

Western brook lampreys at the northern extent of their range



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Figure 1. Western brook lamprey (*Lampetra richardsoni*)

Introduction

The western brook lamprey is a small, nonparasitic lamprey that spends almost its entire life buried in silt, preferring areas with gentle currents but not stagnant water. The northern extent of the range of this species is believed to be in coastal southeastern Alaska.

Our interest in western brook lampreys was piqued in 2002 when an apparently isolated population was discovered upstream of a large waterfall near Petersburg, Alaska. Western brook lampreys had previously been collected from only three locations in the state, and we wondered how unusual this population was. Are western brook lamprey populations truly rare in southeastern Alaska or have they just avoided detection?

We set out to improve our understanding of where and when to look for western brook lampreys in southeastern Alaska.

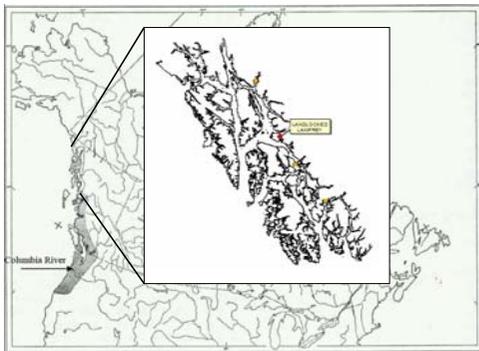


Figure 2. Distribution of *Lampetra richardsoni* (from Scott and Crossman 1973). Inset shows pre-2002 specimen records from southeastern Alaska, and the location of the isolated population discovered in 2002.

Methods

Spawning adults of the Petersburg isolated population had been found in a small, low gradient tributary immediately upstream of a large beaver pond complex. By searching other low gradient, gravel stream channels upstream of beaver ponds, we soon found three more populations in central southeastern Alaska. For the last three years (2005-2007), we monitored one of these (non-isolated) populations in a 700m study reach to determine the timing of spawning and the appearance and longevity of redds.

Settings

All of the spawning lampreys we have found in southeastern Alaska were in low gradient (<6%) gravel streambeds immediately upstream of lakes or, most commonly, beaver ponds:



Figure 3: Beaver pond where lampreys presumably spend their ammocoete stage.

Lampreys and redds were almost invariably located at a pool tailout, just above the head of a riffle and slightly to one side of the main current.



Figure 4: Typical location of lamprey redds.

We have prepared a training video to instruct field biologists where and when to look for spawning lampreys and their redds. In 2008, we will ask biologists visiting apparently suitable sites during the spawning season to record whether lampreys or redds were present.

Results and Discussion

Timing

The timing and length of the lamprey spawning season varied dramatically during the three years of our study. Each year, spawning occurred later than the year before, and the spawning season was also shorter than the previous year.

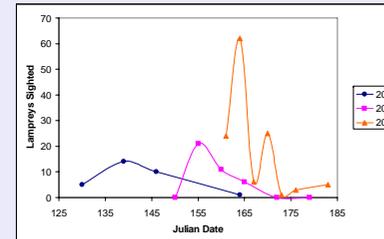


Figure 5: Numbers of lampreys sighted on each visit when lampreys were present.

Spring also arrived later in each of the successive years of our study. The onset of spawning appears to correlate well with the point when the mean daily stream temperature reached about 8°C.

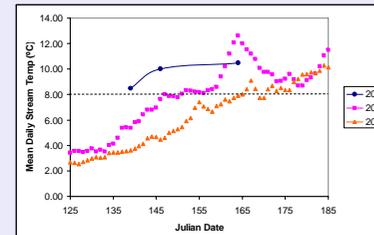


Figure 6: Mean daily stream temperatures.

In southeastern Alaska, lampreys were only visible in streams during a short period of about 3-5 weeks, which fell fairly early in the field season (mid-May to late-June).

We expect that more brook lamprey populations may be identified in southeastern Alaska once biologists are made aware of the timing of the brief window when northern populations can be observed.

Redds

Redds were typically about 4 cm deep and 20 cm in diameter, sometimes ringed by a lip of excavated material. Redds often resemble the circular hoofprints of large ungulates. Where algae was present on stream gravels, redds could be recognized by the absence of algae in the disturbed area around the redd.



Figure 7: Redd showing both excavated area and disturbance to surrounding algae.

Redd detections were greatest about 7-10 days after the peak of spawning. The length of time during which redds could be detected was variable, coming to an end when a high flow event occurred or above-normal stream temperatures resulted in the rapid regrowth of algae.

While redds were sometimes easily recognized, at other times they were not, even when occupied by spawning lampreys. Redds could easily be confused with hoofprints of large ungulates, especially moose. Redd detection rates varied noticeably between observers. Furthermore, the prominence of redds varied between streams, depending on such factors as substrate type and presence of algae.

Though redd surveys can be informative, we feel that they are not a reliable way to assess the presence of western brook lampreys in southeastern Alaska.