

**CHANGES IN MARINE FISH COMMUNITY UNDER INFLUENCE OF LENINGRAD NUCLEAR POWER PLANT AND ANOTHER HUMAN ACTIVITIES IN THE WATERSHED OF KOPORSKAYA BAY (GULF OF FINLAND, BALTIC SEA).**

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The long-time observations (1978-1997) in the Leningrad nuclear power plant cooling water-body (Koporskaya Bay) in the frame of the Regional Ecological Monitoring Program provided reliable data on the local fish community state.

Regular observations allow us to trace structural changes in fish community, because they follow changes on physiological and population levels in this community. 45 species of fishes and lamprey were recorded during all investigation period. However, the species diversity is very poor. Wittaker dominance-diversity curves (Fig.1) reflect degradation in the coastal fish community being under influence of the complex industrial and agricultural factors. The fish community is now dominated by only 2-3 species, especially threespined stickleback and ninespined stickleback; while the first species more abundant then the second one as far as ~10 times.

Using a number of the most frequent species in our samples (frequency > 50%), known as a community nucleus, as an indicator of natural condition of the water-body, we recognized following: in 1980 the nucleus was formed by 9 species, in 1981-1985 - 7-8 species, in 1986 - yet 6 species, in 1989-1995 - only 4-5 species, but in 1996-1997 the number dropped to 2-3 species. Thus, the trend is not very optimistic. One of the most objective information indices - Shannon-Weaver index - reflects fluctuations in the fish community of Koporskaya Bay in 1981-1997 (Fig.2).

The fish losses caused by the cooling system of NPP are significant. Most part of intrained fish is presented by young-of-year small fishes and older but weak and damaged fishes. Thus, young-of-year, 1-year old and 2-year old baltic herrings composed 98% in all number of this species in samples. There are no any fish protecting facilities at two NPP water-input canals. The fish removing system at the pump station is very imperfect, so most part of fishes perished there. That is why fish losses in the NPP water-intake facilities are comparable with commercial fish catches in the bay. Thus, NPP water-intakes promote structural changes and prevalence of fish species of low commercial value in the community.

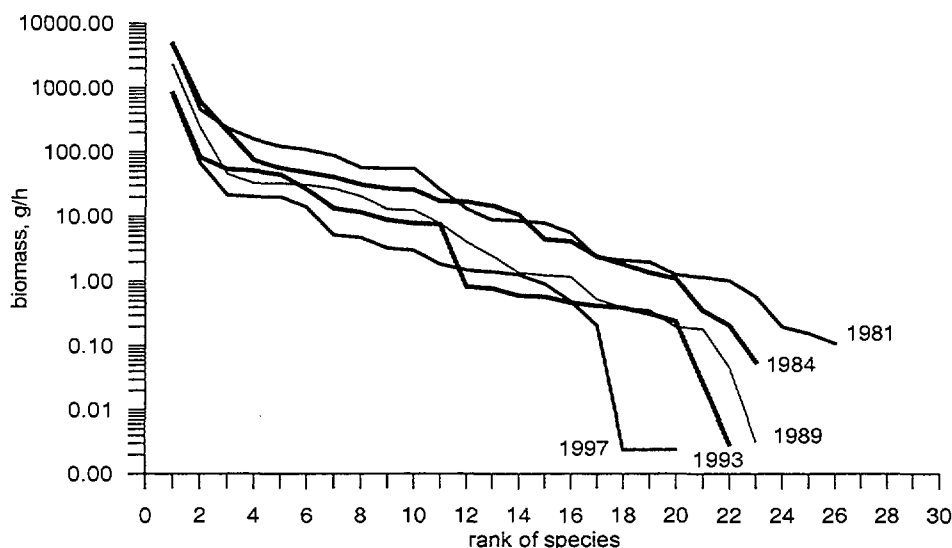


FIG. 1 Wittaker dominance-diversity curves for the fish community of NPP water-input area.

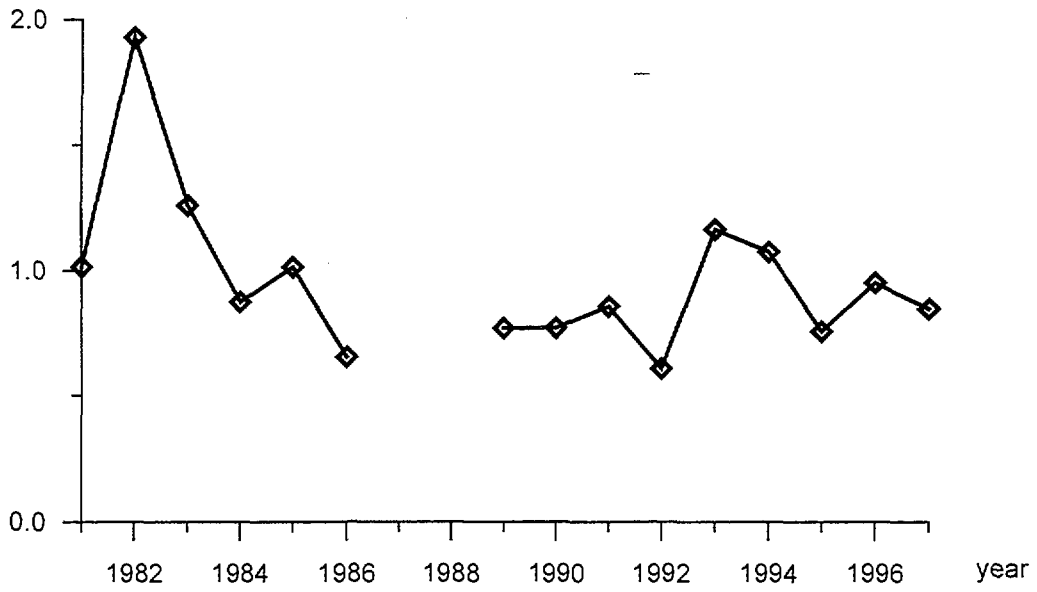


FIG. 2. Shannon-Weaver information index for the fish community of NPP water-input area.