# Neritic Tunas and Seerfishes Fisheries from Purse Seiners in the Andaman Sea of Thailand

Pavarot Noranarttragoon[1*], Kanokwan Maeroh[2] and Sakol Piabpabrattana[3]

[1] Marine Fisheries Research and Development Division, Department of Fisheries, Thailand

[2] Phuket Marine Fisheries Research and Development Center, Department of Fisheries, Thailand

[3] Fisheries Resource Assessment Group, Department of Fisheries, Thailand

*Corresponding author: pavarotn@fisheries.go.th

## Abstract

Catch per unit effort (CPUE), species composition and size of neritic tunas and seerfishes 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 2022. The results showed that the CPUE of purse seiners operated in the Andaman Sea of Thailand in 2022 was 2,232.61 kilogram/day. Species composition of neritic tunas was 13.62% of the total catch divided into Longtail tuna (*Thunnus tonggol*) 5.57%, Kawakawa (*Euthynnus affinis*) 5.24%, Frigate tuna (*Auxis thazard*) 2.17% and Bullet tuna (*A. rochei*) 0.64% and species composition of seerfishes was 0.25% of the total catch divided into Indo-Pacific king mackerel (*Scomberomorus guttatus*) 0.13% and Narrow-barred Spanish mackerel (*S. commerson*) 0.12%. The size measurement of those species found that the fork length of longtail tuna ranged from 9.50-80.00 cm and the average length was 36.93 ± 9.21 cm, the fork length of Kawakawa ranged from 10.00-56.50 cm and the average length was 20.73 ± 8.68 cm, the fork length of frigate tuna ranged from 9.00-49.50 cm and the average length was 25.41 ± 7.51 cm, the fork length of bullet tuna ranged from 10.00-38.00 cm and the average length was 20.28 ± 5.24 cm, the fork length of Indo-Pacific king mackerel ranged from 15.00-59.50 cm and the average length was 43.66 ± 6.05 cm and the fork length of narrow-barred Spanish mackerel ranged from 10.50-110.00 cm and the average length was 59.01 ± 22.14 cm.

**Keywords**: neritic tuna, seerfish, purse seine, Andaman Sea, Thailand

## 1. Introduction

Neritic tunas and seerfishes are pelagic fishes which distribute near shore along the Andaman Sea of Thailand. There are four species of neritic tuna and two species of seerfish found in Thai waters. They are mainly caught by purse seine and inclusively managed under the pelagic fish group. Besides neritic tunas and seerfishes, the pelagic fish group also includes mackerels, scads, sardines, etc. The maximum sustainable yield (MSY) of the pelagic group is assessed and the total allowable catch (TAC) is then determined based on the MSY assessment result. This paper aims to study the catch per unit effort (CPUE) and size of neritic tunas and seerfishes 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). The number of sampled purse seiners was at least 40 vessels/month. The 40-50 kg fish per vessel was sampled to identify the species caught, which was done based on Carpenter and Niem (1998, 1999a, 1999b, 2001a, 2002b). Four species of neritic tuna, i.e., longtail tuna (*Thunnus tonggol*), Kawakawa (*Euthynnus affinis*), frigate tuna (*Auxis thazard*), and bullet tuna (*A. rochei*), and two species of seerfish, i.e., Indo-Pacific king mackerel (*Scomberomorus guttatus*) and narrow-barred Spanish mackerel (*S. commerson*), were sorted out to measure the length (0.5 cm class interval) weight (g). A hundred individuals of each species from the sampled catch were measured for length and weight. If the sample did not reach 100 fish, then the length and weight of all the sampled fish were measured.

### 2.2 Data analysis

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

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

where $\mathrm{Catch}_i$ is the total catch of purse seiner i (kg), $\mathrm{Effort}_i$ is the number of fishing days of purse seiner i, and n is the number of purse seiners sampled.

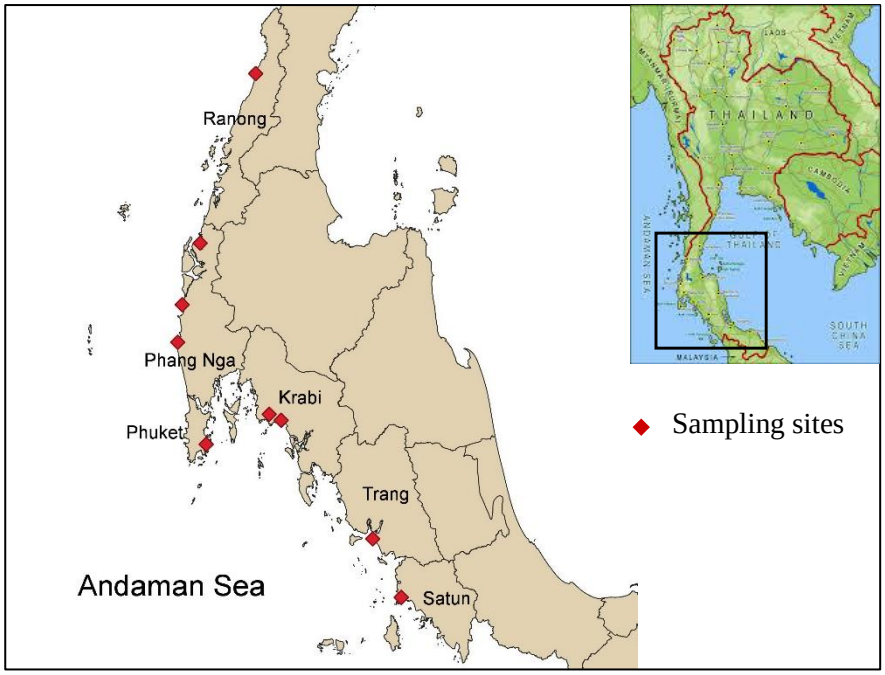


**Figure 1** Sampling sites of purse seiners along the Andaman Sea Coast of Thailand in 2022

The species composition (%) was analyzed as follows.

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

where $\text{Catch}_{ij}$ is the catch of species j from purse seiner i, $\text{Total catch}_i$ 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.

$$\overline{X} = \frac{\sum_{i=1}^{n} x_i f_i}{\sum_{i=1}^{n} f_i}$$

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

where $\overline{X}$ 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 CPUE of purse seiners operated in the Andaman Sea of Thailand in 2022 was 2,232.61 kilogram/day. The CPUE of neritic tuna was 304.16 kilogram/day. The CPUE of longtail tuna (*Thunnus tonggol*), Kawakawa (*Euthynnus affinis*), frigate tuna (*Auxis thazard*) and bullet tuna (*A. rochei*) were 124.44, 116.86, 48.52 and 14.34 kilogram/day respectively. Their species composition was 13.62% of the total catch divided into 5.57%, 5.24%, 2.17 and 0.64% respectively. The CPUE of seerfish was 5.72 kilogram/day. The CPUE of Indo-Pacific king mackerel (*Scomberomorus guttatus*) and narrow-barred Spanish mackerel (*S. commerson*) were 2.93 and 2.79 kilogram/day and species composition were 0.13% and 0.12% respectively (Table 1).

**Table 1** Catch per unit effort (CPUE) and species composition of neritic tunas and seerfishes caught by purse seiners in the Andaman Sea of Thailand in 2022

| Species | CPUE (kg/day) | Composition (%) |
|---|---|---|
| Total | 2,232.61 | 100.00 |
| Longtail tuna (*Thunnus tonggol*) | 124.44 | 5.57 |
| Kawakawa (*Euthynnus affinis*) | 116.86 | 5.24 |
| Frigate tuna (*Auxis thazard*) | 48.52 | 2.17 |
| Bullet tuna (*A. rochei*) | 14.34 | 0.64 |
| Indo-Pacific king mackerel (*Scomberomorus guttatus*) | 2.93 | 0.13 |
| Narrow-barred Spanish mackerel (*S. commerson*) | 2.79 | 0.12 |

The size measurement of neritic tunas and seerfishes found that the fork length of longtail tuna ranged from 9.50-80.00 cm and the average length was 36.93 ± 9.21 cm, the fork length of Kawakawa ranged from 10.00-56.50 cm and the average length was 20.73 ± 8.68 cm, the fork length of frigate tuna ranged from 9.00-49.50 cm and the average length was 25.41 ± 7.51 cm, the fork length of bullet tuna ranged from 10.00-38.00 cm and the average length was 20.28 ± 5.24 cm, the fork length of Indo-Pacific king mackerel ranged from 15.00-59.50 cm and the average length was 43.66 ± 6.05 cm and the fork length of narrow-barred Spanish mackerel ranged from 10.50-110.00 cm and the average length was 59.01 ± 22.14 cm (Table 2).

**Table 2** Size of neritic tunas and seerfishes caught by purse seiners in the Andaman Sea of Thailand in 2022

| Species | Fork length (cm) | | |
|---|---|---|---|
| | Minimum | Maximum | Average |
| Longtail tuna (*Thunnus tonggol*) | 9.5 | 80.0 | 36.93 ± 9.21 |
| Kawakawa (*Euthynnus affinis*) | 10.0 | 56.5 | 20.73 ± 8.68 |
| Frigate tuna (*Auxis thazard*) | 9.0 | 49.5 | 25.41 ± 7.51 |
| Bullet tuna (*A. rochei*) | 10.0 | 38.0 | 20.28 ± 5.24 |
| Indo-Pacific king mackerel (*Scomberomorus guttatus*) | 15.0 | 59.5 | 43.66 ± 6.05 |
| Narrow-barred Spanish mackerel (*S. commerson*) | 10.5 | 110.0 | 59.01 ± 22.14 |

**References**

Carpenter, K. E. and V. H. Niem (Eds.). 1999a. FAO Species Identification Guide for Fishery Purposes. The living marine resources of the Western Central Pacific. Vol. 3. Batoid fishes, chiamaeras and bony fishes part 1 (Elopidae to Linophrynidae). FAO, Rome. p. 1397–2068.

Carpenter, K. E. and V. H. Niem (Eds.). 1999b. FAO Species Identification Guide for Fishery Purposes. The living marine resources of the Western Central Pacific. Vol 4. Bony fishes part 2 (Mugilidae to Carangidae). FAO, Rome. p. 2069–2790.

Carpenter, K. E. and V. H. Niem (Eds.). 2001a. FAO Species Identification Guide for Fishery Purposes. The living marine resources of the Western Central Pacific. Vol 5. Bony fishes part 3 (Menidae to Pomacentridae). FAO, Rome. p. 2791–3380.

Carpenter, K. E. and V. H. Niem (Eds.). 2001b. FAO Species Identification Guide for Fishery Purposes. The living marine resources of the Western Central Pacific. Vol. 6. Bony fishes part 4 (Labridae to Latimeriidae), estuarine crocodiles, sea turtles, sea snakes and marine mammals. FAO, Rome. p. 3381–4218.