

YIELD ANALYSIS OF THE GROUND FISH RESOURCES IN THE AUSTRALIAN WATERS OFF NORTH AND NORTHWESTEN AUSTRALIA¹

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ABSTRACT

Based on the catch statistics, dating from 1972 to 1982, of the Taiwanese pair trawl fishery in the Australian waters off north and northwestern Australia, both the surplus production models and the biomass estimation method were used in this study to assess the stock conditions and to estimate the potential harvest of the groundfish resources in these areas.

The results of this study indicate that: (1) stock condition of groundfish resources in the Australian waters off north and northwestern Australia are in good shape; and (2) the Maximum Sustainable Yield (MSY) of fishable stocks (open zone) in the Australian waters were estimated as 47,000 mt; 11,600 mt; 54,000 mt; and 96,000 mt for the southern part of the Arafura Sea (R1B); the northern part of the Timor Sea (R2A); the southern part of the Timor Sea (R2B); and the northwestern shelf (R3) regions, respectively.

INTRODUCTION

The continental shelf off north and northwestern Australia has been one of the most important trawling grounds for the Taiwanese pair trawlers since 1971 (Liu *et al.* 1978). It was not until 1979, when the Australian Government established its Australian Fishing Zone (AFZ), the historic right to fish by the Taiwanese trawlers can only be assured through the bilateral fisheries agreement signed annually. Since then much research effort has been devoting to this area (Lai and Liu 1979; Liu 1980; Yeh 1984; Yeh and Chiu 1981; Liu and Yeh 1982; Edwards 1983) in order to understand better the biological and dynamic nature of its groundfish resources.

Groundfish community in this area is characterized by the multitude of species present and none of which is really dominant (Liu *et al.* 1978). On the other hand, the fishing method of trawling is non-selective in nature. These two factors heavily retard the assessment and management of the resources on a single species basis. An extended version of the total biomass surplus production models has traditionally been employed on the assumption that the species assemblage as a whole may react as a single population. As a first approximation to the potential total demersal yield, the biomass estimation method (Gulland 1971) and the extended version have demonstrated to be applicable (Low 1974, Yeh *et al.* 1981).

Liu *et al.* (1978) have used the biomass estimation method and reviewed the groundfish resources on the continental shelves off north and northwestern Australia in general based on the 1971-1976 catch statistics of the Taiwanese pair trawl fishery. Yeh (1984)

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