

## Bio-Economic Modeling of the Kingfish Fishery (*Scomberomorus commerson*) in Oman: Preliminary Results

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**ABSTRACT:** The kingfish, *Scomberomorus commerson*, is the preferred species in the Sultanate of Oman and other countries in the area, a fact reflected by the relatively high market prices. In Oman, kingfish landings are of particular importance to the traditional fishery and provides financial security for thousands of fishermen throughout the country. During the 1980s, Oman ranked among the top countries in the western Indian Ocean (FAO area 51) with a total catch of kingfish in excess of 27,000 tons in 1988. However, from this peak-record, landings declined dramatically to an average of 3000 tons during the 1990s. This decline in catch has been accompanied by increases in fishing effort in terms of number of active boats, fishing power and population of fishermen, such that catch per unit effort (CPUE) has also rapidly decreased since 1987. This general decline in kingfish landings calls for scientifically-based stock assessment. In an effort to fill basic gaps in our understanding and to provide policy makers with base line information in building sound fisheries management plan, a three-year project "Management of the Oman's kingfish" funded by the government and led by Sultan Qaboos University and the Marine Science and Fisheries Center (MSFC) started in December 1999 (Siddeek *et al.*, 1996). This project aims at addressing some of the questions concerning the biology and the fishery of the kingfish. The aim of this paper is to investigate the kingfish fishery and its dynamics through a preliminary Surplus Yield model and a bio-economic model for the kingfish combined with the other large pelagic species. Two Fox-Garrod models were built for kingfish and longtail tuna. Nominal and effective fishing efforts were used to deal with the increase in fishing power; but effective efforts seem much more relevant. To reach the Maximum Sustainable Yield of the large pelagic fishery, the effective fishing effort should be reduced to 60% of its current level. Considering 260 fishing days/year, as described in the model, the fishing effort should be reduced to 82% (or 73% when subsidies are considered) of its current level to reach the Maximum Economic Rent, and 30% (or 27% with subsidies) to reach the ZNR. The results revealed that kingfish stock in Oman displays all the symptoms of overfishing. Hence, an urgent management plan needs to be promoted.

**Keywords:** kingfish, traditional fishery, modeling, Sultanate of Oman

### Introduction

All along the 1700 km coastline of the Sultanate of Oman, fishing communities have existed for many centuries and probably

millenia (Donaldson, 1950, in Donaldson, 1980). More recently the fishing community was boosted by a governmental subsidizing program in the late seventies. The traditional fishing sector accounts for more than 80% of the total