

Plant Propagation Protocol for *Claytonia megarhiza* (Alpine spring beauty)

ESRM 412 – Native Plant Production

Protocol URL: <https://courses.washington.edu/esrm412/protocols/CLME.pdf>



Figure 1: *Claytonia megarhiza* var. *nivalis* at Paddy-Go-Easy Pass, Kittitas County, Washington. Photo by Stephen Munro

TAXONOMY	
Plant Family	
Scientific Name	Portulacaceae (Montiaceae is the new monophyletic family that this species should be assigned) [1]
Common Name	Purslane family (Montia family) [1]
Species Scientific Name	
Scientific Name	<i>Claytonia megarhiza</i> (A. Gray) Parry ex S. Watson
Varieties	CLMEB <i>Claytonia megarhiza</i> (A.Gray) Parry ex S. Watson var. <i>bellidifolia</i> (Rydb.) C.L. Hitchc. CLMEM <i>Claytonia megarhiza</i> (A.Gray) Parry ex S. Watson var. <i>megarhiza</i> CLMEN <i>Claytonia megarhiza</i> (A. Gray) Parry ex S. Watson var. <i>nivalis</i> (English) C.L. Hitchc.
Sub-species	N/A
Cultivar	N/A

Common Synonym(s)	<i>Claytonia arctica</i> Adams <i>Claytonia arctica</i> Adams var. <i>megarhiza</i> A.Gray
Common Name(s)	Alpine spring beauty, Wenatchee spring beauty
Species Code (as per USDA Plants database)	CLME

GENERAL INFORMATION

Geographical range

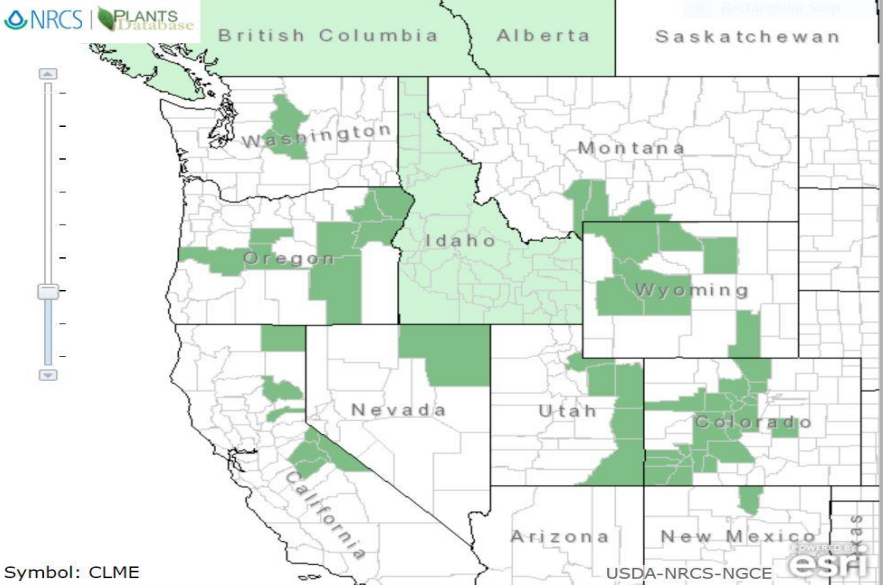


Figure 2: USDA 2018
Claytonia megarhiza proper, or the type species is found in the Rocky Mountains from New Mexico north to Alberta, Canada. Variety *bellidifolia* is found in California, Nevada, and Oregon. Washington State is the home of variety *nivalis* [3].

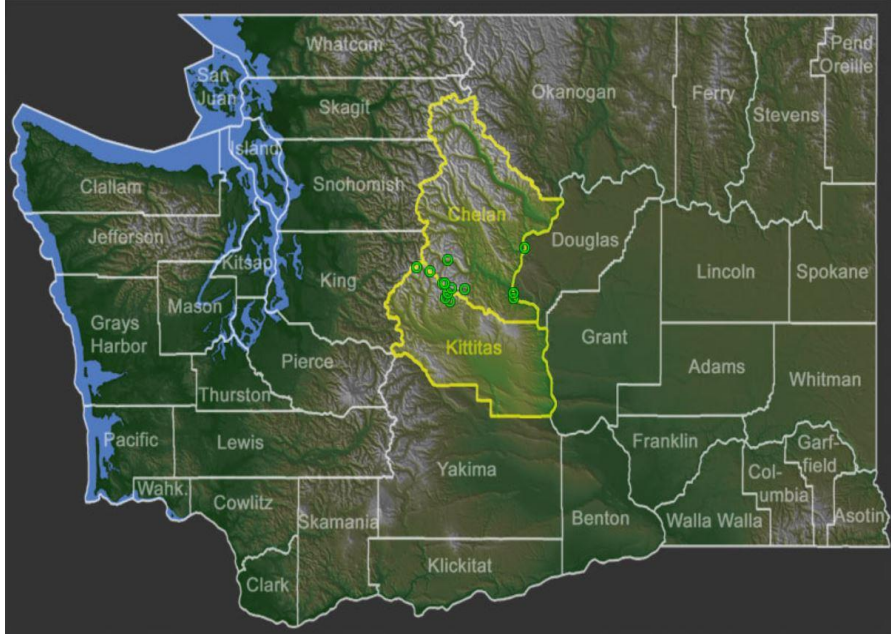



Figure 3: Variety *nivalis* in Washington State. Burke Museum [4].

<p>Ecological distribution</p>	<p>The species and each of its varieties are found on montane talus slopes, always [2]. Variety <i>nivalis</i> in Washington State is a serpentine endemic showing complete fidelity for these substrates [5].</p>  <p>Figure 4: Variety <i>nivalis</i> growing on serpentine on Paddy-Go-Easy Pass at 1500 meters with fellow serpentine endemic <i>Polystichum lemmonii</i>. Photo by Stephen Munro</p>
<p>Climate and elevation range</p>	<p>The type species grows in a continental climate zone at high elevations[7]. Elevation ranges for the type species from roughly 1900 to 3700 meters [6]. Enduring low humidity, high winds, and high solar radiation are all characteristics of the Rocky Mountains where it resides. It is exposed to a harsh mountain climate with extreme temperature swings in very short intervals. Temperature have been reported to vary quickly from near 20 degrees Celsius to below freezing temperature in only hours [7]. Variety <i>nivalis</i> is found at roughly 1500 meters and above in its serpentine haunts in the Wenatchee mountains [4].</p>
<p>Local habitat and abundance</p>	<p>Reportedly on the serpentine talus where it is found in the Wenatchee Mountains, variety <i>nivalis</i> is abundant [8].</p>
<p>Plant strategy type / successional stage</p>	<p>Variety <i>nivalis</i> is tolerant of serpentine soils [5].</p>
<p>Plant characteristics</p>	<p>Plant is an herb from a fleshy tap root with many basal spoon-shaped or paddle like leaves forming large rosettes. Flowers range from white to deep pink with petals free or basally connate. Ovaries generally 6 ovules forming 2-6 seeds. Variety <i>nivalis</i> has rich pink petals 11-15 mm with sepals 7-9 mm and mostly acute. The paired flowering bracts are linear 5-10 mm below the bract of the inflorescence [3].</p>
<p>PROPAGATION DETAILS</p>	

Ecotype	N/A
Propagation Goal	Plants
Propagation Method	Seeds
Product Type	7 cm containers
Stock Type	N/A
Time to Grow	N/A
Target Specifications	N/A
Propagule Collection Instructions	Seed of this species ripens erratically making collection difficult [9]. Care must also be taken when collecting as the seeds are easily lost in the leafy rosette of the parent plant [7].
Propagule Processing/Propagule Characteristics	N/A
Pre-Planting Propagule Treatments	This species requires cold stratification for seed dormancy to be broken. Many reports advise simply leaving sowing the seeds on the surface of the medium in autumn and waiting until spring for germination. Germination is also described as usually erratic [6], [9], [10], [11]. It is reported that exposing the seeds to light while exposing the seeds to cold stratification for 8 weeks followed by several weeks of warmth may induce germination. One or more cycles of this treatment may be needed to break seed dormancy [12].
Growing Area Preparation / Annual Practices for Perennial Crops	The species germinates readily in a heavy, humus rich soil. After germination, once the seedlings have obtained a diameter of an inch across they must be picked out and moved to a container with sharp draining medium [10].
Establishment Phase Details	N/A no specific information obtained yet it has been advised to treat this species as one would for the genus <i>Lewisia</i> [6], [9], [10].
Length of Establishment Phase	N/A no specific information yet it has been advised that this species behavior mimics that of the genus <i>Lewisia</i> [6], [9], [10].
Active Growth Phase	N/A no specific information yet it has been advised that this species behavior mimics that of the genus <i>Lewisia</i> [6], [9], [10].
Length of Active Growth Phase	N/A no specific information yet it has been advised that this species behavior mimics that of the genus <i>Lewisia</i> [6], [9], [10].
Hardening Phase	N/A
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	N/A
Length of Storage	N/A
Guidelines for Outplanting / Performance on Typical Sites	N/A
Other Comments	Seeds are difficult to collect due to erratic ripening [9].
PROPAGATION DETAILS	

Ecotype	N/A
Propagation Goal	Plants
Propagation Method	Vegetative
Product Type	7 cm container
Stock Type	N/A
Time to Grow	It is reported that plants increase rapidly after root growth of the vegetative cuttings commences [7].
Target Specifications	N/A
Propagule Collection Instructions	Cuttings should be collected in spring after new growth has commenced. Cuttings should be taken of offsets of the main rosette [9].
Propagule Processing/Propagule Characteristics	N/A
Pre-Planting Propagule Treatments	Cuttings taken in spring and put under mist root rapidly [7].
Growing Area Preparation / Annual Practices for Perennial Crops	Sand offers excellent results as a cutting medium [10]. In any case, the medium used should offer sharp drainage [9].
Establishment Phase Details	It is reported that plants increase rapidly after root growth of the vegetative cuttings commences [7].
Length of Establishment Phase	N/A
Active Growth Phase	N/A no specific information obtained yet it has been advised to treat this species as one would for the genus <i>Lewisia</i> [6], [9], [10].
Length of Active Growth Phase	N/A no specific information obtained yet it has been advised to treat this species as one would for the genus <i>Lewisia</i> [6], [9], [10].
Hardening Phase	N/A no specific information obtained yet it has been advised to treat this species as one would for the genus <i>Lewisia</i> [6], [9], [10].
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	N/A
Length of Storage	N/A
Guidelines for Outplanting / Performance on Typical Sites	N/A
Other Comments	Cuttings taken of wild specimens should be judicious and sparing. Check for any required permit authorization(s).
INFORMATION SOURCES	
References	[1] Edwards, Erika J., Matthew Ogburn, R., & Edwards, Erika J. 2015. <i>Life history lability underlies rapid climate niche evolution in</i>

	<p><i>the angiosperm clade Montiaceae</i>. Molecular Phylogenetics and Evolution. 92:181-192.</p> <p>[2][USDA NRCS National Plant Data Team. (2018). <i>Claytonia megarhiza</i> (A. Gray) Parry ex S. Watson : Alpine spring beauty. [Accessed May 5 2018].</p> <p>[3]Hitchcock C.L., Cronquist A. 1973. <i>Flora of the Pacific Northwest</i>. Seattle (WA): University of Washington Press.</p> <p>[4]<i>Collections Databases</i>. Collections Databases Burke Museum. N.p., n.d. Web. [Accessed May 5 2018]. http://biology.burke.washington.edu/ https://plants.usda.gov/core/profile?symbol=DONI</p> <p>[5]Kruckeberg, A.R., Leuthy, C. 1991. <i>The Wenatchee Mountains</i>. Bulletin of the American Rock Garden Society. 49: 163-168.</p> <p>[6]Nicholls, G. 2002. <i>Alpine Plants of North America: An encyclopedia of mountain flowers from the Rockies to Alaska</i>. Portland (OR): Timber Press.</p> <p>[7]Alpines '86 Publications Committee. 1986 <i>Rocky Mountain Alpines</i>. Portland (OR): Timber Press.</p> <p>[8]Kruckeberg, A.R. 1982. <i>Gardening with Native Plants of the Pacific Northwest</i>. Seattle (WA): University of Washington Press.</p> <p>[9]Lupp, R. 2002. <i>Claytonia megarhiza</i>. Rock Garden Quarterly. 60(2): 121-122.</p> <p>[10]Doonan, S. 1991. <i>Growing Wenatchee Wildflowers</i>. Bulletin of the American Rock Garden Society. 49: 193-206.</p> <p>[11]Deno, Norman C. 1993. <i>Seed Germination Theory and Practice</i>. 139 Lenor Drive, State College, PA USA 16801.</p> <p>[12] <i>ALPLAINS Seed Catalog</i>. [accessed 2018 May 5]. http://www.alplains.com</p>
Other Sources Consulted	Kruckeberg, A.R. 2002. <i>Geology and Plant Life: The effects of landforms and rock types on plants</i> . Seattle (WA): University of Washington Press.
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