

SURVIVAL ESTIMATION BASED ON LENGTH-FREQUENCY ANALYSIS OF RED SNAPPER (*LUTJANUS MALABARICUS*) IN THE NORTHWEST SHELF OF AUSTRALIA¹

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ABSTRACT

This paper deals with the survivals of red snapper, *Lutjanus malabaricus*, resource in the northwest shelf of Australia based on size frequency data obtained from surveys at Kaohsiung Fishing Port. Conversion of age distribution from size frequency data by using maximum likelihood estimate criterion is adopted.

The results show that (1) age distribution can be reasonably derived from a length frequency data by using maximum likelihood estimate criterion, and the fitting between the observed and the calculated frequencies has been very successful; (2) age III to age VI are the major age groups of red snapper harvested from the northwestern shelf of Australia; (3) fully recruited age of the species to the fishery appears to be age IV; (4) the annual total instantaneous mortality rates of the red snapper resource were estimated as: 0.4607, 0.5494, 0.6792, 0.4332, and 0.3737 for the years from 1982 to 1986, accordingly.

INTRODUCTION

The continental shelf off north and northwestern Australia has been one of the most important trawling grounds for the Taiwanese pair trawlers since early 1970s. It was not until 1979, when the Australian Government established its Australian Fishing Zone (AFZ), the catch of Taiwanese trawl fishery in the northwestern shelf region declines but still contributes a significant portion to the total groundfish catches from the Australian waters. According to the catch statistics of the Taiwanese trawl fisheries (Anon. 1970-1984), the yearly catch from the northwestern shelf region occupied the majority (at least 40%) of the total annual groundfish catch in the Australian waters.

Although the multitude of groundfish species in this area are so many and none of which appears really dominant (Liu and Yeh, 1984), which is one of the profound characteristics of the tropical groundfish community; the red snapper (*Lutjanus malabaricus*) is one of the most economically important and abundant species in the groundfish catches.

In order for better understanding the dynamics of the resource by using analytical models, a knowledge of its survival or mortality is essential. Although aging the species by ring-reading method has been well studied (Chen, Yeh, and Liu 1984), it is very expensive and therefore economically infeasible to perform such aging survey annually. Instead, methods of converting size frequency data into age composition were employed.

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