

## ASSESSMENT ON THE RED SNAPPER (*LUTJANUS ALTIFRONTALIS*) RESOURCE IN THE WATERS OFF NORTHWEST AUSTRALIA

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### ABSTRACT

This paper deals with stock assessment on the resource of red snapper, *Lutjanus altifrontalis*, on the continental shelf off northwest Australia. Historical catch and standardized effort data series are analyzed by surplus production model. The natural and fishing mortalities of the resource are identified and the yield per recruit analysis is also performed to assess the status of the stock.

The results show that (1) CPUE trend of the species in the past two decades varied from 0.91 to 3.55 kg per hour-tow and in recent six years was stable at 2.1 kg per hour-tow; (2) maximum sustainable yield ranged from 86 mt to 125 mt per year and its responding effective effort ranged from 63,500 hours to 115,000 hours of trawling per year; (3) the instantaneous rate of natural mortality of the species is estimated to be 0.9175 per year; (4) the age of recruitment of the species to the fishery is estimated to be 1 year old and the age of first capture is estimated to be 1.5 years old; and (5) the optimum age at entry into the fishery is 1.375 years old recommended for obtaining best yield per recruit under current mesh size and the potential yield per recruit is estimated to be 190 gm.

### INTRODUCTION

In the past two decades, the Taiwanese pair trawlers were the only major fleet that has operated on the continental shelf off northwest Australia (Sainsbury 1987). After the declaration of the Australian Fishing Zone (AFZ) in 1979, fishing activities have been conferred annually through the bilateral agreement. Since then a trawl licensing and access fee has been charged by the jurisdiction of Australia government. The catch of Taiwanese pair trawlers have declined significantly due to managerial regulations such as limitation of catch quota and number of pair trawler, especially after 1985. For the reason of the consideration of resource, the close of pair trawl fishing ground has been introduced. The western zone was closed in October 1985, the middle zone was closed in October 1987. Until 1990, the bilateral agreement was terminated and the fishing ground was fully closed by the Australia government.

Lutjanidae is one of the most important component and occupies about 9% of the catch (Edwards 1983; Sainsbury 1987). The category of Lutjanidae catches are comprised of three major species: *Lutjanus malabaricus*, *L. altifrontalis* and *L. sebae*. *L. altifrontalis* is one of the most abundant and economically valuable species. Due to the importance of the red snapper resource, several studies have been carried out such as: (1) the age and growth of *L. malabaricus* (Chen *et al.* 1984), *L. sebae* (Yeh *et al.* 1986), *L. altifrontalis* (Ju *et al.* 1988); (2) survival estimation of *L. malabaricus* (Yeh and Chen 1986), *L. altifrontalis* (Yeh *et al.* 1990); and (3) assessment of *L. malabaricus* (Yeh 1988).

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