

ESRM PLANT PROTOCOL

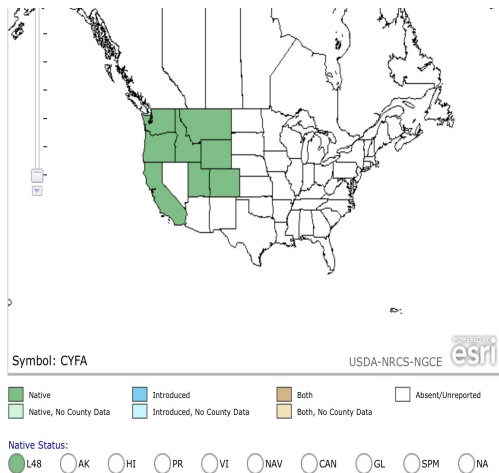
Plant Propagation Protocol for *Cypripedium fasciculatum* Kellogg ex S. Watson

ESRM 412 – Native Plant Production

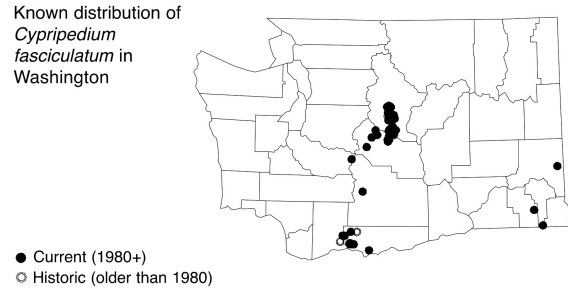
Protocol URL: <https://courses.washington.edu/esrm412/protocols/CYFA.pdf>

North American Distribution

Washington State Distribution



Map from USDA-NRCS Plants Database.



North American Distribution: NRCS Plants Database

Washington State Distribution: E-Flora B.C.

TAXONOMY

Plant Family	
Scientific Name	<u>Orchidaceae</u>
Common Name	Orchid
Species Scientific Name	
Scientific Name	<i>Cypripedium fasciculatum</i> Kellogg ex S. Watson
Varieties	N/A at this time
Sub-species	N/A at this time
Cultivar	N/A at this time
Common Synonym(s)	<i>Cypripedium pusillum</i> Rolfe <i>Cypripedium fasciculatum</i> Rolfe var. <i>pusillum</i> Hooker f. <i>Cypripedium knightae</i> A. Nelson ²
Common Name(s)	Clustered Lady's Slipper, Brownie's Lady Slipper
Species Code (as per USDA Plants database)	CYFA ⁵
GENERAL INFORMATION	
Geographical range	Washington, Oregon, California, Idaho, Montana, Colorado, Utah and Wyoming. ¹

Ecological distribution	Found in coniferous forest, ³ terrestrial, and freshwater ecosystems (6). Found amongst either Ponderosa Pine or Douglas Fir, which give the plant ample shade with its canopies. It also grows next to understory of shrubs and herbs. There is a theory that a specific type of fungus must be present for plant to germinate. Also tend to be in frequently burned areas. ³ Very versatile in ecological distribution, grow anywhere from dry to damp soil as well as rocky and loamy ground. ²
Climate and elevation range	Elevation varies from 1000-5300 ft. They grow in shaded areas, anywhere between 60-100 percent of coverage given by tree canopies. ²
Local habitat and abundance	Local habitat unknown, but generally grows in rough terrain. (4) This species is listed as sensitive to the state of Washington. ³ In Washington state there were 45 sites of CYFA in Wenatchee National Forest and 1 site in Mt. Baker-Snoqualmie National Forest. ²
Plant strategy type / successional stage	Successional stage of plant unknown. Grows in mid to late successional forests. ²
Plant characteristic	<p>General: CYFA are a perennial herb or forb, rising from a small rhizome. CYFA uses photosynthesis (autotroph) and soil fungi (mycotroph) for carbohydrates.⁴</p> <p>Leaves: Leaves are a green color and grow significantly above the soil. CYFA have unique hairy stems right beneath the leaves. On the inferior side of the leaves they do not have hairs and give off a shiny sheen.⁴ Each plant consists of one pair of leaves that have parallel lines running across them.³</p> <p>Fruit: Study being performed exploring whether smell from the flower causes pollination and subsequent fruit. In one particular study, anywhere between 18-68% of CYFA flower produced fruit.</p> <p>Flowers: The drooping flowers range anywhere between 1-7 grouped together in a cluster. The flowers reach a width of about .5 inches. The flower petals are a maroon color. The flowers surround a puffed up lip that is often a light green color with specs of maroon. This plant begins to flower beginning May until the middle of June.³</p> <p>Plant Toxicity: The hairs found on the leaves and stems could cause irritation in the form of a rash. There is also a possibility that CYFA are toxic to animals and even potentially humans.⁶</p>

PROPAGATION DETAILS

Propagation, cultivation and breeding of terrestrial temperate orchids, with focus on *Cypripedium spp.* Note: Not specific to *C. Fasciculatum*⁶

Ecotype	N/A at this time
Propagation Goal	Plants- Germinants ⁶
Propagation Method	Seed propagation and vegetative propagation ⁶
Product Type	N/A at this time

Stock Type	Pots (sizes not given)
Time to Grow	N/A at this time
Target Specification	N/A at this time
Propagule Collection Instructions	Seed: The optimal time to collect seeds are about 8 weeks following the plants pollination. ⁶
Propagule Processing/Propagule Characteristics	Seed: Utilize nutrients and vacuum infiltration on propagule to aid germination. Rhizome: remove decay from <i>Cypripedium</i> spp. ⁶
Pre-Planting Propagule Treatments	Seed: Dormancy protocol, place propagation in 8-10 degree Celsius. Rhizome: Necessary to have 3 months of consecutive dormancy. Must keep cold during this time, do this by covering with gravel. ⁶
Growing Area Preparation / Annual Practices for Perennial Crops	Seed: To mimic deciduous ecosystem, use clay-humid pellets. Soil pH of 6.5-7.0 is preferable. Fertilization discouraged, mild organic matter may be used if needed. ⁶
Establishment Phase Details	N/A at this time
Length of Establishment Phase	N/A at this time
Active Growth Phase	Fall
Length of Active Growth Phase	N/A at this time
Hardening Phase	N/A at this time
Length of Hardening Phase	N/A at this time
Harvesting, Storage and Shipping	N/A at this time
Length of Storage	N/A at this time
Guidelines for Outplanting/ Performance on Typical Sites	Out plant once roots have reached greater than 1 cm long, with shoots shorter than this length. Keep plant moist, away from harsh weather (hot and cold), and in the shade. Out plant from pot after approximately three years. ⁶
Other Comments	No other comments.
INFORMATION SOURCES	
References	<ol style="list-style-type: none"> 1. "Medicinal Plant Fact Sheet: Cypripedium: Lady's Slipper ..." N.p., n.d. Web. 24 May 2016. 2. "Clustered Lady's Slipper Orchid (Cypripedium Fasciculatum)." <i>Clustered Lady's Slipper Orchid (Cypripedium Fasciculatum)</i>. N.p., 1998. Web. 25 May 2016. 3. Department of Natural Resources. "Cypripedium

	<p>Fasciculatum Kell. Ex S. Wats." N.p., n.d. Web. 24 May 2016.</p> <ol style="list-style-type: none"> Lichthardt, Juanita. <i>CONSERVATION STRATEGY FOR CLUSTERED LADY'S-SLIPPER ORCHID (CYPRIPEDIUM FASCICULATUM) IN U.S. FOREST SERVICE REGION 1</i>. Rep. N.p.: Forest Service, n.d. Print. "Plants Profile for Cypripedium Fasciculatum (clustered Lady's Slipper)." <i>Plants Profile for Cypripedium Fasciculatum (clustered Lady's Slipper)</i>. N.p., n.d. Web. 24 May 2016. "Ex Student Archive." <i>Propagation, Cultivation and Breeding of Terrestrial Temperate Orchids, with Focus on Cypripedium Spp.</i> -. N.p., n.d. Web. 24 May 2016.
Other Sources Consulted	<ol style="list-style-type: none"> Krupnick, Gary A., Melissa K. McCormick, Thomas Mirenda, and Dennis F. Whigham. "The Status and Future of Orchid Conservation in North America 1." <i>Annals of the Missouri Botanical Garden</i> 99.2 (2013): 180-98. Web. Krupnick, Gary A., Melissa K. McCormick, Thomas Mirenda, and Dennis F. Whigham. "The Status and Future of Orchid Conservation in North America 1." <i>Annals of the Missouri Botanical Garden</i> 99.2 (2013): 180-98. Web. Lipow, Sara R., Peter Bernhardt, and Nan Vance. "Comparative Rates of Pollination and Fruit Set in Widely Separated Populations of a Rare Orchid (Cypripedium Fasciculatum)." <i>International Journal of Plant Sciences</i> 163.5 (2002): 775-82. Web. 24 May 2016. Love, Askill, and William Simon. "Cytotaxonomical Notes on Some American Orchids." <i>The Southwestern Naturalist</i> 13.3 (1968): 335. Web. 25 May 2016. <p>Note: Interviewed two nurseries, Fourth Corners and Oxbow Nursery, neither knew about this species.</p>
Protocol Author	Monica Kim
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