Plant Propagation Protocol for _Belchnum Spicant (Deer Fern)_
ESRM 412 – Native Plant Production
Spring 2008


J.S. Peterson @USDA-NRCS PLANTS Database copyright Br. Alfred Brousseau, Saint Mary's College

TAXONOMY	
Family Names	
Family Scientific Name:	*Belchnum Spicant*
Family Common Name:	Deer Fern, Hard Fern, Ladder Fern, Rough Spleenwort
Scientific Names	
Genus:	Blechnum L.
Species:	Blechnum spicant (L.) Sm.
Species Authority:	(Linnaeus) Smith
Sub-species:	B. spicant ssp. Mipponicum
Authority for Variety/Sub-species:	(Kunze) A. Löve & D. Löve
Sub-species:	Belchnum spicant (L.) Sm. Var. elongatum
Authority for Variety/Sub-	(Hook.) B. Boivin

species:	
Common Synonym(s) (may repeat this section multiple times as needed)	Lomaria spicant (L.) Desv. Osmunda spicant L. Struthiopteris spicant (L.) Weiss
Species Code (as per USDA Plants database):	BLSP
GENERAL INFORMATION	
General Distribution (geographical range (states it occurs in), ecosystems, etc):	Belchnum spicant can be found throughout low coastal regions in moist forests. It has a sporadic circumpolar distribution ranging from coastal Alaska to California. Belchnum spicant occurs mostly west of the Cascade Range but can also be found in northern Idaho.
Climate and elevation range	Sea level to 2,000' coastal regions in moist forests
Local habitat and abundance; may include commonly associated species	Scattered to abundant, sometimes dominant. Located in areas were there is moist to wet soil conditions; can be in poor-nutrient to moderate-nutrient forests. Associated Species: Alaska cedar (*Chamaecyparis nootkatensis*) noble fir (*Abies procera*), lodgepole pine(*Pinus contorta*), Alaska blueberry (*Vaccinium alaskensis*), red huckleberry (*V. parviflorum*), thimbleberry (*Rubus parviflorus*), salmonberry (*R. spectabilis*), devil's club (*Oplopanax horridus*), menziesia (*Menziesia ferruginea*), salal (*Gaultheria shallon*), Oregon oxalis (*Oxalis oregana*), bunchberry (*Cornus canadensis*), false lily-of-the-valley (*Maianthemum dilatatum*), twisted stalk (*Streptopus spp.*), threeleaf foamflower (*Tiarella trifoliata*), woodnymph (*Moneses uniflora*), pioneer violet (*Viola glabrella*), western swordfern (*Polystichum munitum*), ladyfern (*Athyrium filix-femina*), bracken fern(*Pteridium aquilinum*),

	oakfern (*Gymnocarpium dryopteris*), woodfern (*Dryopteris spp*.), stiff clubmoss (*Lycopodium annotinum)*
Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)	Found in old growth and climax Sitka spruce, western hemlock, western red cedar, Douglas fir, and Pacific silver fir forests. After a disturbance dense clumps of deer fern will form with sparse regeneration of trees. As the shrub layer develops in a recovering forest deer fern declines (20-25 years after logging). Later deer fern (as well as other ferns) will become more abundant and will dominate the under story after 50 to 60 years.
PROPAGATION DETAILS	
Propagation Method (Options: Seed or Vegetative):	There are two was to propagate deer ferns. The first is by using deer fern spores. This will give you substantially more plants but is an extremely long process. The other way to propagate deer ferns is by dividing. Deer ferns have a rhizome that when cut can potentially double or triple the fern mass.
Time to Grow (from seeding until plants are ready to be out planted):	12 months if grow from spores. Propagation through dividing produces full grown plants faster
Target Specifications (size or characteristics of target plants to be produced):	25% of their mature size
Propagule Collection (how, when, etc):	Spores ripen from June to August. If spores have ruffled papery texture, spores have already been released. Collecting Method #1 A recommended method of collection: tie a clear plastic bag over a healthy frond and tap/shake until spores fall into bag. You may need to gently rub a thumb over some of the sori (cases spores develop in) to get them to loosen and release spores into bag. Collecting Method #2 Another method of collecting spores is to cut off the frond at the stem. Use a sheet of paper (typing or copy paper) fold in half lengthwise and store for at least one week (storing it between the pages of a book was recommended.) the frond will dry out and release the spores.
Propagule	To store spores use a glassine envelope or packets of waxed paper. If

Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	storage container is too porous spores will get stuck. Spore viability varies among species from just a few days to several years. The older the spores though the lower the germination rate will be. Packets should be stored in the refrigerator (1-4 degrees C) or freezer in moisture-tight and air tight containers
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	Boil a growing medium of peat moss mixed with perlite or vermiculite to sterilize. Another way to sterilize growing medium is to place mix into a plastic bag and using a deep microwave safe dish, microwave for 2-3 minutes
Propagating	Spores: Grab a couple of sterilized bricks and place them into a nursery tray and pour in H20 to a depth of 1". After this spread a layer of ¼" growing medium of the top surface of the bricks. Gently tap spores over the layer of growing medium. Place a large clear plastic bag or a sheet of glass over the tray. Place the tray in a dark location for about two days then move the tray to a location that gets plenty of light. It is important to keep the growing medium damp, do not allow mold to form or the ferns will be lost. After ferns start to grow divide into bigger pots as needed. Dividing: Cut rhizome and separate the clump of ferns. Plant the separated clumps in the same type of soil that the original plant came from. Place just under the top of the soil. Should take just a few weeks for them to be healthy adults. New plants can be divided again after 1-2 years.
Length of Establishment Phase:	2-3 weeks for germination, 12 months to plant outside
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before	Should be at 1-gallon size. Better to plant in the rainy season. May need to be water during the first summer.

flowering):	
INFORMATION SOURCES	
References (full citations):	-Hardy Fern Foundation Newsletter, Special Publication on Propagation, Volume 8, Number 2. Spring 1998. -Klinka, K., V.J. Krajina, A. Ceska, and A. M. Scagel. "Indicator Plants of Coastal British Columbia". University of British Columbia Press. Vancouver, 1989. -Pojar, J. and MacKinnon, A. Plants of the Pacific Northwest Coast. Lone Pine Publishing, Redmond, WA. 1994. -Holloway, Dr. Patricia S., "Tips on Collecting, Processing, and Storing Fern Spores" Georgeson Botanical Notes, No. 17. University of Alaska Fairbanks, April 1994. http://www.uaf.edu/salrm/gbg/pubs/Notes/17.pdf -King, Michael. How to Propagate Ferns. http://www.greendealer-exotic-seeds.com/seeds/HowtoFerns.html. April 2008. -Washington trails association. Ferns and Horsetails. http://www.wta.org/~wta/cgi-bin.dev/wtaweb.pl?3+hg+flora+ferns. April 2008.
Other Sources Consulted (but that contained no pertinent information) (full citations):	-Plants for a Future—Species Database: http://www.scs.leeds.ac.uk/cgi-bin/pfaf/arr_html?Blechnum+spicant&CAN=COMIND (no longer works) -USDA Forest Service, FEIS website: http://www.fs.fed.us/database/feis/plants/fern/blespi/introductory.html -USDA-NRCS. 2004. **The PLANTS Database** (http://plants.usda.gov/plants). National Plant Data Center, Baton Rouge, LA 70874-4490 USA. (No longer works) -Brockman, Frank C. Mount Rainier National Park Nature Notes Vol. XIV No. 1. March 1936. April 2008.
Protocol Author (First and last name):	Jesse Anderson
Date Protocol Created or Updated (MM/DD/YY):	04/15/2008

Note: This template was modified by J.D. Bakker from that available at: http://www.nativeplantnetwork.org/network/SampleBlankForm.asp