

BC's Coast Region: Species & Ecosystems of Conservation Concern
Western Brook Lamprey (Morrison Creek Population) (*Lampetra richardsoni*
pop. 1) Global: G4G5T1Q Provincial S1: COSEWIC: E BC List: Red



Notes on *Lampetra richardsoni* pop. 1: This member of the family Petromyzontidae (“lampreys”), a cartilaginous, jawless fish is also referred to as “Morrison Creek Lamprey”. The Morrison Creek population occurs as both a non-anadromous, non-parasitic and parasitic form. Three other species of lamprey have been identified in BC: Western Brook Lamprey (a non-anadromous, generally non-parasitic fluvial species), Pacific Lamprey (anadromous and parasitic, commonly found in coastal fluvial and marine environments), River Lamprey (anadromous and parasitic and quite common in the Fraser River and Strait of Georgia) and Cowichan Lake Lamprey (non-anadromous parasitic species found only in the Cowichan Lake watershed).

Description

Length: 10-15 cm. Colouration is silver in immature individuals darkening to a slate-grey, brown or black dorsal colouration as they mature sexually. The ventral area on most age classes is pale grey to white.

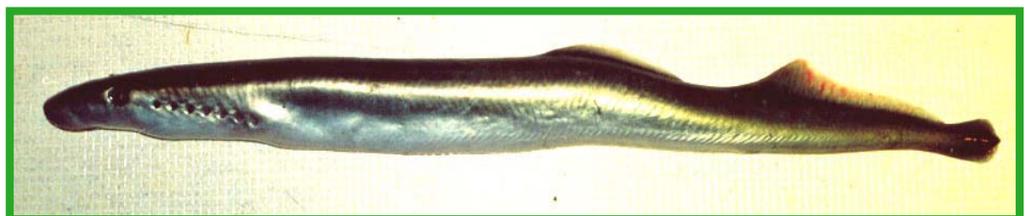
Adults of the parasitic form remain silver and do not become fully coloured and sexually mature until the following spring after metamorphosing from their ammocoete (larval) stage (which can last 3-7 years). They remain in a juvenile phase for a year lacking external sexual characteristics such as larger fins and a shorter caudal (tail) fin. They do however develop sharp teeth in their mouth disc - a trait of parasitic forms of this genus, and may be larger than their non-parasitic counterparts. The non-parasitic form develops small teeth which quickly wear down. No juvenile phase occurs and adults transition into an advanced state of sexual maturity and are ready to spawn immediately after metamorphosing. Sexually mature non-parasitic adults may be smaller than ammocoetes. Ammocoetes have sightless eyes and lack the teeth and disc mouth of adults. Instead the mouth is covered with an oral hood (tissue membrane). The majority of growth occurs when ammocoetes begin to metamorphose into juvenile and adult forms.

Diet

Ammocoetes are filter feeders using their oral hood to filter detritus and microscopic plant and animal matter. This population becomes both parasitic and non-parasitic after metamorphosing. In its parasitic form lamprey feed off other live fish (e.g. Coho Salmon and Coastal Cutthroat Trout juveniles and adults). The fully developed mouth disc is used to sucker onto fish allowing the rasping teeth and mouth parts to penetrate the flesh and consume blood and tissue. The non-parasitic form, which becomes sexually mature shortly after metamorphosis to an adult, does not feed, dying shortly after spawning.

Look's Like?

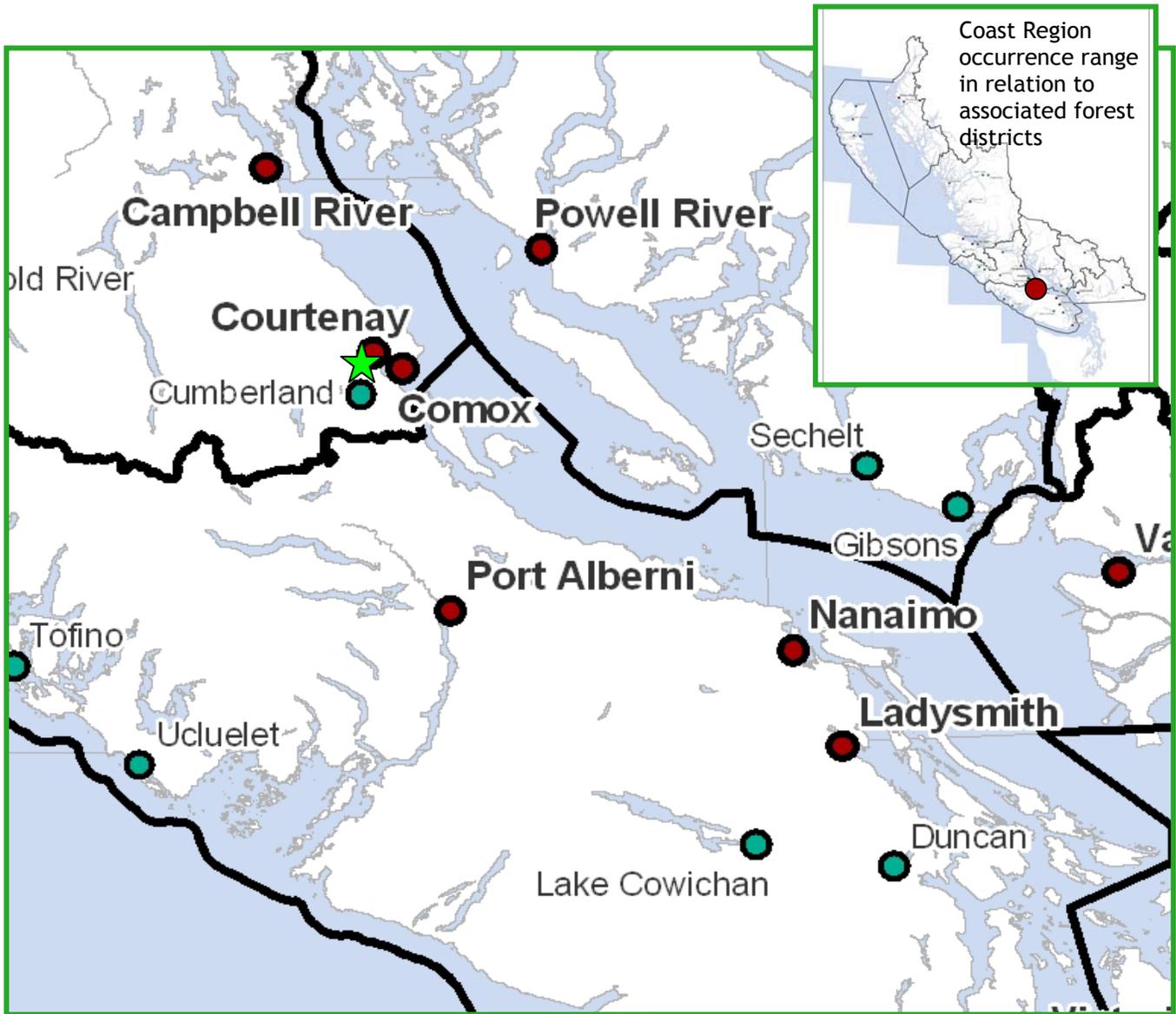
The larger Pacific Lamprey also occurs in the Morrison Creek/Puntledge watershed. Pacific Lamprey, which are anadromous are easily identified by their larger size and more heavily toothed mouth disc. Ammocoetes of Pacific Lamprey also tend to be larger than Western Brook Lamprey and have different fin shape characteristics.



Pacific Lamprey

Distribution

Elevations 130 m: While Western Brook Lamprey are widely distributed throughout western North America and the Coast Region, this unique polymorphic population (one species taking on multiple life history forms) is restricted to the Morrison Creek watershed, a tributary to the Puntledge River system on Vancouver Island.



Western Brook Lamprey Morrison Creek Population (*Lampetra richardsoni* pop. 1), known occurrence range (green star), for the Coast Region.

Habitat Preferences

The Morrison Creek area is characterized by a series of well connected headwater wetlands with meadows, thick brush, beaver dams and open water ponds. The mainstem streambed is dominated by compact till (mix of clay, sand, gravel and rock), with limited patches of small loose gravel ideal for spawning. An abundance of woody debris provides cover and maintains stream temperature.



It is assumed as with other lamprey species access to clean gravels influenced by groundwater or subsurface upwelling is key to selection of spawning sites and successful incubation for the Morrison Creek population.

Critical Features

Spawning habitat is a key component, adults aggregate in well oxygenated, cool areas of clean, small to medium sized gravels in the stream channel. Spawners use their bodies as well as their mouth discs to move individual pieces of gravel to create redds (scooped out nest depressions) to deposit their eggs.

Seasonal Life Cycle

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
				Spawning May – July, eggs hatch a short time after spawning							
Non-parasitic forms spawn following spring, parasitic forms do not sexually mature for another full year until their second spring after metamorphosis								Adult metamorphosis occurs September, after 3-7 years as ammocoetes. Both parasitic and non-parasitic forms overwinter in substrate.			

After hatching ammocoetes bury in soft substrate until metamorphosis. As with other lamprey species, Western Brook Lamprey (including the Morrison Creek population) only spawn once then die.

Threats

- ◆ Restricted distribution makes this population highly vulnerable to changes in the water quality and hydrological regime of the watershed it occurs in.
- ◆ Habitat loss through urban encroachment and highway construction pose a significant threat to this population.
- ◆ Overall lack of knowledge on this unique population’s general biology and habitat needs.
- ◆ Impacts from runoff and sedimentation from adjacent land use activities such as residential/commercial development may impact spawning habitat.

Conservation & Management Objectives

- ◆ Apply conservation and management objectives as set out through the “Recovery Strategy for the Morrison Creek Lamprey (*Lampetra richardsoni* var. *marifuga*) in Canada”
- ◆ Inventory and monitor using methodology set out in the RISC “Reconnaissance (1:20,000) Fish and Fish Habitat Inventory: Standards and Procedures.”

Specific activities should include:

- ◆ Further monitoring is needed to assess this population's general biology including life history, dispersal patterns, population trends and genetic variability in relation to other lamprey populations in the Coast Region.
- ◆ Protection of surface and sub-surface hydrological interactions is critical (e.g. protection of the hyporheic or groundwater - streambed interface zone and groundwater sources in spawning areas).
- ◆ Clear-span crossings are preferred. Culvert crossings should be a minimum 2 m diameter with open bottoms with natural substrate, no longer than 30 m and should not have large drops that would impede small mammal (or fish) movement. On long culverts that are dark in the middle, consider the use of grates that will allow light and rain to enter.
- ◆ Reduce sediment entry and minimize loading of contaminants into ground and surface waters and infilling of spawning areas. Protection of spawning zones may be warranted.
- ◆ Encourage stewardship amongst private landowners, the general public and through land use decision making and associated maintenance activities.
- ◆ Increase awareness about the sensitivity and value of lamprey species and their role in the health of watersheds where they occur.

This population of Western Brook Lamprey is listed under the Federal Species at Risk Act (SARA) and is subject to protections and prohibitions under the BC Wildlife Act. Habitat for this species may also be governed under other 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

Report for *Lampetra richardsoni* pop. 1

BC Fisheries Information Services Branch. 2001. [Internet] Reconnaissance (1:20,000) Fish and Fish Habitat Inventory: Standards and Procedures. Resource Inventory Standards Committee.

National Recovery Team for Morrison Creek Lamprey. 2007. [Internet] Recovery Strategy for the Morrison Creek Lamprey (*Lampetra richardsoni* var. *marifuga*) in Canada. Species at Risk Act Recovery Strategy Series, Fisheries and Oceans Canada, Ottawa. v + 24 pp.

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).

Proulx, Gilbert et al. 2003. A Field Guide to Species at Risk in the Coast Forest Region of British Columbia. Published by International Forest Products and BC Ministry of Environment. Victoria (BC).

The Recovery Team for Non-game Freshwater Fish in British Columbia. 2010. [Internet] Western Brook Lamprey (Morrison Creek population).

Prepared by: Pamela Zevit of Adamah Consultants for the South Coast Conservation Program (SCCP) in partnership with: International Forest Products (Interfor), Capacity Forestry (CapFor) and the BC Ministry of Environment (BC MoE), E-Flora and E-Fauna the Electronic Atlas of the Flora and Fauna of BC, Species at Risk & Local Government: A Primer for BC. Funding for this factsheet was made possible through the Sustainable Forestry Initiative (SFI): <http://www.sfiprogram.org/>

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: Western Brook Lamprey (Morrison Creek): Jim Palmer, Pacific Lamprey; Alexei Orlov, Habitat: Pamela Zevit. 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.