

Billfish from Purse Seiners fisheries in the Andaman Sea of Thailand

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Abstract

Catch per unit effort (CPUE), species composition and size of billfish from purse seine fisheries in the Andaman Sea of Thailand were studied by collecting the data from purse seiners landing along the Andaman Sea Coast from January to December in 2020 - 2022. The results showed that the CPUE of purse seiners operated in the Andaman Sea of Thailand in 2020 - 2022 was 2,406 kilogram/day divided into Indo-Pacific sailfish (*Istiophorus platypterus* and Black marlin (*Istiompax indaca*) equal 0.794 and 0.142 kilogram/day respectively. Species composition of billfish was 0.04% of the total catch divided into Indo-Pacific sailfish 0.03% and Black marlin 0.01%. The length (lower jaw to fork length; LJFL) of Indo-Pacific ranged from 40.0 - 190.0 cm and the average length was 129.0 ± 28.1 cm.

Keywords: billfish, purse seine, Andaman Sea, Thailand

1. Introduction

Billfish are large pelagic fish with unique body shapes. Therefore, it is well known, especially the Indi-Pacific sailfish which are more common than other species cause many tourists posted the picture they caught the fish to the Internet when traveling at sea. However, in the fisheries sector, it is not commonly found. According to Marine Capture Production of Commercial Fisheries in 2022, found that most billfish were caught by purse seine and pair trawl equal 38 and 16 metric tons accounting for 0.015 and 0.007% of the total catch (DOF, 2023). This paper aims to study the fishing ground, catch per unit effort (CPUE), species composition and size of billfish caught by purse seine in the Andaman Sea of Thailand to explore their fishery and resource status.

2. Method

2.1 Sampling methods

The data were collected monthly from purse seiners landed at fishing ports along the Andaman Sea Coast of Thailand (Figure 1) during 2020-2022. The number of sampled purse seiners was at least 40 vessels/month. They were interviewed for the information of the trip such as fishing day, fishing ground (latitude and longitude), number of set and total catch. All billfish were observed and identify species based on Nakamura (1985) and measure the length (lower jaw to fork length; LJFL) and weight.

2.2 Data analysis

Fishing area, using QGIS (Quantum Geographic Information System) to produce the map that shows the fishing ground of purse seiners fisheries and the distribution of billfish.

The catch per unit effort (CPUE) was analyzed as follows.

$$CPUE = \frac{\sum_{i=1}^n \text{Catch}_i}{\sum_{i=1}^n \text{Effort}_i}$$

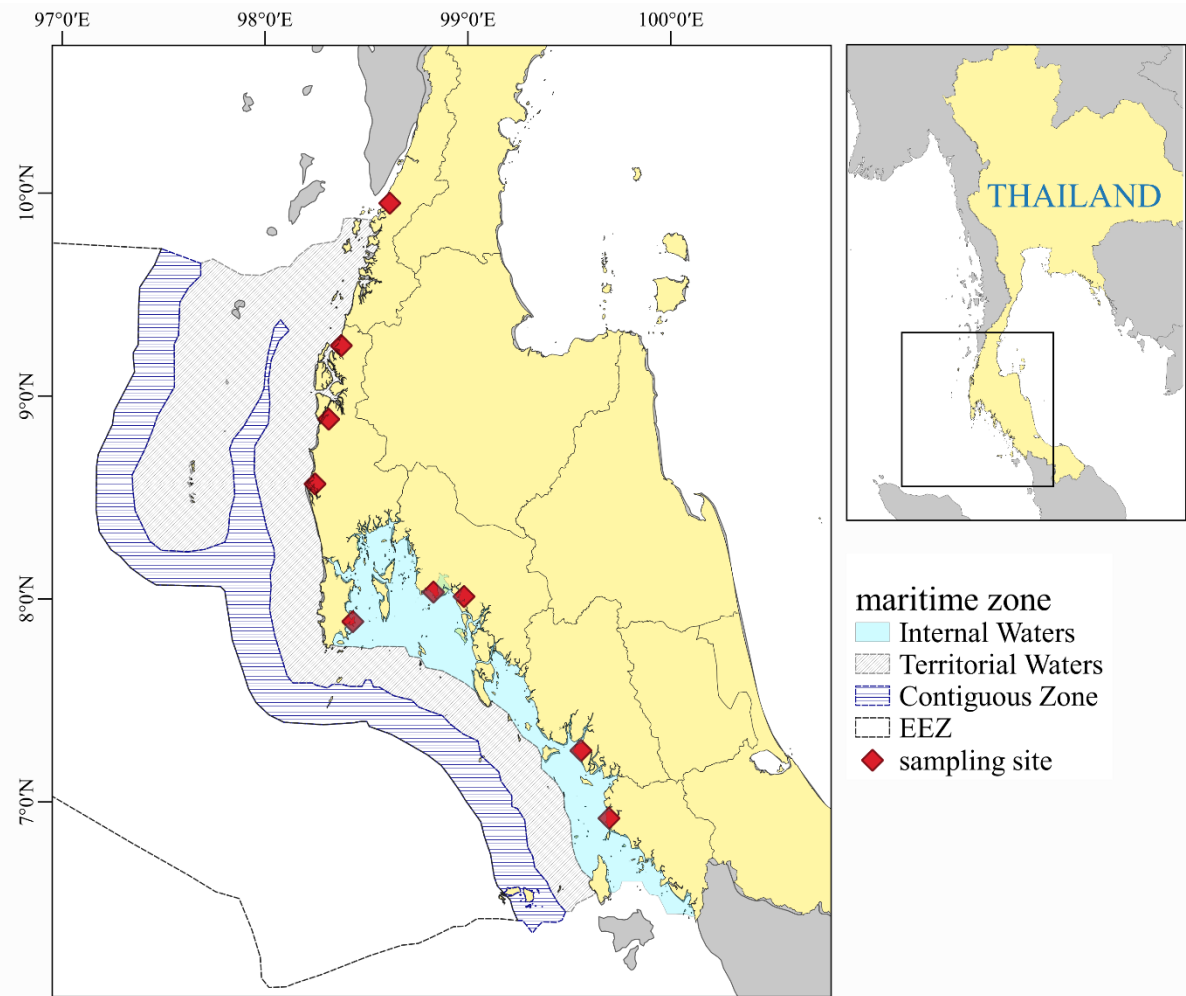


Figure 1 Sampling sites of purse seiners along the Andaman Sea Coast of Thailand in 2020 - 2022

where $Catch_i$ is the total catch of purse seiner i (kg), $Effort_i$ is the number of fishing days of purse seiner i , and n is the number of purse seiners sampled.

The species composition (%) was analyzed as follows.

$$\text{Species composition}_i = \frac{\sum_{j=1}^n \text{Catch}_{ij}}{\sum_{j=1}^n \text{Total catch}_i} \times 100$$

where $Catch_{ij}$ is the catch of species j from purse seiner i , Total catch_i is the total catch of purse seiners i and n is the number of purse seiners sampled.

Mean, maximum and minimum length and standard deviation (cm) were analyzed from the length composition of each species as follows.

$$\bar{x} = \frac{\sum_{i=1}^n x_i f_i}{\sum_{i=1}^n f_i}$$

$$\text{S.D.} = \sqrt{\frac{\sum_{i=1}^n f_i (x_i - \bar{x})^2}{\sum_{i=1}^n f_i - 1}}$$

where \bar{x} is mean length, x_i is mid-class interval i , f_i is frequency of class interval i , S.D. is standard deviation and n is the number of class intervals.

3. Result

The total sampling of purse seine was 2,923 boats (trips) 4,248 fishing days and the average was 1.45 days per trip, the most were 1-2 days per trip (87.00% of total trips). There are three kinds of fishing operations, the most common was Light Luring Purse Seine (LPS) 60.52%, followed by Anchored fish Aggregating Devices (FAD) 31.85% and Thai Purse Seine (TPS) 7.63%. LPS fishing grounds were scattered throughout the area, but high density in the middle part. while FAD was mostly found in the North and the South of the area. Considering fishing grounds in the maritime zone, most of the purse sein were operated in contiguous zone and territorial zone account for 52.16% and 30.70% in order. Billfish rarely occurred in the purse seine, it was found only 55 times representing 1.88% of the total trips, and most of them were found in the South (Figure 2).

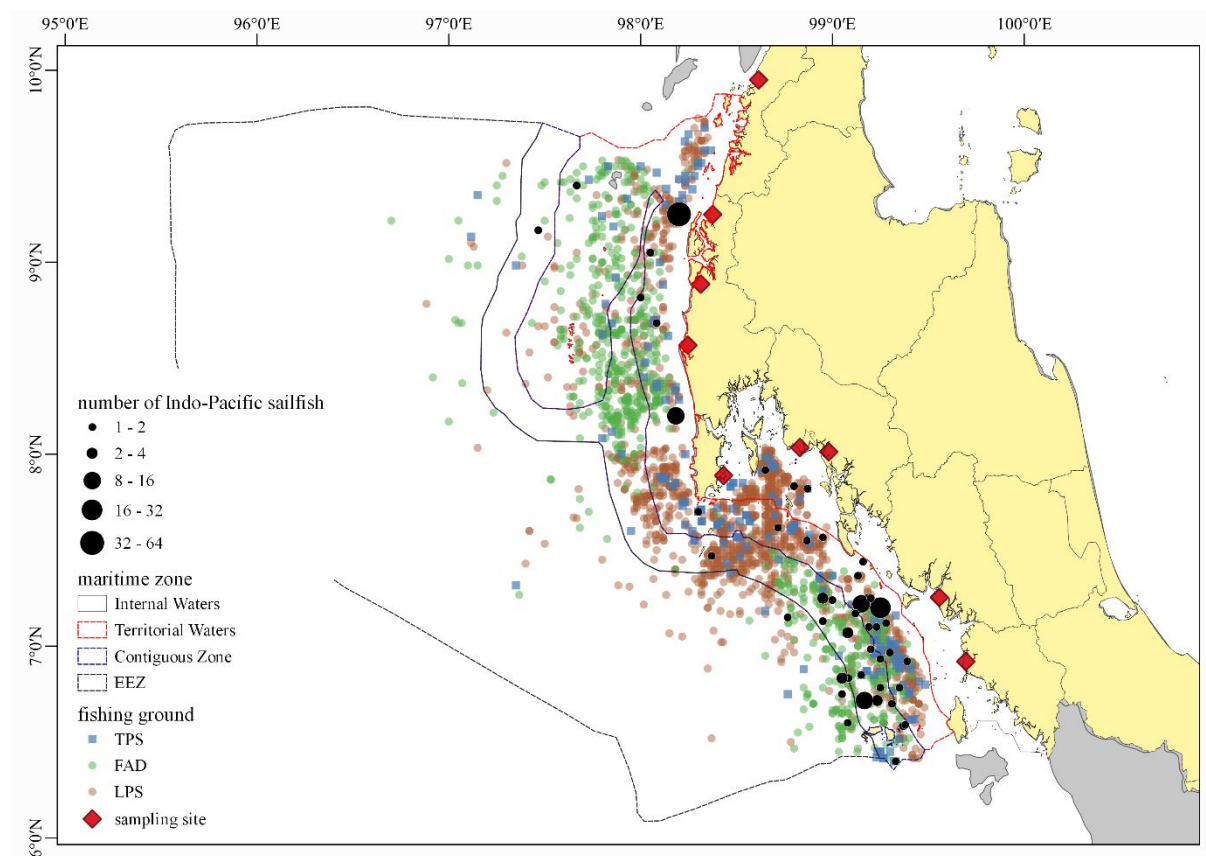


Figure 2 Fishing ground and distribution of billfish of purse seiners fishing along the Andaman Sea Coast of Thailand in 2020-2022

The total CPUE of purse seiners operated in the Andaman Sea of Thailand during 2020 - 2022 was 2,406 kilogram/day. The CPUE of billfish was 0.936 kilogram/day. The CPUE of Indo-Pacific sailfish (*Istiophorus platypterus*) and black marlin (*Istiompax indaca*) were 0.793 and 0.142 kilogram/day respectively. Their species composition was 0.04% of the total catch divided into 0.03 and 0.01% respectively. (Table 1).

Table 1 Catch per unit effort (CPUE) and species composition of billfish caught by purse seiners in the Andaman Sea of Thailand in 2020 - 2022.

Species	CPUE (kg/day)	Composition (%)	
		total catch	billfish
Total	2,406.423	100.00	
Other fauna	2,405.487	99.96	
Billfish	0.936	0.04	100.00
Indo-pacific sailfish (<i>Istiophorus platypterus</i>)	0.794	0.03	84.85
black marlin (<i>Istiompax indaca</i>)	0.142	0.01	15.15

The size measurement (lower jaw to fork length; LJFL) of Indo-Pacific sailfish ranged from 40.0-190.0 cm and the average length was 129.0 ± 28.1 cm (Figure 3), black marlin was measured 2 fish, the LJFL were 130 and 205 cm.

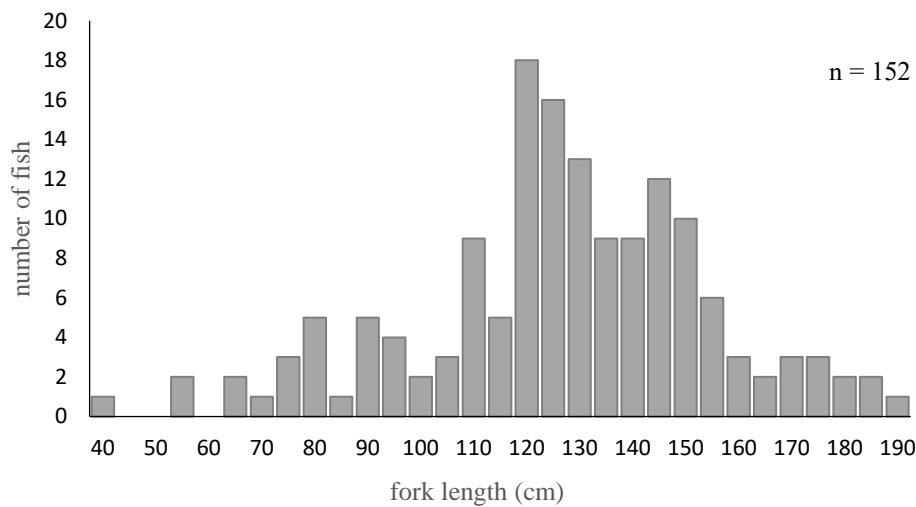


Figure 3 Length distribution of Indo-Pacific sailfish caught by purse seiners in the Andaman Sea of Thailand in 2020 - 2022

References

- Department of Fisheries. 2023. Marine Capture Production of Commercial Fisheries 2022. Technical paper no. 1/2023. Department of Fisheries, Ministry of Agriculture and Cooperative. 185 p.
- Nakamura, I. 1985. FAO Species Catalogue. Vol. 5. Billfishes of the world. An annotated and illustrated catalogue of marlins, sailfishes, spearfishes and swordfishes known to date. 65 p.