



SURF SMELT (*Hypomesus pretiosus*)



Surf Smelt are in the smelt family. They are small elongate fish that are silvery in color with greenish colored backs that are darker for males and brighter for females. The lower sides and belly of males is yellowish, but the females are white in these areas. Their pelvic fins are located below the middle portion of their dorsal fin. Surf Smelt are one of about 30 species of what are called forage fish that are key components of the California Current ecosystem. These forage fish eat plankton and are preyed upon by a wide variety of fishes, birds, and marine mammals. These species provide the key trophic link from primary and secondary production to higher trophic order consumers.

OVERVIEW

- **Oregon Conservation Strategy Species**
- **Size:** Up to 12 inches long
- **Weight:** Up to about 1.6 ounces
- **Lifespan:** Up to 5 years
- **Key Strategy Habitats:** Nearshore, Estuaries
- **Similar Species:** Night Smelt, Longfin Smelt.

RANGE AND DISTRIBUTION

In Oregon: Surf Smelt can be found throughout the state's marine waters. They also utilize estuaries.

Everywhere Else: Surf Smelt range from the Alaska Peninsula and Gulf of Alaska to southern California.

FUN FACTS

- Favorite Food:** Crustaceans including copepods, isopods, amphipods, shrimps, and krill. They will also eat worms, various planktonic larvae, and occasionally small fish.
- Surf Smelt spawn on beaches made of coarse sand to fine gravel.
 - Spawning timing varies by location across the range of this species but occurs during summer months in Oregon.
 - Peak spawning activity usually occurs during high tides around the full moon.
 - Surf Smelt smell like cucumbers when they are fresh out of the ocean.
 - Surf Smelt were a traditional harvest for coastal Native Americans.

LIFE HISTORY AND ECOLOGY

Surf Smelt gather in large schools to spawn at specific beach locations. Females produce between 1,320 and 36,000 eggs per season which they spawn in batches. The eggs are laid near the high tide line with peak spawning times usually occurring around the full moon. Males and females move into waters a few inches deep around the high slack tide to release sperm and eggs. They move together in small groups that usually contain more males than females. The eggs sink to the bottom. Once



SURF SMELT (*Hypomesus pretiosus*)

fertilized the outer membrane of the egg turns inside out to form a sticky pedestal that attaches to the sand. The eggs get buried in the sand as the tide recedes where the embryos develop and hatch in 9 to 56 days depending on water temperature. Like all smelt, Surf Smelt larvae are planktonic. Surf Smelt mature at 1 to 2 years old and live up to 5 years. Surf Smelt are a schooling fish.

Known predators of Surf Smelt include Chinook and Coho salmon and other predatory fish. Birds that eat Surf Smelt include Bald Eagles, Great Blue Herons, Common Murres, Rhinoceros Auklets, and several species of terns. Marine mammals such as harbor seals are also predators of Surf Smelt. Humans eat Surf Smelt too. Surf Smelt were an important food source for several Native American tribes in the Pacific Northwest, and they have been harvested in both commercial and recreational fisheries.

DIET AND FORAGING

Surf Smelt eat a variety of crustaceans including copepods, isopods, amphipods, crab larvae, shrimps, and krill. They will also eat worms, various planktonic larvae, fish eggs, and occasionally small fish. They forage both in the water column and near the bottom. Warm ocean conditions can affect prey availability and diet.

HABITAT CHARACTERISTICS

Surf Smelt are a coastal species. Schools of juveniles and adults are common in areas with vegetation such as eel grass or kelp. Schools of adults are also found further from shore in areas without vegetation.

CONSERVATION AND MANAGEMENT

Threats: Surf Smelt require beaches with specific sized coarse sand or fine gravel for spawning habitat. Alteration of those beach habitats either due to natural or man-made causes can threaten populations of Surf Smelt.

Conservation and management: There is little information about the factors that affect Surf Smelt biomass, population size, or trends anywhere in their range. Surf Smelt, like all smelt species, are included as a shared Ecosystem Component Species in all of the Fishery Management Plans administered by the Pacific Fishery Management Council (PFMC) as part of the Comprehensive Ecosystem Based Amendment 1 which prohibits development of new directed commercial fisheries for these species in federal waters. States manage fisheries for Surf Smelt in state waters, and the Department of Fisheries and Oceans in British Columbia manage fisheries there. Surf Smelt are harvested for personal consumption in many places, there are small commercial landings made in California, and a directed fishery in Puget Sound Washington. There is no directed commercial harvest of Surf Smelt in Oregon, but recreational harvest is allowed.



SURF SMELT (*Hypomesus pretiosus*)

REFERENCES

- Brodeur, R.D., M.E. Hunsicker, A. Hann, and T.W. Miller. 2019. Effects of warming ocean conditions on the feeding ecology of small pelagic fishes in a coastal upwelling ecosystem: a shift to gelatinous food sources. *Marine Ecology Progress Series* 617-618:149-163
- Love, M. S. 2011. Certainly more than you want to know about the fishes of the Pacific Coast. A postmodern experience. Really Big Press, Santa Barbary, CA.
- Moss, M.L., R. Minor, and K. Page-Botelho. 2017. Native American fisheries of the southern Oregon coast: Fine fraction needed to find forage fish. *Journal of California and Great Basing Anthropology* 37(2):169-182
- Tushingham, S. and C. Christiansen. 2015. Native American fisheries of the Northwestern California and Southwestern Oregon coast: A synthesis of fish-bone data and implications for later Holocene storage and socio-economic organization. *Journal of California and Great Basin Anthropology* 35(2):189-215