FISHING ACTIVITIES AND EFFECTS OF SEASONAL MONSOON TOWARDS SHRIMP AND FISH LANDING IN PROPOSED TUN MUSTAPHA PARK, KUDAT, SABAH

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THESIS SUBMITTED IN FULFILLMENT
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2014

DECLARATION

I hereby declare that the material in this thesis is my own except for quotations, excerpts, equations, summaries and references, which have been duly acknowledged.

03 April 2014

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ABSTRACT

The northern part of Sabah has been proposed as Tun Mustapha Park (TMP) since 2003. Establishment of the park essentially required information on the marine resources and fisheries activities within the area. Therefore, the objectives of this study are to access fishing activities and their impacts on endangered species, to identify potential fishing area and to determine the influence of seasonal monsoon on fishing operation. The study was carried out through the analysis of data from the Annual Fisheries Statistics (Kudat District) of the Department of Fisheries Sabah and meteorological data (wind and rainfall data) from Department of Meteorology Malaysia from 2000 to 2010, and a combination of survey interviews and observing trips on fishing boats. Survey interviews were conducted from October 2007 to October 2008 (one year) and were interviewed 79 fishers operating with gill nets; 95 and 41 fishers working on board shrimp trawl net and fish trawl net boats. Based on the information gathered from the gill net users via interview, onboard observations on 116 gill net fishing field trips were carried out between October 2008 and March 2009 (during Northeast Monsoon) near the main town of Banggi, Karakit and coastal villages. A decrease in landing for a 10 year period was recorded for both shrimp and fish trawler while the landing for gillnets has increased. The shrimp landing in Kudat were higher during the Northeast monsoon (average of 603.2 tonnes) than during the Southwest monsoon (average of 249.6 tonnes) while the landings for fish trawlers and gillnets are less affected by the monsoon seasons. Results indicated that gillnets operated within the waters of the islands of TMP while the shrimp and fish trawlers operated from Kudat and trawl in TMP waters. The important fishing ground for all three gears depended on the distance of the fishing ground from the port and the abundance of catch in that area, this was concluded as most of the important fishing ground are located near the ports and has mangroves, seagrass beds or corals nearby. The fishing grounds are overlapping between the three fishing gears and all gears have effects on turtle which is known as one of endangered marine species in Malaysia. Accidental turtle catch is relatively higher in gill nets (66.1%) compared to shrimp (25.9%) and fish (8%) trawl net boats.The information gathered from this study supports the establishment of the proposed TMP, that is, planning and future management plan of the park.

ABSTRAK

FISHING ACTIVITIES AND EFFECT OF SEASONAL MONSOON TOWARDS SHRIMP AND FISH LANDING IN PROPOSED TUN MUSTAPHA PARK, KUDAT, SABAH

Sejak tahun 2003, bahagian Utara Sabah telah dicadangkan sebagai Taman Tun Mustapha (TMM). Maklumat-maklumat berkenaan dengan sumber-sumber marin dan aktiviti-aktiviti perikanan yang dijalankan di kawasan ini diperlukan dalam penubuhan taman ini. Oleh itu, objektif kajian ini adalah bagi mengetahui aktiviti-aktiviti perikanan dan kesannya kepada spesis-spesis terancam, mengenalpasti kawasan-kawasan penangkapan ikan dan mengenalpasti kesan musim monsun terhadap operasi perikanan. Kajian ini dijalankan melalui analisa data daripada Perangkaan Tahunan Perikanan (Daerah Kudat), Jabatan Perikanan Sabah dan data meteorologi (data angin dan hujan) dari tahun 2000 ke 2010 dan kombinasi pemantauan temuramah dan pemerhatian atas bot nelayan. Pemantauan temuramah dijalankan dari bulan Oktober 2007 hingga bulan Oktober 2008 (satu tahun). Seramai 79 nelayan pukat tenggelam, 95 nelayan pukat tunda udang dan 41 nelayan pukat tunda telah ditemuramah. Berdasarkan keputusan temuramah, sebanyak 116 pemerhatian atas bot nelayan pukat tenggelam dijalankan antara bulan Oktober 2008 hingga bulan Mac 2009 (Monsun Timur Laut) di kawasan perairan pekan utama Pulau Banggi, iaitu, Karakit dan juga perairan kampung-kampung persisiran pantai. Keputusan menunjukkan penurunan bagi pendaratan pukat tunda udang dan ikan tetapi peningkatan pendaratan direkodkan bagi pendaratan pukat tenggelam. Pendaratan udang di Kudat didapati lebih tinggi pada monsun Timur Laut (purata 603.2 ton) berbanding dengan monsun Barat daya (purata 249.6 ton); pendaratan ikan bagi pukat tunda ikan dan pukat tenggelam kurang dipengaruhi oleh musim monsun. Keputusan menunjukkan bahawa nelayan pukat tenggelam beroperasi di sekitar kawasan pulau-pulau TMM manakala kapal-kapal pukat tunda beroperasi dari Kudat dan menunda di kawasan perairan TMM. Kawasan penangkapan ikan yang penting bagi ketiga-tiga alat penangkapan ini bergantung kepada jarak kawasan penangkapan ikan dari kawasan pendaratan ikan dan juga banyaknya ikan atau udang yang terdapat di kawasan tersebut. Ini dapat disimpulkan kerana kawasan-kawasan penangkapan ikan atau udang yang telah dikenalpasti berada pada jarak yang dekat dengan kawasan pendaratan dan juga mempunyai kawasan bakau, rumput laut dan terumbu karang di kawasan yang berdekatan. Kawasan penangkapan ikan ketiga-tiga peralatan perikanan adalah bertindih dan memberi kesan kepada penyu yang telah dikenalpasti sebagai haiwan terancam di Malaysia. Penangkapan penyu secara tidak sengaja adalah lebih tinggi bagi perikanan pukat tenggelam (66.1%) berbanding dengan pukat jerut udang (25.9%) dan pukat jerut ikan (8%). Maklumat yang didapati dalam kajian ini penting dalam menyokong penubuhan cadangan Taman Marin Tun Mustapha dari segi perancangan dan pengurusan taman kelak.

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LIST OF ABBREVIATIONS

DoFM	Department of Fisheries Malaysia
DoFS	Department of Fisheries Sabah
HP	Horse Power
Kg.	Kampung/ Village
m	meter
mm	milimeter
MRF	Marine Research Foundation
NEM	Northeast Monsoon
SWM	Southwest Monsoon
TMP	Tun Mustapha Park
USD	United States Dollar

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CHAPTER 1

INTRODUCTION

1.1 The Proposed Tun Mustapha Park and Fisheries Activities

The proposed Tun Mustapha Park (TMP) is located at the North of Sabah, the park encompasses the waters of Kudat, Kota Marudu and Pitas and consist of Banggi Island along with neighbouring Balambangan Island, Manawali Island, Mandi Darah Island and amongst others (WWF, 2006; The Borneo Post, 2013). The waters of proposed TMP is unique as it is the meeting point of the South China Sea and Sulu Sea, the region is characterized by relatively shallow seas, strong tidal currents and turbid waters near the coast. The climate in this area is affected by the Northeast Monsoon (NEM) and Southwest Monsoon (SWM) (Teh et al., 2006).

The waters of proposed TMP is rich with marine resources and also home to a number of migratory and charismatic species such as sea turtles and marine mammals (WWF, 2006). The coasts of mainland Kudat, Kota Marudu and Pitas are lined with mangroves which serves as a nursery for shrimps and fishes. This condition ensures that the waters in these areas are rich with marine resources. The bigger islands within the waters of proposed TMP, namely Balambangan Island and Banggi Island are also lined with mangroves and has coral reef and sea grass cover which in all serves as a habitat for the marine life in these waters.

The commercial fishing areas of Sabah is divided into three main zones, namely, the West Coast, East Coast and Tawau Zones, the zoning of these fishing areas are determined by the Department of Fisheries Sabah (DoFS). The waters of proposed TMP falls within the East Coast fishing zone which extends from the waters of Kudat District to the waters in Tambisan which is within the Sandakan District (Buising, 2001; Manjaji-Matsumoto and Jumin, 2011).

The fishing rights of the fishermen in Sabah are controlled by issuance of fishing licenses. Thus, fishermen registered in Kudat could fish from the waters of

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East Coast Fishing Zone. The waters of proposed TMP serves as the fishing ground for thousands of fishermen who make a living through commercial and artisanal fishing. The commercial and traditional fishermen depend on the rich resources of these waters for their livelihood (Buising, 2001; Manjaji-Matsumoto and Jumin, 2011).

The commercial fisheries of Kudat include purse seines and trawlers. However, for this study, only trawlers are investigated. Through personal observation, the trawlers registered in Kudat can be divided into two, shrimp trawlers and fish trawlers, the different type of trawlers can be distinguished by its size. The shrimp trawlers are normally smaller in size while the fish trawlers are bigger. Both shrimp and fish trawlers trawl within the waters of TMP and land their catch in the landing ports of Kudat which is located within the Kudat Township.

Through personal observation and interviews with local communities, the main artisanal fisheries operating within the islands of proposed TMP are gillnets and hook and line. The fishermen in the islands of proposed TMP favour hook and line due to its low cost and the increase of the demand of live fish. Hook and line fishermen would focus on reef fishes and sell their catch to the fish cage culture in the islands of proposed TMP. The gillnet fishermen fish in near shore areas or waters close to their fishing villages and land their catch in their villages or the fish landing ports nearest to their village. For this study, the artisanal fishing gear assessed is gillnets as it has higher impact on the environment, mainly in contributing towards turtle bycatch.

The gillnet fishermen are located in the coastal areas of proposed TMP, however, the study would emphasize gillnet fishermen in the islands of TMP as baseline information on these fishermen are scarce due to the islands' remote nature. More, heavy reliance on the marine resource of proposed TMP would be greater among the artisanal fishermen on the islands of TMP as they are located far from the mainland and thus changing their source of income would be difficult.

The waters of proposed TMP has been heavily exploited as the waters are shared by both commercial and artisanal fisheries. Commercial fisheries are

improving their catch through investment on technologies such as usage of fish finders while the fishermen in the islands of proposed TMP have resort to using destructive fishing methods such as fish bombing and also cynide fishing (Poh, 2009; Sham et al., 2010). The increase in efficiency of commercial fisheries would deplete the fish stok even more while destructive fishing would destroy the habitat of the fishes. The management of the current situation in the waters of proposed TMP is highly needed to ensure measures are carried out to aid in rebuilding the fish stock and ensuring that future generations would still be able to enjoy these resources.

1.2 Significance of Study

Baseline information on fishing activities within the waters sourrounding the islands of Banggi, Balambangan, Mandi Darah, Manawali and the waters off Kudat and Pitas are scarce as comprehensive studies have not been conducted or are unpublished, this includes information on the landings trends and effects of seasonal monsoon towards the landings of shrimp trawlers, fish trawlers and gillnets in proposed TMP. The information on the gear specification and operational information is also not well documented. Thus, information gathered from this study would aid in better understanding the gears operating within the waters of proposed TMP. This study would also help identify the landing trend for each gear and identify the monsoon season or month with high or low landings. These baseline informations would be useful for the formation of the management plan of proposed TMP.

There is a lack of fisheries profile on the island of Banggi and its neigbouring islands as Banggi Island is considered a sub-district under the Department of Fisheries, Kudat. The Kudat Office of the Department of Fisheries is located on mainland Kudat, thus, due to budget constraints, monitoring and information gathering on the fishermen in Banggi Island and its surround islands are not adequate. In that, more information is needed from studies in order to understand the fisheries profile of Banggi Island and its surrounding Islands. Information on the number of fishermen in Banggi Island and their gears are still lacking, there is also no information on the location of villages in Banggi Island.

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Thus, this study would look into mapping the location of fishing villages and to identify the number of gillnet fishermen in these waters.

A need in information regarding the fishing areas for the fishing gears operating within the islands in TMP is needed as zoning of the fishing areas for the proposed TMP are still in way. Information on the fishing ground would aid in the construction of the management plan of TMP and reducing conflicts between fishermen of different gears.

The waters of TMP has been recognised as the central source from which the rest of the Indo-Pacific recruited much of its fauna, threatened, charismatic and migratory species such as turtles (WWF, 2006). The waters of TMP have also been identified as an important route for turtle migration. More, there are records of turtle eggs in the islands of TMP (Hin, 2010). This indicates the importance of the waters of TMP for turtles. Thus, it is important to understand the impacts of the fishing pressure from fishing gears operating in TMP towards turtles.

1.3 Objectives of Study

The scope and overall objective of this study is to obtain baseline information on the fisheries activities of shrimp trawlers, fish trawlers and gillnets of proposed TMP. In order to achieve the overall objective, the following specific objective are targeted:

1. To obtain baseline information on the landing trend for shrimp trawlers, fish trawlers and gillnets operating within the waters of proposed TMP at different seasonal monsoon.
2. To determine the distribution of gillnet fishermen operating within the waters of proposed TMP and obtain baseline information on the number of gillnet fishermen in the waters of proposed TMP.
3. To identify gear characteristics and fishing grounds for shrimp trawlers, fish trawlers and gillnets in the water of TMP.
4. To identify impacts of shrimp trawlers, fish trawlers and gillnets on turtle population in proposed TMP.

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CHAPTER 2

LITERATURE REVIEW

2.1 Establishment of Proposed TMP

In 2001, Sabah Parks proposed the establishment of TMP in north Sabah, including Banggi Island, with the aim of alleviating overexploitation of the region's fisheries and conserving the rich biodiversity found within its coastal environment (Teh et al., 2005). The Sabah State Government, through a State Cabinet decision, approved the proposal to gazette the northern part of Sabah as a Marine Protected Area (MPA) in 2003. (Teh et al., 2005; Komilus et al., 2012, Lajiun, 2013) (Figure 2.1). The objectives of the establishment of the proposed TMP are to protect and enhance biodiversity of terrestrial and marine environment of the area, to exploit the marine and terrestrial resources of the area in an ecologically sustainable manner and to alleviate the socio-economic conditions of the local people, particularly the hard-core poor of the area, through ecologically sustainable economic development (Lajiun, 2013).

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Sabah Parks was mandated to coordinate the development of a management plan that was required for the subsequent gazetting of the Park, in collaboration with relevant government agencies and other stakeholders including academics, local communities and NGOs. Once fully gazette, TMP will be the largest marine park in Malaysia and second largest marine protected area in South-East Asia with 1.02 million hectares and managed in line with the concept of multi-stakeholder collaborative management (Lajiun, 2013; The Borneo Post, 2013). The concept for the park is to be multiple use, managed area which includes areas for strict protection, tourism, artisanal fishing and commercial fishing among others.

The proposed TMP is a globally significant conservation area. The waters of TMP is one of the priority conservation areas (PCAs) of the Sulu Sulawesi Marine Ecoregion (SSME) and is located within the Coral Triangle, the centre of the world's marine diversity. This complex bioregion supports the highest levels of