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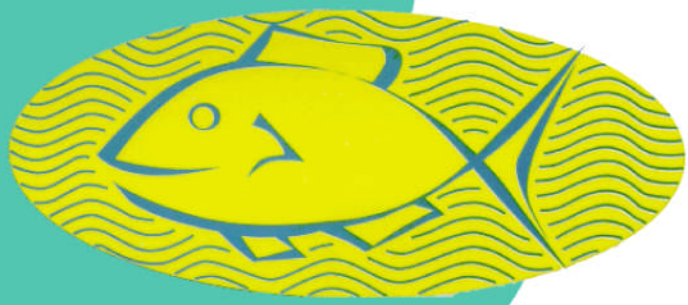

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Indonesian Fisheries Research Journal publishes research results on resources, oceanography and limnology for fisheries, fisheries biology, management, socio-economic and enhancement, resource utilization, aquaculture, post harvest, of marine, coastal and inland waters.

Manuscript is entering to Indonesian Fisheries Research Journal will be checked on the guidelines writing by Editorial Office. If it is in compliance will be reviewed by one (1) person Editorial Board and one (1) person peer-reviewer based on the appointment of Editor in Chief. The decision whether or not a manuscript accepted the rights of Editor in Chief based on the recommendations of Editorial Board and peer-reviewer.

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PREFACE

Indonesian Fisheries Research Journal (IFRJ) in 2018 entered the Volume 24. The process of publishing this journal is funded by Center for Fisheries Research and Development of the fiscal year 2018. All submissions should be published through the process of evaluation by the Editorial Board, Peer-Reviewers and editing by Editorial Office.

The IFRJ Volume 24 Number 1 2018 presented seven fisheries research articles: Spatial and Temporal Distribution of Fish in the Floodplain of Kumbe River, Papua; Genetic Diagnosis and Reproductive Biology of Introduced *Mystacoleucus Marginatus* in the Toba Lake, North Sumatra; Reproductive Biology of the Red Bigeye (*Priacanthus macracanthus* Cuvier, 1829) in Palabuhanratu Bay, Indonesia; Using DNA Barcode to Improve the Identification of Marine Fish Larvae, Case Study Coastal Water Near Jakarta and Banda Sea, Indonesia; Fisheries Sanctuary Planning in Practice: Lesson Learnt From Ecosystem Approach to Fisheries Management in North Kalimantan Province; The Development of Harvest Strategies for Tropical Tuna in Indonesia's Archipelagic Waters; Population Dynamic and Exploitation Rate of The Blue Swimming Crab (*Portunus pelagicus*) in The Kendari 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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ABSTRACT

GENETIC DIAGNOSIS AND REPRODUCTIVE BIOLOGY OF INTRODUCED *MYSTACOLEUCUS MARGINATUS* IN THE TOBA LAKE, NORTH SUMATRA

Siswanta Kaban
IFRJ, Vol. 24 No. 1, Page: 1-9

ABSTRACT

After *M. marginatus* has been introduced to Toba Lake, North Sumatra, the status of *M. marginatus* stocks and their biological properties is unknown. In this study, we examine the genetic patterns of the *M. marginatus* in Toba Lake, North Sumatra Province. Employing the cytochrome *c* oxidase subunit I (COI) gene of the mtDNA, we profile the genetic variation within *M. marginatus* in Toba Lake. We also analyzed reproductive characteristic and commercial catches of *M. marginatus.* The result shown *M. marginatus* is a synonim for *M. marginatus*, in total, 1 polymorphic sites (represent singleton dimensions) was identified and phylogenetic reconstruction reveal low levels of genetic diversity with no clear pattern of haplotype-partitioning. Nucleotide diversity analysis infer the present of two lineages. The Ne value of *M. marginatus* (1,936 to 3,878), the population has not experienced population growth/expansion as expected and the total production of *M. marginatus* in Toba Lake of the year for 2013 has ranged between 3347,05 – 6694,1 ton. *M. marginatus* in the Toba Lake share similar life history traits include maximum body size, longevity, age at maturity, and fecundity (the number of eggs produced). *M. marginatus* is categorized as the opportunistic strategy consisted of fishes with short generation time, low batch fecundity, and low investment per offspring. This life history traits approach of *M. marginatus* are important for guide fisheries management for its sustainability. More over the information can be use as pilot data and apply it to data-poor species.

Keywords: ***M. marginatus*; Reproductive; DNA; Toba Lake**

REPRODUCTIVE BIOLOGY OF THE RED BIGEYE (*Priacanthus macracanthus* Cuvier, 1829) IN PALABUHANRATU BAY, INDONESIA

Meuthia Aula Jabbar
IFRJ, Vol. 24 No. 1, Page: 11-22

ABSTRACT

The reference point of reproductive biology play an important roles in developing a baseline information for fishery management. Different waters will provide different overview of fisheries related to its biological aspects. The red bigeye (*Priacanthus macracanthus*) is one of economically important demersal fish species in Indonesia. To support the biological status of this species, a regular field observation were carried out during May 2016 to April 2017 in Palabuhanratu bay, south of West Java. The objective of this study is to estimate the spawning season and potential reproductive stages including to evaluate how the key management related to the species and its gear selectivity. Numbers of red bigeye (*Priacanthus macracanthus)* specimen was collected from bottom gillnetter and hand liner. Basic information related to length-weigth, bio-reproduction (maturity) were collected regularly to determine GSI, Fecundity and its impact of fishing (Lc, Lm) to evaluate the recent stock status. The result showed sex ratio no significant differences between males and females except in September to December. The growth pattern indicated negative allometric. The predicted of spawning seasons were around June-July and December-January. Mean of fecundity was estimated to be 230,000 ± 178,000 eggs. Management keys were obtained i.e. length at first maturity (Lm) value was to be 21.9 cm TL which is smaller than length at first capture (Lc) 22.4 cm TL for bottom gill netter and 23.1 cm TL for average fishes caught by hand liner. Therefore it is recommended to close the waters in the bay area during the spawning period. In the case of catch, it is important to apply the precautionary approach with emphasizes to the size of fish allowed to be captured more than the Lm value (above 21.9 cm TL).

Keywords: ***Priacanthus macracanthus*; reproduction; sex ratio; fecundity; spawning season**

USING DNA BARCODE TO IMPROVE THE IDENTIFICATION OF MARINE FISH LARVAE, CASE STUDY COASTAL WATERS NEAR JAKARTA AND BANDA SEA, INDONESIA

Arif Wibowo
IFRJ, Vol. 24 No. 1, Page: 23-30

ABSTRACT

The sustainability of the exploitation of the Indonesian fishes resources depends heavily on many of fish's basic information including both larvae distribution and dispersal. However, the identification of fish larvae and juvenile to species is very limited. In this study, we employed DNA barcoding techniques to identify marine fish larvae to a species level in Jakarta Bay and Banda Sea by comparing the querries with sequences from

adult stage as reference library to contribute to biodiversity information on that particular area. The result revealed that i*n Jakarta Bay, t*he molecular marker of a 471 bp region of the mitchondrial *cyctochrome c oxidase I gene (COI)* has been successfully found to be species-specific, genetic distance within species (0.0 - 1.30 percent). There are total of 8 families, 5 genera and 5 species from a total of 15 successful PCR that could be used to calculate the accuracy of larval fish identification in three taxonomic categories. Meanwhile in the Banda Sea, for the adult specimens, after some PCR experiment, we have successfully amplified 27 individuals, only 8 sequences available. There are a total 326 eggs and larvae which been collected from 19 stations, of the 28 successfully amplified PCR samples, 11 sequences were available for DNA analysis and at least 10 species used Banda Sea and surrounding area as their spawning ground. We prove the ability of COI barcodes to identify species level resolution from query sequences and to classify species from distinct geographical origins and determine of how the data retrieved give important information for proposing plans for conserving and managing of fisheries in the marine waters.

Keywords: Jakarta Bay; Banda Sea; larvae; and DNA barcode

FISHERIES SANCTUARY PLANNING IN PRACTICE: LESSON LEARN FROM ECOSYSTEM APPROACH TO FISHERIES MANAGEMENT IN NORTH KALIMANTAN PROVINCE

Andhika Prima Prasetyo
IFRJ, Vol. 24 No. 1, Page: 31-38

ABSTRACT

Governor Decree of North Kalimantan No. 26 in 2014 concerning Management of Bombay Duck in the North Kalimantan Province Waters was established in order to address over-exploitation of Bombay duck (*Harpadon nehereus*) population. Fisheries sanctuary is the feasible solution that was agreed by comprehensive stakeholder discussion. This research aims to extract and elaborate our experiences on establishing fisheries sanctuary in the Bangkudulis waters which focus on science communication and in the fisheries sanctuary planning. The acoustic and larva survey conducted to support the consensus and to proof the traditional ecological knowledge of the communities. The results showed that the proposed conservation area of the Bangkudulis waters has significant ecological function to ensure the sustainability of Bombay duck population. The distribution and abundance of larva and juveniles were found higher in that area. The approach and challenges to deal with ecological and socio-economic aspects as well as recommendations were discussed in this paper.

Keywords: EAFM; MPA; fisheries sanctuary; community engagement; science communication; Tarakan; North Kalimantan Province

THE DEVELOPMENT OF HARVEST STRATEGIES FOR TROPICAL TUNA IN INDONESIA'S ARCHIPELAGIC WATERS

Fayakun Satria
IFRJ, Vol. 24 No. 1, Page: 39-48

ABSTRACT

Significant roles of the fishery in the Indonesia's archipelagic waters/IAW (FMAs 713, 714 and 715), with proportion of around 60% came from the IAW, and a strong residential behavior for skipjack (SKJ) and yellowfin tuna (YFT) encourage Indonesia to develop harvest strategies for the tropical tuna in the IAW. This is a priority action of the National Tuna Management Plan (NTMP) for tropical and neritic tuna. Fisheries operating in the IAW are mainly small scale commercial vessels. A specific harvest strategy framework that appropriate with the fishery characteristics has been developed. This paper describes the process of harvest strategy (HS) development for the tropical tuna in the Indonesia's archipelagic waters (FMAs 713, 714 and 715). The HS is developed scientific works (including data collection, analysis/modelling and series technical and consultative stakeholder workshops as well as expert consultancies. Four technical workshops and seven stakeholder workshops have been done between 2015 and 2017. An interim HS (consisted of management objective, limit reference point, monitoring, analysis, harvest control rule and management measure) has been determined and agreed. Continues collaboration and commitment from related stakeholders including Government, fishers, fishing association, NGOs by adopting co-mangement and participatory approach in implementing the agreed harvest strategy, through data collection and sustain supports.The time series of catch and effort data, and size data could be used to monitor the fishery, stok status and its performance.In addition, involvement of relevant international tuna experts through expert consultancies are integrated process with the technical and stakeholder workshops. This HS development process is still on-going and can be refined, as HS development is a cycle and an iterative process.

Keywords: Harvest strategy; harvest control rule; tropical tuna; archipelagic waters

CHRONOLOGY AND CAUSE OF MASS MORTALITY EVENT ON FISH IN THE LOWER PART OF YAMAIMA RIVER, MIMIKA REGENCY, PAPUA

Husnah
IFRJ, Vol. 24 No. 1, Page: 49-59

ABSTRACT

Mass mortality events (MMEs) on fish tend to increase recently both for cultured and wild fish both in coastal and inland waters. The MMEs on wild fish are mostly unknown. Mass mortality events on wild fishes of Mimika estuary, Papua have been recorded since long time ago and limited information was provided due to its remote area. A rapid appraisal study of mass mortality event (MME) of wild fishes chronology and cause was conducted in Yamaima river to Tifuka Estuary, Papua Province a week after the MME in April 2016. Seven sampling sites were selected. Two activities were conducted during the field survey: interview with the local people to get information on the chronology of the MME and collecting primary data on aquatic environment quality and fish samples. The occurance of goldstripe sardine inYamaima river and Tifuka estuary were triggered by the present of strong El Nino with ONI value more than 0.5^{o}C in the ocean and atmosphere above Equator Pasific. Water quality at MME site was similar with remaining schooling fish and Tifuka estuary sites. Concentration of heavy metals in the sediment tend to decreased along with the distance from the MME site. Mass mortality of goldstripe sardinella could relate to oxygen suffocation as a result of disorentation movement of the fish shoals inaccordance with low tide and new moon phase. The number of the death goldstripe sardinella was estimated 200,000 fish with the weight of 18 tons. To mitigate MMEs in the future, efforts should be done such as: routine early detection of El Nino pattern and its effect on salinity and water temperature raising by placing key water quality parameter buoy in the mouth river of Papua and to set net or stack of logs in the cape area of west tailing levee Yamaima river to prevent the entrapment of migrating small pelagic fish specialy in the closed water area.

Keywords: Yamaima river; mass mortality events; heavy metals; goldstripe sardinella; El nino; Papua

Abstract

POPULATION DYNAMIC AND EXPLOITATION RATE OF THE BLUE SWIMMING CRAB (*Portunus pelagicus*) IN THE KENDARI BAY WATERS

Ali Suman
IFRJ, Vol. 24 No. 1, Page: 61-67

ABSTRACT

Kendari Bay waters consitute a potential blue swimming crab (BSC) fishing ground in WPP NRI 714 (the Banda Sea). The intensive fishing activities have been increasing from year to year that will disturb resource sustainability. Therefore, an alternative sustainable management is advisable. The purpose of this research was to examine the population dynamics and exploitation rate of BSC in the Kendari Bay waters conducted between January and November 2016. The results show the isometric of BSC growth pattern and balance of male and female ratio. The length at first capture (L_c) of BSC was 116.65 mm (carapace width), smaller than the length at first maturity (L_m) at 119.7 mm (carapace width). The von Bertalanffy growth equation for the blue swimming crab was $L(t) = 182.0[1-e^{-0.91\ (t\ -\ 0)}]$ and the fishing mortality rate (F) was higher than the natural mortality rate (M). The blue swimming crab exploitation rate calculated BSC from Kendari Bay has exceeded the optimum rate of 0.73 per year and is indicating a category “overfishing”. Therefore, to maintain the BSC stock sustainability, a management measure is needed to reduce the current fishing effort of approximately 46 % from the current effort and regulation of net mesh size.

Keywords: Blue swimming crab; population dynamics; exploitation rate; Kendari Bay; Fishing Management Area (FMA) 714