



UNIVERSITI PUTRA MALAYSIA

***CATCH PER UNIT EFFORT (CPUE) AND POPULATION DYNAMICS
OF JAPANESE THREADFIN BREEM (*Nemipterus japonicus*) AT
COASTAL AREA OF SUNGAI BESAR, SELANGOR***

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**This project report is submitted in partial fulfilment of the
requirements for the degree of Bachelor of Agriculture
(Aquaculture)**

DEPARTMENT OF AQUACULTURE

FACULTY OF AGRICULTURE

UNIVERSITI PUTRA MALAYSIA

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This is certifying that I have examined the final project report and all corrections have been made as recommended by the panel of examiners. This report complies with the recommended format stipulated in the AKU4999 project guidelines, Department of Aquaculture, Faculty of Agriculture, Universiti Putra Malaysia.

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Abstract

Nemipterus japonicus is the demersal commercial fish which also known as Japanese threadfin bream. In Malaysia, threadfin bream is more in the food industry. As the demand of the market is high, the population of the fish in the sea around Malaysia has decrease due to the overfishing activities and also the degradation of the biology parameter in west coast of peninsular Malaysia. The objectives of the study are to determine the population dynamics based on the length-weight parameter and estimating the catch per unit effort (CPUE) per boat. The study was conducted at Sungai Besar (3° 40' 0" North, 100° 59' 0" East), Selangor. Samplings were carried out between January 2013 and October 2013. The samples being collected consists of 60 to 100 individuals. Boat from class B or C was used for determining the catch per unit effort (CPUE). The asymptotic length (L_{∞}) was 28.88 cm and growth co-efficient (K) was 0.42 year⁻¹. The growth performance index (ϕ') was 2.54. The value of total mortality (Z), natural mortality (M) and fishing mortality (F) were 2.334 year⁻¹, 1.039 year⁻¹ and 1.295 year⁻¹ respectively. The exploitation level (E) was 0.555. Recruitment pattern was along the year where the highest in September – October with percentage of 17.06 %. The value of growth coefficient (b) and coefficient of determination (r^2) were 2.8755 (± 0.02) and 0.8583 respectively. The CPUE value was 0.000167 kg h⁻¹ L⁻¹. The result showed that the stock of the *Nemipterus japonicus* was over exploited.

Abstrak

Nemipterus japonicus merupakan ikan komersial demersal yang juga dikenali sebagai ikan kerisi Jepun. Di Malaysia, ikan kerisi termasuk di dalam industri makanan. Kerana permintaan pasaran yang tinggi, populasi ikan di laut sekitar Malaysia menurun disebabkan oleh aktiviti penangkapan ikan berlebihan dan juga degradasi parameter biologi di pantai barat Semenanjung Malaysia. Objektif kajian ini adalah untuk menentukan dinamik populasi berdasarkan parameter panjang-berat dan menganggarkan tangkapan bagi setiap unit usaha (CPUE) bagi setiap bot. Kajian ini telah dijalankan di Sungai Besar (3 ° 40 '0 "North, 100 ° 59' 0" Timur). Persampelan telah dijalankan di antara Januari 2013 dan Oktober 2013. Sampel dikumpul sekurang-kurangnya mengandungi 60 hingga 100 individu. Bot dari kelas B atau C telah digunakan untuk menentukan tangkapan bagi setiap unit usaha (CPUE). Panjang asimptot (L_{∞}) adalah 28.88 cm dan koefisien pertumbuhan (K) adalah 0.42 setahun. Indeks prestasi pertumbuhan (ϕ') adalah 2.54. Nilai jumlah kematian (Z), kematian semula jadi (M) dan kematian tangkapan (F) adalah masing-masing 2,334 setahun, 1.039 setahun dan 1.295 setahun. Tahap eksploitasi (E) adalah 0.555. Pola pengambilan adalah sepanjang tahun di mana yang paling tinggi adalah pada September-Oktober dengan nilai peratusan adalah 17.06%. Nilai pekali pertumbuhan (b) dan pekali penentuan (r^2) adalah 2,8755 (\pm 0.02) dan 0,8583. Nilai CPUE adalah 0.000167 kg h⁻¹ L⁻¹. Hasil kajian menunjukkan bahawa stok *Nemipterus japonicus* telah dieksploitasi secara berlebihan.

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LIST OF ABBREVIATIONS

%	=	Percentage
<i>a</i>	=	Condition factor
<i>b</i>	=	Growth Coefficient
cm	=	Centimetre
CPUE	=	Catch per Unit Effort
<i>E</i>	=	Exploitation Rate
<i>F</i>	=	Fishing Mortality
FiSAT	=	FAO-ICLARM Stock Assessment Tools
<i>g</i>	=	Gram
<i>H</i>	=	Hour
<i>K</i>	=	Growth Co-efficient
kg	=	Kilogram
<i>L</i>	=	Liter
<i>L</i>	=	Total Length
<i>L_∞</i>	=	Asymptotic Length
<i>M</i>	=	Natural Mortality
Spp.	=	Species
VBGF	=	Von Bertalanffy Growth Curve
<i>W</i>	=	Weight
<i>Z</i>	=	Total Mortality
ϕ'	=	Growth Performance Index

CHAPTER 1

INTRODUCTION

Nemipterus spp. or known widely around the world as the threadfin bream fish is one of the species of demersal commercial fish. In Malaysia, threadfin bream is locally known as kerisi. In this study, the threadfin bream that was used as the sample is *Nemipterus japonicus* which is also known as the Japanese threadfin bream. According to Russell, (1990), the Japanese threadfin bream inhabits the area of muddy or sandy bottoms. It can be found between the depth of 5 meters and 80 meters and very abundant in the coastal water area (Russell, 1997).

In Malaysia, threadfin bream is more in the food industry as it is one of the staple foods. As the demand is high on the seafood industry, the population of the fish in the sea around Malaysia has decrease due to the overfishing activities and also the degradation of the biology parameter in west coast of peninsular Malaysia. Several work have been conducted in the various subjects at the west peninsular Malaysia (Amin *et al.*, 2009; Baharuddin *et al.*, 2009) however there is no published report on population dynamic of *Nemipterus japonicus* at Sungai Besar, Selangor.

Length and weight relationship is use as the data to estimating the population parameter of the *N. japonicus* in the water area of west coast of peninsular Malaysia. Many tools can be used to determining the various population

parameters and one of those is the FiSAT (FAO-ICLARM Stock Assessment Tools). FiSAT has been popular in use for estimating the population parameters (Amin *et al.*, 2006; Jayawardane *et al.*, 2003; Papaconstantinou and Kapiris, 2001; Tuaycharden *et al.*, 1988). By using this, the length and weight can be seen as related to each other during the 10 month period of study.

Catch per unit effort (CPUE) is one of the methods which were used for the stock fish status estimating (Petrere *et al.*, 2010). It can be defined as the relationship of the catch and the effort value which are strictly proportional (linear) through the origin value (Petrere *et al.*, 2010; Gulland, 1954; 1964; Garrod, 1964; Ricker, 1975; Lima *et al.*, 2000).

Thus, objectives for this study were:

- i) To determine the population dynamics based on the length-weight parameter.
- ii) To estimate the catch per unit effort (CPUE) per boat.

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