

Forage Fish

Friends of Semiahmoo Bay Society

Background Information

Forage fish are often referred to as prey fish or bait fish and are small pelagic fish that school together. They are a main food source for larger predators including other fish such as salmon, seabirds and marine mammals. They form a critical link in the ocean food web providing energy transfer through the trophic levels by eating plankton and then becoming food themselves for a multitude of other predators.

Surf smelt and Pacific sand lance are two of the seven forage fish species in British Columbia, and the only ones that spawn intertidally. Since the early 2,000s stewardship groups around the Salish Sea have been involved in monitoring the intertidal spawning of forage fish and documenting where and when they spawn.

In 2017, the Mount Arrowsmith Biosphere Region Research Institute (MABRRI) at Vancouver Island University (VIU) improved the way scientists study where small fish, called forage fish, lay their eggs on beaches. They also created a program to train and support regular people, called citizen scientists (more currently called ‘community scientists’, to help with the research.

In 2019, WWF-Canada wrote a report suggesting changes to the law to better protect these fish and the beaches where they spawn. This is important because forage fish are a food source for many animals, including the endangered Southern Resident orcas. Scientists also realized that there wasn’t enough information about these fish and their habitats, so more people started working to monitor them in British Columbia (BC). WWF-Canada, led by Jacklyn Barrs, brought together different environmental groups across BC that were studying forage fish. They focused on two types—surf smelt and Pacific sand lance. These groups worked together to record important data about these fish and shared it in a central database called the Strait of Georgia Data Centre.

WWF-Canada finished its work in the spring of 2022, but the groups involved saw the benefits of working together. By teaming up, they could get more funding, share resources, and make a bigger impact. So, in the summer of 2022, they officially formed the Coastal Forage Fish Network to continue protecting these important fish. (**Adapted from an excerpt from the Coastal Forage Fish Network*) <https://bit.ly/40H0GyS>



The Friends of Semiahmoo Bay Society led early efforts (2007- 2009, 2016-17 & ongoing from 2022) in Boundary Bay to train volunteers or community scientists to monitor their local beaches for forage fish spawning as well as to assess the integrity of the beach habitat for spawning. Volunteers 16 years and older are welcomed to the methods training and field sampling throughout the year. www.birdsonthebay.ca



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What Are Forage Fish?

Here in the Pacific Ocean, herring, Pacific sand lance, surf smelt, anchovy & capelin are small, schooling fish species which feed mainly on zooplankton (small marine organisms within the water column). Often, these fish are referred to as “*forage fish*”, aptly named as hundreds of species of larger fish, seabirds & marine mammals *forage* directly on them. See WWF Canada for information about forage fish and other species of interest:

<https://bit.ly/4hzaLEu>



Why Are Forage Fish Important to the Marine Chain of Life?

Forage fish are a **critical food source** for many marine animals including salmon, rockfish, ling cod, marbled murrelet, great blue heron, loon, rhinoceros auklet, tufted puffin, minke, humpback & killer whale.

35% of the diet of juvenile salmon & 60% of the diet of Chinook are comprised of Pacific sand lance. In turn, larger fish & orca feed on these salmon.

From their eggs to larval juveniles & adults, the biomass of forage fish on our west coast *fuel* a marine food chain.

Forage fish are harvested for bait by recreational & commercial fisheries & used by First Nations. Since other fish species depend upon them for food, forage fish populations indirectly affect other commercial fisheries as well.

Forage fish populations are a valuable indicator of the health of the local marine environment

Shoreline habitats such as beaches are critical spawning habitats for Pacific **sand lance & surf smelt**. Eggs, about 1mm. in size, are incubated within the small gravel & sand grains near the high-water mark.

The food web and food chain rely on your care & protection of spawning habitat for ‘forage fish’.

Altering shorelines, building seawalls & removing trees that provide shade deprives beach spawners of critical habitat. Seawalls convert sandy beaches to cobble, making them unusable for fish spawning and people to enjoy.



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What Can You Do?

- Reduce pollution by not using harmful detergents, chemicals or fertilizers in your yard & garden.
- Keep pets on a leash, pick up & dispose of their feces at home.
- Promote natural ‘green shores’ solutions, not seawalls, to protect your beachfront property.
- Plant & maintain native species of trees & shrubs to provide shade & wildlife habitat.
- Get involved in local groups and initiatives (visit the Friends of Semiahmoo Bay Website for a calendar of upcoming events and to learn more about our projects and partner organizations! www.birdsonthebay.ca)
- Become Educated about local aquatic and marine species and environments!



A Few Resources to help you Get Started:

Forage Fish:



The Pew Foundation has some excellent videos with both animations and live action documentaries about Forage Fish and other ocean-related terms in their ‘Visual Glossary’ <https://bit.ly/42vN4J6>

Life in Boundary Bay

- The Friends of Semiahmoo Bay Society has downloadable resources about life in and around Boundary Bay on our Website. Visit Explore & Learn in Boundary Bay (under the Education Tab in our main menu) <https://www.birdsonthebay.ca/educational-guides-brochures> (some resources are available in English, French and mandarin)
- The Delta Naturalists have a variety of brochures available for download including “Life in Boundary Bay” <https://deltanaturalists.org/nature-resources/>
- The Sound Stewards EZ ID Guide is an online interactive marine species identification tool: <https://bit.ly/4aABG0w>



Food Chains and Webs

- Seaquaria in the Schools YouTube. A Student created bite sized lesson video helps us understand Food Chains and Webs and their importance in the ecosystem. <https://bit.ly/4gq55fq>
- Students can create Food Chain Flexigons (find this and other activities and lessons ideas: <https://seaquaria.org/resource-collection/>)

