

PACIFIC LAMPREY (*Entosphenus tridentatus*)



Larval Pacific Lamprey are typically dark brown in color and resemble earthworms in body shape and size. Unlike larvae, juveniles possess eyes and sharp teeth in their jawless mouths. Juveniles are silver in coloration with dark blue on their backs. Adults that recently migrated into freshwater are silver and sometimes dark blue. Adults that have been back in fresh water for longer periods are dark to light brown and yellow. All lampreys are cryptic. In freshwater, lampreys reside within the substrate of streams or concealed within structure like woody debris or cobble and they are most active at night. In the ocean Pacific Lamprey are often found with their prey.

OVERVIEW

- **Oregon Conservation Strategy Species**
- **Size:** To about 33 inches long
- **Weight:** To over 1 pound
- **Lifespan:** Up to 13 years
- **Key Strategy Habitats:** Nearshore, Estuaries, Coast Range, Klamath Mountains, West Cascades, Willamette Valley, East Cascades, Columbia Plateau
- **Similar Species:** Other lampreys, including about 10 species in Oregon. Two lampreys commonly co-occur with Pacific Lamprey, including the Western River Lamprey and Western Brook Lamprey.

FUN FACTS

Favorite Food: Fishes and whales.

- Lampreys are eel-like fishes that lack jaws and bones.
- As a group, ancient lampreys arose a few hundred million years ago, making them older than the dinosaurs.
- Pacific Lamprey is a parasite.
- Pacific Lamprey grow to their maximum body size in the ocean and migrate into freshwater to spawn and die.
- Pacific Lamprey do not return to the same streams from which they were born.
- Lamprey hatch from tiny eggs and develop as eyeless, filter-feeding larvae that burrow in the soft sediment of river bottoms.

RANGE AND DISTRIBUTION

In Oregon: Pacific Lamprey can be found throughout the state's marine waters, estuaries, and freshwater rivers along the coast, and into the Columbia River Basin and its tributaries.

Everywhere Else: Fresh and marine waters of the Northern Hemisphere of the Pacific Ocean. Pacific Lamprey range extends from Baja California north into Alaska, and southwesterly into Russia and Japan.

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LIFE HISTORY AND ECOLOGY

Pacific Lamprey feeding as parasites in the ocean, and migrate back into freshwater to spawn and die. Females can produce approximately 150,000 to over 200,000 eggs that are fertilized externally by males in saucer-shaped nests. Spawning occurs in the spring, typically in gravel substrate of the downstream-end of pools. The young hatch within a few weeks and settle downstream into the soft substrate of slow-moving habitats. At this stage, the less than one inch long larvae burrow into the substrate and filter feed at the substrate surface on algae and micro-organisms. After up to eight years of rearing in streams, the larvae undergo a significant transformation from eyeless individuals adapted to filter feeding into eyed juveniles ready for parasitic feeding in the ocean. Transformation and outmigration occurs during the fall, in preparation for winter freshets that will move the juveniles to the ocean.

DIET AND FORAGING

Pacific Lamprey feed on at least 32 different species of fishes and mammals, and this species is thought to be an opportunistic feeder. Pacific Lamprey switch the host species on which they feed as they grow

HABITAT CHARACTERISTICS

Larval Pacific Lamprey can be found buried in the soft sediment of slow-moving habitats of freshwater streams that have access to the ocean. Recently transformed juveniles may be found in larger substrate. Juveniles feeding in the ocean can occur down to approximately 1,500 meters, but more often between the sea surface and 500 m, where they commonly co-occur with their prey.

CONSERVATION AND MANAGEMENT

Limiting factors: The five most common limiting factors in freshwater are: artificial barriers to upstream and downstream migrations, water quantity, habitat degradation, poor water quality, and predation by other species. In the ocean, the three limiting factors are thought to be predation and bycatch, the availability of host species to feed on, and the contaminant loads of these hosts.

Threats: Threats include: pollution, climate change, unfavorable oceanographic conditions, and the effects of interactions between climate change and oceanographic conditions, and land use relative to human population growth.

Conservation and management: Pacific Lamprey is not a target species of commercial fisheries. This species is harvested by indigenous peoples and some non-tribal harvesters in freshwater. The Pacific Lamprey has been the focus of targeted restoration and conservation efforts by various tribes and by the U. S. Fish and Wildlife Service and partners, through the Pacific Lamprey Conservation Initiative. The Oregon Department of Fish and Wildlife has created a conservation plan that targets Pacific Lamprey and other lamprey species.

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REFERENCES

- Clemens, B. J. and 21 co-authors. 2017. Conservation challenges and research needs for Pacific lamprey in the Columbia River Basin. *Fisheries* 42: 268 – 280.
- Clemens, B. J., T. R. Binder, M. F. Docker, M. L. Moser, and S. A. Sower. 2010. Similarities, differences, and unknowns in biology and management of three parasitic lampreys of North America. *Fisheries* 35: 580 – 594.
- Clemens, B. J., L. Weitkamp, K. Siwicke, J. Wade, J. Harris, J. Hess, L. Porter, K. Parker, T. Sutton, and A. M. Orlov. 2019. Marine biology of the Pacific Lamprey *Entosphenus tridentatus*. Review s in *Fish Biology and Fisheries* 29: 767 – 788.
- Moyle, P. B. 2002. *Inland fishes of California*. University of California Press, Berkeley and Los Angeles.
- Pacific Lamprey Conservation Initiative. <https://www.pacificlamprey.org/>
- Renaud, C. B. 2011. *Lampreys of the world: An annotated and illustrated catalogue of lamprey species known to date*. Food and Agriculture Organization of the United Nations, Rome. Species Catalogue for Fishery Purposes No. 5.