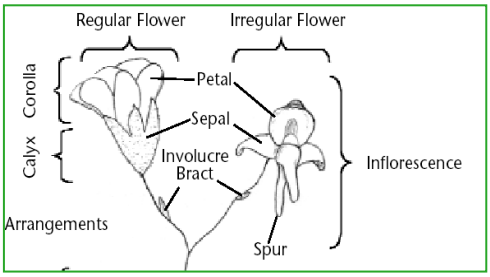
SCCP Species Profile – August 2010 Version

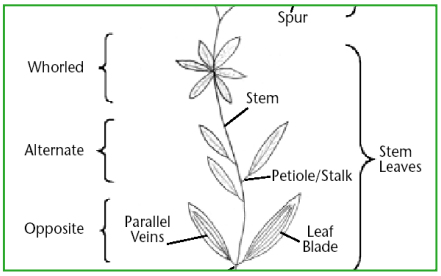
BC's Coast Region: Species & Ecosystems of Conservation Concern
Streambank Lupine (*Lupinus rivularis*)

Global: G2G4 Provincial: S1 COSEWIC: E BC List: Red

Notes on *Lupinus rivularis*: A member of the family Fabaceae ("pea"), this species is also referred to as "riverbank lupine." Lupines as with most members of the pea family are adept at fixing nitrogen from the atmosphere into ammonia via "rhizobium-root nodule symbiosis." Their root nodules host nitrogen fixing bacteria, fertilizing the soil for other plants. This adaption allows lupines to grow in poor soils as well as being pioneers in changing soil quality to support other plant species.

Plant Anatomy





Description

Height up to 60 cm. This herbaceous perennial carries spikes (racemes), of blue to lavender coloured flowers. Unlike many other species of lupine, the stems lack basal leaves. The alternate palmate leaves are divided into 6-9 leaflets, with the upper surface hairless and the underside bearing minute hairs. Seeds are produced in up to 5cm long pea-pod like structures which become blackened and hairy as they age. When fully mature, the pods split open explosively.

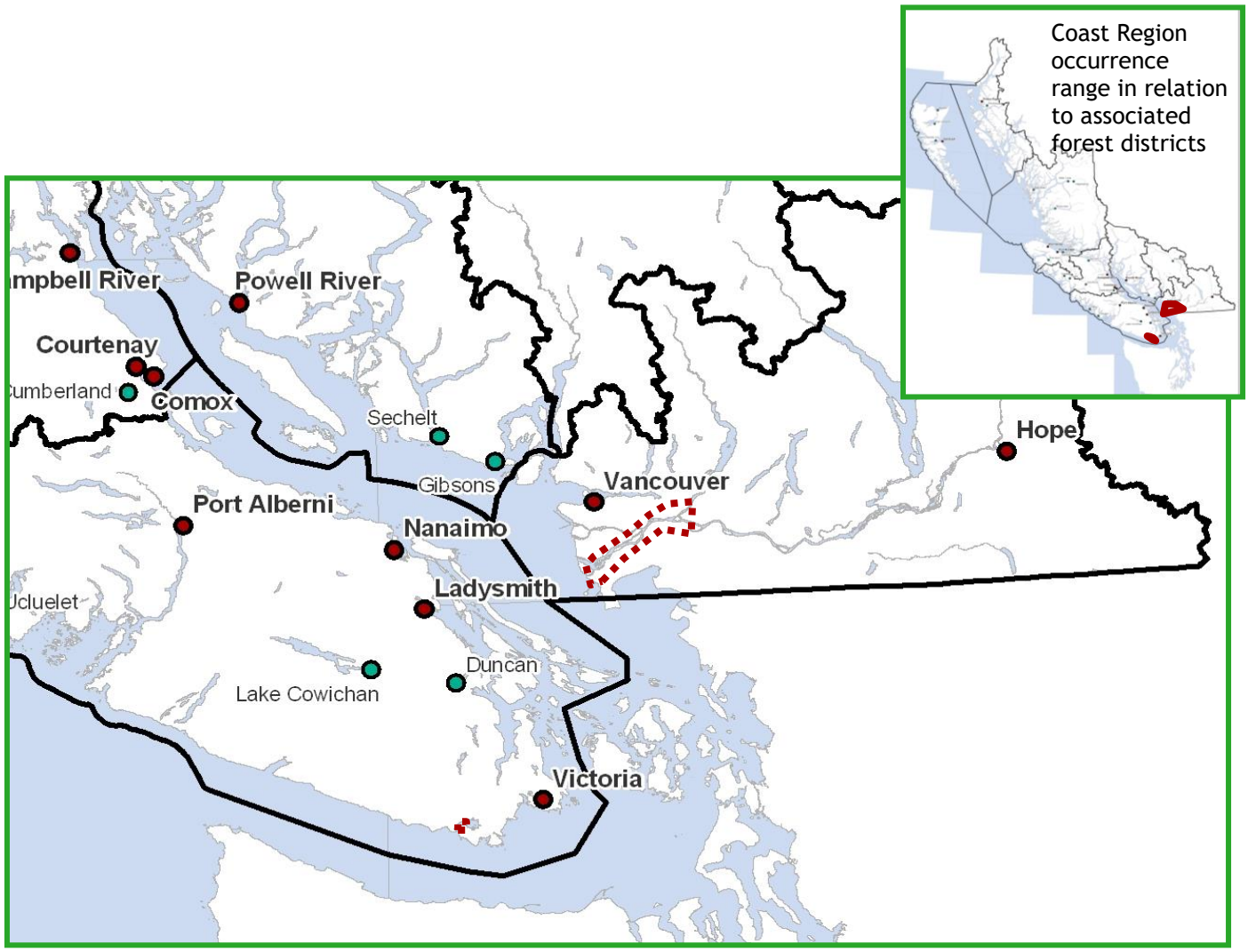
Look's Like?

Streambank lupine can be distinguished from other lupine species within its range in BC by its early flowering season (early May), upright habit and delicate leaves lacking hairs on the upper surface. Seashore lupine is the most likely plant to be mistaken for streambank lupine in the Fraser Lowlands. Seashore lupine has long silky hairs and grows in a low sprawling manner. Broadleaf lupine, a newly reported species in BC may also cause some confusion.

Seashore Lupine

Distribution

Streambank lupine is found only on the west coast of North America, from southwestern British Columbia to northwestern California. In Canada it is currently known from approximately five locations including Sooke on southern Vancouver Island, Delta, Surrey, and along the Coquitlam and Pitt Rivers. Populations are small, with only 1 to 100 individuals, and presently consist mainly of seedlings with only a few mature plants (the result of mowing and other disturbances). The Sooke location, an alluvial floodplain site, consisted of only a single plant, which has not been seen since 2003 and may have been extirpated as a result of severe flooding events.



Streambank Lupine (*Lupinus rivularis*), known range of population occurrences (red-dotted line) for the Coast Region

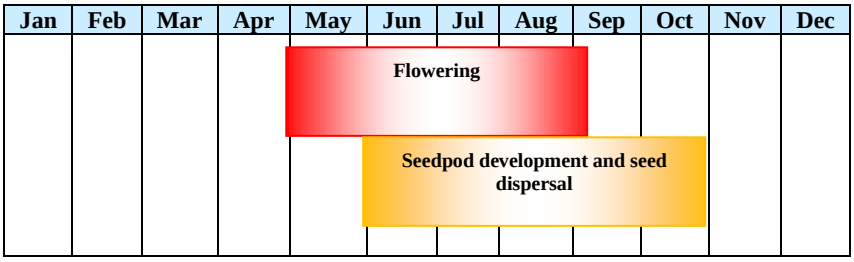
Habitat Preferences

On the Coast Region streambank lupine is found at low elevations along the banks of sloughs, streams, creeks and rivers. Populations in Delta and other Fraser Lowland locations include gravel dykes and the gravel beds of railway lines. Common features of these sites are limited groundcover and low competition from other plants. Plants have also been known to grow under trees as long as sufficient drainage and light is available.

Critical Features

Specific ecological requirements (e.g. specific soil chemistry needs) are not known for this species. Populations in the Fraser Lowlands appear to have limited spread and recruitment in the locations where they are found. As with other lupines, it may be that this species requires highly specific soil conditions and microorganisms to assist in seed germination.

Common characteristics are moist, sandy or gravelly soils. This species is not restricted to naturally occurring fluvial areas or areas near open water.



Seeds are dispersed through the explosive rupturing of the seed-pods which can drop seeds up to 8 meters from the parent plant. Seeds are further dispersed by birds and rodents.

Threats

- Habitat loss, encroachment and population fragmentation from land use conversion and development may contribute to the limited distribution and colonization success of this species.
- Dykes built along the Fraser River have altered hydrological conditions and may have left many of the original populations lacking the moisture levels needed to persist.
- The present remaining populations occur on Fraser tributary and floodplain dykes or along railway beds making this species vulnerable to site maintenance activities, including mowing, clearing brush, spraying, track maintenance, grading and dumping.
- Many lupine species hybridize in the wild. Streambank lupine is reported to hybridize with the invasive yellow bush lupine and seashore lupine. In the case of yellow bush lupine this can result in "genetic swamping" in which the genes of this more robust or aggressive species overwhelms the less dominant genes of streambank lupine. This produces hybrids with little trace of streambank lupine's characteristics. As these hybrids reproduce and continue to spread they will likely compete with and may ultimately eradicate the original pure streambank lupine population.
- With so few remaining populations and individual plants in BC, this species is especially vulnerable to plant harvesting, flower picking and seed collecting. Seedlings are also targeted by introduced slug species.
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Conservation & Management Objectives

- Apply conservation and management objectives for this species as set out in the "National Recovery Strategy for the Streambank Lupine (*Lupinus rivularis*) in Canada (in draft) and the published Assessment and Status Report on the Streambank Lupine *Lupinus rivularis* in Canada."

- Collection activities should be limited and apply practices identified in the Province's "Voucher Specimen Collection, Preparation, Identification and Storage Protocol: Plants & Fungi." Inventory activities should consider approaches and references identified in E-Flora's Protocols For Rare Vascular Plant Surveys.

Specific activities should include:

- Protection of all known locations through land stewardship and outreach mechanisms is critical if this species is to continue to persist in British Columbia.
- Further inventory should be conducted in the Fraser Lowlands and on Vancouver Island to determine the current extent of this species in BC.
- Further research is needed to better understand the conservation needs of this species. In addition to factors that limit seed dispersal and spread, further information is needed on life history, population dynamics, substrate requirements and relationships with soil microorganisms.
- Signage and or fencing as a means of site management will reduce potential impacts from rail bed or dyke maintenance (e.g. mowing, spraying).
- Activities to assist in seed propagation such as mowing, should be restricted to management of competitive species or to mimic natural disturbance regimes in floodplain areas.
- Effective long-term control and reduction in competition from invasive or aggressively spreading vascular plants (e.g. invasive grasses, Himalayan blackberry) must form part of strategies to protect and recover populations. Disturbance to rare plant species and communities must be minimized during control activities.

This species is listed under the Federal Species at Risk Act (SARA) and may be subject to protections and prohibitions under the BC Wildlife Act. Habitat for this species may also be governed under provincial and federal regulations including the Fish Protection Act and Federal Fisheries Act as well as Regional and local municipal bylaws.

Content for this Factsheet has been derived from the following sources

B.C. Conservation Data Centre. 2010. [Internet] Species Summary: *Lupinus rivularis*. B.C. MoE.
Douglas, G.W., D.V. Meidinger, and J. Pojar (editors). 1999. Illustrated Flora of British Columbia. Volume 3: Dicotyledons (Diapensiaceae Through Onagraceae). B.C. Ministry of Environment, Lands & Parks and B.C. Ministry of Forests. Victoria. 423p.
E-Flora. 2010. [Internet] Electronic Atlas of the Plants of British Columbia
Jarvis, Cassy (Editor). 2008. [Internet] Burke Museum of Natural History and Culture. University of Washington, Seattle, Washington.
Klinkenberg, Brian. 2005. [In draft] National Recovery Strategy for the Streambank Lupine (Lupinus rivularis) in Canada. BC Ministry of Water, Land and Air Protection, Surrey.
Klinkenberg Rose. 2010. [Pers. Communication]
Klinkenberg, Brian and Rose Klinkenberg. 2001. [Internet] COSEWIC Status Report on the Riverbank Lupine (Lupinus rivularis) in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa.
Ministry of Environment, Lands and Parks Resources Inventory Branch. 1999. [Internet] Voucher Specimen Collection, Preparation, Identification and Storage Protocol: Plants & Fungi. Standards for Components of British Columbia's Biodiversity No. 4b
Polster, D. et al. 2006. [Internet] Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia. Prepared for the BC Ministry of Environment. Victoria (BC).

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[1]Original account prepared by Cindy Sayre.

Every effort has been made to ensure content accuracy. Comments or corrections should be directed to the South Coast Conservation Program: info@sccp.ca. Content updated August 2010.

Image Credits: Streambank lupine (Delta BC population): Mike Brotherston, Streambank lupine close-up (Port Coquitlam population): Niall Williams, Seashore lupine: Brian Klinkenberg, Habitat: Mike Brotherstone (railbed) / Pamela Zevit (gravel bar), Plant anatomy graphic: Gilbert Proulx. Only images sourced from "creative commons" sources (e.g. Wikipedia, Flickr, U.S. Government) can be used without permission and for non-commercial purposes only. All other images have been contributed for use by the SCCP and its partners/funders only.