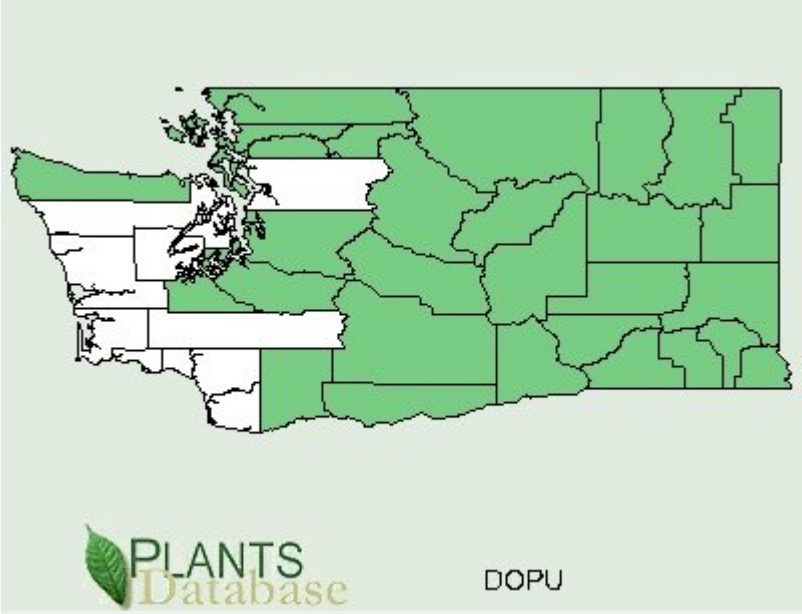
Plant Propagation Protocol for *Dodecatheon pulchellum*
ESRM 412 – Native Plant Production

TAXONOMY	
Family Names	
Family Scientific Name:	Primulaceae
Family Common Name:	Primrose
Scientific Names	
Genus:	*Dodecatheon*
Species:	*pullchellum*
Species Authority:	(Raf.) Merrill
Variety:	Monanthum (5) Pulcellum (5) Watsonii (5)
Sub-species:	Cusickii (6) Macrocarpum (6) Monanthum (6) Pulcellum (6)
Cultivar:	
Authority for Variety/Sub-species:	
Common Synonym(s) (include full scientific names (e.g., *Elymus glaucus* Buckley), including variety or subspecies information)	Dodecatheon pauciflorum
Common Name(s):	darkthroat shootingstar
Species Code (as per USDA Plants database):	DOPU
GENERAL INFORMATION	
Geographical range (distribution maps for North America and Washington state)	Alaska to Mexico. (5,6)

	 
Ecological distribution (ecosystems it occurs in, etc):	In variety of forests from tundra to boreal to temperate. Often grows in meadow communities with early spring moisture and summer drought. Also grows in wet coastal rocks, bluffs and streambanks. (3,4,7)
Climate and elevation range	Montane to subalpine elevation. Although, Pojar says that it is most commonly found at low elevations. (3)
Local habitat and abundance; may include commonly	Can grow in soil that is dry to circumneutral to weakly alkaline, nitrogen rich. It grows with Mahonia nervosa group indicating dry soils, Tiarella trifoliate group indicating nitrogen rich soils and polystichum

associated species	mumitum indicating humus. (3)
Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)	Shade intolerant. (3)
Plant characteristics (life form (shrub, grass, forb), longevity, key characteristics, etc)	This is a small herbaceous plant with leafless flowering stem that can grow 5-50 cm tall. The leaves are spoonshaped, 3-20 cm long. Flowers have 5 parts, and are 'swept backwards' with magenta petals. At the base of the petals is a bright yellow band which subtends dark-reddish anthers. Fruits are cylindrical capsules with multiple seeds in each. (4,5)
PROPAGATION DETAILS	
Ecotype (this is meant primarily for experimentally derived protocols, and is a description of where the seed that was tested came from):	Glacier National Park (7)
Propagation Goal (Options: Plants, Cuttings, Seeds, Bulbs, Somatic Embryos, and/or Other Propagules):	Plants (7)
Propagation Method (Options: Seed or Vegetative):	Seed (7)
Product Type (options: Container (plug), Bareroot (field grown), Plug + (container-field grown hybrids, and/or Propagules (seeds, cuttings, poles, etc.))	Plugs (7)
Stock Type:	Containers (7)
Time to Grow (from seeding until plants are ready to be outplanted):	8 months. Shootingstar only produces 2 codyledons in 1st year of growth, so it is imperative to keep them photosynthesizing for as long as possible. (1,7)
Target Specifications	Rootbound, container seedlings with 4 to 6 true leaves.

(size or characteristics of target plants to be produced):	
Propagule Collection (how, when, etc):	These seeds reach maturity when brown but should be collected when tan. They can also be collected when when they are matured and the seed capsule starts to split. The can be stored in brown paper bag. (7,8)
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	Longevity and seeds/kg is unknown. Highest germination percentage is 65%. (7)
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	Seeds have physiological dormancy and should go through 5 month outdoor cold-moist stratification for highest germination, 65%. Germination without stratification is 50%. 3 month cold stratification causes a decease in germination to 40%. Gibberellins applied to no stratification treatment decreases germination to 40%. (1,2,7,8,9)
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	An outdoor growing facility is sufficient for propagating shootingstar. To sow, place in medium and cover with growing medium that includes peat, perlight and vermiculite. To fertilize, add 1g Osmocote slow release fertilizer and 0.2g Micromax fertilizer per 172 ml conetainer. Seeds should be sow in fall and watered until winter stratification, they will undergo a 5 month cold-moist stratification during winter. These seeds will germinate in spring, and will harden naturally to the fluctuating spring temperatures. They usually live in meadows and should be placed in full sunlight while actively growing. During their growing season (April to mid-October) plants should be irrigated. (7)
Establishment Phase (from seeding to germination):	Soil should be kept moist during establishment phase. The fluctuation in temperature in April and May aid germination. (7)
Length of Establishment Phase:	4 weeks (7)
Active Growth Phase (from germination until plants are no longer actively growing):	After 4 weeks, plants should be root-bound to conetainers and after 3 weeks have 4-6 true leaves. (7)
Length of Active Growth Phase:	12 weeks (7)
Hardening Phase (from end of active growth phase to	Plants should gradually be receiving smaller amounts of water until October, when they should stop receiving water. (7)

end of growing season; primarily related to the development of cold-hardiness and preparation for winter):	
Length of Hardening Phase:	4 weeks (7)
Harvesting, Storage and Shipping (of seedlings):	Plants should be stored over winter in insulation and protected from snow, they should be taken out of protection as soon as temperatures start to rise in early spring. They can be out planted in early spring. (7)
Length of Storage (of seedlings, between nursery and outplanting):	5 months (7)
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	Late fall outplanting can often be advantageous when sites are muddle in early spring. An easy way to transplant is to use a drill a hole at the planting site big enough for the soils from the container. (7)
Other Comments (including collection restrictions or guidelines, if available):	Plants should not be dug up for replanting because there is a very low success rate. (10)
INFORMATION SOURCES	
References (full citations):	1. Seed Germination Theory and Practice, Deno, Norman, Penn State University, 1993. 2. Second Supplement to Seed Germination Theory and Practice, Deno, Norman, Penn State University, 1998. 3. Klinka, K., Krajina, V., Ceska, A., Scagel, A. Indicator Plants of Coastal British Columbia. Vancouver: University of British Columbia, 1989. 4. Pojar, J., McKinnon, A. Eds. Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia and Alaska. British Columbia: Lone Pine Press, 1994 5. Hitchcock, C. Leo and Cronquist, Arthur. Flora of the Pacific Northwest. 1998. University of Washington Press. Seattle and London. 6. USDA Plants database. <plants.usda.gov>

	7. Native Plant Journal <nativeplantnetwork.org> 8. Seed Germination Theory and Practice, Deno, Norman, Penn State University, 1993. 9. Seeds: Ecology, Biogeography, and Evolution of Dormancy and Germination, Baskin and Baskin, Academic Press, 1998. 10. Parish, Roberta, Ray Coupe, and Dennis Lloyd (eds.). 1996. Plants of Southern Interior British Columbia. Lone Pine Publishing, Vancouver, BC, Canada. 463 pp.
Other Sources Consulted (but that contained no pertinent information) (full citations):	Potast, Laura L., Aubry, Carol A. Nature Plant Notebook; 2nd ed. Mt. Baker-Snoqualmie National Forest, North Cascade Institute, 1997.
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