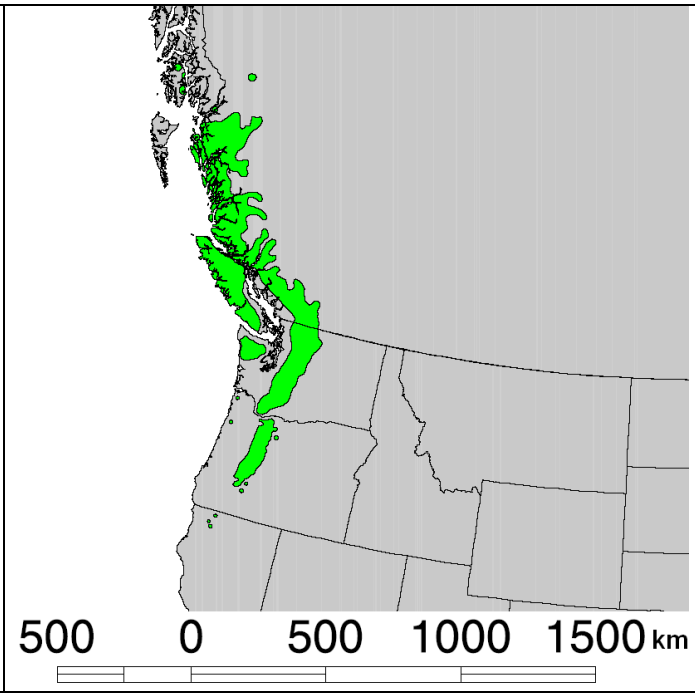
Plant Propagation Protocol for Abies amabilis
ESRM 412 – Native Plant Production
Spring 2008

TAXONOMY	
Family Names	
Family Scientific Name:	Pinaceae
Family Common Name:	Pine
Scientific Names	
Genus:	Abies
Species:	A. amabilis
Species Authority:	Douglas ex J.Forbes
Variety:	
Sub-species:	
Cultivar:	Compacta, Spreading Star (USDA.)
Authority for Variety/Sub-species:	
Common Synonym(s):	White fir, red fir, lovely fir, Amabilis fir, Cascades fir, silver fir (Earle 2006.)
Common Name(s):	Pacific Silver fir
Species Code:	ABAM (USDA.)
GENERAL INFORMATION	
Geographical range:	

Ecological distribution (ecosystems it occurs in, etc):	Subalpine forests at elevations of 1700-2140m (Wikipedia.) Tree growth varies within geographical range, for example Pacific Silver fir heights range with changes in climate and elevation (Crawford, Olver.)
Climate and elevation range	Cool summers with an average of 58 degrees, and winters that are rarely lower than 16 degrees. Not drought tolerant, average annual precipitation is 59" (Crawford, Oliver.)
Local habitat and abundance; may include commonly associated species	Found from Southeastern Alsaska, British Columbia, Vancouver Island to Washington and Northern Oregon. Also appears sporadically in Oregon and California (Crawford, Oliver.)
Plant strategy type / successional stage:	Very shade tolerant, slow growing but can out grow associated species such as Douglas firs over time (Crawford, Oliver.) Climax successional stage, which means that it comes in last after a disturbance (Forest Service.)
Plant characteristics :	Tree. Coniferous, evergreen. Oldest tree recorded to live 725 years (Plants for a Future.) Most trees live 400-500 years, and only 250-350 years on sites that don't meet adequate growth requirements (Forest Service.)
PROPAGATION DETAILS	
Ecotype:	Subalpine forests in the Pacific northwest. Unable to find specific site information.
Propagation Goal:	Plants
Propagation Method:	Seed (USDA.)
Product Type:	Bareroot, container, or seed (USDA.)
Stock Type:	Container plants.
Time to Grow:	Take one year from seedling to container.
Propagule Collection:	Cone collection should take place mid to late August and stored in well ventilated area at 70-80 degrees until cones disintegrate. (USDA.)
Propagule Processing/Propagule Characteristics:	Each cone can produce up to 400 seeds, but less than half of the seeds are viable (USDA.)
Pre-Planting Propagule Treatments:	Seeds undergo cold stratification in dry conditions at 10-30 degrees for 4-6 months (USDA.) Since seed viability is low in firs the seeds should be planted within one year after collection (Sheat 1948.) Sources vary on whether light is helpful for germination or detrimental.
Growing Area Preparation / Annual Practices for Perennial Crops:	Can be grown in boxes or in containers and should be spaced to accommodate 125 seedlings per acre. The seeds should be planted about ¼ " deep (USDA.) When planting in boxes use compost of 2 parts loam, 1 part peat moss, and 1 part sand (Sheat 1948.)
Establishment Phase:	Seeds should be planted in early February and germination should start by March (Sheat 1948.)
Length of Establishment Phase:	Approximately 1 month.
Active Growth Phase:	During the first few years growth ranges from 4 -16" per year (USDA.)

Hardening Phase:	Seedlings can be moved into a cold frame in March and start to harden (Sheat 1948.)
Guidelines for Outplanting / Performance on Typical Sites:	Seedlings can be planted out during summer after the last frost has come through to ensure that the seedlings will have time to adapt to the new environment and be able to survive their first winter (Plants for a Future.)
Other Comments :	
INFORMATION SOURCES	
References:	• Earle, Christopher. "Abies amabilis ". Gymnosperm Database. April 28, 2008 <http://www.conifers.org/pi/ab/amabilis.htm>. • "Abies amabilis ". USDA Plant Database. April 28, 2008 <http://plants.usda.gov/java/charProfile?symbol=ABAM>. • Sheat, Wilfrid. Propagation of Trees, Shrubs, and Conifers. London: Macmillan and Co., 1948. • Baskin, Carol C.; Baskin, Jerry M. 2004. Propagation protocol for production of container Abies amabilis (Dougl.) Forbes plants; University of Kentucky, Lexington, Kentucky. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 28 April 2008). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery. • Crawford, Peggy. Oliver, Chadwick. "Pacific Silver Fir". US Forest Service. April 29, 2008 <http://na.fs.fed.us/spfo/pubs/silvics_manual/Volume_1/abies/amabilis.htm>. • "Abies Amabilis." Plants for a Future. April 29, 2008. <http://www.pfaf.org/database/plants.php?Abies+amabilis >. • "Abies Amabilis." Wikipedia. April 29, 2008. <http://en.wikipedia.org/wiki/Abies_amabilis >.
Other Sources:	• Macdonald, Bruce. Practical Woody Plant Propagation For Nursery Growers. Portland: Timber Press, 1986. • J. N. Owens, L. M. Chandler, J. S. Bennett, T. J. Crowder, Cone enhancement in Abies amabilis using GA4/7, fertilizer, girdling and tenting, Forest Ecology and ManagementVolume 154, Issues 1-2, , 15 November 2001, Pages 227-236. (http://www.sciencedirect.com/science/article/B6T6X-448YJ4WM/1/a2f53a479caf2b14bccac689660dcf09) • A.K. Mitchell, R. Koppenaal, G. Goodmanson, R. Benton, T. Bown, Regenerating montane conifers with variable retention systems in a coastal British Columbia forest: 10-Year results, Forest Ecology and ManagementVolume 246, Issues 2-3, , 31 July 2007, Pages 240-250. (http://www.sciencedirect.com/science/article/B6T6X-4NY4RP9-3/1/dfd3fb4e42ea40eb837b9cf0438666b0)
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