NORTH PACIFIC RESEARCH BOARD

Juvenile North Pacific Flatfish Habitat Structure (R0301)

Evaluation of Emergent Structure in Low-Relief Benthic Habitats as a Criterion for Defining the Essential Fish Habitat of Juvenile North Pacific Flatfishes

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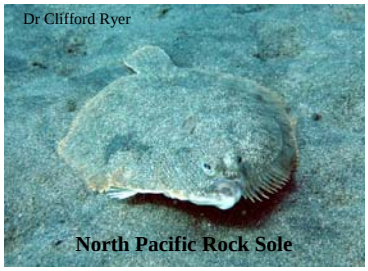
What is a Flatfish? "Flatfish" is the common name for any member of the unique and widespread order Pleuronectiformes containing over 500 species of fish (including the flounder, halibut, plaice, sole, and turbot), 130 of which are American. All flatfishes have an unusual flattened body form well suited to life on the bottom of the ocean. The newly hatched transparent flatfish look similar to other fish, but soon the characteristic lateral compression of the body develops and one eye "migrates" to the other side of the head. As this occurs, the fish begins to swim 'flopped over' on one side, which becomes the fish's underside. The underside of the flatfish becomes pale and the top is colored to match the sediment on the ocean floor. Flatfishes are divided into two groups: the soles, and the flounders (including the halibuts). In the North Pacific and the Bering Sea, flatfish support large commercial fisheries.



North Pacific Rock Sole

What makes a flatfish feel at home? Despite the great economic importance of North Pacific flatfish species in Alaska, little is known about their habitat requirements during the early juvenile stage of their life (less than 2 years). Flatfish like Pacific halibut and northern rock sole may prefer bottom habitats with emergent structures (sand waves, shells, corals, and sessile invertebrates like sponge), and are more abundant where these features occur.

This project uses field surveys, field experimentation, and laboratory experimentation to examine the importance of emergent structure in the behavior, ecology and survival in two species of juvenile flatfish: the Pacific halibut and the northern rock sole.

In laboratory studies Researchers focus upon two types of bottom structure that are found in probable flatfish habitat; sponge and shell. Sponge, a living structure, can be damaged by fishing trawls, whereas shell is unlikely to be impacted by trawling. Laboratory testing for possible effects of decreased sponge and shell structure on the use of habitats as flatfish nursery areas provides managers with a new understanding and tools for protecting fish habitats and nursery areas.

The field studies occur in the shallow flatfish nursery grounds around Kodiak Island, Alaska. Using an underwater camera, attached to a towed sled, the study is mapping and classifying various types of emergent structures in shallow continental shelf habitats and the degree to which the juveniles of commercially important flatfish species associate with them.

What have we determined? While preliminary data does indicate that juveniles of some species, such as the Pacific halibut, demonstrate an association with sea floor habitats containing structural components like shell and sponges, this relationship may be influenced by other habitat characteristics. For example, research is also addressing whether the presence of potential competitors and predators influence the attractiveness of structured habitats for these small flatfish.