



British Columbia's Lake Lamprey, Rare and Little Known

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It is a blood-sucking parasite, an immutable descendant of an ancient and distinguished line of parasites. It is a fish with no spine and no jaws—its kind has done quite nicely with neither of these evolutionary frills for over 280 million years. Its name is *Lampetra macrostoma*: the stone sucker with the big mouth. It shows hardly any interest in sucking stones however. Doing itself no favors, it feeds on the blood of fishes held in much higher regard than it could ever hope for. It is a lamprey, commonly known—or little known—as lake lamprey. It can be found in only two connected lakes on British Columbia's Vancouver Island: Cowichan and Mesachie Lakes.

Its eel-like body, barely a foot in length when fully grown, is built around a flexible internal rod, or notochord. The head, shaped and supported by soft cartilage, sports two believable fish eyes and a single nostril right between them. A short distance behind and below each eye there is a row of seven round gill openings. From this point on, the body extends in the form of repeating muscle segments, or myomeres, their arrangement faintly discernible through the smooth and slimy skin. It has no pectoral or pelvic fins, but only two soft dorsal fins, the rear one extending into the spear-shaped tail.

In agility and speed it measures up to any of its potential hosts. Being practically black, however, and almost invisible at night, it probably uses nocturnal stealth to attach itself to the sides of its victims. Its fatal grip is made decisive with its circular, oversized mouth, a mean-looking suction disc seemingly made out of nothing else but rings of horny teeth.

With the rasping action of its incisive tongue it makes short work of scales, skin and tissue, and through a well-placed hole starts draining blood and vital fluids. A steady drool of an anti-coagulant released into the open wound keeps the liquid diet flowing, until eventually the host is weakened or even killed. The lake lamprey will then move on to find another victim and then another and another. A large number of cutthroat trout, coho salmon, and Dolly Varden swimming in Cowichan and Mesachie Lakes carry the bloody round scars of at least one troublesome encounter with the lamprey. The injury invites infection and potential death, yet the many survivors suggest that the attacks are only infrequently fatal.

The lake lamprey feeds on the blood of fishes only as an adult, and unlike its anadromous relative the Pacific lamprey (*Lampetra tridentata*), does so only in fresh water. The lake lamprey is non-anadromous: it has the opportunity to reach the sea through the Cowichan River, but shows no proclivity to make a dash for it—despite the fact that in the lab it has been able to survive in salt water. So there it stays, a homebody of Cowichan and Mesachie lakes, feeding on the blood of highly prized salmonids, from its first bite to its last for about two years. And then, finally mature, it stops feeding, and from May to August it may be seen milling about over shallow gravel bars where spawning takes place. That is when the “stone sucking” title comes from the name. Both male and female rearrange stones with their mouths to construct a shallow nest. Their anadromous relatives suck stones to hold their position against stream currents, scale rapids, and even ascend hazardous waterfalls. Lake lamprey may build several nests during spawning, laying in them successfully a few hundred eggs. In the process several males may gather around and spawn with a single female. When they complete their spawning all lampreys die.

This article, under the title “Our Very Own Lake Lamprey, Rare and Little Known,” originally appeared in The Victoria Naturalist Vol. 55.4, Jan.-Feb. 1999, and is reprinted here by permission from the author and publisher.

The larvae that emerge from the eggs are called ammocoetes, and may stay buried in U-shaped tunnels in the silty bottom of the lake for almost six years. They resemble their parents, but have no teeth and their eyes are covered with a membrane. They filter feed with tentacles under an oral hood, shifting through detritus for algae, diatoms and protozoans. It is a lowly diet, to be sure, but after six years on it they slowly grow to half a foot. Still, six years of eating muck is six years too many, and finally, throughout the summer and into the fall, they gradually metamorphose into convincing looking lampreys, ready to swim away and suck blood.

This is a curious and interesting lifestyle, but certainly the later part of it does not make easy friends for the lake lamprey, and it is the lake lamprey, of course, who is most in need of friendship. No sooner was it described and declared a new species by Richard J. Beamish in 1982, that it was designated rare, or vulnerable, by the Committee on the Status of Endangered Wildlife in Canada in 1986. Not that anyone is going to be alarmed by all the apocalyptic epithets, but one may rest assured that the lake lamprey is in no danger of extinction. In the language of animal welfare, “vulnerable” is a “species of special concern because of characteristics that make it particularly sensitive to human activities or natural events.” But what is it that makes this parasite unique?

The lake lamprey is a “derivative” form of the Pacific lamprey. The latter is in no shortage of derivative forms, with at least five of them carrying a distinct species designation. The lake lamprey has the largest mouth of them all. Besides other obscure morphological and physiological differences, it also differs from them in the size of the eyes, in the position of its gill openings, and in the number and coloration of its velar tentacles (located between the pharynx and esophagus, protecting the gill chamber from solid chunks of food). Most important, however, the lake lamprey is the only known freshwater parasite in British Columbia. And this is perhaps the attribute that makes it so distinct.

Despite the absence of physical barriers and the fact of living in proximity, the lake lamprey does not mingle or interbreed with the anadromous Pacific lamprey. It is an ostensibly simple adaptation of two closely related species, but the detailed story, hidden in the glacial past of Vancouver Island, may hold important knowledge inexorably locked in the fate of *Lampetra macrostoma*. This, at any rate, is the case made by Richard J. Beamish in defense of his newly discovered lamprey. But one can easily picture the man sunk in his chair in utter resignation. A unique case study in evolutionary history? Try to present this as a supportive statement to the

“outdoor enthusiasts” who enjoy pursuing plentiful, unblemished trout—despite the fact that they are the ones who are most likely to kill their catch.

Regardless of favorable arguments, however, all lampreys are damned to exist until the end of time under the grim legacy of their East Coast relative the sea lamprey (*Petromyzon marinus*)—the “vampire of the Great Lakes.” Sometime in the last century, it found its way into the upper Great Lakes, established itself there, and by the end of the 1950s had nearly wiped out the stocks of lake trout and other commercial fish species. As a note on interest, the sea lamprey had been denied access to the Great Lakes by the impervious force of Niagara Falls, until the man-made Welland Canal disrupted this natural arrangement and opened up an artificial pathway. All the same, in the public eye, the sea lamprey incident made “lampricide” universally fashionable and justifiable, and one of the derivative forms of the Pacific lamprey, *Lampetra minima*, has already paid the price of extinction by deliberate extermination. [Ed. note: *L. minima*, the Miller Lake lamprey, have since been rediscovered; see “Riffles” item on p. 29 of the Spring 2000 AC.]

In this dim light, instead of a plea for protection, the lake lamprey should consider itself lucky it has avoided preemptive persecution. Our self-serving attitudes aside, of course, no creature on this planet needs our justification in order to exist. Unfortunately, they all need our sympathy, because invariably our self-righteous activities pose the most serious threat to their existence. True, given its unsavory parasitic habits, a low profile may be the lake lamprey’s best bet. But then again, knowing a few things about this strange creature may help us grow a bit more sympathetic.

References

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