

CHANGES IN FISHING EFFICIENCY OF THE POLE-AND-LINE SKIPJACK TUNA FLEET BASED AT SORONG, IRIAN JAYA, INDONESIA

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ABSTRACT

Data from the fishing operations of the pole-and-line fishing fleet based in Sorong, Irian Jaya, eastern Indonesia are examined to assess the status of the fishery in that region. A General Linear Model was used to derive standardised indices of relative vessel efficiencies for the baitfish used per boat day and tuna caught per boat day.

The most appropriate models in each case were $\text{Ln}(\text{Bait used}) = \text{Constant} + \text{Year} + \text{Month} + \text{Vessel}$ which explained 56% of the variation in the bait used per boat day and $\text{Ln}(\text{Tuna catch}) = \text{Constant} + \text{Year} + \text{Month} + \text{Vessel} + \text{Ln}(\text{Bait/boat day})$ which explained 53% of the catch-effort variation for tuna. Parameters for relative vessel efficiencies were used to standardise the recorded fishing effort.

By 1992, fishing effort (boat days) for baitfish and tuna had increased by approximately 800% since the start of the fishery in 1976. Relationships between both baitfish used and tuna caught, and standardised fishing effort were linear and tuna catches were strongly dependent on the amount of bait available. The pole-and-line fleet has experienced declining bait usage and tuna catches per boat day since 1992. The reasons for this are unclear from the available data but may be related to changes in the operations of the bagan fishery that supplies baitfish or a decline in the abundance of these fish.

KEYWORDS: skipjack tuna, Sorong, baitfish, CPUE.

INTRODUCTION

The pole-and-line fisheries for skipjack (*Katsuwonus pelamis*) and yellowfin tuna (*Thunnus albacares*) are important commercial fisheries in eastern Indonesia (Naamin & Gafa, this volume). One of the largest fleets of pole-and-line vessels in eastern Indonesia is based at Sorong, Irian Jaya and operates for the state fishing company, PT Usaha Mina (Usaha Mina).

The success of pole-and-line fishing is totally reliant on a regular nightly supply of baitfish which are caught in a totally separate fishery. Baitfish are taken at night in inshore areas by baitfishing units, known locally as bagans, or less commonly by the pole-and-line vessels themselves using the "basnig" system (See Naamin & Gafa, this volume, for a detailed description of the fishing methods, fishing grounds and the species composition of baitfish).

Owners/operators of the bagans receive payment based on the number of buckets of baitfish that they supply to the pole-and-line vessels. The

captain of the pole-and-line vessel records on a logsheet, the number of buckets of baitfish that he receives each night from each bagan. The logsheets are returned to the Usaha Mina office where the number of buckets of baitfish that have been supplied by each bagan is calculated. These data are compiled on a monthly basis.

Usaha Mina uses the same data source to compile details of the number of buckets of baitfish supplied to each pole-and-line vessel per month. In addition to this, the amount of tuna landed and the number of fishing days undertaken by each pole-and-line vessel during each month are recorded.

Purpose of the Study

The initial aim of this study was to review the historical catch and effort data that had been collected by Usaha Mina in order to assess the baitfish stocks. However, the basic assumption of using catch per unit effort (CPUE) data to monitor the status of a fishery is that changes in CPUE

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