



Rare Forest Plants of Southern British Columbia

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What are they?

Did you know that in British Columbia about a quarter of the flora is considered rare? More than 600 rare plants have been recorded in our province! While these species are important components of beautiful B.C.'s biological diversity, little is known about them. The BC Conservation Data Centre, which compiles information on rare species and plant communities, has recently conducted studies on three rare forest plants. Evidence shows that under current conditions these species are at risk, and that quick, effective protection is required if we want to preserve them as part of our natural heritage.

Lyall's mariposa lily (*Calochortus lyallii*), **tall bugbane** (*Cimicifuga elata*) and **Scouler's corydalis** (*Corydalis scouleri*) are all extremely rare in Canada, found only in southern British Columbia. A combination of biological limitations, habitat alteration, and a lack of formal protection puts these plant species at risk.

Lyall's mariposa lily is an attractive and delicate member of the lily family (Liliaceae), also known as butterfly lily and star tulip. The generic name *Calochortus* – from the Greek *kalo* meaning “beautiful” and *chortus* meaning

“grass” – refers to the showy flowers of nearly all species of that genus. The species name, *lyallii*, honours David Lyall, a Scottish surgeon and naturalist who collected in North America in the mid-1800s. Lyall's mariposa lily grows on the eastern front of the Cascade mountains, from Washington to the South Okanagan region, where it is restricted to a height of land between the Okanagan and Similkameen valleys. It flowers in grassy meadows and in

natural openings in Douglas-fir (*Pseudotsuga menziesii* var. *glauca*) forests.

Scouler's corydalis belongs to the fumitory or bleeding-heart family (Fumariaceae). The Greek name *Corydalis* refers to the refined shape of the flower which some say resembles a crested lark. This corydalis is named after Dr. John Scouler, who accompanied botanist David Douglas in his nineteenth-century explorations of the Pacific Northwest. It is common on the Oregon and Washington coasts, but is known only from southwestern Vancouver Island in British Columbia, where it is restricted to

the Nitinat and Klanawa valleys. A shade-tolerant species, Scouler's corydalis can grow over extensive areas in cool, moist habitats associated with watercourses and flood plains, chiefly in mixed forests dominated by bigleaf maple (*Acer macrophyllum*), red alder (*Alnus rubra*), western redcedar (*Thuja plicata*) or Sitka spruce (*Picea sitchensis*).

Tall bugbane is a member of the buttercup family (Ranunculaceae). Both its common name and its botanical genus name, *Cimicifuga*, allude to its ability to ward off

insects – *cimex* means “bug” and *fugare* means “to repel.” The species name *elata* means “tall.” Tall bugbane grows west of the Cascade Mountains from Oregon to Washington, and north to southern British Columbia, where it is confined to the Chilliwack Valley. There, it grows in deciduous and mixed wood forests, mainly composed of bigleaf maple, red alder, Douglas-fir and western redcedar. Small gaps in the forest canopy resulting from windthrow, fire or the death of older trees, are important elements of its habitat, as they allow sufficient light to penetrate the understorey. Tall bugbane is also found in disturbed habitats, along road-cuts and in recently logged areas, where plentiful light favours its growth. However, on these artificially open sites, it is quickly out-competed by species more adapted to open habitats.

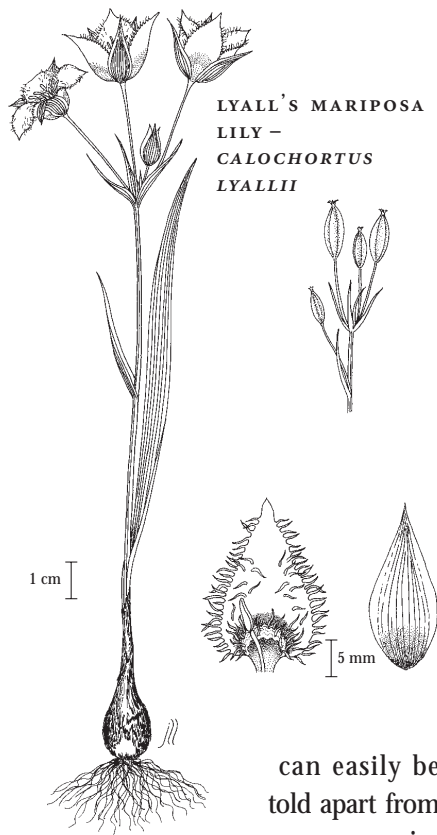
What do they look like?

Lyall's mariposa lily is a 10- to 50-centimetre tall plant that each year arises from a subterranean bulb. It bears a single long, flat basal leaf and up to twelve delicate star-like white flowers.

Even though most populations occur in areas under exploitation, none of these rare species is protected in British Columbia.

The three broadly lance-shaped petals are tinged with a purple crescent at the base and conspicuously fringed with slender hairs. The three sepals, slightly smaller than the petals, display the same purple pattern but lack any fringed margin. The fruit is an erect three-winged capsule, ready to release straw-coloured seeds in

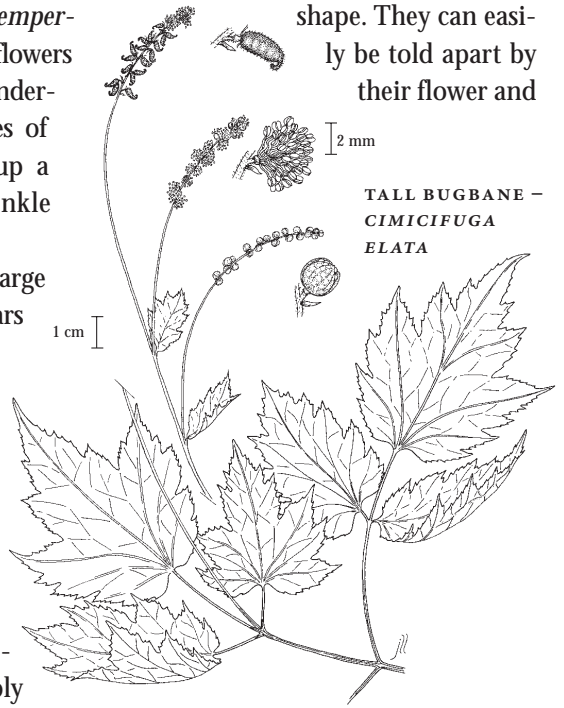
July. Two larger mariposa lilies are also found in the Okanagan grasslands and



LYALL'S MARIPOSA
LILY -
CALOCHORTUS
LYALLII

fruit is an egg-shaped capsule which springs open when jarred even slightly, scattering black, shiny seeds a considerable distance. Only one of the three other species of corydalis found in B.C. is found in Scouler's corydalis habitat. Pink corydalis (*Corydalis semper-virens*), however, has smaller flowers with yellow tips. In the forest understorey, the large dissected leaves of Scouler's corydalis can make up a lush foliage, over which twinkle clusters of pink flowers.

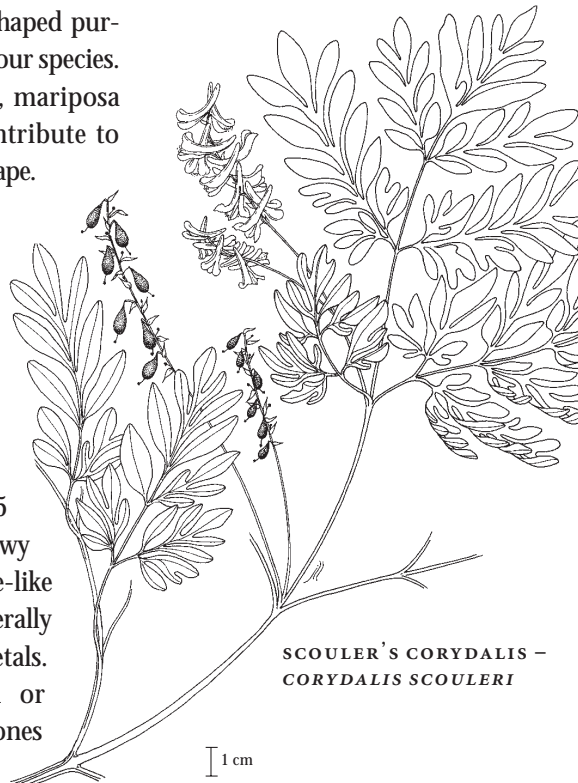
Tall bugbane is a rather large plant, 1 to 2 metres tall, and bears broad compound leaves that look like 3 clusters of maple-like leaves. Its inflorescence is made of 50 to 900 tiny white flowers and resembles a bottle-brush. Because these flowers lack any petals and their sepals readily fall off, they soon consist of only the reproductive organs, most noticeably a starburst of white stamens. When the fruits are dry they split on one side to release small, dark-coloured seeds.



TALL BUGBANE -
CIMICIFUGA
ELATA

can easily be told apart from our rare species by a close look at the flowers. Whereas the sagebrush mariposa lily (*Calochortus macrocarpus*) has lavender petals, the three-spot mariposa lily (*Calochortus apiculatus*) has white petals that lack the moon-shaped purple pattern characteristic of our species. Often covering large areas, mariposa lily populations subtly contribute to the beauty of the local landscape.

Scouler's corydalis is a 60- to 120-cm tall plant that grows from thick rhizomes (creeping underground stems) and bears large spreading leaves, each one dissected into many lance-shaped leaflets. The inflorescence is made of 15 to 20 small, rosy-pink showy flowers, growing in a spike-like cluster. Each flower is bilaterally symmetrical with four petals. One of these is hooded or spurred and the two lower ones are fused to form a lip. The



SCOULER'S CORYDALIS -
CORYDALIS *SCOULERI*

No other species of bugbane is found in British Columbia; our rare species, however, can be confused with a closely related species, baneberry (*Actaea rubra*), which has similar growth habits and leaf shape. They can easily be told apart by their flower and

fruit. Baneberry has larger flowers arranged in a rounded cluster rather than in a bottle-brush style, and bears red or white berries. Although the flowers lack showy petals, the crowded inflorescence of tall bugbane is a cheering sight in the shady woods.

What is their status?

The historical increase or decline of populations of these species is unknown, and all that can be currently assessed is their sparse abundance and vulnerability to habitat change. Even though most populations occur in areas under exploitation, none of these rare species is protected in British Columbia.

Lyall's mariposa lily is known from only 11 sites in the province. It is found on Crown land licensed for both grazing and timber harvesting. Whereas regulations exist that limit the intensity and timing of grazing on

Crown land, no specific legislation protects this species. It is considered threatened in British Columbia and is Red-listed by the Conservation Data Centre (CDC).

Scouler's corydalis has been reported from 18 sites in British Columbia and mainly grows on Crown land administered for timber. Its future largely depends on sound forestry management. The species is Blue-listed, or vulnerable, in British Columbia.

Until recently, tall bugbane was thought to be extirpated (no longer occurring) in Canada, since the last record of this plant in British Columbia dated from 1957. The species was rediscovered in 1996 and field work recently conducted by the CDC confirmed its presence in eight sites. Half of the known sites in B.C. occur in disturbed areas such as logging roads and clearcuts, where the species is not likely to persist. Tall bugbane is rare throughout its range. It is considered vulnerable to extirpation or extinction in Washington, and is a candidate for listing as a "threatened or endangered species" in Oregon. In British Columbia it is considered endangered, and is on the Red List. Two protected areas designated by the BC Ministry of Forests as a "wildlife tree patch" and a "visual landscape unit" are forms of protection this species currently receives in Canada.

Although no current legislation protects these three species, tall bugbane, Scouler's corydalis and Lyall's mariposa lily are candidates for listing as "Identified Wildlife" – species sensitive to habitat alterations associated with forest or range practices. Critical habitats will be

preserved through the implementation of Wildlife Habitat Area and buffer zones. These protection measures could secure the viability of existing populations.

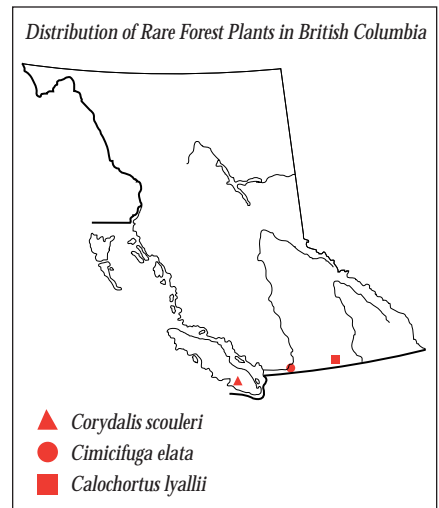
Why are they at risk?

Because Lyall's mariposa lily, tall bugbane, and Scouler's corydalis show a poor ability to propagate and establish themselves in new sites, they rely entirely on the preservation of existing habitats. Today, they are at risk because their habitats are in jeopardy. Extensive logging operations in the Nitinat and Klanawa valleys pose the greatest threat to existing populations

Trends in rare species populations may be valuable indicators of significant environmental changes.

of Scouler's corydalis. Modification and destruction of habitat due to logging threaten tall bugbane populations in the Chilliwack Valley. In the South Okanagan, decline of periodic natural fires, trampling by livestock, and increasing encroachment by exotic

species, all contribute to degrade the habitat of Lyall's mariposa lily. These rare species all depend on relatively young forests. Under normal circumstances, young forests are replaced by mature and old forests, but natural disturbances constantly rejuvenate forest stands, providing suitable habitat for many species. In modern times, human intervention has steadily reduced the frequency of these crucial natural disturbances. Forest fires, critical for the survival of Lyall's mariposa lily, are now much less frequent due to stand management practices. Likewise, current silvicultural practices tend to prevent the



establishment of deciduous trees and the creation of natural canopy gaps in second growth stands, both important components of Scouler's corydalis and tall bugbane habitats.

Depletion of the genetic pool is also a foreseeable threat for these species, because of poor gene flow between Canadian and American populations. The consequences of low genetic diversity can include low resistance to disease, limited ability to adapt to a changing environment, and poor capacity to colonize new sites. All can severely impact a species in the long run. For the tall bugbane, poor genetic diversity is already an issue. Because its flowers lack nectar, it is a poor competitor for pollinators and has adapted by allowing fertilization to occur in the same inflorescence, which reduces the mixing of genes. Its relatively small Canadian populations – ranging in size from 1 to 67 individuals – further compound the problem.

Why are they important?

The preservation of rare species is vital to the conservation of biological diversity in British Columbia. Losing rare plants will add to the impoverishment of our ecosystems, already under severe stress in many places. Although we do not fully understand the dynamic relationships between species, we can be

sure that all species contribute to the richness and the complex balance of the ecosystem they inhabit. For example, Lyall's mariposa lily is a good source of food for a variety of invertebrates and vertebrates that browse on its herbage, fruits and bulb.

Trends in rare species populations may be valuable indicators of significant environmental changes. Lyall's mariposa lily's habitat is an area of high biological diversity threatened by human-induced disturbances. Monitoring of its populations could provide valuable information for the management of large areas of our Douglas-fir forest-grassland complex.

In the same way, sensible management of Scouler's corydalis populations found in the rare Sitka spruce/Salmonberry (*Picea sitchensis/Rubus spectabilis*) community would likely help preserve this unique habitat.

Preserving potential medicinal properties of plants is another reason for the conservation of all biodiversity. Tall bugbane is chemically very similar to a closely related species, black cohosh (*Cimicifuga racemosa*), which is commonly used in Eastern Asia and the U.S. Appalachian region for its medicinal properties. The two species have anti-inflammatory and sedative properties, and other medicinal uses for tall bugbane might one day be revealed.

Losing rare plants will add to the impoverishment of our ecosystems, already under severe stress in many places.

Occurring at the northern range of the species, Canadian populations of Lyall's mariposa lily, Scouler's cory-



SCOULER'S CORYDALIS CAN GROW OVER EXTENSIVE AREAS, ITS LUSH FOLIAGE FORMING A RAISED CARPET IN THE FOREST UNDERSTOREY. Samantha Flynn photo

dalis and tall bugbane, could play a crucial role as centres for expansion and migration in the event of global warming. Peripheral populations sometimes differ slightly from central ones, and can therefore add to the species' adaptability to environmental changes.

Finally, any ecological and genetic studies of these rare species would considerably improve our understanding of species rarity, enhancing our competence in preserving biological diversity.

What can we do?

Finding out more about our rare species is vital for the preservation of B.C.'s biodiversity. What makes these plants rare? Where are they found? Are their numbers going down significantly with time? General and detailed field surveys are required to answer these questions and gather other information needed to implement appropriate conservation strategies.

As individuals, we should become aware of the diversity of life around us, and learn to appreciate it. See what you find in the woods or in the fields near your home. Use field guides available for your region to identify a bird or a flower. Join or support local naturalist organizations that promote education about and conservation of these rare organisms. The South Okanagan Conservation Strategy coordinates research and inventory in that region. The Federation of BC Naturalists and the Okanagan-Similkameen Parks Society are involved in habitat conservation. Supporting land

acquisition by government and private agencies, such as The Nature Trust of B.C. and The Nature Conservancy of Canada, is an effective way to help protect our natural heritage.



THE ELABORATE CLUSTER OF SCOULER'S CORYDALIS FLOWERS IS A SPECTACULAR SIGHT IN THE FOREST. Photo: Gerry Allen

Preserving existing populations of Lyall's mariposa lily, tall bugbane, and Scouler's corydalis is the only way to ensure their survival. Land acquisition for the creation of parks and reserves, along with the implementation of protected areas will secure some of these populations. Sound forest management that maintains and mimics natural disturbances will support these species and overall biological diversity. Thinning stands by removing a few large trees, and burning of small patches in Douglas-fir forests, are management tools that favour tall bugbane and Lyall's mariposa lily populations. Responsible logging practices that preserve margins along water courses should



THE BOTTLE-BRUSH INFLORESCENCE OF TALL BUGBANE HAS NO EQUAL IN THE SHADY WOODS.

Lois Kemp photo



IN THE FOREST UNDERSTOREY, TALL BUGBANE ABSORBS LIGHT THROUGH GAPS IN THE CANOPY.

Lois Kemp photo




LYALL'S MARIPOSA LILY RANKS AMONG THE MOST ATTRACTIVE WILDFLOWERS OF THE SOUTH OKANAGAN.

Steve Cannings photo

spare most of our known Scouler's corydalis populations.

Solutions are available and protection is possible. As long as we care

and value the diversity of life enough to take action, there is a chance that these species will remain a part of our Canadian legacy. 

FOR INFORMATION ON RARE SPECIES AND ECOSYSTEMS, CONTACT:

BC Conservation Data Centre
 Ministry of Environment, Lands and Parks
 PO Box 9344 Stn Prov Govt
 Victoria, British Columbia V8W 9M1
www.elp.gov.bc.ca/wld/cdc

FOR MORE INFORMATION ON HABITAT ACQUISITION PROGRAMS, CONTACT:

Habitat Conservation Trust Fund
 PO Box 9354 Stn Prov Govt
 Victoria, British Columbia V8W 9M1
www.elp.gov.bc.ca/hctf



LYALL'S MARIPOSA LILY IS ONLY KNOWN FROM 11 SITES IN A SMALL AREA OF SOUTHERN BRITISH COLUMBIA.

Mike Miller photo

BROCHURE FUNDING PROVIDED BY

Forest Renewal British Columbia

ISBN 0-7726-7660-7

MELP 973744.299

FEBRUARY 1999

TEXT BY MARIE FONTAINE AND GEORGE DOUGLAS
 COVER ARTWORK COPYRIGHT MICHAEL HAMES
 LINE DRAWINGS BY JANE LEE LING
 DISTRIBUTION MAP BY RICHARD PAWLAS
 DESIGN BY ARIFIN GRAHAM, ALARIS DESIGN
 PROJECT COORDINATION BY ANDREW HARCUMBE
 AND LAURA FRIIS

Printed in British Columbia on recycled paper with vegetable inks

Q.P. 4500015472

