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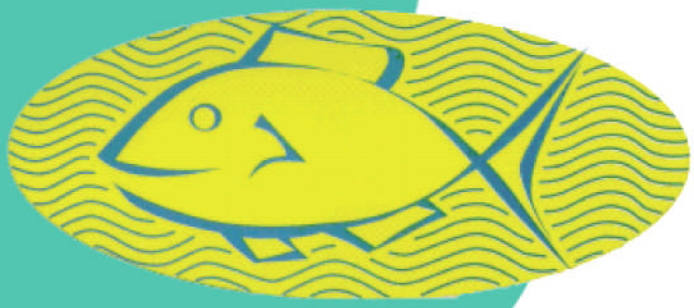

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PREFACE

Indonesian Fisheries Research Journal (IFRJ) in 2017 entered the Volume 23. The process of publishing this journal is funded by Center for Fisheries Research and Development of the fiscal year 2017. All submissions should be published through the process of evaluation by the Editorial Board, Peer-Reviewers and editing by Editorial Office.

The IFRJ Volume 23 Number 1 2017 presented seven fisheries research articles. Those seven articles are: Comparison of Indonesian Tuna Longline Fishing Performance Within and Outside Indonesia Exclusive Economic Zone (EEZ); Delta Model Approach for CPUE Standardization of Swordfish (X*iphias gladius* Linnaeus, 1978) Caught by Indonesian Longline Fleet in the Eastern Indian Ocean; The Population Dynamic of Banana Prawn (*Penaeus merguiensis* de Man) in Tanah Laut Waters, South Kalimantan; Parasites as Potential Stock Markers for Tuna in Indonesian Waters; Standardizing Cpue Of Albacore Tuna (*Thunnus alalunga* Bonnaterre, 1788) On Tuna Longline Fishery In Eastern Indian Ocean; Analysis 16S RDNA of the Turtles in Foreclosure Cages at Padei Laut, Central Sulawesi, Indonesia; Possible use of Length-Based Spawning Potential Ratio for Skipjack (*Katsuwonus pelamis*) in Indonesia's Archipelagic Waters.

Those scientific papers are expected to contribute to policy makers and managers of fisheries resources in Indonesia. Editor would deliver sincere thanks to reseachers from the Center for Fisheries Research and Development and outside for their active participation in this edition.

Editor in Chief

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INDONESIAN FISHERIES RESEARCH JOURNAL
Volume 23 Number 1 June 2017

CONTENTS

Page

PEER-REVIEWER..... i

ACKNOWLEDGEMENTS..... ii

PREFACE iii

CONTENTS iv

ABSTRACT..... v-vii

Comparison of Indonesian Tuna Longline Fishing Performance Within and Outside Indonesia Exclusive Economic Zone (EEZ)
By: Bram Setyadji and Irwan Jatmiko..... 1-6

Delta Model Approach for CPUE Standardization of Swordfish (*Xiphias gladius* Linnaeus, 1978) Caught by Indonesian Longline Fleet in the Eastern Indian Ocean
By: Irwan Jatmiko, Humber Andrade and Budi Nugraha..... 7-16

The Population Dynamic of Banana Prawn (*Penaeus merguiensis* de Man) in Tanah Laut Waters, South Kalimantan
By: Ali Suman, Ap'idatul Hasanah, Tri Ernawati and Andina Ramadhani Putri Pane..... 17-22

Parasites as Potential Stock Markers for Tuna in Indonesian Waters
By: Pratiwi Lestari, R.J.G. Lester and Craig Proctor 23-28

Standardizing Cpue Of Albacore Tuna (*Thunnus alalunga* Bonnaterre, 1788) On Tuna Longline Fishery In Eastern Indian Ocean
By: Fathur Rochman, Bram Setyadji and Arief Wujdi..... 29-38

Analysis 16S RDNA of the Turtles in Foreclosure Cages at Padei Laut, Central Sulawesi, Indonesia
By: Adriani Sri Nastiti, Masayu Rahmia Anwar Putri, Joni Haryadi, Arif Wibowo and Ngurah N. Wiadnyana 39-44

Possible use of Length-Based Spawning Potential Ratio for Skipjack (*Katsuwonus pelamis*) in Indonesia's Archipelagic Waters
By: Fayakun Satria and Lilis Sadiyah..... 45-53

CERTIFICATE..... App. 54

AUTHOR GUIDELINES..... App. 55

INDONESIAN FISHERIES RESEARCH JOURNAL
Volume 23 Number 1 June 2017

ABSTRACT

COMPARISON OF INDONESIAN TUNA LONGLINE FISHING PERFORMANCE WITHIN AND OUTSIDE INDONESIA EXCLUSIVE ECONOMIC ZONE (EEZ)

Bram Setyadji
IFRJ, Vol. 23 No. 2, Page: 1-6

ABSTRACT

Indonesian tuna longline fleets have been fishing in the Exclusive Economic Zone (EEZ) and high seas of the Indian Ocean for quite some time. However, effort has never been made to separate catch from the EEZ and the high seas as it important for fisheries management. A total of 2,430 set-by-set longline fishing data had been collected by scientific observers based in the Research Institute of Tuna Fishery in Bali since August 2005 to December 2014 on which present analysis was made. The current paper presents comparison between trend of tuna catch of the EEZ and of the high seas of Indian Ocean. The results show that the mean hook rate of both catch of big eye tuna (BET) and southern Bluefin tuna (SBT) caught in the high seas was significantly higher than that within the EEZ (two sample t-test, $p<0.05$), while for yellow fin tuna (YFT)it was in the opposite direction (two sample t-test, $p<0.05$). As for albacore (ALB), the mean hook rate value was statistically similar in both fishing grounds (two sample t-test, $p>0.05$).

Keywords: Tuna; longline; Exclusive Economic Zones; hook rate

DELTA MODEL APPROACH FOR CPUE STANDARDIZATION OF SWORDFISH (*Xiphias gladius* Linnaeus, 1978) CAUGHT BY INDONESIAN LONGLINE FLEET IN THE EASTERN INDIAN OCEAN

Irwan Jatmiko
IFRJ, Vol. 23 No. 2, Page: 7-16

ABSTRACT

Relative abundance indices as calculated based on commercial catches are the input data to run stock assessment models to gather useful information for decision making in fishery management. A Generalized Linear Model (GLM) was used to calculate relative abundance indices and effect of longline fishing gear configuration. Data were collected by a scientific observer program from August 2005 to November 2013. Most of the boats monitored were based in the Benoa Port, Bali. Catches are often equal to zero because swordfish is a bycatch for Indonesian longline fleets. Therefore, a hurdle model and binomial distribution was used to model the proportion of positive catch rates, while gamma distribution was used to model the positive longline sets. Correlations between the proportion of positive sets and year (0.109; $p = 0.781$) and quarter (0.492; $p = 0.507$) were weak. However, linear correlation between the proportion of positive sets and the length of branch lines ($r = -0.628$; $p = 0.029$) and number of hooks between floats (-0.446; $p = 0.084$) were negative and significant. The probability of success is higher for surface longline with small number of hooks and short branch lines. Models with year in interactions as random effects did not converge. Models with year in interactions as fixed effects did converge, but the estimation of standard errors of year coefficients were high. Meaningful estimations were obtained only when using the simplest model, in which year is not in interactions. The low proportional decrease of deviance indicates that most of the variability of catch rates of swordfish caught by Indonesian longline boats are not related to year, quarter, number of hooks between floats and the length of branch lines. Other variables and information, like the daytime while the longlines deployed in the water (day or night), type of bait, size and type of hooks, and if the fishermen use light-sticks to attract the fish, are necessary to better understand the catch rate, and improve the estimations of the relative abundance indices.

Keywords: Swordfish; standardized CPUE; GLM; GLMM

THE POPULATION DYNAMIC OF BANANA PRAWN (*Penaeus merguiensis* de Man) IN TANAH LAUT WATERS, SOUTH KALIMANTAN

Ali Suman
IFRJ, Vol. 23 No. 2, Page: 17-22

ABSTRACT

Scientific advices on population dynamic of banana prawn (P. merguiensis de Man) are required as an input to support an apropriate fisheries management. This study aims to identify the population parameters of the banana prawn in Tanah Laut waters. The study was conducted in Tanah Laut based on monthly enumeration data (January to November 2016). Results has been shown that the length size of carapace at first maturity of banana prawn was 43.39 mm. Sex ratio of males and

females was 1 : 0.8. The chi square test indicated that comparison of male and female of the banana prawn was significantly different. It means that there was not balance in number between males and females. The spawning season of banana prawn in Tanah Laut waters happened throughout year and reached the peak on November (south-east monsoon). The growth parameter of banana prawn was 1.05/year with maximum carapace length (Loo) of 55.0 mm. Instantaneous total mortality (Z) and natural mortality (M) were 6.05/year and 1.58/ year, respectively. While fishing mortality (F) and exploitation rate (E) respectively were 4.47/year and 0.74/ year respectively. The exploitation rate of banana prawn in Tanah Laut waters was high. Therefore, fishing effort of the banana prawn in that waters should be reduced to about 48 % for next coming year.

Keywords: Banana prawn; population dynamic; Tanah Laut; FMA 712

PARASITES AS POTENTIAL STOCK MARKERS FOR TUNA IN INDONESIAN WATERS

Pratiwi Lestari

IFRJ, Vol. 23 No. 2, Page: 23-28

ABSTRACT

Tuna are highly migratory species. Clarifying their stock structures and migration patterns is important for tuna fisheries management. The purpose of this research was to examine the parasites of bigeye tuna (Thunnus obesus) and yellowfin tuna (Thunnus albacares) to determine which parasites may be potential stock markers for assessment of tuna migration patterns. Bigeye tuna and yellowfin tuna were collected (measured between 28-48 cm fork length) from 9 sites across Indonesia and from 2 'outlier sites' (The Maldives and Solomon Islands). Organs including gills (filaments and branchial arches), stomach wall, liver, pyloric caeca, and intestines were examined. Seven types of didymozoids were distinguished including 3 Didymosulcus spp., 4 Kollikeria spp. and one acanthocephalan (Bolbosoma sp.). The results suggest these fish parasites are potentially useful markers for assessment of tuna migration pattern, contributing information needed for fisheries management in Indonesia.

Keywords: Tuna; parasites; stock markers; Indonesia

STANDARDIZING CPUE OF ALBACORE TUNA (*Thunnus alalunga* Bonnaterre, 1788) ON TUNA LONGLINE FISHERY IN EASTERN INDIAN OCEAN

Fathur Rochman

IFRJ, Vol. 23 No. 2, Page: 29-38

ABSTRACT

Albacore (Thunnus alalunga) is the third dominant catch of Indonesian tuna longline fishery operating in the eastern Indian Ocean. The percentage production of albacore catch reaching up 6% of the total catch of tuna groups in Indonesia. Thi study aims to examine a relative abundance indices using standardized catch per unit of effort (CPUE) of longliner based on albacore tuna. This information will give a valuable input and information to support stock assessment particularly in the regional basis. In this study, we use Generalized Linear Model (GLM) with Tweedie distribution to standardize the CPUE and to estimate relative abundance indices based on the Indonesian longline dataset time series. Data were collected from January 2006 to October 2015 (106 trip observer and 8.989 fishing days) by conducting direct onboard observation on tuna longline vessels operating in the Indian Ocean. The resulted showed that year, area,hooks between floats, year*season, year*area and year* hooks between floats significantly influenced the nominal CPUE of albacore. The highest value of Standardized CPUE appeared in 2014 and probably related to the large number of foreign fishing vessels with a high capacity (over 60 GT) targeting frozen tuna including albacore. In 2015, standardized CPUE value was sharply decreased due to the ban of foreign vessels in Indonesia.

Keywords: Standardization; albacore; generalized linear model; Indian Ocean

ANALYSIS 16S RDNA OF THE TURTLES IN FORECLOSURE CAGES AT PADEI LAUT, CENTRAL SULAWESI, INDONESIA

Adriani Sri Nastiti

IFRJ, Vol. 23 No. 2, Page: 39-44

ABSTRACT

Marine turtle is one of the protected aquatic animals as listed in CITES Appendix and IUCN red list. However, illegal fishing of marine turtle is still occurred Padei Laut

Village, in Morowali Regency, Central Sulawesi Province, Indonesia. The research aims to study the population of marine turtle based on the carapace length and the genetic relationships. Data of carapace length was measured in-situ and genetic analysis was used mitochondrial DNA. The results showed that the carapace (ten samples which was green turtles/ *Chelonia mydas*) was ranges between 42-102 cm; 91% of samples was immature and 9% was mature. Moreover, it also revealed that those turtles resembled by 99.98% of genetic similarity.

Keywords: Turtle; carapace; genetic; Sulawesi; Indonesia

POSSIBLE USE OF LENGTH-BASED SPAWNING POTENTIAL RATIO FOR SKIPJACK (*Katsuwonus pelamis*) IN INDONESIA'S ARCHIPELAGIC WATERS

Fayakun Satria
IFRJ, Vol. 23 No. 2, Page: 45-53

ABSTRACT

A harvest strategy development for skipjack tuna (Katsuwonus pelamis - SKJ) fishery within Indonesia's archipelagic waters (Indonesian Fisheries Management Areas - FMAs 713-715) has been initiated, which is mandated within its National Tuna, Skipjack and Neritic Tuna Management Plan. Information on the stock status or indicator is needed, since it is one essential component of a harvest strategy. In fact, the lack of catch and effort data from Indonesian fishery, in general, is still an international concern. A method to assess the stock status for data poor fisheries namely Length-based Spawning Potential Ratio (LB-SPR) was developed. This study attempted to investigate a possible use of the LB-SPR to estimate spawning potential ratios of SKJ using length data from Indonesian pole and line fishery collected by the port-based sampling program (a collaborative project between Indonesia and the Western and Central Pacific Fisheries Commission (WCPFC). There is a decreasing trend in the estimated SPR from 2010 to 2015 unless 2014, indicating that impact of fishing on the resources increased over the study period. If the SPR20% is adopted as limit SPR, then the estimated values of SPR less than SPR20% suggested that recruitment overfishing might be occurring. In fact, the results should be considered as preliminary results, as the size data of SKJ from pole and line might not be capturing large SKJ or the nature of SKJ in Archipealgic waters has smaller size in general compare to other region that potentially hampered the asymptotic selectivity assumption within the LB-SPR model underestimating the SPR. Further work is required to gather complete representative of length data of SKJ covering all length classes of the fishery.

Keywords: Spawning potential ratio; skipjack; Indonesia's archipelagic waters