SIZE DISTRIBUTION OF PELAGIC FISHES IN THE JAVA SEA BY MEANS OF TARGET STRENGTH ANALYSIS

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ABSTRACT

This study aims to provide information on spatial distribution of fish size of pelagic community in the Java Sea. It was based on target strength data observed during the acoustic cruises made by Research Vessel Bawal Putih in the years 1992 until 1994 and October 2005, using dual beam and split beam echosounder operated at 120 Khz. The data were analysed descriptively by performing single regression and graphical presentation. A gradient of fish size was obviously indicated in the middle and northen part of the Java Sea, while random pattern was clearly observed in the north coast of Madura-Flores waters. These implied that migratory routes existed in west northeast axis, from Karimunjawa to Matasiri Bank. Most of the pelagic fishes tended to stay and spend part of their life span in the Java Sea. The results implied that only part of the stock(s) were exploited by the fisheries.

KEYWORDS: **target strength, pelagic fish, Java Sea**

INTRODUCTION

During the first three decades of this century, observations on fish size distribution in the Java Sea had been done as part of oceanographic research. Based on those observations, Hardenberg (1938) built a hypothesis on the *Decapterus* populations and its migration. Recently, based on intensive length measurement data, a more comprehensive hypothesis was proposed in the context of migration and recruitment (Potier & Sadhotomo, 1995). It maybe stated that the javanese seiner fishery exploits only part of the stock (s) in the Java Sea. However, knowledge of geographical repartition is important, especially in relation with partition of exploited stocks. In general, for many migratory fish spatial feature of size distribution relates to the life history. It can be pointed out that the importance of a study in this domain is apparent, especially to underlie an estimation of abundance and biological parameters as well as in modelisation of population change. If this is the case, ignoring spatial feature of size distribution in fish abundance estimation may lead to substantial biases.

It has been recognized that fluctuation of pelagic fish abundance in the Java Sea associating with seasonal change of hydrographic characters. Justified by this fact, evaluation on the ecological aspects will involve these variations. In the area of the Java Sea, fishery data were usually used to explain fluctuation of pelagic abundance and their relation to climatic parameter, for example, the investigations conducted by Potier & Boely (1990).

As consequence of operational aspect exerted in the fishery, the evolution of the catch and catch per unit of nominal effort exhibited in the same pattern (Sadhotomo & Widodo, 1994; Potier, 1998). In this case, vulnerability to the fishery could be assumed to be proportional to the abundance. A complete absence of fishing fleet in certain months in the areas around Kangean Island and Southern of the South China Sea could generate an under estimate but since the fleet operated in fishing areas inside the Java Sea tends to be proportional to the concentration of shoal as mentioned previously (Potier & Sadhotomo, 1995), the seasonal abundance of pelagic fish by fishing zones would fluctuate in the same trend as catch composition derived from the fishery data. This study is a synthesis of information generated from exploratory survey data collected during the Java Sea pelagic fishery assessment project (1991 until 1997) and the recent data (during inhouse project in 2005). Preliminary information had been published elsewhere during the project running (see Potier & Nurhakim (*eds*), 1995).

This study attempted to evaluate size distribution of the pelagic species by exploring target strength data collected during the acoustic survey. Still in the frame of the context of this study, this paper dealed with ecological behaviour of the pelagic community in the Java Sea, and consists of spatial distribution of fish size and its relation to migration.

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