

# CONSERVATION ASSESSMENT

for

*Coptis trifolia* (L.) Salisb.

Originally issued  
as Management Recommendations  
December 1998  
Marty Stein

Reconfigured-January 2005  
Tracy L. Fuentes

**USDA Forest Service Region 6 and  
USDI Bureau of Land Management, Oregon and Washington**

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## CONSERVATION ASSESSMENT FOR *COPTIS TRIFOLIA*

### **Preface**

#### *Management Recommendations*

Much of the content in this document was included in a previously transmitted Management Recommendation (MR) developed for management of the species under the previous Survey and Manage Standards and Guidelines (USDA and USDI 1994a,b). With the removal of those Standards and Guidelines, the previously transmitted MR has been reconfigured into a Conservation Assessment (CA) to fit the BLM Oregon/Washington and Region 6 Forest Service Special Status/Sensitive Species Programs (SSSSP) objectives and language.

Since the transmittal of the original MR in 1998, a new occurrence has been documented in Washington State. Brief habitat information about this documented occurrence has been included. In addition, a new treatment of the genus *Coptis* has been completed. However, most information presented here reflects information up to and including the year 1998. New information on habitat management has not been included in this document, and further updates should incorporate this and any other new information.

#### *Assumptions on site management*

In the Final Supplemental Environmental Impact Statement (FSEIS) and Record of Decision (ROD) to Remove or Modify the Survey and Manage Standards and Guidelines, assumptions were made as to how former Survey and Manage species would be managed under agency Special Status Species policies. Under the assumptions in the FSEIS, the ROD stated “The assumption used in the final SEIS for managing known sites under the Special Status Species Programs was that sites needed to prevent a listing under the Endangered Species Act would be managed. For species currently included in Survey and Manage Categories A, B and E (which require management of all known sites), it is anticipated that only in rare cases would a site not be needed to prevent a listing... Authority to disturb special status species lies with the agency official that is responsible for authorizing the proposed habitat-disturbing activity” (USDA and USDI 2004). This species was in Survey and Manage Category A at the time of the signing of the ROD, and the above assumptions apply to this species’ management under the agencies’ SSSSP.

#### *Management Considerations*

Under the “Managing in Species Habitat Areas” section in this Conservation Assessment, there is a discussion on “Management Considerations”. “Management Considerations” are actions or mitigations that the deciding official can utilize as a means of providing for the continued persistence of the species’ site. These considerations are not required and are intended as general information that field level personnel could utilize and apply to site-specific situations.

Management of this species follows Forest Service 2670 Manual policy and BLM 6840 Manual direction. (Additional information, including species-specific maps, is available on the Interagency Special Status Species website.)

## CONSERVATION ASSESSMENT FOR *COPTIS TRIFOLIA*

### Summary

**Species:** *Coptis trifolia* (L.) Salisb. (threeleaflet goldthread)

**Taxonomic Group:** Vascular Plants

**Other Management Status:** NatureServe ranks *Coptis trifolia* with a Global Heritage Rank of G5, described as apparently to demonstrably secure globally. The Washington Natural Heritage Program ranks this species as S1 and State Threatened. The Oregon Natural Heritage Information Center ranks this species as S1 and Heritage List 2 (species that are threatened, endangered, or possibly extirpated from Oregon, but are more common or stable elsewhere).

*Coptis trifolia* is a Forest Service Region 6 Sensitive Species and a BLM Bureau Assessment Species in Oregon.

**Range and Habitat:** *Coptis trifolia* follows a circumboreal range from Greenland to Alaska and eastern Asia south to North Carolina, Iowa, Idaho, Washington, and Oregon. The species is known from Clackamas and Wasco Counties in Oregon and from Clallam County, Washington. In Oregon, the plants occur in the margins of boggy, wet, seepage areas within mature coniferous forests in the Western Hemlock and Silver Fir Zones at an elevation of 1000 to 1170 meters (3280 to 3800 ft.) above sea level. Plants typically grow on organic substrates, including decayed wood. In Washington, the plants occur in a sphagnum bog, mostly below other vegetation in the lower spaces between sphagnum hummocks. Elevation is approximately 60 m (200 ft) above sea level.

**Threats:** The major threats to this species are activities that alter *Coptis trifolia* habitat or directly impact individual plants (including medicinal gathering). These actions include changes to hydrologic function, a loss of down wood recruitment, soil disturbance, or any action that results in mechanical damage to plants.

### Management Considerations

- Avoid soil and plant disturbance.
- Maintain water table at its current level. Avoid activities that could alter flows.
- Maintain habitat conditions at documented occurrences including inputs of down wood 18 inches in diameter and greater, hydrologic function, light levels, and undisturbed soils.
- Where it exists, maintain a mature tree component (18"+ DBH) to provide for down wood inputs.
- Avoid salvage of dead, dying, diseased or insect infested trees within or adjacent to *Coptis* sites.
- Maintain existing canopy closures.

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### **Data and Information Gaps**

- Current population trends of documented occurrences.
- Ecological requirements of the species.
- Genetic relationships between known Oregon sites and populations within the main portion of the species' range.
- Pollination and seed dispersal mechanisms.

## I. NATURAL HISTORY

### A. Taxonomy and Nomenclature

Linnaeus (Linné 1753) first described *Coptis trifolia* as *Helleborus trifolius*. Salisbury (1807) established the genus *Coptis* and included *C. trifolia*. *Helleborus pumilus* (Hitchcock *et al.* 1964), *Coptis groenlandica*, *Coptis trifolia* subsp. *groenlandica* and subsp. *trifolia* are also synonyms (Ford 1996).

Various authorities have segregated eastern and western races as species (Fernald 1929) and subspecies (Hultén 1937, Taylor and Mulligan 1968) based on sepal and seed shape as well as other minor characteristics. Ford (1996) compared characters of sepals, seeds, petiolules, and nectaries of herbarium specimens from the Aleutian Island, the rest of North America, and eastern Asia. He concluded that there was no clear distinction between the two subspecies.

Kingdom: Plantae (Plants)  
 Division: Magnoliophyta (Angiosperms)  
 Class: Magnoliopsida (Dicotyledons)  
 Order: Ranunculales (Buttercups)  
 Family: Ranunculaceae (Buttercups)  
 Genus: *Coptis*  
 Species: *trifolia*

### B. Species Description

#### 1. Morphology

The following species description is based on Hitchcock *et al.* (1964), Pojar and MacKinnon (1994), Hultén (1968), and Ford (1996).

*Coptis trifolia* is an evergreen, perennial herb from 4-10 cm (1.6-4.0 inches) tall. The leaves are shiny and dark above, paler below, and basally attached. Each leaf is divided into 3 subsessile, toothed leaflets. The leaf blade measures 1-2 cm (0.4-0.8 inches) in length (Figure 1). Plants form small, compact mats due to its rhizomatous habit. The rhizomes are bright yellow in color, a characteristic common to all species in the genus, which accounts for the common name, goldthread.

Each plant may produce one flower, which has 5 whitish sepals 5-10 mm (0.2-0.4 inches) long and 5 hollow, fleshy, club-shaped orange petals, that produce nectar at the tip. The petals are about half as long as the sepals. Flowering generally occurs in June. Fruits are a follicle measuring 5-10 mm (0.2-0.4 inches) long and are cup-shaped with a suture on the upper surface.

Although it resembles both *Coptis occidentalis* (western goldthread) and *Coptis laciniata* (cut-leaf goldthread), *C. trifolia* can be differentiated by its unlobed to slightly lobed leaflets. *Coptis occidentalis*, which occurs in northeastern Washington State, has leaflets that are lobed halfway to the base of the leaf. *Coptis laciniata*, which occurs coastal Washington to California, has deeply lobed leaflets (Ford 1996, Hitchcock *et al.* 1964).

**2. Reproductive Biology**

No published information could be found on the reproductive biology of *Coptis trifolia*. Casual observation of Oregon populations suggests that the species reproduces both vegetatively from rhizomes and from seed. Contrary to some references about the paucity of flowering, Oregon sites were found to be flowering in profusion when visited in 1992 and 1996. The nectariferous petals appear to be attractive to solitary bees and hover flies (family Syrphidae).

An Alaskan study of *Coptis aspleniifolia* (Tappeiner and Alaback 1989) may be used to infer a strategy for *Coptis trifolia*. The study, which looked at seed germination, seedling establishment, and clonal growth development, took place in various age stands of *Tsuga heterophylla*-*Picea sitchensis* forest in Alaska. The study concluded that the species' slow growth rate, low rate of fruit production, evergreen leaves, and clonal growth habit appear to make it well suited as an understory species in old forests. These same characteristics result in slow establishment in young forest stands.

**3. Ecological Roles**

Little is known about the ecology of *Coptis trifolia*.

**C. Range and Sites**

*Coptis trifolia* has a circumboreal distribution extending from Greenland across North America to Alaska and into northeast Asia, south to northern Japan, British Columbia, Saskatchewan, North Carolina, Iowa, Idaho, Washington and Oregon (Figure 2, Ford 1996). Four documented occurrences/sites of this species are in Oregon, and one is in Washington (Table 1).

**Table 1. *Coptis trifolia* sites by administrator, by number of documented occurrences, and by county.** Data are from ISMS (2004) and from Acker (2004).

Documented occurrences are locations at least 100 m apart (ISMS Development Team 2000) and are not necessarily the same as Natural Heritage Element Occurrences. An asterisk (\*) marks sites that have not been relocated.

<u>Administrator</u>	<u># documented occurrences</u>	<u>County, State</u>
Olympic National Park	1	Clallam, WA
Mt. Hood National Forest	3	Clackamas, OR
Private	1	Wasco, OR
Total	5	

**D. Habitat Characteristics and Species Abundance**

*Coptis trifolia* is described as inhabiting boggy, wet seepage areas (Pojar and MacKinnon 1994), sphagnum hummocks (Calder and Taylor 1968), muskegs to deep woods (Hitchcock *et al.* 1964), and mossy places (Hultén 1968).

The documented occurrence in Washington occurs in a sphagnum bog with a few stunted (mostly under 30 cm tall) *Thuja plicata* (western red-cedar) trees (Acker 2004). Plants typically

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occur below other vegetation, in the lower spaces between sphagnum hummocks. Other associated species are *Ledum groenlandicum* (bog Labrador tea), *Blechnum spicant* (deer fern), *Empetrum nigrum* (crowberry), *Pteridium aquilinum* (bracken fern), *Gaultheria shallon* (salal), *Sphagnum* spp. (peat moss), and *Calamagrostis canadensis* (bluejoint grass). Elevation is approximately 200 m (656 ft) above sea level. Population size is estimated at 300-400 plants.

Documented occurrences in Oregon are located within the western Hemlock Zone and Pacific Silver Fir Zone (Halverson et al. 1986, Hemstrom et al. 1982) at an elevation of 1000-1170 meters (3280-3800 feet) above sea level. Precipitation ranges from 1500-2000 mm (60-90 inches) per year. Occurrences are associated with small wetland areas within mature coniferous forest. Soils are poorly drained histosols. This habitat is not uniformly wet, but a mosaic of small stream channels and boggy depressions interspersed with slightly higher, drier hummocks. The hummocks are the remains of large downed wood and the root masses of windthrown trees, while the depressions are likely the holes left by the displaced root masses. Typically, *Coptis trifolia* is found on the hummocks immediately above the level of saturated soil. This habitat often forms a narrow zone approximately 10-40 centimeters (4-16 inches) in width. Plants may be growing in either mineral soil or organic substrates, including decomposing wood. The Oregon occurrences contain a total of approximately 5,000 stems of *Coptis trifolia*, covering an area of one half hectare (1.25 acres).

In Oregon, canopy closure of the overstory tree component varies from 25 to 60 percent. Perhaps due to the high water table, snags and live trees with broken tops or sparse crowns are often present. Herbaceous vascular plants, mosses, and liverworts provide a ground cover of between 80 and 100 percent. Associated species include *Tsuga heterophylla* (western hemlock), *Thuja plicata* (western red-cedar), *Pinus monticola* (white pine), *Pinus contorta* (lodgepole pine), *Abies amabilis* (Pacific silver fir), *Picea engelmannii* (Engelmann spruce), *Rhododendron macrophyllum* (Pacific rhododendron), *Menziesia ferruginea* (Fool's huckleberry), *Alnus incana* (mountain alder), *Taxus brevifolia* (Pacific yew), *Vaccinium ovalifolium* (oval-leaf huckleberry), *Gaultheria ovatifolia* (slender wintergreen), *Kalmia occidentalis* (Western swamp laurel), *Cornus canadensis* (bunchberry), *Caltha biflora* (marshmarigold), *Linnaea borealis* (twinline), *Senecio triangularis* (arrowleaf groundsel), *Listera cordata* (heart-leaf twayblade), *Lysichiton americanum* (skunk cabbage), *Mitella pentandra* (alpine mitrewort), and *Sanguisorba occidentalis* (western burnet). Bryophytes associated with these sites include the mosses *Pleurozium schreberi*, *Rhytidiadelphus loreus*, *Rhytidiadelphus triquetrus*, *Philonotis fontana*, *Eurhynchium praelongum*, *Dicranum fuscescens*, *Rhytidiopsis robusta*, *Hylocomnium splendens*, *Sphagnum* spp., and the liverwort, *Scapania americana*.

## II. CURRENT SPECIES SITUATION

### A. Status History

NatureServe (2004) ranks *Coptis trifolia* with a Global Heritage Rank of G5, described as apparently to demonstrably secure globally. The Washington Natural Heritage Program (2003) ranks this species as S1 and State Threatened. The Oregon Natural Heritage Information Center (2004) ranks this species as S1 and Heritage List 2 (species that are threatened, endangered, or possibly extirpated from Oregon, but are more common or stable elsewhere).

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*Coptis trifolia* is a Forest Service Region 6 Sensitive Species and a BLM Bureau Assessment Species in Oregon.

Under the Northwest Forest Plan, this species was considered to be at risk because it was known from only a few scattered sites (USDA and USDI 1994b). *Coptis trifolia* is at the southern limit of its range in the Pacific Northwest, known from only a single site in Washington on the Olympic Peninsula and a few isolated populations in Oregon.

### **B. Major Habitat and Viability Considerations**

Individual plants occur just above the level where soils are saturated and the effective rooting zone may be very shallow for this species. Any action that damages this soil layer may adversely affect individual plants.

Oregon plants are most often found on low hummocks resulting from down wood and decomposed root wads. The maintenance of a mature forest component will provide for down wood 18 inches and greater in diameter.

*Coptis trifolia* sites in Oregon and Washington are all located within wetlands. Plants are found growing a few centimeters above the zone of saturated soil. It is, therefore, important to maintain the water level and hydrologic function at these sites.

Light levels are a consideration for habitat maintenance. Documented occurrences in Oregon have canopy closures which range from 25 to 60 percent.

### **C. Threats to the Species**

Due to the small number of populations occurring on federal lands, a loss of individuals is potentially a threat to the species in Washington or Oregon. A loss of individuals may result from changes in habitat including altered hydrologic function, loss of the large tree component and corresponding loss of future down wood inputs, or mechanical damage to plants or soils.

This species could be collected for medical use (Sullivan 1992), although no such use is currently known for Oregon or Washington state documented occurrences.

### **D. Distribution Relative to Land Allocations**

Four of the five documented occurrences of *Coptis trifolia* occur on on federally managed lands (Table 2); all sites on National Forest lands are in Riparian Reserve.

**Table 2. *Coptis trifolia* sites by administrative unit and land allocation.**

<u>Administrative Unit</u>	<u>Land Allocation</u>	<u># Sites</u>
Olympic National Park	National Park	1
Mt. Hood National Forest	Matrix/Riparian Reserve	3
Private		1
Total		5

### III. MANAGEMENT GOALS AND OBJECTIVES

Management for this species follows FS Region 6 Sensitive Species (SS) policy (FS Manual 2670), and/or BLM Oregon and Washington Special Status Species (SSS) policy (6840).

For Oregon and Washington BLM administered lands, SSS policy details the need to manage for species conservation. Conservation is defined as the use of all methods and procedures that are necessary to improve the condition of SSS and their habitats to a point where their Special Status recognitions no longer warranted. Policy objectives also state that actions authorized or approved by the BLM do not contribute to the need to list species under the Endangered Species Act.

For Region 6 of the Forest Service, SS policy requires the agency to maintain viable populations of all native and desired non-native wildlife, fish, and plant species in habitats distributed throughout their geographic range on National Forest System lands. Management “must not result in a loss of species viability or create significant trends toward federal listing” (FSM 2670.32) for any identified SS.

### IV. HABITAT MANAGEMENT

#### A. Lessons from History

There has been little active management of sites where *Coptis trifolia* occurs in Washington and Oregon. No research or monitoring studies have been conducted to document response to disturbance; therefore, no conclusions can be made.

#### B. Identifying Species Habitat Areas

All sites of *C. trifolia* on federal lands administered by the FS and/or BLM in Washington and Oregon are identified as areas where the information presented in this Conservation Assessment could be applied. A species habitat area is defined as the suitable habitat occupied by a known population, plus the surrounding habitat needed to support the site.

#### C. Managing in Species Habitat Areas

The objective of Species Habitat Areas is to maintain habitat conditions for *Coptis trifolia* such that species viability will be maintained at an appropriate scale, in accordance with agency policies.

Some specific management considerations include the maintenance or restoration of hydrologic function, maintenance of canopy cover, and avoidance of ground disturbance. The following identifies in further detail the management considerations for this species:

- Maintain current cool, moist habitat conditions of known populations. Include an area that is large enough to maintain the habitat and associated microclimate of the population. This includes undisturbed forest structure (where present), cool, moist, conditions, and undisturbed soil litter layer. Determine the size of the area by a field visit.

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- Hydrologic function, as a consideration for *Coptis trifolia*, equates to maintaining the water table at its current level. Activities that could alter flows, including road construction, culvert placement, and the manipulation of vegetation should be avoided.
- *Coptis trifolia* occurs in a narrow band of habitat immediately above the zone of saturated soil during the growing season. It is, therefore, likely to be shallow-rooted and prone to be adversely affected by soil disturbance. Avoid activities that may lead to soil disturbance or mechanical damage and trampling of plants.
- If present, maintain canopy closure at the site to provide for proper light levels. At Oregon sites, canopy closure range between 25-60%.

### V. RESEARCH, INVENTORY, AND MONITORING OPPORTUNITIES

The objective of this section is to identify opportunities for additional information which could contribute to more effective species management. The content of this section has not been prioritized or reviewed as to how important the particular items are for species management. The inventory, research, and monitoring identified below are not required. These recommendations should be addressed by a regional coordinating body.

#### A. Data and Information Gaps

*Coptis trifolia* is an inconspicuous plant which has only been known from Oregon since 1991 (ISMS 2004) and Washington since 1998 (Acker 2004) and is easily overlooked. Additional inventory work within areas of potential habitat could be conducted to determine the extent of its range in Oregon and Washington. In particular, focus on the area between the Oregon sites and the species' primary range in British Columbia.

Very little information exists for *Coptis trifolia*. Any opportunity to gain knowledge on the ecology, demographics, genetics, or reproductive biology of this species could be pursued.

#### B. Research Questions

- What are the genetic relationships between disjunct populations of *Coptis trifolia* in Washington and Oregon and plants within the main range of the species?
- What are the dispersal mechanisms for *Coptis trifolia*?
- What are the demographics of *Coptis trifolia*?
- What is the pollination biology of *Coptis trifolia*?

#### C. Monitoring Opportunities and Recommendations

Basic monitoring information is needed to determine population trends at documented occurrences.

## VI. GLOSSARY

### **Documented Occurrence**

Generically, it is the location of an individual of a species. Multiple occurrences may equal one or more Element Occurrence. Documented occurrences are at least 100 m apart (ISMS Development Team 2000). ). A physical record exists to indicate that the species either occurred historically or currently exists in the area defined. See also Site (Occupied).

### **Element Occurrence**

An area of land/or water in which a species is, or was, present (Master, et al. 2001). An element occurrence should have practical conservation value for the species or ecological community as evidenced by historical or potential continued presence and/or regular recurrence at a given location. Often corresponds with the local population, but, when appropriate, may be a portion of a population or a group of nearby populations.

### **Habitat Disturbance**

Natural or human caused disturbances that likely may have impacts on the species habitat, its life cycle, microclimate, or life support requirements.

### **ISMS (Interagency Species Management System) database**

An interagency database containing information about Survey and Manage species in the Northwest Forest Plan area. ISMS includes data for surveys, species locations, and associated habitats/environmental conditions.

### **Management Considerations**

Potential management activities designed to achieve the conservation of a species at a site. Management Considerations are not mandatory.

### **Monitoring**

The collection of information used to determine if management actions are meeting objectives of standards and guidelines and if they comply with laws and management policy. Monitoring is used to determine if standards and guidelines are being followed (implementation monitoring), if they are achieving the desired results (effectiveness monitoring), and if underlying assumptions are sound (validation monitoring). Monitoring involves collecting information on a sampling basis, provides standardized data, and occurs at multiple levels and scales.

### **Persistence**

The likelihood that a species will continue to exist or occur within a geographic area of interest over a defined period of time. Includes the concept that the species is a functioning member of the ecological community of the area.

### **Site (Occupied)**

The location where an individual or population of the target species (taxonomic entity) was located, observed, or presumed to exist and represents individual detections, reproductive sites, or local populations. Specific definitions and dimensions may differ depending on the species in

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question and may be the area (polygon) described by connecting nearby or functionally contiguous detections in the same geographic location. This term also refers to those located in the future (USDA and USDI 1994a). See Documented Occurrence and Element Occurrence.

### **Range**

The limits of the geographic distribution of a species

### **Species Habitat Area**

The geographic area identified that requires management to provide for the continued persistence of the species. May include occupied and unoccupied habitats and sites.

### **Suitable Habitat**

Abiotic and biotic environmental conditions within which an organism is known to carry out all aspects of its life history.

### **Viable Populations**

A wildlife or plant population that contains an adequate number of reproductive individuals appropriately distributed on the planning area to ensure the long-term existence of the species (USDA and USDI 1994a). For invertebrate, non-vascular plant, and fungi species, “appropriately distributed” may include the following conditions: the species is well-distributed, the species is distributed with gaps, or the species is restricted to refugia. Refer to page 123 in Chapter 3 and 4 of the FSEIS for the Northwest Forest Plan for further clarification.

### **Well-distributed**

Distribution of the species is sufficient to permit normal biological function and species interactions. This distribution considers life history characteristics of the species and the habitats for which it is specifically adapted.

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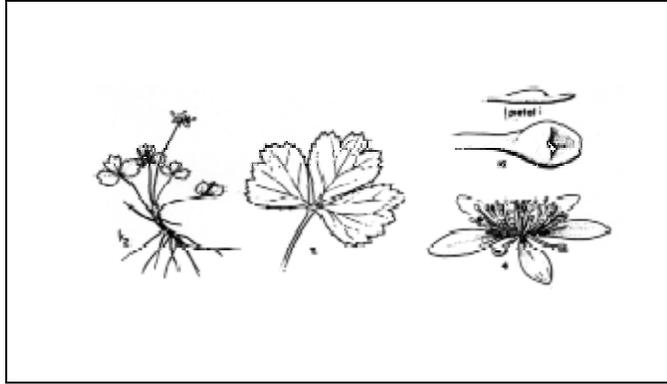
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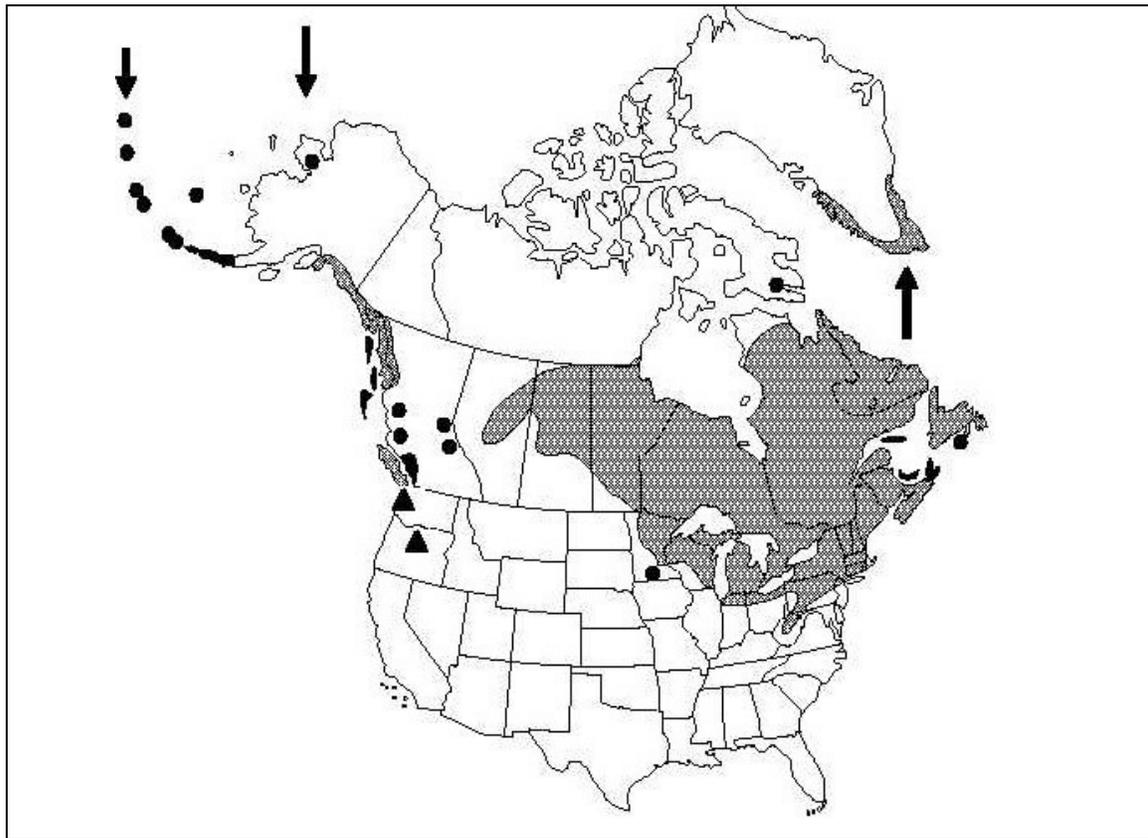
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CONSERVATION ASSESSMENT FOR *COPTIS TRIFOLIA*



**Figure 1. Line drawing of *Coptis trifolia* by Jeanne R. Janish (from Hitchcock *et al.* 1964). Reprinted by permission of University of Washington Press.**



**Figure 2. Approximate range of *Coptis trifolia* in Canada and the United States (adapted from Ford 1996). Stippled areas and filled circles represent the species range as it appears in Ford (1996). Filled triangles represent the one site known from Washington (Acker 2004) and the four sites known from Oregon (ISMS 2004). Map reprinted by permission of Flora of North America Editorial Committee and Oxford University Press.**