

# Spatial and temporal variability of longtail tuna from Thai purse seine fishery in the Andaman Sea of Thailand

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## Abstract

Longtail tuna (*Thunnus tonggol*) is an important neritic tuna species contributing to coastal fisheries and food security in Thailand. However, information on the long-term variability of its fisheries' characteristics remains limited. This study investigated the spatial and temporal variability of longtail tuna in Thai purse seine fishery using fishery-dependent data collected during 2016–2025. Analyses focused on annual changes in fishing grounds, temporal variations in catch contribution and catch per unit effort (CPUE), and seasonal and interannual variability in size structure. Results indicated that the fishing grounds associated with longtail tuna catches showed noticeable interannual variability over the study period. Catch contribution and CPUE also fluctuated considerably among months and years, suggesting strong temporal dynamics in the availability of the species within the Thai purse seine fishery. Length-frequency analysis indicated seasonal and interannual variability in the size composition of longtail tuna, with differences in dominant size classes observed among months and years. These variations may reflect seasonal availability, spatial distribution, and changes in fishing patterns over time. The findings highlight the importance of long-term fishery monitoring for understanding the dynamics of neritic tuna fisheries in tropical ecosystems. Fishery-dependent indicators such as catch contribution, CPUE, fishing ground distribution, and size composition can provide useful information to support ecosystem-based fisheries management and future assessment of data-limited neritic tuna resources in the Indian Ocean region.

## 1. Introduction

Longtail tuna (*Thunnus tonggol*) is a neritic tuna species widely distributed throughout the Indo-West Pacific region, particularly in coastal waters of Southeast Asia, the Arabian Sea, and northern Australia. The species is an important component of coastal fisheries and contributes substantially to the livelihoods of small-scale fishers in many countries. Longtail tuna is widely marketed for domestic consumption and plays an important role in food security and local economies throughout the region.

Along the Andaman coast of Thailand, longtail tuna is an important component of neritic tuna fisheries and is commonly caught by small-scale purse seiners operating in coastal and offshore waters. The fishery also catches other neritic tuna species, including kawakawa (*Euthynnus affinis*), frigate

tuna (*Auxis thazard*), and bullet tuna (*Auxis rochei*). These fisheries provide an important source of income and food for coastal communities in the region.

Effective fisheries management requires reliable information on catch composition, abundance, spatial distribution, and population structure. Catch per unit effort (CPUE) is commonly used as an indicator of relative abundance, while fishing-ground information provides insights into the spatial distribution of fishing activities and resource availability. Similarly, size composition data are useful for understanding population structure, recruitment patterns, and seasonal changes in the fishery. Together, these indicators provide essential information for evaluating fishery status and supporting sustainable management measures.

Therefore, this study aimed to examine temporal variations in catch contribution, CPUE, fishing-ground distribution, and size structure of longtail tuna caught by small-scale purse seiners along the Andaman coast of Thailand during 2016–2025. The findings provide baseline information on the status and dynamics of longtail tuna fisheries in the Andaman Sea and may contribute to future stock assessment and management initiatives.

## Objective

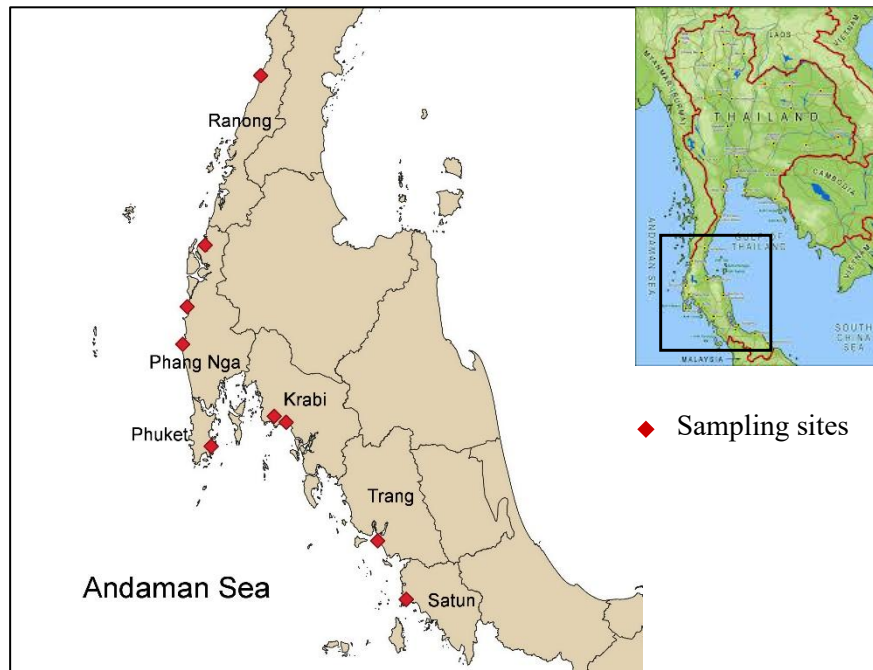
1. To describe annual changes in fishing grounds of longtail tuna during 2016–2025.
2. To examine temporal variations in the catch contribution and CPUE of longtail tuna in small purse seine fisheries.
3. To investigate seasonal and interannual changes in the size structure of longtail tuna.

## 2. Method

### 2.1 Sampling methods

The data were collected monthly from purse seiners landing at fishing ports along the Andaman Sea Coast of Thailand from January to December 2016-2025 (Figure 1). When the vessels landed, the captain or fishing master was interviewed about fishing methods, fishing effort, fishing ground, and total catch. A sample of 40-50 kg of fish per vessel was taken to identify the species caught, which was done based on Carpenter and Niem (1998, 1999a, 1999b, 2001a, 2002b). Each species was weighed in grams (g). At least 10 vessels were sampled per month. The fishing logbook of sampled purse seiners was copied and fishing locations in the fishing logbook were used to analyze fishing positions.

Longtail tuna was sorted out to measure the length (0.5 cm class interval) and weight (g). A hundred individuals 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.



**Figure 1** Sampling sites of purse seiners along the Andaman Sea Coast of Thailand in 2016-2025

## 2.2 Data analysis

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

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

where  $\text{Catch}_i$  is the total catch of purse seiner  $i$  (kg),  $\text{Effort}_i$  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.

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

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.

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

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

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. Results

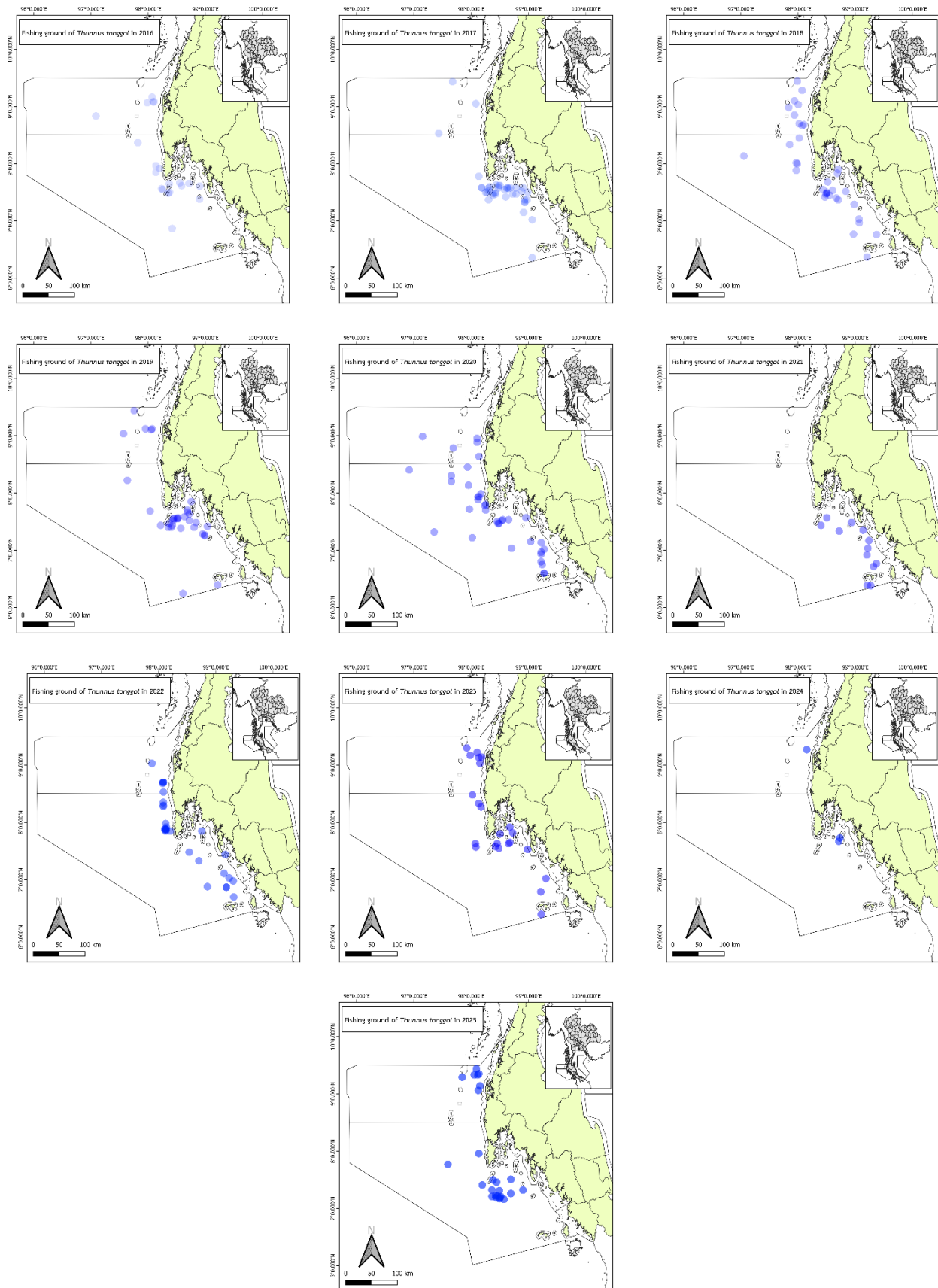
#### 3.1 fishing grounds of longtail tuna

The fishing grounds associated with longtail tuna catches showed changes among years during 2016–2025. Fishing activities were mainly found along the Andaman coast of Thailand, especially in waters around Phuket and Phang Nga provinces. The fishing grounds varied over years, with some years showing a wider offshore distribution and others showing fishing activities concentrated in smaller areas.

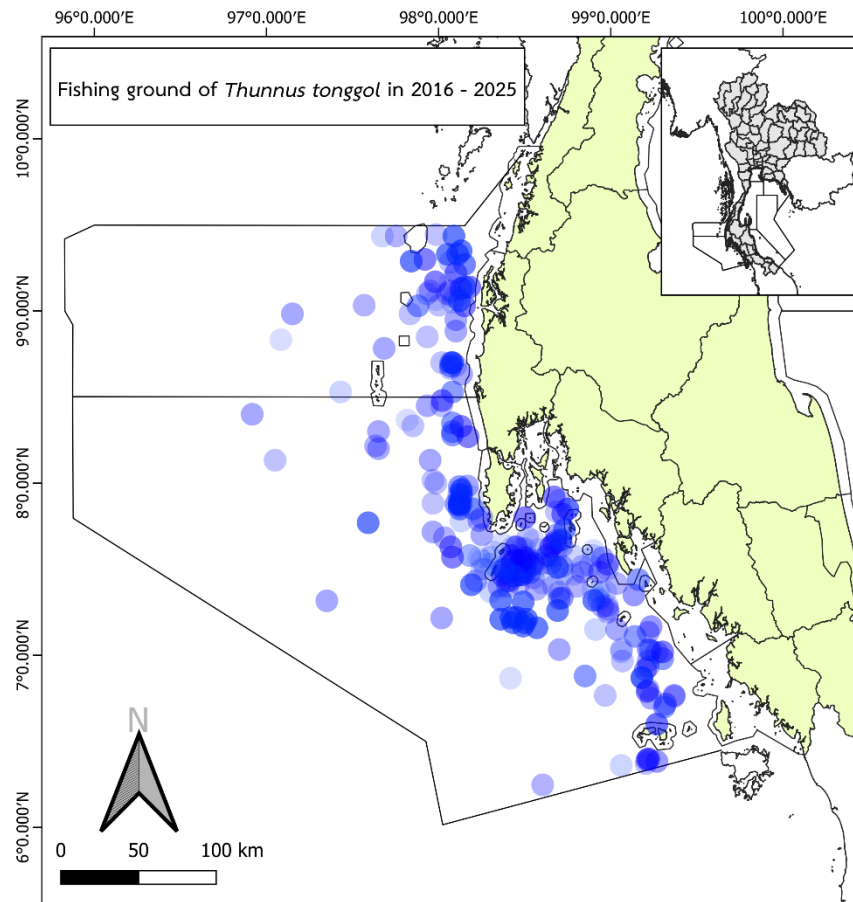
During 2018–2020, fishing activities were found over a larger area of the Andaman Sea, including several offshore locations west of the Thai coast. The widest distribution was observed in 2020, when fishing grounds covered both coastal and offshore waters across much of the study area. In contrast, fishing grounds in 2021 were mainly concentrated in the southern part of the Andaman coast.

During 2022–2023, fishing activities were recorded in both coastal and offshore waters, although most fishing locations remained concentrated around the main fishing grounds west of Phuket and Phang Nga. In 2024, fishing activities were recorded at only a few locations. The fishing grounds expanded again in 2025, with fishing activities observed in both the northern and southern parts of the study area.

Overall, the distribution of longtail tuna fishing grounds changed considerably over the years. In recent years, fishing activities tended to occur in fewer locations and were more concentrated in coastal waters compared with earlier years (Figure 2 and 3).



**Figure 2** Annual changes in the distribution of longtail tuna (*Thunnus tonggol*) fishing grounds along the Andaman coast of Thailand during 2016–2025.



**Figure 3** Spatial distribution of longtail tuna (*Thunnus tonggol*) fishing grounds along the Andaman coast of Thailand during 2016–2025.

### 3.2 Species composition

The species composition of neritic tunas varied among years during 2016–2025 (Table 1). Kawakawa (*Euthynnus affinis*) and longtail tuna (*Thunnus tonggol*) were the major components of the neritic tuna catch throughout the study period.

Kawakawa contributed between 24.57% and 48.20% of the total neritic tuna catch and was the dominant species in most years. The highest contribution was recorded in 2023 (48.20%). Longtail tuna accounted for 9.51–44.80% of the catch, with relatively high proportions observed in 2021 (44.33%), 2022 (40.82%), and 2025 (44.80%).

Frigate tuna (*Auxis thazard*) showed relatively stable contributions over the years, ranging from 10.48% to 18.90%. In contrast, bullet tuna (*Auxis rochei*) generally contributed a smaller proportion of the catch, although its contribution increased markedly in 2020 (34.68%) and became the dominant species in 2024 (49.27%).

Overall, kawakawa and longtail tuna together accounted for more than 60% of the neritic tuna catch in most years, indicating their importance in the small purse seine fishery along the Andaman coast of Thailand.

**Table 1.** Species composition (%) of neritic tuna catches in the small purse seine fishery along the Andaman coast of Thailand during 2016–2025.

Common name	Scientific name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Longtail tuna	<i>Thunnus tonggol</i>	34.25	32.56	32.37	28.58	9.51	44.33	40.82	30.15	11.81	44.80
Kawakawa	<i>Euthynnus affinis</i>	40.22	39.29	38.41	41.00	40.97	34.32	38.42	48.20	24.57	30.81
Frigate tuna	<i>Auxis thazard</i>	14.38	18.62	17.98	18.90	14.84	16.83	16.16	10.48	14.35	11.35
Bullet tuna	<i>Auxis rochei</i>	11.15	9.53	9.22	10.53	34.68	4.51	4.59	11.18	49.27	13.05
Grand Total		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

### 3.3 catch contribution of longtail tuna

The contribution of longtail tuna to the total catch of the small purse seine fishery varied among months and years during 2016–2025 (Table 2). Monthly catch contributions ranged from less than 1% to 27.66% of the total catch, indicating considerable temporal variation throughout the study period.

Higher catch contributions were generally observed during the second half of the year, particularly from August to December. The highest monthly contributions were recorded in September 2021 (27.51%) and December 2025 (27.66%). Relatively high contributions were also observed in September 2017 (21.63%), October 2018 (20.89%), and November 2019 (24.26%).

In contrast, low contributions (<5%) were recorded in several months, particularly during the first half of the year. Although periods of high contribution occurred in most years, the timing and magnitude of peak contributions varied over years. Overall, longtail tuna tended to contribute a larger proportion of the catch during the second half of the year compared with the first half.

**Table 2.** Monthly catch contribution (%) of longtail tuna (*Thunnus tonggol*) in the small purse seine fishery along the Andaman coast of Thailand during 2016–2025.

Year Month	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Jan	0.31	0.04	1.60	1.31	1.06	6.81	10.42	0.32	0.03	0.47
Feb	1.58	1.42	-	0.35	0.60	2.16	1.39	1.52	-	-
Mar	0.57	2.09	0.24	0.00	2.46	0.27	2.59	0.59	-	2.21
Apr	0.67	0.41	0.19	0.02	2.48	0.06	2.74	2.32	Ta-	1.14
May	-	3.52	2.72	5.60	0.59	0.07	0.31	3.28	0.38	2.72
Jun	0.14	1.94	1.83	7.84	0.00	0.06	1.36	15.84	0.04	6.53
Jul	2.82	5.37	1.55	1.87	0.14	0.29	0.75	2.03	13.77	3.99
Aug	0.15	8.25	1.22	3.64	0.00	0.47	16.43	3.78	2.47	17.25
Sep	1.34	18.14	9.84	5.55	0.02	27.51	7.51	14.85	0.12	1.89
Oct	0.10	0.85	15.05	0.95	0.92	17.74	11.31	6.78	0.20	9.12
Nov	20.46	1.21	0.17	18.93	2.24	4.95	6.12	0.31	0.54	2.16
Dec	0.04	6.97	0.13	0.32	4.88	1.23	12.34	0.00	0.21	27.66

### 3.4 CPUE of longtail tuna

The CPUE of longtail tuna changed noticeably among years and months during 2016–2025 (Table 3). The annual mean CPUE ranged from 31.805 kg/day in 2020 to 138.499 kg/day in 2025. Lower annual CPUE values were generally found during 2016–2020, while higher values were recorded in most years after 2020.

Monthly CPUE also varied throughout the study period. Higher CPUE values were often observed during the second half of the year, particularly from August to November. Several peak values were recorded in September 2021 (783.301 kg/day), June 2023 (389.218 kg/day), July 2024 (536.868 kg/day), and December 2025 (745.808 kg/day). In contrast, lower CPUE values were commonly observed during February–April in several years.

Overall, the results indicate clear temporal variation in the availability of longtail tuna to the small purse seine fishery, with differences observed among both seasons and years throughout the study period.

**Table 3.** Monthly CPUE (kg/day) of longtail tuna (*Thunnus tonggol*) in the small purse seine fishery along the Andaman coast of Thailand during 2016–2025.

Year Month	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Jan	11.997	0.536	39.544	21.287	40.535	117.238	219.329	3.362	1.713	11.478
Feb	23.300	29.930	-	8.032	35.548	42.750	16.451	23.332	-	-
Mar	20.680	43.472	5.431	0.026	75.018	9.744	51.911	9.853	-	47.278
Apr	18.879	13.174	2.285	0.599	101.084	1.105	70.579	79.680	-	29.326
May	-	100.864	68.874	200.980	15.186	1.311	5.135	61.053	24.576	84.164
Jun	1.820	42.513	28.452	154.323	0.083	1.890	26.287	389.218	1.085	120.109
Jul	62.366	68.247	35.561	36.389	4.074	6.442	15.239	40.191	536.868	74.039
Aug	2.521	106.227	19.979	62.005	0.022	9.460	238.670	72.484	72.758	290.044
Sep	16.241	262.802	116.856	115.630	0.351	783.301	93.673	319.320	2.859	28.781
Oct	1.460	12.379	262.735	23.622	16.190	325.178	109.045	142.177	4.254	139.845
Nov	414.129	22.823	2.695	349.123	44.035	61.482	119.554	9.536	16.949	29.899
Dec	0.471	128.841	1.804	7.621	85.780	18.613	211.430	0.091	4.203	745.808
Total	52.932	64.187	53.373	79.898	31.805	123.476	94.411	100.719	60.755	138.499

### 3.5 Size structure of longtail tuna

The size composition of longtail tuna varied among months and years during 2016–2025 (Table 4). Fish ranging from approximately 10 to 72 cm were recorded in the catches, although most individuals were concentrated between 30 and 42 cm throughout the study period.

A seasonal pattern in size composition was observed. Larger fish were generally more common during July–September, when catches were dominated by individuals in the 32–46 cm size classes. In contrast, smaller fish occurred more frequently during October–February, with increased proportions of

individuals below 20 cm observed in several years. This pattern was particularly evident in late-year and early-year catches, where small size classes contributed a larger proportion of the total catch.

Despite interannual fluctuations in the relative abundance of different size classes, medium-sized fish remained the dominant component of the catch throughout most of the study period. Large individuals (>50 cm) were recorded occasionally but generally contributed a relatively small proportion of the catches.

**Table 4.** Monthly length-frequency distribution (%) of longtail tuna (*Thunnus tonggol*) caught by small purse seiners along the Andaman coast of Thailand during 2016–2025.

Year	Month	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70								
2016	1	3	6	0	0	0	0	0	0	7.92	15.85	18.05	20.08	3.1	0	8.67	7.08	0	0	0	0	0	1.25	0	0	0	0	0	0	0	0	0	0	0						
2017	1	0	38.7	44.46	0	6.93	0	0	0	0	0	0	3.3	6.61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
2018	1	0	28.62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
2019	1	12.08	0	7.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2020	1	0	0	0	0	0	0	0	0	2.39	6.11	34.72	48.07	6.91	1.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2021	1	0.61	2.74	2.46	4.94	0	0	0	0	0	2.03	6.1	4.07	6.66	0	9.8	6.85	44.76	8.98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2022	1	0	0.14	0	0.02	0	0	0	0.8	0.8	7.21	20.04	13.38	14.64	15.88	2.19	0.9	5.61	12.82	3.2	2.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2023	1	76.63	53.55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2024	1	0	0	76.78	12.14	0	0	12.13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2025	1	0	0	0	6.58	0	0	0	0	0	7.11	35.88	28.57	4.27	7.17	6.43	3.53	6.68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2016	2	0	0	0	0	0	0	0	0	0	0	1.23	10.63	2.47	19.51	19.3	17.49	3.94	10.2	9.62	2.24	0.55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.82	0		
2017	2	2.03	0	2.92	7.05	0	0.89	0.99	0	7.34	7.34	3.37	5.75	45.2	9.52	0	2.49	1.25	3.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2018	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2019	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2020	2	0	0	0	0	0	0	0	0	0	10.60	67.94	21.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2021	2	0	8.79	11.22	0	0	5.09	2.33	0	24.84	28.91	8.04	0	0.34	0.34	0.34	0	0	0	0.41	0	0	0	0	0.82	1.24	0.82	2.89	2.48	0.41	1.24	1.24	0	0	0	0	0			
2022	2	0.5	0	13.11	4.72	18.52	25.4	4.72	1.79	2.61	3.48	0	2.36	13.3	6.65	3.84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2023	2	54.81	8.46	0	0	2.02	1.42	2.84	5.84	3.93	11.81	4.82	2.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2016	3	0	0	0	0	0	0	0	0	16.29	0	5.92	0	0	30.85	25.1	3.9	0	1.36	16.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2017	3	0	0	0.62	0.62	0.62	0.62	5.37	0	40.91	34.35	14.73	0	0.43	1.3	0.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2018	3	0	0	0	24.58	25.91	0	0	14.44	7.22	0	0	13.92	0	0	13.93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2020	3	0	0	1.96	0	0	0	0	0	0.86	1.74	9.71	23.25	25.63	27.36	3.47	5.08	5.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2021	3	30.85	18.58	0	21.85	0	0	4.63	0	1.45	1.45	8.52	8.61	2.81	1.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2022	3	4.07	5.99	2.75	2.07	4.02	2.47	11.07	21.01	14.52	10.87	5.83	0	0	0	0	2.81	10.78	2.34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2023	3	1.63	0	0	22.18	38.81	17.43	14.55	3.17	0	0	0	0	0	0	0	0	2.23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2025	3	0	0	0	0	0	0	0	2.7	13.56	15.25	2.87	0	0	2.71	9.73	15.62	24.92	6.32	6.32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2016	4	0	0	0	0	0	0	0	0	2.76	13.61	33.69	36.5	7.76	0	5.68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2017	4	0	0	0	0	0	0	0	31.4	8.56	8.56	8.56	5.71	31.44	2.86	2.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	4	11.46	0	6.92	7.4	0	0	0	0	33.34	33.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2019	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2020	4	0	0	0	0	0	0	1.18	0	0	0	4.19	14.84	27.4	40.98	3.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2021	4	47.42	51.59	0	0	0	0	0	0.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2022	4	0	0	2.72	3.39	22.11	0.14	5.18	3.45	21.56	20.33	10.09	7.53	3.36	0.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2023	4	0	0	2.9	1.85	0	0.44	0	1.49	0.72	6.82	0	0	0	1.43	7.16	14.34	2.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2025	4	0	8.82	29.11	39.7	9.87	0.13	0	0	2.71	2.1	1.96	3.03	1.45	0.98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2017	5	0	0	0	0	0	0	5.24	25.09	18.37	24.36	12.27	1.24	0	1.19	0	0.29	0.29	2.63	3.21	2.33	2.04	0.29	1.16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2018	5	0	0	0	0	1.17	0	0.59	6.68	7.68	12.77	25.01	25.72	14.9	4.05	0.64	0.81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2019	5	12.42	28.02	9.88	0.73	1.47	0.91	0	0	0.76	1.41	5.33	9.2	13.05	7.85	5	2.74	0.82	0	0	0.42	0.21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2020	5	0	0	0																																				

#### 4. Conclusion

Longtail tuna fisheries along the Andaman coast of Thailand exhibited substantial temporal and spatial variability during 2016–2025. Fishing grounds varied over years, while catch contribution and CPUE fluctuated considerably across both months and years. Higher catch contribution and CPUE were generally observed during the second half of the year. Size composition also showed seasonal variation, with larger individuals occurring more frequently during mid-year and smaller individuals becoming more common during late-year and early-year periods. These findings provide baseline information on the dynamics of longtail tuna in the Andaman Sea and may support future monitoring, stock assessment, and fisheries management.

#### 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, chimaeroids 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.