

SPATIAL DISTRIBUTION AND SHOALING BEHAVIOUR OF FISHERY RESOURCES IN THE WATERS OFF WESTERN COAST OF ACEH: PRELIMINARY RESULTS FROM THE POST TSUNAMI EXPEDITION 2005

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ABSTRACT

Acoustic investigation, which is one of the programmes of the Post Tsunami Expedition, was done in Aceh waters during 24 July to 14 August 2005. Research vessel Bawal Putih I and Baruna Jaya VIII were used for the survey. The objective of this survey is to obtain pelagic fish resources distribution, after the area hit by tsunami at the end of 2004. Two different models and frequencies were used in acquisition of the data; SIMRAD EK-500 Scientific Echosounder with 38 kHz splitbeam transducer (Baruna Jaya VIII) and Simrad EK-60 scientific echosounder with 120 kHz splitbeam transducer (Bawal Putih I). Results show that fish aggregations appeared in high density layers in deep waters all over the study area. Fish shoals occurred in relation to topographic features such as shelf edges and deep valleys. On the shelf, fish shoals tend to stay close to the bottom during daytime, while it raised, with more fish shoals were observed, during night time. More abundance prevails in areas of rough bottom conditions where trawl fishing was not possible, specifically in north areas between Lhok Nga and Calang. Abundances of fish in the coastal area off Sibolga seem to be relatively lower compared with those in its northern part.

KEYWORDS: fishery resources, abundance, hydro acoustics, post Tsunami, western coast of Aceh

INTRODUCTION

Traditionally, fish distribution, and abundance may be indirectly estimated through analysis of historical data on fish catch per unit effort or through the statistical analysis of mark recapture experiments using tagged fish. However, these indirect methods are often biased not only by the selectivity of fishing gear and by artificial on the economic ground, but also by means of communication between fishermen and researchers on the information of catch data. In addition, considerable time, and substantial efforts are required in estimating fish distribution and abundance by the statistical analysis on the historical data.

Following the advance development of hydro acoustic technology, sonar and echosounder have a major impact on fisheries, especially their application in fishing system, such as searching for profitable concentration of fish. In fisheries research, it has become increasingly importance over the years for studying and monitoring distribution, congregation, and migration of fish (Engas & Ona, 1987; Misund, 1987; Thorne *et al.*, 1987).

Hydro acoustic method can be considered as on of the suitable methods for estimating fish abundance directly. The procedure involves echo sounding along a transect area and measuring the

return echo intensity. A calibrated hydro-acoustic system then provides an estimate of the fish biomass for specified depth and distance intervals along the transect area (Burczynski, 1982).

A programme of the investigation of tsunami effects on marine life in Aceh and North Sumatera was carried out during July to August 2005. Research vessel Bawal Putih I and Baruna Jaya VIII were commissioned to survey the fisheries resources, mainly those of the waters off west and north coast of Aceh that was severely hit by tsunami. Acoustic and exploratory fishing survey were done to meet the objective. Acoustic system observed fish biomass, depth, and bottom topography, while fishing system observed catch, species, fish size and composition, and fish biological data. Oceanographic data were also collected during the survey. This paper discuss specifically on the preliminary results of the acoustic survey, which are related to the spatial distribution and shoaling behaviour of pelagic fish resources.

MATERIALS AND METHODS

Description of Acoustic Equipment

Acoustic data acquisition was conducted simultaneously with bathymetric transect. Two different models and frequencies were used in acquisition of the data; SIMRAD EK-500 Scientific

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