

Western Brook Lamprey

Interim Risk Assessment

The status of the Western Brook Lamprey SMU was assessed by evaluating six interim criteria. The criteria were identical to those used for assessing salmonids, except that abundance and productivity could not be quantitatively assessed. The SMU was considered to “pass” each interim criterion only if all three populations passed that particular criterion. Western brook lampreys are considered as “at risk” because only three of the interim criteria were met.

The western brook lamprey is probably the second most common and widely distributed lamprey in Oregon after the Pacific lamprey (Kostow 2002). Western brook lampreys have no special state or federal status. In 2003, eleven environmental organizations petitioned for the listing of western brook lamprey and three other lamprey species as endangered in Oregon, Washington, Idaho, and California by the U. S. Fish and Wildlife Service under the Endangered Species Act. The petition cited western brook lamprey as being vulnerable to habitat losses due to reduced river flows, water diversions, dredging, streambed scouring, channelization, inadequate protection of stream side vegetation, chemical pollution, and impeded passage. Introductions of exotic fish predators such as smallmouth bass were also cited as a factor in the decline of lamprey. The U.S. Fish and Wildlife Service recently determined that the petition does not contain sufficient information to warrant further review.

Existing Populations

Little is known about western brook lamprey, with detailed life history and behavior observations limited to one study in British Columbia (Pletcher 1963). It is likely that western brook lamprey movement is minimal, and that most remain within their stream of origin. This lack of movement has likely resulted in significant population structure among western brook lampreys, but no supporting information exists. The relatively wide distribution of western brook lamprey makes it prudent to assess status in multiple areas; however, assessment of each possible population is not feasible. This report therefore summarizes information from three areas, even though each may contain more than one population: coastal, lower Columbia/Willamette, and interior Columbia (Table 1).

Table 1. Population list and existence status for the Western Brook Lamprey SMU.

Exist	Population	Description
Yes	Coastal	All coastal basins within Oregon other than the Columbia.
Yes	Lower Columbia/Willamette	Columbia River basin downstream from Bonneville Dam, including the Willamette River subbasin.
Yes	Interior Columbia	Columbia River basin upstream from Bonneville Dam.

Habitat Use Distribution

To pass this criterion, a population must currently occupy at least 50% of the historically used habitat. Evaluation of the criterion was based primarily on records of western brook lamprey presence in fish inventory surveys. Historical distribution is not well known in some areas, but western brook lampreys were likely widely distributed throughout coastal streams and the lower Columbia River basin. Documentation of current distribution is somewhat confused by the difficulty in identifying lamprey ammocoetes to species.

Western brook lampreys remain present throughout most Oregon coastal streams. Although the extent of distribution is not known, it is believed that they occupy more than half of their historic habitat. Therefore, the coastal population passes this criterion. Distribution in coastal streams has been somewhat reduced in upstream reaches of basins because of road culverts that act as passage barriers.

Little data specific to western brook lampreys exists for the lower Columbia/Willamette population. Dams in the Clackamas, Santiam, McKenzie, and Middle Fork Willamette subbasins have blocked passage of Pacific lampreys, but a small number of brook lampreys have been observed above North Fork Dam on the Clackamas River. Numerous road culverts and habitat degradation have likely precluded distribution of western brook lampreys in numerous areas. For example, recent surveys documented lampreys in only 12 of 33 streams in the Portland metropolitan area (Tinus et al. 2003). Based on this limited information, the lower Columbia/Willamette western brook lamprey population failed the habitat use distribution criterion.

Western brook lampreys have not recently been observed in the interior Columbia River Basin, except for a group in the South Fork of the Walla Walla River. Historical abundance in the interior Columbia River Basin is not well known; however, historic collections were made in the John Day River and Willow Creek subbasins. For this reason, it is presumed that the interior Columbia River population fails the distribution criterion.

Abundance

To pass this criterion, abundance of a population must be at least 25% of the 30-year average abundance in at least three of the last five years. There are no historic or current abundance estimates or indices for any population of western brook lampreys. As a result, the abundance criterion is failed for all populations.

Productivity

To pass this criterion, a spawning population must have produced 1.2 spawning offspring for each parent in three of the last five years when parent abundance was below the 30-year average. No data are available to adequately assess productivity and the intrinsic rate of population increase for western brook lampreys in Oregon. As with abundance, this criterion cannot be quantitatively assessed; however, the likely declining trends in abundance indicate that productivity is limited. Degraded habitat and impaired water quality are factors that decrease the rate of population growth and may be impacting western brook lampreys. It is likely that all three populations fail this criterion.

Predation by exotic predators such as smallmouth bass may also decrease productivity. The petition requesting the U.S. Fish and Wildlife Service to list western brook lampreys cited introduction of exotic fish predators such as smallmouth bass as contributing to the decline in abundance. PacifiCorp (1998) found lamprey in the stomachs of 10% of smallmouth bass examined from the Umpqua River. Summers and Daily (2001) examined the stomachs of 186 smallmouth bass from the Willamette River and found lamprey in only one. It is possible that occurrence of western brook lamprey in diets is underestimated because they lack diagnostic bones that remain intact throughout most of the digestive process.

Reproductive Independence

To pass the reproductive independence criterion, over 90% of the spawners in a population must be naturally-produced in three of the last five years. All western brook lampreys are naturally-produced. Therefore, all three populations passed this criterion.

Hybridization

To pass the hybridization criterion, the occurrence of interspecific hybridization must be rare or non-existent in three of the last five years. Interspecific hybridization has not been identified as an issue for western brook lampreys. Therefore, all three populations passed this criterion.