

CONSERVATION ASSESSMENT

for

Coptis aspleniifolia Salisb.

Originally issued
as Management Recommendations
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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, new information has been gathered regarding number of documented sites and distribution of the species relative to land allocation. In addition, a new treatment of the genus *Coptis* has been completed. This new information has been included in this document. 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.)

SUMMARY

Species: *Coptis aspleniifolia* Salisb. (spleenwort-leaved goldthread)

Taxonomic Group: Vascular Plants

Other Management Status: NatureServe ranks *Coptis aspleniifolia* with a Global Heritage Rank of G5, described as apparently to demonstrably secure globally. In Washington, *C. aspleniifolia* is a BLM Bureau Assessment Species and a Forest Service Region 6 Sensitive Species. The Washington Natural Heritage Program ranks this species as State Sensitive and S2, vulnerable to extirpation.

Range and Habitat: *Coptis aspleniifolia* reaches the southern extent of its range in the Pacific Northwest. It is more common in coastal British Columbia and Alaska. *Coptis aspleniifolia* is rare within Washington State and is currently known from 17 sites. Extant populations are known to occur in Snohomish, King, Clallam, and Grays Harbor Counties; the two reported Jefferson County populations have not been relocated. No populations are known from Oregon or California.

The species appears to require moist, cool, mossy sites, in old-growth forests with a well-developed litter layer, below 850 m (2800 ft) elevation. Sites where this species occurs in the western North Cascades appear to be similar environmentally to the more northerly sites in coastal British Columbia and southeast Alaska.

Threats: The major threats to this species are loss of populations due to activities that directly impact the habitat or the population. Actions that disrupt conditions necessary for its survival can include treatments that alter the moisture or temperature regime, trampling, or actions that cause disturbance to the soil litter layer. Climate change that alters conditions necessary for its survival may result in a decline in vigor of this species, or may be a factor in causing local extirpation.

Management Considerations

- Manage to protect the environmental conditions at documented sites.
- Develop and implement a lakeshore management for Lake Isabel, to reduce recreation impacts.
- Avoid trampling, digging, or any other activity that would result in mechanical damage to plants, including habitat restoration projects.

Data and Information Gaps

- Conduct surveys to locate populations of *Coptis aspleniifolia* in areas identified as potential suitable habitat.
- Monitor sites in areas of low and high use recreation to assess possible impacts from trampling.
- Continue to fine tune the habitat model for this species to document specific habitat requirements of *Coptis aspleniifolia*.
- Monitor population reproduction and growth.

I. NATURAL HISTORY

A. Taxonomy and Nomenclature

Salisbury (1807) established the genus *Coptis* and included *C. aspleniifolia*. *Coptis aspleniifolia* var. *biternata* Huth is the only synonym listed in Hitchcock et al. (1964). Ford (1996) recognizes no synonyms or varieties of this species.

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

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 aspleniifolia* 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" (Pojar and MacKinnon 1994). Its rhizomatous habit creates extensive spreading mats. It is a compact, low growing plant from 10-30 cm tall. Leaves are divided into 5 or more lobed and toothed leaflets that are 2-6 cm long (Figure 1).

This species is similar in morphology to *Coptis laciniata*, which is more common and widespread in the western Olympics and extends south into northwestern California. They differ in the number of leaflets and in the height of the flowering stalk relative to the leaves. *Coptis aspleniifolia* has at least 5 leaflets, and the flowering stalk is taller than the leaves at anthesis. *Coptis laciniata* has 3 leaflets, and the flowering stalk is shorter than the leaves. All goldthreads have a touch of yellow at the base of the leaf stalk.

Flowers are inconspicuous, greenish-white and regular, with 2-3 flowers nodding on a leafless stalk. The flowering stalk is usually taller than the leaves at anthesis and has hyaline scales at the base. Sepals are somewhat linear and reflexed, 5-6 in number, 6-15 mm long. The petals are also 5-6 in number, but they are shorter and strap-shaped and have a broader, glandular base. Stamens are numerous. *Coptis aspleniifolia* flowers early in the season, from late April through May.

Fruits are follicles, up to 12 in a head, 7-9 mm long, membranous with a very short beak, and with 5-10 seeds. Fruits are upright and spreading when mature. The fruits split open along the upper side, which is believed to be an adaptation for splash-cup dispersal (Pojar and MacKinnon 1994). Fruits are visible beginning in May or June.

2. Reproductive Biology

In Alaska, *Coptis aspleniifolia* reproduces both vegetatively and sexually (Tappeiner and Alaback 1989). The germination rate was high, with significantly greater emergence in old

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stands (250+ year) compared with younger (40 year) stands. Germination and seedling emergence was completed by September following a winter on the forest floor.

Litterfall reportedly killed 10-15% of the *C. aspleniifolia* seedlings in a young stand. Mortality of 3-year-old seedlings was also high; only a small percentage survived. It was also apparent that seedlings had become established in the understory of the young stand, rather than persisting from the previous stand. Height growth is slow in young stands, reaching only 10 mm at 3 years. Average annual rhizome growth measured in young stands ranged from 0-3 cm compared with 1-15 cm in the old stand. Establishment of *Coptis aspleniifolia* may be limited by the low light levels in moss mats, as the seedlings are only 10-12 mm tall compared with the moss height of 15-20 mm. No predation of the *Coptis aspleniifolia* seed capsules was observed. Tappeiner and Alaback concluded that this species maintains itself in old stands by both seedling establishment and vegetative development of clones. However, the compact clones of this species may limit its ability to migrate by vegetative growth compared to other species in the study.

3. Ecological roles

Little is known about the ecology of *Coptis aspleniifolia*. This species is important deer forage in the northern part of its range (Pojar and MacKinnon 1994).

C. Range and Sites

Coptis aspleniifolia occurs from south-central Alaska, south through coastal British Columbia to Washington (Ford 1996). In Washington State, the species occurs in Snohomish, King, Clallam, and Grays Harbor Counties. There are currently 15 extant documented occurrences/sites comprising seven element occurrences (functional populations) of this species in Washington State (Table 1). The Jefferson County occurrences (two documented occurrences, two element occurrences) were not relocated in 1994.

Table 1. Element Occurrence by administrator, by number of documented occurrences, and by county. Data are from ISMS (2004). Documented occurrences are locations at least 100 m apart (ISMS Development Team 2000) and are not necessarily the same as Element Occurrences. An asterisk (*) marks sites that have not been relocated.

Element Occurrence Site	Administrator	# documented occurrences	County
Bogachiel River	Olympic NP	3	Clallam
Harlow Creek	WA DNR	1	Grays Harbor
Queets-Clearwater School*	Quinault Reservation	1	Jefferson
WA DOT*	WA DOT	1	Jefferson
Lake 22	Mt. Baker-Snoqualmie NF	2	Snohomish
Wallace River	Mt. Baker-Snoqualmie NF	3	Snohomish
Lake Isabel	Mt. Baker-Snoqualmie NF	3	Snohomish
Squire Creek	Mt. Baker-Snoqualmie NF	2	Snohomish
Lennox Creek	Mt. Baker-Snoqualmie NF	1	King
Total		17	

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Although *Coptis aspleniifolia* has been reported from the Oregon Coast Range (USDA and USDI 1994b), the Oregon State University Herbarium contains only one specimen identified as *Coptis aspleniifolia* from Tillamook County, on Rogers Peak within the Tillamook Burn area (C. Mayrsohn 1995, pers. comm.). Dr. Ken Chambers has annotated this specimen as *Coptis laciniata*. Therefore, there are no known records of *Coptis aspleniifolia* for Oregon.

D. Habitat Characteristics and Species Abundance

Coptis aspleniifolia occurs in moist forests and bogs (Hitchcock et al. 1964), at low to middle elevations, in areas with a strong maritime influence (Klinka et al. 1989). It is common and widespread in Alaska and British Columbia (Pojar and MacKinnon 1994), 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.

In coastal British Columbia, *Coptis aspleniifolia* indicates very moist, acidic, nitrogen poor soils with high organic matter content and generally occurs on forest floors matted by fungal mycelia (Klinka et al. 1989). It is commonly associated with *Sphagnum girgensohnii* (sphagnum moss) and *Blechnum spicant* (deerfern).

Habitat information is limited for *Coptis aspleniifolia* in northwestern Washington. On the Mt. Baker-Snoqualmie National Forest, it occupies cool, 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 9°C (48°F), and average annual precipitation greater than 250 cm (100 in) (Henderson 1995).

Known populations from the Mt. Baker-Snoqualmie National Forest occur in old-growth to near climax forests, with canopy structure ranging from closed to open and patchy. *Coptis aspleniifolia* occurs in moist plant associations in the Western Hemlock Zone or lower Silver Fir Zone (Henderson, et al. 1992). Overstory tree species are commonly *Tsuga heterophylla* (western hemlock), *Thuja plicata* (western red-cedar) and occasionally *Abies amabilis* (Pacific silver fir). Common understory associates are *Sphagnum* spp. (sphagnum moss), *Blechnum spicant* (deerfern), *Rubus pedatus* (five-leaved bramble), *Lysichiton americanum* (skunkcabbage), *Maianthemum dilatatum* (false lily-of-the-valley), *Cornus canadensis* (bunchberry), *Tiarella unifoliata* (single-leaved foamflower), *Athyrium filix-femina* (ladyfern), *Oplopanax horridum* (devil's club), *Vaccinium alaskaense* (Alaska huckleberry), *Rubus spectabilis* (salmonberry), *Gymnocarpium dryopteris* (oakfern), *Galium kamtschaticum* (boreal bedstraw), *Ribes bracteosum* (stink currant), *Listera cordata* (heartleaf twayblade), *Menziesia ferruginea* (fool's huckleberry), and *Elliotia pyroliflorus* (copperbush). Sites where *Coptis aspleniifolia* occur often have a well-developed moss or duff layer or wet organic soil.

On the Olympic Peninsula, both extant populations occur in areas with high precipitation (>250 cm (100 in)) and high humidity (Henderson 1995). The Bogachiel population occurs at 670 m (2200 ft) elevation, in a boggy site along the trail. This site was originally reported in 1967 and

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was revisited in 1994. The Harlow Creek site occurs on Washington State Department of Natural Resources land in a designated Forest Health Plot. This stand was harvested about 15 years ago but not burned, and currently has about 20 percent cover of western hemlock. Understory species on this wet site include abundant *Sphagnum* (sphagnum moss), *Gaultheria shallon* (salal), *Vaccinium ovalifolium* (oval-leaf huckleberry), *Carex obnupta* (slough sedge), *Menziesia ferruginea* (fool's huckleberry) and *Blechnum spicant* (deerfern). This population of *Coptis aspleniifolia* was reported as very large.

Coptis aspleniifolia tends to occur in extensive mats. Due to its rhizomatous growth habit, it is difficult to determine how many individuals occur at each location. However, the number of aerial stems reported from the documented occurrences in Washington varies from a few hundred to over 10,000.

Two other sites of *Coptis aspleniifolia* previously reported on the west side of the Olympic Peninsula were searched for in 1994, but not relocated. These sites are in close proximity. The original 1982 sighting report for the Quinault Indian Reservation population noted that brush and succession may be possible threats (Washington Natural Heritage Program 2004). When this site was revisited in 1994, the population was not relocated; the forest canopy had closed and there was a sparse understory of swordfern and oxalis. The 1994 sighting report suggested *Coptis aspleniifolia* may have been suppressed by forest development. The other site reported in 1988 from the Washington State Department of Transportation land was revisited in 1994, but not relocated. It was reported that *Coptis aspleniifolia* may have been misidentified at this site.

II. CURRENT SPECIES SITUATION

A. Status History

NatureServe (2004) ranks *Coptis aspleniifolia* with a Global Heritage Rank of G5, apparently to demonstrably secure globally. The Washington Natural Heritage Program (1997) ranks this species as State Sensitive and S2, vulnerable to extirpation. In Washington, *C. aspleniifolia* is a BLM Bureau Assessment Species and a Forest Service Region 6 Sensitive Species.

Coptis aspleniifolia is at the southern limit of its range in Washington, known from only a few isolated populations in the western North Cascades and Olympic Peninsula. 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). At the time the original MR for this species was written, only five element occurrences were known to be extant. Further calibration and validation of a habitat model for this species has led to the discovery of two more element occurrences.

B. Major Habitat and Viability Considerations

The major viability considerations for *Coptis aspleniifolia* are loss of populations due to management activities that directly impact the habitat or the population, or trampling from recreational use. Climate change could result in a decline in vigor of this species, and may result in an even more restricted distribution, or may be a factor in causing local extirpation.

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Relatively little is known about the autecology of this species. It is a species of cool, moist, old-growth forest habitats, and 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.

Fire history analysis shows little evidence of any historical fires in the sites where *Coptis aspleniifolia* is known. Fire is not a significant threat to *Coptis aspleniifolia* because the habitats where this species occurs are cool and wet. However, if fire were to occur, it could have a devastating effect on this species from disturbance to its rooting habitat of soil litter and duff, or by altering the environmental conditions.

Climate change could be a potential impact to the populations of *Coptis aspleniifolia*. An increase in temperature or decrease in precipitation could affect populations of this species, as it tends to be restricted to localized areas that are cool and moist, and similar to environments that occur farther north. As climate has warmed during the last century, stress on the populations of *Coptis aspleniifolia* at the southern edge of its range may have increased.

C. Threats to the Species

Threats to *Coptis aspleniifolia* are those actions that disrupt stand conditions that are necessary for its survival. This includes treatments that alter the moisture or temperature regime, or actions that cause disturbance to the soil litter layer.

Trampling from recreational use is currently believed to be the main threat to this species for the majority of the populations in western Washington. Trampling impacts on *Coptis aspleniifolia* have been documented at the Lake Isabel site on the Mt. Baker-Snoqualmie National Forest (Potash 1995, pers. comm.). Visitors to the lake regularly trample plants along the trail and near campsites. One location of *C. aspleniifolia*, on the eastern end of the lake, is regularly used as a latrine.

There is potential impact from trampling of the Lake Twenty-two population along a trail that gets heavy recreational use. The recent construction of a boardwalk along part of trail may alleviate this. However, the boardwalk construction itself destroyed a patch of *C. aspleniifolia*.

The Wallace River site is fairly remote and does not have trail access, so there is little threat of trampling in this area. The Olympic National Park population occurs along the trail on the Bogachiel River. There is a boardwalk through part of this area, but trampling may potentially impact this population.

Other species of *Coptis* are used in medicinal medicine (Sullivan 1992). This species could be collected for such use, although no such use is known for any of the Washington state sites.

This species is important deer forage in the northern part of its range (Pojar and MacKinnon 1994). Browsing is a potential threat to this species in Washington.

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D. Distribution Relative to Land Allocations

Most documented occurrences occur in land allocations that currently afford a considerable degree of protection (Table 2).

Table 2. *Coptis aspleniifolia* sites, administrative unit, district, land allocation, and number of documented occurrences.

<u>Administrative Unit</u>	<u>District</u>	<u>Land Allocation</u>	<u># Documented occurrences</u>
Mt. Baker-Snoqualmie NF	Darrington RD	Congressionally Withdrawn	2
Mt. Baker-Snoqualmie NF	Darrington RD	Late-Successional Reserve	2
Mt. Baker-Snoqualmie NF	Skykomish RD	Administratively Withdrawn	3
Mt. Baker-Snoqualmie NF	Skykomish RD	Late-Successional Reserve	3
Mt. Baker-Snoqualmie NF	Snoqualmie RD (North Bend RD)	Late-Successional Reserve	1
Olympic NP		Congressionally Withdrawn	3
Quinault Reservation		Unknown	1
WA DNR		Unknown	1
WA DOT		Unknown	1
Total			17

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

This species has been studied in Alaska in response to timber harvest, but it is not expected to respond to treatments in Washington the same as it does farther north. In southeast Alaska (Tappeiner and Alaback 1989), *Coptis aspleniifolia* was able to survive clear-cutting and persisted into young forests.

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Very little is known about the response of *Coptis aspleniifolia* to habitat disturbance at the southern limit of its range. There has been little active management of sites where *Coptis aspleniifolia* occurs in Washington. No research or monitoring studies have been conducted to document response to habitat disturbance and, therefore, no conclusions can be made.

In Washington, there are two documented occurrences of *Coptis aspleniifolia* that occur in young stands, both in the Western Olympics. The Quinault Indian Reservation site was reported by N. and H. Buckingham in 1982. The sighting report noted this population could be potentially threatened by brush and succession, implying that it may be outcompeted by the developing vegetation (WNHP 2004). When this site was revisited in 1994, the population of *Coptis aspleniifolia* was not relocated (Salstrom 1994, pers. comm.). Salstrom reported the canopy had closed, the diameter of trees in the stand ranged from 10-35 cm (4-14 in) dbh, and that the understory was sparse. Salstrom concluded that *Coptis aspleniifolia* may have been suppressed by forest development. It appears that in this case this species was not able to survive and compete with vegetation in the young stand, and could not survive the period of canopy closure in the stand development process.

The other Olympic population, in the Harlow Creek area, occurs in a young stand on Washington State land in a DNR Forest Health plot. As of 1994, it was the only known population surviving in a young forest in Washington. Monitoring this population would supply information on how this species responds to early stages of stand development. Information on site history, stand treatment, and response of *Coptis aspleniifolia* to harvest may be available from the Department of Natural Resources. This stand has not yet reached canopy closure.

B. Identifying Species Habitat Areas

All sites of *C. aspleniifolia* 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 Management Areas is to maintain habitat conditions for *Coptis aspleniifolia* 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, cool, moist, shaded conditions, and undisturbed soil litter layer. Determine the size of the area by a field visit.
- Develop and implement a lakeshore management plan for Lake Isabel, to reduce recreational impacts.

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- Minimize impacts from trampling where it is a current or potential threat. Highest priority should be given to those populations where trampling impacts are currently occurring. Actions to minimize recreational impacts from trampling may include installation of barriers, and signs, displaying educational material, and rerouting trails.
- Prevent disruption to the soil litter layer around sites/populations.

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

- Conduct surveys to locate populations of *Coptis aspleniifolia* in areas identified as potential suitable habitat. Prioritize surveys in areas where management treatments or projects are scheduled or proposed. Potential suitable habitat is identified as low to middle elevation old-growth forests with low incident radiation, a cool temperature regime, and high precipitation (Henderson 1995).
- Determine effects of trampling on this species. Monitor sites in areas of low and high use recreation to assess possible impacts from trampling.
- Continue to fine tune the habitat model for this species to document specific habitat requirements of *Coptis aspleniifolia*.
- Monitor population reproduction and growth.

B. Research Questions

- How does *Coptis aspleniifolia* respond to forest clearing activities (i.e., thinning or harvesting) at the southern edge of its range, especially related to changes in microclimate or changes to the soil surface layer?
- What is the reproductive strategy for this species? Does the species reproduce sexually or does it rely on vegetative reproduction? What is its pollination mechanism?
- What is the reproductive status of known populations? Are seeds viable?
- How sensitive is *Coptis aspleniifolia* to different degrees of soil disturbance?
- What are the dispersal mechanisms for this species?

C. Monitoring Opportunities and Recommendations

- Monitor Lake Isabel and Lake Twenty-two RNA populations to evaluate and document trampling impacts and recovery after trampling is eliminated.
- Monitor the population of *Coptis asplenifolia* in the Forest Health plot on Washington Department of Natural Resources land to help determine the response of this species to canopy cover and competition during the early stages of stand development.

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.

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

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Figure 2. Approximate range of *Coptis asplenifolia* in Canada and the United States (from Ford 1996). Reprinted by permission of Flora of North America editorial committee and Oxford University Press.