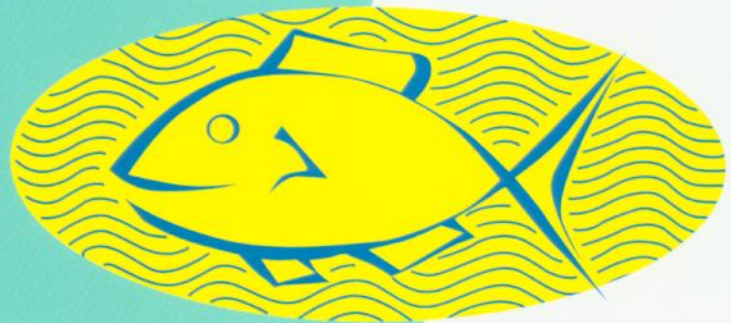


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## PREFACE

Indonesian Fisheries Research Journal Volume 21 Number 1 June 2015 is the first publication of English journal of the Research Center for Fisheries Management and Conservation in 2015. The journal is expected to be a source of newest science and technology for all scientists and researchers in Indonesia and other countries. The financial for publication is provided by the Research Center for Fisheries Management and Conservation budget in the fiscal year of 2015.

This volume contains: Identification and classification of lake bottom surface and aquatic vegetation in Laut Tawar Lake, Aceh; Limnological condition and estimation of potential fish production of Kerinci Lake Jambi, Sumatra; Fishing activities and fishermen income in Ranau Lake, South Sumatra; Striped catfish (*Pangasianodon hypophthalmus*) (SAUVAGE, 1878) movement and growth in Gajah Mungkur reservoir, Central Java; Abundance and biomass estimates of commercial fish species using hydro-acoustic method in Jakarta Bay, Indonesia; Potential production of demersal fish stock in the malacca strait of Indonesia; Bio-exploitation status of bombay duck (*Harpodon nehereus* HAMILTON, 1822) on trawl fishery in Tarakan Waters.

We hope that all the articles on this volume may contribute significantly to the development of fishery science and technology in Indonesia. We are grateful to the editorial board for their improvement and suggestion on reviews of the manuscripts.

Editor

**INDONESIAN FISHERIES RESEARCH JOURNAL**  
**Volume 21 Number 1 June 2015**

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**ABSTRACT**

**IDENTIFICATION AND CLASSIFICATION OF LAKE BOTTOM SURFACE AND AQUATIC VEGETATION IN LAUT TAWAR LAKE, ACEH**

Zulkarnaen Fahmi  
*IFRJ, Vol. 21 No.1, Page: 1-8*

**ABSTRACT**

Identification and classification of benthic habitats in Lake of Laut Tawar, Aceh by using hydro acoustic method can provide data and information on types of substrate and aquatic vegetation in a short time and wide spatial coverage, as done in the present work. Data acoustic collection was performed in 2013 using quantitative echosounder with split beam frequency of 120 kHz, and through a visual observation. The later is destined to look at the bottom types and macrophytes that lie on the line transect of acoustic survey. Analysis of data is to extract the value of bottom volume backscattering for each transect of 0.5-1 km. Classification of the bottom type was done based on the value of Sv using geospatial models. Results show the interval value of Sv for soft bottom ranged between -24.00 dB and -32.00 dB, the type of hard bottom (e.g. rocks, rocky sand substrate) ranged between -14.00 dB and -22.00 dB, whereas the Sv value of macrophyte ranged between -45.00 dB and -54.00 dB. The percent covers were about 42.90%, 44.71% and 12.93% for hard bottom type, soft bottom and macrophytes, respectively. The types of aquatic vegetation commonly found in the lake were two genera belonging Hydrocharitaceae and Gramineae. The current work is still lack of information on the classification of organisms into genera scales. Therefore, more signal verification and algorithms verification would be needed in order to estimate macrophytes biomass by comparing with other visual observation.

**KEYWORDS:** Bottom surface, Laut Tawar Lake, macrophytes, hydro acoustic methods

**LIMNOLOGICAL CONDITION AND ESTIMATION OF POTENTIAL FISH PRODUCTION OF KERINCI LAKE JAMBI, SUMATRA**

Samuel  
*IFRJ, Vol. 21 No.1, Page: 9-18*

**ABSTRACT**

Kerinci Lake is a type of tectonic lakes located in a protected forest area of National Park of Kerinci Sebelat and a source of various fish species important for local

people for their daily food consumption and income. However, few information is available on is limnological condition and fish resources. Field research observing the limnological condition and estimating the potential fish production was conducted four times in April, June, August and October 2013. The research is aimed to describe the condition of limnology to estimate the potential fish production of the lake. Limnological aspect included the physico-chemical and biological parameters, namely: temperature, water transparency, depth, substrate, conductivity, pH, dissolved oxygen, alkalinity, ammonia, nitrate, phosphate, total phosphorus, chlorophyll-a and trophic state. Potential fish production was calculated by using the biological parameter levels of chlorophyll-a. The results show that the euphotic layer of the lake waters was still feasible for fish life. Water condition of the bottom layer was less supportable for fish life due to low dissolved oxygen content. Trophic state index (TSI) values, either measured by temporal or spatial ways, had TSI with an average of 61.75. From these indeces, the lake is classified as a lake at the high productivity level (eutrophic). Annual fish production was an average of 307 kg/ha/year. By taking account the average of fish production and the total area of lake of around 4,200 ha, the potential fish production of Kerinci Lake is estimated about  $\pm 1,287$  tons/year.

**KEYWORDS:** Water quality, trophic state, potential fish production, Kerinci Lake of Jambi, Sumatra

**FISHING ACTIVITIES AND FISHERMEN INCOME IN RANAU LAKE, SOUTH SUMATRA**

Dina Muthmainnah  
*IFRJ, Vol. 21 No.1, Page: 19-26*

**ABSTRACT**

Fish resources contribute to the socio-economic development for people who live surrounding the waters. The fishermen of Ranau Lake, South Ogan Komerang Ulu Regency, South Sumatra Province and West Lampung Regency, Lampung Province are the prime stakeholder with direct interest in fish resources, because they depend on it for their livelihoods or they are directly involved in its exploitation in some ways. However, to well manage these resources, it needs data and information about fish utilization and fishing activity. The objectives of this work are to assess fishing activities such as the fishing boat and gears, catch composition, fish yield, catch per unit of effort (CPUE) and to estimate the fishermen income with economical parameter such as cost and

price. Field surveys were conducted from February to November 2014. Fishing activities data were collected from field survey and interview. The results showed that fish resources utilization in Ranau Lake was categorized as traditional and small scale fisheries using different selective fishing gears such gillnet, harpoon, net trap and basket trap with the fish catch in average of 696.66 g/day; 205.03 g/day; 1.584.06 g/day and 123.67 g/day, respectively. Fisherman income (IDR 2,163,300) means the fishermen in Ranau Lake reach standard Indonesian welfare.

**KEYWORDS:** Fishery activity, fish biodiversity, Ranau Lake

### **STRIPED CATFISH (*Pangasianodon hypophthalmus*) (SAUVAGE, 1878) MOVEMENT AND GROWTH IN GAJAH MUNGKUR RESERVOIR, CENTRAL JAVA**

Siti Nurul Aida  
*IFRJ, Vol. 21 No.1, Page: 27-38*

#### **ABSTRACT**

Movement is an essential mechanism by which mobile animals acquire the resources necessary for the successful completion of their life-cycles. Striped catfish (*Pangasianodon hypophthalmus*) contributed about 384 tonnes or approximately 40,04% to the total fish production in Gajah Mungkur reservoir. Diversion of Keduang River, one of Gajah Mungkur important inlets, could affect the the movement of this fish. The objective of this research were to describe the movement patterns and to analyze growth of *Pangasianodon hypophthalmus*. Field works were conducted from March to December 2011 by tagging experiment of large fish with the PDS-Tags and the T Bar-Tags for the small ones. Fish samples used for the experiment were collected from fisherman catch's in Gajah Mungkur reservoir. The tag numbers, the release time, and the fish size were noted before releasing the tagged fish were released. Fishermen who caught the tagged fish were advised to report the fish tag number, time of catching, and fish size. The results showed that the *Pangasianodon hypophthalmus* could moved as far as 200 m to 15 km in 3- 176 days. In the wet season most of the catfish moved far into the inlet wiroko and Keduang, and some to the inlet Wuryantoro. *Pangasianodon hypophthalmus* in Gajah Mungkur Reservoir had growth equation of  $L_t = 99(1 - e^{-0.762(t-0.15)})$ , with the growth coefficient (K)= 0.762/year,  $t_0=0.15$  year, infinity length ( $L_\infty$ )= 99 cm. Water diversion of Keduang river, one of Gajah Mungkur inlets, did not fully dried the River during dry season and affected striped catfish movement and growth.

**KEYWORDS:** Movement pattern, growth, striped fish, *Pangasianodon hypophthalmus*, reservoir

### **ABUNDANCE AND BIOMASS ESTIMATES OF COMMERCIAL FISH SPECIES USING HYDRO-ACOUSTIC METHOD IN JAKARTA BAY, INDONESIA**

Andria Ansri Utama  
*IFRJ, Vol. 21 No.1, Page: 39-44*

#### **ABSTRACT**

The Jakarta Bay is known as a fishing ground area for several traditional types of fishing gears. The fishery has important role to provide nutrition, sustainable livelihoods, and poverty alleviation around the area. Abundance estimation of commercial fish species in the Jakarta Bay is essential particularly comparable of series data in order to evaluate the potential changes in distribution and abundance. The purpose of this study is to analyze the distribution of commercial fish species in the Jakarta Bay and estimate their abundance and biomass. Fish assemblages were concentrated in the eastern and central part of bay. Apparently salinity and DO associated with rich density of phytoplankton and zooplankton may explain the spatial variability of short-bodied mackerel and pony fish, while assemblages pattern of spiny hairtail and croaker might be driven by the availability of small planktivorous fish as their diet. The most abundant commercial fish in the Jakarta Bay are Short-bodied mackerel (*Rastrelliger brachysoma*), Ponyfish (*Leiognathus* sp.), Croaker (*Johnius* sp.) dan Spiny hairtail (*Lepturacanthus savala*) respectively. Furthermore, biomass estimates for those species showed short-bodied mackerel has the highest biomass followed by spiny hairtail, croaker, and ponyfish.

**KEYWORDS:** Hydro-acoustics, fish abundance, spatial distribution, Jakarta Bay

### **POTENTIAL PRODUCTION OF DEMERSAL FISH STOCK IN THE MALACCA STRAIT OF INDONESIA**

Purwanto  
*IFRJ, Vol. 21 No.1, Page: 45-52*

#### **ABSTRACT**

Malacca Strait is one of the main fishing areas for demersal fishery in Indonesia. To support the management of that fishery, an assessment of the

demersal fish stock was conducted. This study estimated that the maximum sustainable yield and the optimal catch per unit effort of demersal fishery in the Malacca Strait were about 106.8 thousand tons/year and 28.5 tons per unit of Danish seine, respectively, resulting from the operation of 3,752 Danish seines. Unfortunately, fishing effort was higher than its optimum level and the fish stock was over-exploited since 2003. To recover the demersal fish stock to its optimum level and to ensure the optimal fish production from demersal fishery in the Malacca Strait, it was necessary to reduce fishing effort at about 67% from its level in 2011.

**KEYWORDS: Potential production, optimal fishing effort, demersal fishery, the Malacca Strait**

### **BIO-EXPLOITATION STATUS OF BOMBAY DUCK (*Harpadon nehereus* HAMILTON, 1822) ON TRAWL FISHERY IN TARAKAN WATERS**

*Duto Nugroho*  
*IFRJ, Vol. 21 No.1, Page: 53-59*

#### **ABSTRACT**

North Kalimantan Province, notably Tarakan City marine waters, is one of the important fishing ground in

boundary area between Indonesia and Malaysia within Sulu Sulawesi Marine Ecoregion. It produces approximately 100 mt/yr of Bombay duck (*Harpadon nehereus*) with valued of US\$ 750,000. The sustainability of this fishery is a crucial concern due to its: substantial economic contribution and the, significant dependence of small-scale fishers on this species for their livelihoods. The fishing intensities has a growing threats to their habitats. To evaluate the vulnerability of individual species that might caused from over exploitation, the spawning potential ratio (SPR) approach was applied to describe the status of Bombay duck fisheries. This approach provides the ability to determine fishing mortality as reference points to ensure its sustainability. The objective of this study is to understand this fish biomass resilience to harvesting. The calculated SPR based on the value of estimated length of first capture or  $L_c$  at 208 mm is equivalent to the SPR of 28%. With a base line of stocks are generally thought to risk recruitment declining when  $SPR < 20\%$ , recent finding indicated that the existing fishery can be generally described as nearly fully exploited. In recognition of this fishery has an ecological importance and socio-economic significance, the sustainable development of Bombay duck fisheries should be initiated through developing local fishery committee to provide a their local fishery management plan.

**KEYWORDS: Bio-exploitation, Bombay duck, *Harpadon nehereus*, Trawl Fishery, Tarakan**