

Feeding habitat function of fishing ports for fish assemblages in southwestern Hokkaido, Japan

*Rumiko Kajihara¹, Masanori Nunokawa¹, Hiroyuki Matono¹, Masami Ohashi², Tomohiro Komorita³, Kazushi Miyashita⁴, Shigeru Montani⁴

1. Public Works Research Institute, Civil Engineering Research Institute for Cold Region, 2. Tokai University, 3. Prefectural University of Kumamoto, 4. Hokkaido University

Habitat creation based on the life histories of aquatic organisms is being promoted to restore fish resources in Japan. Coastal structures such as fishing ports must be improved to protect and foster aquatic organisms. While several studies have examined the nursery function of fishing ports in Japan, there is little information on northern Japan (i.e., Hokkaido), which is a major productive area, or on benthic primary production, which is an important component of coastal shallows ecosystems. Therefore, this study conducted field surveys in Suttsu fishing port in southwestern Hokkaido to examine fish behavior using biotelemetry and to measure biological and physicochemical habitat variables. We discuss the function of benthic ecosystems in the fishing port as feeding habitat for fish assemblages. Throughout the study, it was calmer inside the port than in open water, although the water salinity and temperature were similar in both areas. The bottom water dissolved oxygen concentration always exceeded 6 mg O₂/L inside the port, so the water column was always aerobic. Although zooplankton density did not differ significantly inside and outside the port, macrozoobenthos density and biomass were significantly higher in the innermost part of the port. In addition, the surface sediment in the innermost part of the port had higher standing stocks of chlorophyll *a*, total organic carbon, and NH₄. Fish at various life stages inhabited the port. Moreover, the dominant macrozoobenthos species in the port were found in the stomachs of seven fish species. Eleven rockfish (*Sebastes taczanowskii*), the dominant species in the port, caught inside the port were equipped with ultrasonic transmitters and released in the port. We installed receivers inside, at the entrance, and outside the fishing port for 5 months. The results showed that there was little movement between inside and outside the port. As the main rockfish habitat was inside the port, the function of the port as a feeding ground is important in their life cycle. The study found that various fish species use the fishing port as feeding grounds and the stable seafloor environment helps to maintain a sustainable benthic ecosystem combined with a planktonic ecosystem that supports the feeding ground function of the fishing port.

Keywords: nursery function, rockfish, biotelemetry, zooplankton, benthic ecosystem