

# **Ecosystem approach in the research and management Of the Chilean fisheries**

by

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The research for the management of the Chilean fisheries has been funded by two sources: Fondo de Investigación Pesquera (FIP) and the Undersecretariat of Fisheries. Although Chile has not incorporated explicitly the ecosystem approach in the fisheries management, the concept has been introduced in a practical form through specific research projects, and regulations for the conservation of the stocks and the protection of the biodiversity.

In this sense and nevertheless the principal focus of interest of the fishing research in Chile has been monospecific, in the last 12 years an important amount of information has been produced that allowed a substantial improvement in the knowledge on topics referred to bio-diversity the same as to the ecological relations between the species of interest. Stand as sources of information for this purpose: the programs of scientific observers, programs of monitoring of the national fisheries and the programs of surveys to assess the main fish stocks. On the other hand studies identified by FIP have been developed to obtain information and to describe the ecotrophics interactions between species, emphasizing for example age specific relations of predation by the southern hake (*Merluccius australis*) on the hoki (*Macroronus magellanicus*), which allowed to formulate a multispecific stock assessment model for the southern hake.

It is necessary to highlight also the permanent interest of the State to reduce the effects of fishing in secondary species, standing out two important Plans of Action in process of public consultation: the protection plan of sharks in the swordfish fishery, and the protection plan of sea birds in longline fisheries to reduce the incidental mortality. Chile has also impelled policies to protect biodiversity via the creation of marine protected areas, creating in fact 3 Marine Protected Areas and has participated together with Peru in the development of a proposal for the integrated management of the Humboldt Large Marine Ecosystem, with the support of the Global Environmental Fund (GEF) and UNDP.

In terms of applications of methodologies, it is necessary to emphasize the work done by scientist of the Universidad de Concepción, Chile, in the use of trophic dynamics models (Ecopath / Ecosim) in order to describe the abundance in pelagic fish stocks such as anchovy (*Engraulis ringens*) and common sardine (*Strangomera bentinki*), and some demersal resources such as the common hake (*Merluccius gayi*) and the squat lobster (*Pleuroncodes monodon*). In terms of the formulation of models with ecological considerations for fisheries management, IFOP implemented during 2005 a Bayesian stock assessment model for the common hake and his trophic interaction with the Humboldt giant squid (*Dosidicus gigas*). The application of this model permitted to recommend a total allowable catch for the year 2006, representing another clear example of ecosystem approach in fisheries management in Chile.

The challenge of Chile is to impel the development of research programs to allow for a gradual development of an ecosystem management approach for their fisheries.