



Activity report of SCOR Working Group 105



Chang Ik Zhang
Department of Marine Production Management,
Pukyong National University,
Pusan, 608-737. REPUBLIC of KOREA
E-mail: cizhang@dolphin.pknu.ac.kr

Currently about 80×10^6 tons of fish are removed from the world's oceans every year. An unknown but large amount of additional biomass is destroyed as unreported catch and as catch discarded at sea. Studies of freshwater systems have demonstrated that the removal of predators alters the biodiversity and stability of the ecosystem ("top-down control", cascade models). Alterations of intermediate trophic levels have consequences both higher and lower in lacustrine and riparian trophic systems. Despite continued expansion of fisheries on top predators and into lower trophic levels, only limited ecosystem-level examinations of the impacts of fisheries harvests on marine ecosystem dynamics have been carried out.

Many examples of changes in ocean ecology, including so-called regime shifts, have been documented; for example, the upsurge in Antarctic crab-eater seal; declines in Bering Sea seal and seabird populations; and changes in relative abundance of sardine and anchovies within eastern boundary currents. These changes may be the direct consequence of environmental influences. For example, the declines in Bering seal and seabird populations may be the result of mortality in drift-nets; while subtle changes in circulation and mixing of eastern boundary currents may have favored sardine growth over anchovies. However, these changes may also be the consequence of responses of the whole ecosystem to fishery harvests.

Given the magnitude of fishery removals in the world's oceans, it is urgent that scientists document not just the changes in ecosystems that have occurred, but also the contribution of the fisheries to causing the change. Moreover, as fisheries expand into lower trophic levels as well as different production regimes, it is important to understand and document how marine ecosystems respond to harvesting at different trophic levels.

In 1996 SCOR initiated a Working Group on the Impact of World Fisheries Harvests on the Stability and Diversity of Marine Ecosystems. Their activities compliment parallel work being carried out in the

North Atlantic under the auspices of the International Council for the Exploration of the Sea (ICES) by the Working Group on the Ecosystem Effects of Fishing, which has been active since 1990. While the ICES study concluded that the underlying reasons for the spatial and temporal differences in the patterns observed remain unclear, it is considered that a SCOR Working Group focusing on species regime shifts in all geographic region is appropriate at this time. At the PICES Fifth Annual Meeting in Nanaimo, Canada (1996), the Governing Council named me, then the Chairman-elect of the Fishery Science Committee, to represent PICES on the SCOR WG 105.

The first meeting of the new WG was held in Halifax, Nova Scotia, Canada, on November 5-7, 1996. In essence the terms of reference of the SCOR WG 105 are to provide a global synthesis of what is known about the impacts of fishing on the marine ecosystem, report on new methods for quantifying the impacts at the ecosystem level, and to provide a forum for discussions on how these methods can provide the basis for formulations of management strategies and tactics. The goal of the first meeting was to develop a work plan to meet the spirit of the terms of reference. It was decided that a number of teams should be established to provide peer-reviewed syntheses of the impacts of fishing on diverse ecosystems. To facilitate the synthesis and a forum for discussion, ICES and SCOR are planning to hold a symposium on "The ecosystem Effects of Fishing", the results of which are to be published in the primary literature (Co-conveners Dr. M. Sinclair and Mr. H. Gislason). The framework of symposium was discussed and it was decided to aim for a four-day meeting on March 16-19, 1999, in Montpellier, France; Presentations will be restricted to invited keynote papers that should all be subject to peer-review before the symposium.

I am encouraging all interested PICES members to attend the ICES/SCOR symposium. Any person who is interested in more details of SCOR WG 105 activities, feel free to contact me for more information.