <a href="https://www.pacificbulbsociety.org/pbswiki/files/Mariposa/MP.php?v=13&amp;i=1">https://www.pacificbulbsociety.org/pbswiki/files/Mariposa/MP.php?v=13&amp;i=1</a></p> <p>Lady Bird Johnson Wildflower Center. (2008). <i>Calochortus greenii</i>. The University of Texas at Austin.  <a href="http://wildflower.org/plants/result.php?id_plant=CAGR">http://wildflower.org/plants/result.php?id_plant=CAGR</a></p>
Protocol Author	Claire Johnson
Date Protocol Created or Updated	05/03/21