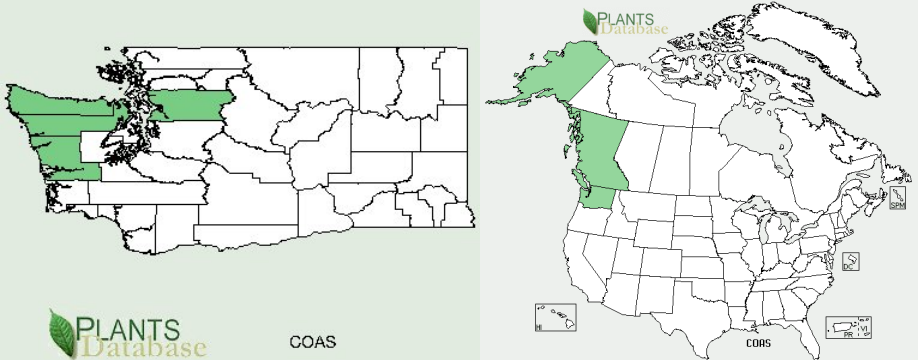


**Plant Propagation Protocol for [*Coptis asplenifolia*]**  
 ESRM 412 – Native Plant Production

<b>TAXONOMY</b>	
Family Names	
Family Scientific Name:	<i>Ranunculaceae</i>
Family Common Name:	Buttercup
Scientific Names	
Genus:	<i>Coptis</i>
Species:	<i>Asplenifolia</i>
Species Authority:	Salisbury (1807)
Variety:	<i>Coptis aspleniifolia</i> var. <i>biternata</i> Huth
Sub-species:	N/A
Cultivar:	N/A
Authority for Variety/Sub-species:	N/A
Common Synonym(s)	<i>Coptis aspleniifolia</i> Salisb.
Common Name(s):	Fern-Leaved Goldthread; Spleenwort-leaved Goldthread
Species Code	COAS
<b>GENERAL INFORMATION</b>	
Geographical range	 <p>(6)</p>
Ecological distribution	<p>In coastal Washington and Oregon, <i>Coptis asplenifolia</i> occurs adjacent to wetlands, rivers, streams or lakes or on higher ground in areas with high precipitation and in sites with low evaporative stress. Sites are generally on gentle lower slopes, and often northerly aspects. (11)</p> <p>It is believed that its survival and viability depends on maintaining these conditions. It is thought to be a shallowly "rooted" species that may be very sensitive to disturbance of the soil litter layer, e.g., from trampling. Therefore, disturbance that changes the microclimatic regime or soil litter layer may have significant impacts on local populations. (9)</p>
Climate and elevation range	<p><i>Coptis asplenifolia</i> occurs moist forest and bogs (3), at low to middle elevations, in areas with a strong maritime influence. (4) It is common and widespread in Alaska and British Columbia (7), but becomes restricted to localized populations in the western North Cascades and western Olympics. At the southern limit of its range, it occurs in cool, moist, old-growth forest habitats. (9)</p>
Local habitat and abundance; may	<p>Habitat information is limited for <i>Coptis aspleniifolia</i> in northwestern Washington or the Oregon Coast Range. On the Mt. Baker-Snoqualmie National Forest, it occupies cool,</p>

include commonly associated species	<p>moist sites that are similar climatically to environments farther north in British Columbia and Alaska. It occurs adjacent to wetlands, rivers, streams or lakes, or on higher ground in areas with high precipitation, and generally in sites with low evaporative stress. Sites are generally on gentle lower slopes, and often northerly aspects. It is thought that these sites have low incident solar radiation because of their location on the landscape. Sites have a mean annual temperature less than 9C (48F), and average annual precipitation greater than 250 cm (100 inches). (2)</p> <p>Its rhizomatous habit creates extensive spreading mats. It is a compact, low growing plant from 10-30 cm (3.9-11.8 inches) tall. Leaves are divided into 5 or more lobed and toothed leaflets that are 2-6 cm (0.8-2.4 inches) long. <i>Coptis aspleniifolia</i> occurs in moist plant associations in the Western Hemlock Zone or lower Silver Fir Zone. Overstory tree species are commonly western hemlock, western redcedar and occasionally Pacific silver fir. Common associated understory species include <i>Sphagnum</i> spp., <i>Blechnum spicant</i>, <i>Rubus pedatus</i>, <i>Lysichitum americanum</i>, <i>Maianthemum dilatatum</i>, <i>Cornus canadensis</i>, <i>Tiarella unifoliata</i>, <i>Athyrium filix-femina</i>, <i>Oplopanax horridum</i>, <i>Vaccinium alaskaense</i>, <i>Rubus spectabilis</i>, <i>Gymnocarpium dryopteris</i>, <i>Galium kamtschaticum</i>, <i>Ribes bracteosum</i>, <i>Listera cordata</i>, <i>Menziesia ferruginea</i> and <i>Cladothamnus pyrolaeformis</i>. Sites where <i>Coptis aspleniifolia</i> occurs often have a well-developed moss or duff layer, or wet organic soil. This species is similar in morphology to <i>Coptis laciniata</i>, which is more common and widespread in the western Olympics and extends south into northwestern California. (2)</p>
Plant strategy type / successional stage	This plant has a late successional stage. It is a predominant ground cover in old-growth forests. It is also shade tolerant. (13)
Plant characteristics	<i>Coptis aspleniifolia</i> is an evergreen perennial herb with shiny, fern-like basal leaves. The bright yellow thread-like rhizomes led to the origin of the common name "goldthread" (7). Its rhizomatous habit creates extensive spreading mats. It is a compact, low growing plant from 10-30 cm (3.9-11.8 inches) tall. Leaves are divided into 5 or more lobed and toothed leaflets that are 2-6 cm (0.8-2.4 inches) long. (2)
<b>SEED PROPAGATION DETAILS</b>	
Ecotype	N/A
Propagation Goal	Plants
Propagation Method	From seed; germinate in a damp paper towel
Product Type	Container (plug)
Stock Type:	Range: 100 ml containers to 500 ml containers
Time to Grow	September
Target Specifications	Stock Type: Container seedling Height: 8 cm Caliper: 8 mm Root System: firm plug in container.
Propagule Collection	Seeds are small and difficult to collect; seeds disperse by water. Fruits collected at maturity but before follicle splits.
Propagule Processing / Propagule Characteristics:	Seeds sown as soon as ripe in ericaceous compost. (13)
Pre-Planting Propagule Treatments:	N/A
Growing Area Preparation / Annual Practices for Perennial Crops	Seeds may be sown as soon as ripe in pots or pans of sandy peat and placed in cold frames for the winter. The seedlings are pricked out when large enough into other boxes or pots, and may be transferred to open ground in spring during mild weather. They may be grown as an edging or border to Rhododendrons, Azaleas, Kalmias, and other plants of the Erica family. (12)

	Seedlings grown in cool shade. (13)
Establishment Phase	Germination and seedling emergence was completed by September following a winter on the forest floor. Establishment of <i>Coptis aspleniifolia</i> may be limited by the low light levels in moss mats, as the seedlings are only 10-12 mm (3.9-4.7 inches) tall compared with the moss height of 15-20 mm (5.9-7.9 inches). Average annual rhizome growth is 1-15 cm (0.4-5.9 inches) in older stands. <i>C. aspleniifolia</i> maintains itself in old stands by seedling establishment. (10)
Length of Establishment Phase:	Germination: 1 to 6 months at 10 °C. (13)
Active Growth Phase	N/A
Length of Active Growth Phase	April to June (flowering)
Hardening Phase	N/A
Length of Hardening Phase:	N/A
Harvesting, Storage and Shipping	Harvest in late summer and fall. Seeds are small and difficult to collect.
Length of Storage	Seed does not store well; sow as soon as possible. (5)
Guidelines for Outplanting / Performance on Typical Sites	The seedlings may be transplanted at any time after the leaves are large, by keeping plenty of soil. (1)
Other Comments:	Parts of plant are poisonous if ingested
<b>VEGETATIVE PROPAGATION DETAILS</b>	
Ecotype	N/A
Propagation Goal	Plants
Propagation Method	By dividing rhizomes, tubers, corms or bulbs (including offsets)
Product Type	Container (plug)
Stock Type:	Range: 100 ml containers to 500 ml containers
Time to Grow	Division should be done in early spring. (8)
Target Specifications	Stock Type: Container cutting Height: 20 cm Caliper: 0.5 cm Root System: firm plug in container.
Propagule Collection	Rhizome can be divided for propagation when plant is established.
Propagule Processing / Propagule Characteristics:	Rhizomes are cut and divided for propagation. (8)
Pre-Planting Propagule Treatments:	N/A
Growing Area Preparation / Annual Practices for Perennial Crops	N/A
Establishment Phase	Average annual rhizome growth is 1-15 cm (0.4-5.9 inches) in older stands. <i>C. aspleniifolia</i> maintains itself in old stands by vegetative development of clones. However, the compact clones of this species may limit its ability to migrate by vegetative growth compared to other species. (10)
Length of Establishment Phase:	1-6 months

Active Growth Phase	N/A
Length of Active Growth Phase	N/A
Hardening Phase	N/A
Length of Hardening Phase:	N/A
Harvesting, Storage and Shipping	Harvest in late summer and fall. Harvest root primarily, also upper plant parts. Recommended to gather carefully from edge of patches. Collect only where species is abundant. No more than 7.5 cm of rhizome and roots are gently pulled up and clipped with shears. Roots are clipped using clippers; do not pull out. (12)
Length of Storage	N/A
Guidelines for Outplanting / Performance on Typical Sites	Roots should be scored at outplanting time in late September.
Other Comments:	Parts of plant are poisonous if ingested
<b>INFORMATION SOURCES</b>	
References	<p>(1) "Coptis." <i>Gardenology.org - Plant Encyclopedia and Gardening Wiki</i>. Web. 16 May 2011. &lt;<a href="http://www.gardenology.org/wiki/Coptis">http://www.gardenology.org/wiki/Coptis</a>&gt;.</p> <p>(2) Henderson, J. A. 1995. Unpublished Potential Natural Vegetation Model, Mt. Baker-Snoqualmie National Forest and Olympic National Forest.</p> <p>(3) Hitchcock, C. L., A. Cronquist, M. Ownbey and J. W. Thompson. 1964. <i>Vascular Plants of the Pacific Northwest. Part 2: Salicaceae to Saxifragaceae</i>. University of Washington Press, Seattle. 597 p.</p> <p>(4) Klinka, K., V. J. Krajina, A. Ceska and A. M. Scagel. 1989. <i>Indicators Plants of Coastal British Columbia</i>. University of British Columbia Press. Vancouver. 288 p.</p> <p>(5) "PlantFiles: Detailed Information on Fern-leaf Goldthread <i>Coptis Asplenifolia</i>." <i>Tips and Advice on Outdoor Gardening, Flower Gardens, Plants, &amp; Seeds - Dave's Garden</i>. Web. 18 May 2011. &lt;<a href="http://davesgarden.com/guides/pf/go/122423/">http://davesgarden.com/guides/pf/go/122423/</a>&gt;.</p> <p>(6) "Plants Profile." <i>United States Department of Agriculture</i>. Natural Resources Conservation Service. Tue. 17 May. 2011. &lt;<a href="http://plants.usda.gov/java/profile?symbol=COAS&amp;mapType=large&amp;photoID=sosc2_002_ahp.tif">http://plants.usda.gov/java/profile?symbol=COAS&amp;mapType=large&amp;photoID=sosc2_002_ahp.tif</a>&gt;.</p> <p>(7) Pojar, J. and A. MacKinnon (eds). 1994. <i>Plants of the Pacific Northwest Coast</i>. B.C. Ministry of Forests and Lone Pine Publishing. Canada. 527 p.</p> <p>(8) "Rock Garden Plant Database." <i>KadeL Data Servis</i>. Web. 18 May 2011. &lt;<a href="http://www.kadel.cz/flora/c/kvCard.asp-Id=486.htm">http://www.kadel.cz/flora/c/kvCard.asp-Id=486.htm</a>&gt;.</p> <p>(9) "Spleenwort-Leaved Goldthread - (<i>Coptis Asplenifolia</i> Salisb.)." <i>DOI: BLM: National Home Page</i>. 30 Nov. 1999. Web. 17 May 2011. &lt;<a href="http://www.blm.gov/or/plans/surveyandmanage/MR/VascularPlants/section6.htm">http://www.blm.gov/or/plans/surveyandmanage/MR/VascularPlants/section6.htm</a>&gt;.</p> <p>(10) Tappeiner, J. C. II, and P. B. Alaback. 1989. Early establishment and vegetative</p>

	<p>growth of understory species in the western hemlock-Sitka spruce forests of southeast Alaska. Can. J. Bot. 67: 318-326 p.</p> <p>(11) Washington Department of Natural Resources, Washington Natural Heritage Program and the U.S.D.I. Bureau of Land Management. Web. 17 May 2011. &lt;<a href="http://www1.dnr.wa.gov/nhp/refdesk/fguide/pdf/copasp.pdf">http://www1.dnr.wa.gov/nhp/refdesk/fguide/pdf/copasp.pdf</a>&gt;.</p> <p>(12) Weathers, John. <i>A Practical Guide to Garden Plants</i>. London: Longmans, Green, and, 1901. 154 p. Print.</p> <p>(13) Web. 16 May 2011. &lt;<a href="http://www.fs.fed.us/pnw/pubs/gtr513/gtr513c.pdf">http://www.fs.fed.us/pnw/pubs/gtr513/gtr513c.pdf</a>&gt;.</p> <p>(14) Web. 17 May 2011. &lt;<a href="http://www.vetmed.wsu.edu/org_nws/NWSci%20journal%20articles/2007%20files/Issue%202/08%20Willson.pdf">http://www.vetmed.wsu.edu/org_nws/NWSci%20journal%20articles/2007%20files/Issue%202/08%20Willson.pdf</a>&gt;.</p>
Other Sources Consulted	<p><a href="http://www.blm.gov/or/plans/wopr/deis/files/vol%203/WOPR_DEIS_App_E.pdf">http://www.blm.gov/or/plans/wopr/deis/files/vol%203/WOPR_DEIS_App_E.pdf</a></p> <p><a href="http://www.energy-northwest.com/downloads/gen/packwood/relicensing/FinalRarePlantReportJan2007.pdf">http://www.energy-northwest.com/downloads/gen/packwood/relicensing/FinalRarePlantReportJan2007.pdf</a></p> <p><a href="http://www.mountainnature.com/Plants/PlantsLatinNameResult.asp?ID=395&amp;fCommonName=Fern-leaved+Goldthread&amp;LatinName=Coptis+asplenifolia">http://www.mountainnature.com/Plants/PlantsLatinNameResult.asp?ID=395&amp;fCommonName=Fern-leaved+Goldthread&amp;LatinName=Coptis+asplenifolia</a></p> <p><a href="http://www.rurdev.usda.gov/rhs/pss/EIS%20White%20Pass/09_FINAL-Appendix-G-supplemental-vegetation.pdf">http://www.rurdev.usda.gov/rhs/pss/EIS%20White%20Pass/09_FINAL-Appendix-G-supplemental-vegetation.pdf</a></p>
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