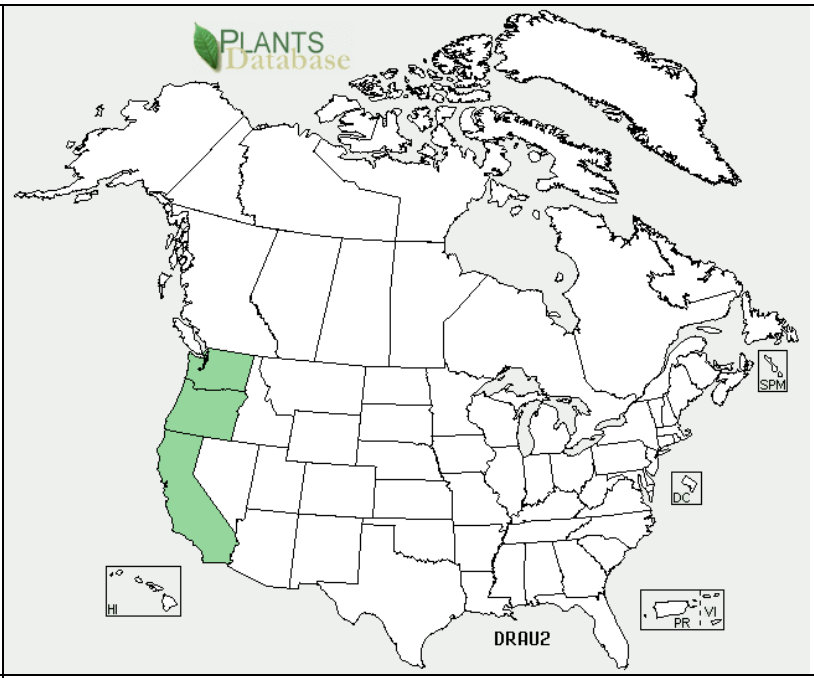
Plant Propagation Protocol for *Draba aureola* (Mt. Lassen draba)
ESRM 412 – Native Plant Production
Spring 2008

TAXONOMY	
Family Names	
Family Scientific Name:	*Brassicaceae*
Family Common Name:	Mustard Family
Scientific Names	
Genus:	*Draba*
Species:	*aureola*
Species Authority:	S. Watson
Variety:	
Sub-species:	
Cultivar:	
Authority for Variety/Sub-species:	
Common Synonym(s):	*Draba aurea*
Common Name(s):	Mt. Lassen draba, golden draba(1)
Species Code (as per USDA Plants database):	DRAU2
GENERAL INFORMATION	

Geographical range:	
Ecological distribution:	Subalpine forest and Alpine fell-fields(1)
Climate and elevation range:	Found around 8500-14200 feet(1) often at cliff bases(3).
Local habitat and abundance; may include commonly associated species:	There is no endangerment issue in the state of California and very little endangerment outside of the state. (2)
Plant strategy type / successional stage:	Not found.
Plant characteristics:	Forb/herb
PROPAGATION DETAILS ***NOTE: No protocols were available on *Draba aureola* so this is taken from The Mustard Family/*Draba oligosperma* (3)**	
Ecotype:	Glacier National Park, 2500m elevation, Scenic Point, Two Medicine
Propagation Goal:	Plants
Propagation Method:	Seed

Product Type:	Container (plug)
Stock Type:	160 ml containers
Time to Grow:	9 months
Target Specifications:	A height of 3 cm with at least a couple leaves in a tight rosette, and a firm plug in the container for the roots.
Propagule Collection:	Hand collect in late August, when the mature silicates begin to split and become tan in color. Mature seeds will be brown. Seeds were stored in a well ventilated drying shed in a paper bag before they were cleaned.
Propagule Processing:	Via screening, the seeds are hand cleaned in the nursery. The dormancy is classified as physiological dormancy. Purity: 100% ; Germination: 50%
Pre-Planting Propagule:	A 6 month outdoor, cold and moist stratification is necessary. A dry storage for fresh seeds 6 months prior to the stratification is recommended for higher germination percentages.
Growing Area Preparation / Annual Practices for Perennial Crops:	An outdoor nursery growing facility was used. A direct seeding sowing method was used and the seeds were then covered with medium. ____ Medium used: 6:1:1 milled spaghnum peat, perlite, and vermiculite with Osmocote controlled release fertilizer and Micromax fertilizer with a rate of .8 g of Osmocote and .18g of Micromax per 160 ml container. _____ During late fall is when the containers are filled and sown. Before winter stratification can occur, the containers are irrigated thoroughly.
Establishment Phase (from seeding to germination):	During germination, the medium is kept slightly moist. With the fluctuating temperatures of May, in an outdoor nursery, the germination is completed in 2 weeks.
Length of Establishment Phase:	4 weeks
Active Growth Phase:	After root germination, root development occurs quickly. After 6 weeks of germination, 4 to 6 real leaves were clear and in a tight rosette formation. In a short time the containers were full and were then potted with a well aerated mix of 50% 6:1:1 milled sphagnum peat, perlite, and vermiculite and 50% sand with 1.5 grams of lime in 490 ml inch pots. They were then fertilized using 13-13-13-liquid NPK at 100 ppm while in the growing season.
Length of Active Growth Phase:	8 weeks
Hardening Phase:	During September and October, irrigation is gradually reduced. Plants should be fertilized using 10-20-20-liquid NPK at 200 ppm fertilizer. Before winterization plants are leached with clear water.

Length of Hardening Phase:	2 to 4 weeks
Harvesting, Storage and Shipping (of seedlings):	The total time it took to harvest was 9 months. Late September was the time of harvest. During the overwinter, the plants were stored in an outdoor nursery under an insulating foam cover as well as snow.
Length of Storage (of seedlings, between nursery and outplanting):	5 months
Guidelines for Outplanting / Performance on Typical Sites :	Not found.
Other Comments:	The species used produced a well-branched taproot and a number of tight crowned ramets. It is suggested to try the divisions of ramets from the established nursery stock. ____ After about a year of germination the plants flowered.
INFORMATION SOURCES	
References (full citations):	1. Calflora: Information on California plants for education, research and conservation. [web application]. 2008. Berkeley, California: The Calflora Database [a non-profit organization]. Available: http://www.calflora.org/. (Accessed: May 31, 2008) 2. California Native Plant Society (CNPS). 2008. Inventory of Rare and Endangered Plants (online edition, v7-08b). California Native Plant Society. Sacramento, CA. Accessed on Sat, May. 31, 2008 from http://www.cnps.org/inventory 3. Evans, Jeff; Wick, Dale; Luna, Tara. 2008. Propagation protocol for production of container *Draba oligosperma* Hook. plants (160 ml conetainers); USDI NPS - Glacier National Park, West Glacier, Montana. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 31 May 2008). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery. 4. Treatment from the Jepson Manual. [web application]. 1993. Berkeley, California: The Regents of the University of California. Available:

	http://ucjeps.berkeley.edu/cgi-bin/get_JM_treatment.pl?Draba+aureola. (Accessed May 31, 2008) 5. Kartesz, J. K. (1993). *Mt. Lassen Draba*. Retrieved May 31, 2008, from USDA Plants Database: http://plants.usda.gov/java/nameSearch?keywordquery=DRAU2&mode=symbol 6. (n.d.). *Herbaceous Forest Species*. Retrieved May 31, 2008, from Sheboygan Area Land Conservancy: http://www.webresults.net/gardener/FOREST-SPECIES.htm
Other Sources Consulted (but that contained no pertinent information) (full citations):	7. Baskin, Carol C.; Baskin, Jerry M. 2002. Propagation protocol for production of container *Draba aurea* Vahl. plants; University of Kentucky, Lexington, Kentucky. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 31 May 2008). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery. 8. (n.d.). *Berkeley Natural History Museums*. Retrieved May 31, 2008, from University Herbarium: http://bnhm.berkeley.edu/query/sa.php?uk=UCJEPSUCUC117776&ic=UCJEPS 9. (n.d.). *Montana Field Guides*. Retrieved May 31, 2008, from Montana's Official State Website: http://fieldguide.mt.gov/detail_PDBRA110E0.aspx 10. (2008, December 5). *The British Database of World Flora and Fauna*. Retrieved May 31, 2008, from British Towns and Villages: http://www.british-towns.net/nature/07_specie_detail.asp?GetLSID=35999
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