

## **STRUCTURE OF THE REEF FISH COMMUNITIES IN TONGA TAPU.**

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A survey using underwater visual transects (UVC) was conducted on the reefs north of Tonga Tapu. A total of 46 transects were performed. Species richness averaged 49 species/transect (range 22 - 76), average density was 3.3 fish /m<sup>2</sup> (range 0.7 - 9.7) and average biomass was 128 g/m<sup>2</sup> (range 21 - 828). Winward stations had higher values than leeward stations. These differences were higher than differences between reef types (fringing, middle lagoon or barrier reefs). Species richness was dominated by microherbivorous and carnivorous species. Species with a size between 8 and 15cm were the most diverse. There was approximatively the same number of sedentary and mobile species. Schooling species did not make a large number of the species. Density was dominated by zooplanktivores and microherbivores. Fish density was essentially composed of sedentary fish and of small size (less than 15 cm). Biomass was dominated by microherbivores, the second important group being macrocarnivores. The biomass was mainly composed of mobile species and fish of average (8-15cm) to large size (15-30cm). There were only minor differences in the structure of the assemblages according to exposition or type of reef. Fish parameters were essentially correlated to depth and coral cover. Piscivores and macrocarnivores were correlated to soft substrates and deeper waters. Microcarnivores and microherbivores were found mainly over hard bottoms in shallow waters. Zooplanktivores increased with depth, whilst microcarnivores displayed the opposite pattern. Fish size, gregarity and mobility were little correlated to environmental parameters. These data are compared to similar data sets from New Caledonia and French Polynesia.

## **STOCK ASSESSMENT OF COMMERCIAL FISHES IN THE NORTHERN NEW CALEDONIAN LAGOONS. 3: LINKS BETWEEN FIELD DATA AND SOCIO-ECONOMIC ASPECTS OF THE FISHERY.**

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At the request of the Northern Province of New Caledonia, ORSTOM undertook an assessment of the commercial demersal fish stocks of the northern lagoons of New Caledonia. The area studied covers approximatively 10 000 km<sup>2</sup> and can be divided into three lagoons, North, East and West. Fishing effort was estimated by two methods. Directly by analyzing fishermen's log books, indirectly by a study of the human fish consumption in this area. This consumption was obtained from data from a large survey conducted by the ITSEE (Territorial Institute of Statistical and Economical Surveys). Fishing effort and catch data could thus be estimated for each lagoon and could to some extent be further detailed down to the major fish groups. These informations were correlated with data from experimental surveys of the reef and lagoon commercial fishes. In particular, estimates of fishing effort and catch were linked to total stock estimates and helped to calculate MSY values per lagoon and for the major fish groups. In 1996, The total MSY was about 14 000 tons which was 10% of the estimated total stock (138 000 tons). This estimated MSY was ten times greater than the current yields (1 330 tons). The stocks of commercial fishes were general not endangered, but on some reef biotopes and some line-species MSYs were probably reached or exceeded. An analysis of the social-economical aspects of this fishery (potential market and consumption, economical structure of the fishery) showed also that the available methods for estimating catch and fishing effort in this area were not adequate and that new ways of estimating these parameters were needed for management actions.

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