

SCOULER'S CORYDALIS

Corydalis scouleri

Adapted by Sharon Hartwell and Kathy Paige¹

Species Information

Taxonomy

Scouler's corydalis is in the *Fumariaceae* (fumitory or bleeding-heart) family. It is one of five *Corydalis* species indigenous to Canada, four of which occur in British Columbia. There are no recognized infraspecific taxa.

Description

Scouler's corydalis is a tall (0.6–1.2 m) perennial herb with thick rhizomes. Stems are upright, hollow, and may be simple or somewhat branched. The large, blue-green, deciduous leaves, usually three in number, arise from near or above the middle of the stem and are much dissected (tri- to quadripinnate). The inflorescence is a terminal or axillary raceme of 15–35 showy, rosy-pink, spurred flowers. Individual flowers are relatively small (~2.5 cm long) and bilaterally symmetrical. The fruits are pod-like capsules (10–15 mm long), containing small (4 mm) shiny black seeds. The plant is summer dormant, and foliage dies back completely after seed set. See Douglas et al. (1999, 2002) for complete description and illustrations and Pojar and MacKinnon (1994) for colour photograph.

Distribution

Global

Scouler's corydalis is limited to the Pacific Northwest, where it occurs west of the Cascades, from northwestern Oregon northward through the Olympic Peninsula to southwestern Vancouver Island (Douglas and Jamison 2000, 2001). It is frequent to common in Oregon and Washington (>100 extant populations), but rare in British Columbia (~22 extant populations).

British Columbia

In British Columbia, this species is restricted to extreme southwestern Vancouver Island. It is found in the Nitinat River valley, the northeast shore of Nitinat Lake, the Klanawa River valley, the Kissinger Lake area, immediately west of Cowichan Lake, and Heather Lake.

Forest region and district

Coast: South Island

Ecoprovinces and ecosections

COM: WIM

GED: LIM

Biogeoclimatic units

CWH: vm1

Broad ecosystem units

FR, SR

Elevation

5– ~200 m (Douglas and Jamison 2000, 2001)

Life History

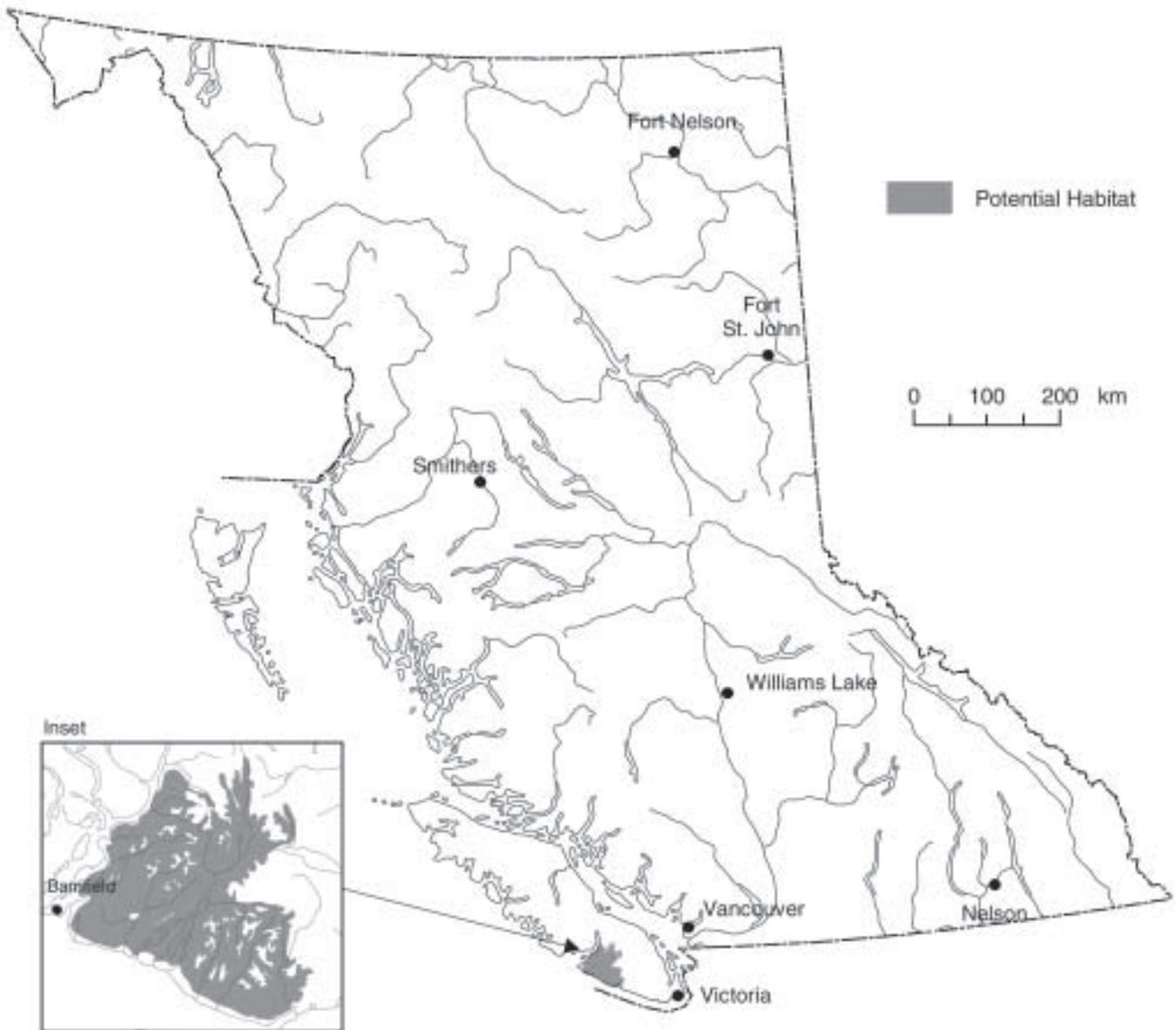
Reproduction

Scouler's corydalis is a perennial, herbaceous understorey plant with thick rhizomes. It reproduces well vegetatively, generating annual stems apically from the rhizome. This vegetative growth can result in extensive single clones with numerous stems, which may cover tens of square metres (Douglas and Jamison 2001). Single leaves are produced on each stem until the plants reach sexual maturity, after 4 or more years.

In British Columbia, flowering occurs in May and June. A raceme typically produces 15–20 flowers,

¹ Account largely adapted from Douglas and Jamison 2000.

Scouler's Corydalis (*Corydalis scouleri*)



Note: This map represents a broad view of the distribution of potential habitat used by this species. The map is based on several ecosystem classifications (Ecoregion and Biogeoclimatic) as well as current knowledge of the species' habitat preferences. This species may or may not occur in all areas indicated.

each with two multi-seeded carpels. There is the potential for considerable seed set, but Hitchcock et al. (1969) note that only the terminal flower of the raceme may develop, which would limit seed production. A number of pollinators visit the species. Self-fertilization is also a possibility (Ownbey 1947), but Ryberg's observations of cultivated specimens lead him to speculate that Scouler's corydalis is probably self-sterile (1960).

Dispersal

The ripe seed capsule explodes elastically when disturbed, spreading seeds a considerable distance. Seeds are also typically dispersed by ants (D. Fraser, pers. comm.); however, the seeds are also short lived and readily dry out. Periodic flooding may facilitate dispersal of both rhizome fragments and seeds (Douglas and Jamison 2000, 2001).

Habitat

Structural stage

- 5: young forest
- 6: mature forest
- 7: old forest

Important habitats and habitat features

In British Columbia, Scouler's corydalis grows in cool, moist, shady habitats adjacent to watercourses, which vary in size from moderately large rivers (Nitinat and Klanawa) to small tributary streams (Jasper Creek, Vernon Creek) and roadside ditches draining into streams (Old Nitinat Campsite). The fine silts and sediments of floodplains and alluvial flats and river benches are prime habitat, but the plant also grows where silty soil is combined with coarser floodplain material or river-smoothed rocks on stream banks, river terraces, islands, and bottomlands. Known sites occur on slopes ranging from 0 to 45%. Aspects include west, southwest, and north to northeast.

The preferred cool, moist, and moderately shady habitat is usually found in deciduous or mixed forests. Occurs in young and older dominant red alder (*Alnus rubra*) stands, but is also found in mixed conifer stands with mature big-leaf maple (*Acer*

macrophyllum) and Sitka spruce (*Picea sitchensis*), as well as red alder, western redcedar (*Thuja plicata*), and western hemlock (*Tsuga heterophylla*). Understorey associates include western swordfern (*Polystichum munitum*), salmonberry (*Rubus spectabilis*), red elderberry (*Sambucus racemosa*), devil's-club (*Oplopanax horridus*), palmate-leaved coltsfoot (*Petasites palmatus*), and stink currant (*Ribes bracteosum*) (Douglas and Jamison 2000, 2001). These plant communities are typically found in areas of high precipitation, with a nitrogen-rich moder and mull humus (Douglas and Jamison 2000, 2001).

At least two of the Nitinat River populations occur in older forest (one in a *Tsuga heterophylla/Acer macrophyllum* stand, and one in a *Picea sitchensis* stand). The remaining sites range from young to mature forest.

Although all of the known populations in British Columbia occur adjacent to watercourses, Diaz and Mellen (1996) classify Scouler's corydalis as a facultative, rather than obligate, wetland species. The plant can be cultivated in shady or woodland situations and is grown by gardeners in Europe (Ownbey 1947) and the Pacific Northwest, where it is sold by nurseries specializing in native plants.

Conservation and Management

Status

Scouler's corydalis is on the provincial *Blue List* in British Columbia. It is designated as *Threatened* in Canada (COSEWIC 2002).

Summary of ABI status in BC and adjacent jurisdictions (NatureServe Explorer 2002)

BC	WA	OR	Canada	Global
S3	S?	S?	N3	G4

Trends

Population trends

Population trends are not possible to determine due to the lack of information for the few existing historical records. The 22 extant populations in British Columbia are restricted to two major watersheds on southwestern Vancouver Island (Klanawa, Nitinat, and immediately east of the Nitinat near Cowichan Lake). These populations range in size from one stem to 100 000 stems growing over a 6-ha area.

Habitat trends

Not known. Scouler's corydalis occurs on southwest Vancouver Island, an extensively logged area with a widespread network of logging roads providing widespread access. In addition, southwest Vancouver Island is used extensively for recreational activities.

Recreational activity has also had an impact on the riparian habitat of southwest Vancouver Island. Forestry recreation sites tend to be situated on lakeshores and riverbanks, and there are several along the Nitinat River, including Nitinat Provincial Park. Nitinat Lake is a popular windsurfing destination, and the campsite at the mouth of the Caycuse River receives heavy use. A moderate-sized population of Scouler's corydalis (ca. 500 stems) exists close to this site.

Threats

Population threats

Scouler's corydalis propagates very successfully by rhizomatous growth, but appears to have low sexual reproductive success and possibly has limited seed dispersal (Douglas and Jamison 2000, 2001; D. Fraser pers. comm.). These characteristics, combined with the limited number of populations in the province, may well have resulted in a lack of genetic heterogeneity. If this is true, the long-term survival of the species in British Columbia could be at risk due to factors such as disease.

Habitat threats

Forest management practices including road building and maintenance, may be a potential threat to habitat for Scouler's corydalis. Logging occurring too close to rivers and streams may damage individuals, alter suitable habitat by removing shade cover, or cause downstream erosion or flooding which could result in alteration or loss of habitat. Road maintenance and stream crossing developments may have an impact. However, new road and bridge construction and forest harvesting will be limited in known sites of Scouler's corydalis (Beese, pers. comm.; Ferguson pers. comm.)

Recreational activity may also be a threat. Along the Nitinat River, logging roads and their associated bridges provide direct access to more than half the known populations of Scouler's corydalis. The summer dormancy of the species makes it difficult to detect. Repetitive or continuous recreational activity such as camping in the same site where Scouler's corydalis is found may potentially affect populations.

Large scale or severe flooding of the Nitinat River could result in loss or alteration of habitat, although it might also assist in dispersing seeds and rhizomes. An examination of the historic patterns of flooding in these watersheds could yield insight to population distribution and density. Where there are small populations, natural flooding and resultant erosion may threaten their continued existence.

Forest succession will lead to changes in forest structure which will eventually shade out the corydalis.

Legal Protection and Habitat Conservation

There is currently no legislation that specifically protects Scouler's corydalis in British Columbia. One population occurs within an ecological reserve and is protected from human disturbance.

The riparian management recommendations under the results based code will be the most important component in protecting this species, because the

majority of known populations are adjacent to rivers and creeks of significant size. A number of populations are on private land (e.g., Caycuse River sites on the Nitinat downstream from the fish hatchery, and sites west of Cowichan Lake, near Kissinger Lake).

Identified Wildlife Provisions

Wildlife habitat area

Goal

Maintain populations and provide adequate habitat for populations to persist.

Feature

Establish WHAs at known populations.

Size

WHAs for this species will typically be <10 ha. The WHA size will ultimately depend on the extent of the individual population and suitable habitat as well as surrounding conditions, which will determine the size of the management zone.

Design

The WHA should include a core area and management zone. The core area should be defined by the perimeter of the population. Most of the known populations have been mapped. Most are <1 ha although one population occurs over several hectares. The management zone will normally be approximately 50 m but may extend up to 250 m depending on site-specific characteristics, but should be large enough to preserve the ambient conditions and be windfirm. In some cases a wider management zone may be required on the upslope side of the population to maintain hydrological conditions.

General wildlife measures

Goals

1. Prevent direct mortality from road or stream crossing construction or maintenance activities.
2. Maintain core area as suitable habitat to allow population to persist.
3. Maintain microclimatic conditions (i.e., light conditions, soil moisture).

4. Avoid creating large canopy gaps.
5. Maintain hydrological conditions of core area.
6. Maintain important habitat features (e.g., dominant overstorey tree species, such as *Alnus rubra*, *Acer macrophyllum*, and *Picea sitchensis*).

Measures

Access

- Do not construct access structures (roads, trails, or stream crossings) in the core area.
- Avoid developing access structures in the management zone, particularly upslope of the core area.
- Where roads are determined to be necessary or already exist within WHA, ensure road maintenance activities do not damage or kill plants and use methods to prevent the spread of invasive species.

Harvesting and silviculture

- Do not harvest within core area except for treatments aimed at maintaining or improving stand characteristics for Scouler's corydalis.
- Use partial harvesting systems in the management zone that maintain ~60% basal stem area. Remove 40% basal stem area in small openings.
- Do not salvage unless it can be done without disturbing important structural elements (e.g., dominant overstorey trees).

Pesticides

- Do not use pesticides.

Recreation

- Do not develop recreational trails, facilities, or structures within the core area.

Information Needs

1. Baseline biological and ecological information for British Columbia.
2. Genetic research on Scouler's corydalis populations in British Columbia (e.g., genetic diversity, heterogeneity).
3. Long-term response of populations of Scouler's corydalis to human and natural occurrences to different activities.

Cross References

Marbled Murrelet, “Queen Charlotte” Goshawk,
“Vancouver Island” Common Water Shrew

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