

Eulachon of the Pacific Northwest: A Life History

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1 Introduction

Eulachon, or oolichan, as they are also known, is a small fish in the smelt family, *Osmeridae*. Their scientific name *Thaleichthys pacificus* comes from the Greek word *Thaleia*, which means rich, and *ichthys*, which means fish. *Pacificus* means that they live in the Pacific Ocean. They are anadromous (live in saltwater, but spawn in freshwater) and migrate into some of the major river systems along the west coast of North America to spawn in the early spring every year. Eulachon are important fish for many reasons. They are the first arrivals to the river after winter and are a staple food source for many First Nations people along the coast. Eulachon are prepared many ways including having the grease rendered for packing and consumption. Grease trails from the coast through the interior of British Columbia mark the importance of eulachon grease as a trade item between coastal and interior First Nations.

2 Description

Eulachon are long, slender fish, reaching approximately 15-20cm in length and weighing 40-60 grams (Stoffels, 2004). The males are slightly larger than females. They are bright silver in colour and have no marks or spots on their bodies, fins or tails.

The males are distinguishable during spawning season because of their larger body size and because their ventral fins are longer and wider than the female's fins.



Figure 1: Female spawning eulachon on left and male spawning eulachon on right. Note the large ventral fins on the male.

Eulachon are believed to spawn when they are 3-4 years old. They travel up river beyond the saltwater to spawn. Most eggs are laid at night onto clean sand or small gravel. Eulachon are broadcast spawners and the females release up to 25,000 eggs in the flowing water, and the males release milt at the same time. As the eggs are fertilized they are covered in a sticky substance that helps them adhere to the sand and gravel substrate.



Figure 2: Eulachon eggs along the riverbank of the Kemano River.

The eggs incubate for 3-4 weeks, depending on the water temperature, before the larvae hatch. Eulachon larvae are 4-5mm in length and do not look very much like adult fish. They have large eyes and a visible yolk sac that supplies their food during the early stages of their lives. After hatching they are carried downstream to the estuary of their natal stream, and out into the ocean where they feed on zooplankton and grow.



Figure 3: Eulachon Larvae

As a schooling fish, eulachon travel together in the ocean. They have been found to live near the ocean bottom at depths of 20-150m (Hay and McCarter, 2000). Schools of eulachon support a variety of ages and the adult eulachon that reach sexual maturity in the late summer or early fall leave the schools of younger fish to swim to the rivers in preparation for spawning. It is believed that eulachon return to the estuary of their birth, but it is not known if they return to the same river from where they hatched. (Hay and McCarter, 2000).

3 Habitat

3.1 Estuary Habitats

Larval eulachon use estuaries for their early life stage. Estuarine vegetation like sedge grasses, provide shelter from predators and opportunities to forage for food. Eulachon typically enter their juvenile stage of life (8 weeks to 12 months) in this estuarine environment. At this stage they resemble adult fish more than the larval appearance they had when they hatched. They also develop the schooling behaviour. The fish are approximately 3cm in length as they enter the juvenile stage of life. As they grow, they move into ocean environments. It is believed that eulachon leave the estuary for the ocean within the first year after hatching, but it is not confirmed how soon after hatching, or how long the fish stay in the estuary.

After living in the ocean for 1 to 3 years, the eulachon come back to the estuaries in preparation for going up stream. While in the estuary their bodies adapt so they can survive in fresh water and get ready to spawn.

3.2 Ocean Environments

Distribution in the ocean has been identified through studies of eulachon as by-catch for shrimp trawlers. This information is limited to locations where shrimp trawling has taken place. Eulachon have been caught along the coast throughout British Columbia, although research trawls caught very few fish off north eastern Vancouver Island and the outer coasts of the Queen Charlotte Islands. Higher catch levels were noted between the Queen Charlottes and the mainland and along the southwest coast of Vancouver Island. Another area of higher catch levels north of Vancouver Island, approximately 1/3 of the way to the Queen Charlotte Islands (Hay and McCarter, 2000).

3.3 Fresh Water (River) Environments

Eulachon start and end their life cycles in fresh water. After spending 1 to 3 years at sea and having gone through their physical and biological adaptations to survive in fresh water, the eulachon begin their trip up river to spawning locations. At this time the fish resorb minerals from their scales and teeth in order to develop eggs and milt for spawning.

There are 33 rivers in BC with known eulachon runs. Of these, 19 are considered irregular, having fish one year and no fish the next year.



Figure 4: Skeena River looking west

Some of the rivers with eulachon runs in BC include:

- | | | |
|-----------|--------------------------|---------------|
| ▪ Nass | ▪ Kemano/Wahoo | ▪ Kingome |
| ▪ Kitimat | ▪ Bella Coola | ▪ Kiliniklini |
| ▪ Skeena | ▪ Kimsquit, Kwatna, Dean | ▪ Fraser |
| ▪ Kildala | ▪ Chuckwall/ Kil bella | ▪ Kitlope |
| ▪ Kowesas | ▪ Wannock | |

There are also several rivers in south eastern Alaska, the Columbia River in Washington State, and three rivers in California that have supported eulachon runs (Figure 5).

Eulachon Spawning Rivers

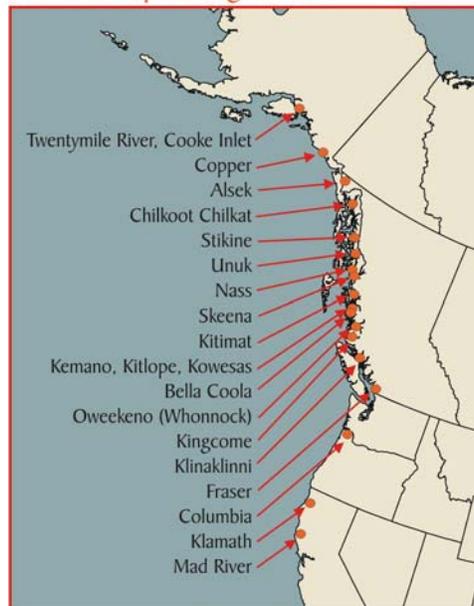


Figure 5: Eulachon spawning rivers on the west coast of North America.

Eulachon eggs require fresh water to incubate. The fish tend to use rivers with spring freshets and go up the river beyond the extent of saltwater intrusion to spawn prior to the freshet. Timing of spawning varies with the stream and there is no trend that correlates timing of the spawn with the latitude of the river. All spawning takes place between late February and May in the rivers in British Columbia.

4 Importance

Eulachon play a vital role to both wildlife and to First Nations people in BC.

4.1 First Nations

As the first fish to return to the river after winter, eulachon were a valued source of fresh protein. They were also dried as a method of preservation. Another key role that eulachon played was as a trade item. The fish were rendered for their grease which is highly valued on the coast and in the interior. Grease trails have been identified from the Pacific Ocean well into the interior of BC. These were the trails used by aboriginal traders who brought grease to the interior and brought goods and supplies back to the coast. Because of the importance of eulachon to the cultural and history, there is more information available on the spawning stages of the lifecycles of eulachon than any other lifecycle. In some rivers, the exact migration routes, spawning times and information on the size of runs is known through Traditional Ecological Knowledge, or TEK.



Figure 6: Haisla First Nation 2003 Eulachon Fishery on the Kemanan River

4.2 Wildlife

Eulachon are a prey species for many predators. During spawning season, sea lions, seals, and even whales have been observed following schools of eulachon into estuaries and up rivers.



Figure 7: Steller Sea Lion in Kemanan River

After they die, their carcasses are food for gulls, ducks, and other birds, as well as mammals like otters, wolves and other animals that may feed along the river banks.

In the ocean eulachon are prey to larger fish species including sturgeon, dogfish, Pacific cod, and hake. There appears to be less predation by marine mammals in the ocean. One reason for this may be that the eulachon live at depths that are greater than many marine mammals hunt.

5 Management

Because of the declines in populations, researchers have requested that COSEWIC (Committee on the Status of Endangered Wildlife in Canada) list the eulachon as a *threatened* species. This will enable some protection under SARA (the Species at Risk Act). In British Columbia, the Conservation Data Centre has rated the eulachon as *blue listed*. This means that while it has a globally secure ranking (G5), the provincial rankings are S2S3, which classifies the eulachon as somewhere between *imperilled* and *vulnerable*. Land and Resource Management Plans, like the *Central Coast Land and Coastal Resource Management Plan* have identified eulachon as an important species within their plan area and are working to develop management strategies around eulachon. The *North Coast Land and Resource Management Plan* has also identified eulachon as an important species and has outlined the importance of protecting and enhancing spawning locations for this fish.

Oceanic activities like commercial net fishing, especially for shrimp, have taken eulachon as by-catch and concerns over mortality from by-catch have been raised. Logging and road building along rivers has been identified as a concern, and some suggestions have included limiting barging and moving materials through eulachon spawning rivers during spawning season to protect the eggs and larvae.

6 Conclusion

Eulachon are a unique species to the Pacific Ocean. Their anadromous behaviour, and their spawning timing and location have made them a very important fish for cultural and natural reasons. Concerns have been raised over declines in eulachon populations, and because of limited studies, little information is known as to why the populations are declining. Efforts have been made to have eulachon recognised by COSEWIC as a threatened species in hopes having legislation to protect habitat and the species.

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