

**TUNA LONGLINE FISHERY BY THAI LONGLINERS  
IN THE INDIAN OCEAN DURING 2009 - 2013**

Pattira Lirdwitayaprasit\* Prasit Luesrithawornsinand Aekkarat Wongkeaw  
Deep Sea Fishery Technology Research and Development Institute,  
Department of Fishery, Thailand

\* Corresponding author: [Pattiral@hotmail.com](mailto:Pattiral@hotmail.com)

**ABSTRACT**

This report was based on the data extracted from fishing logsheets by two Thai tuna longliners namely, “Mook Andaman 018” and “Mook Andaman 028”, which declared to Department of Fisheries, Thailand. Data from their logsheets displayed important information of their fishing operation and effort. During 2009-2013, fishing grounds were mainly in the Western coast of the Indian Ocean, fishing operations were recorded 2,073 fishing days. The highest total catch was in 2010 with 607.69 tonnes followed by 2012, 2011, 2013 and 2009 respectively (470.41, 373.44, 307.74 and 295.22 tonnes). The highest CPUE was found in 2010 with 13.62 fish/1,000 hooks followed by 2012 and 2013, respectively (10.83 and 10.16 fish/1,000 hooks)

During 2009-2013, the bigeye tuna (*Thunnus obesus*) and yellowfin tuna (*T. albacares*) caught by number (and weight) were 24,126 fish (1,120.61 tonnes) and 10,531 fish (374.47 tonnes), respectively. The average percentage composition by number of the bigeye tuna and yellowfin tuna were 45.17% and 19.72% and by weight 54.54% and 18.23%, respectively.

The composition of bigeye tuna by zone during 2009-2013 was the highest catch in the 2<sup>nd</sup> zone (15,571 fish and 690.85 tonnes) and the lowest catch in the 1<sup>st</sup> zone (86 fish and 3.70 tonnes).

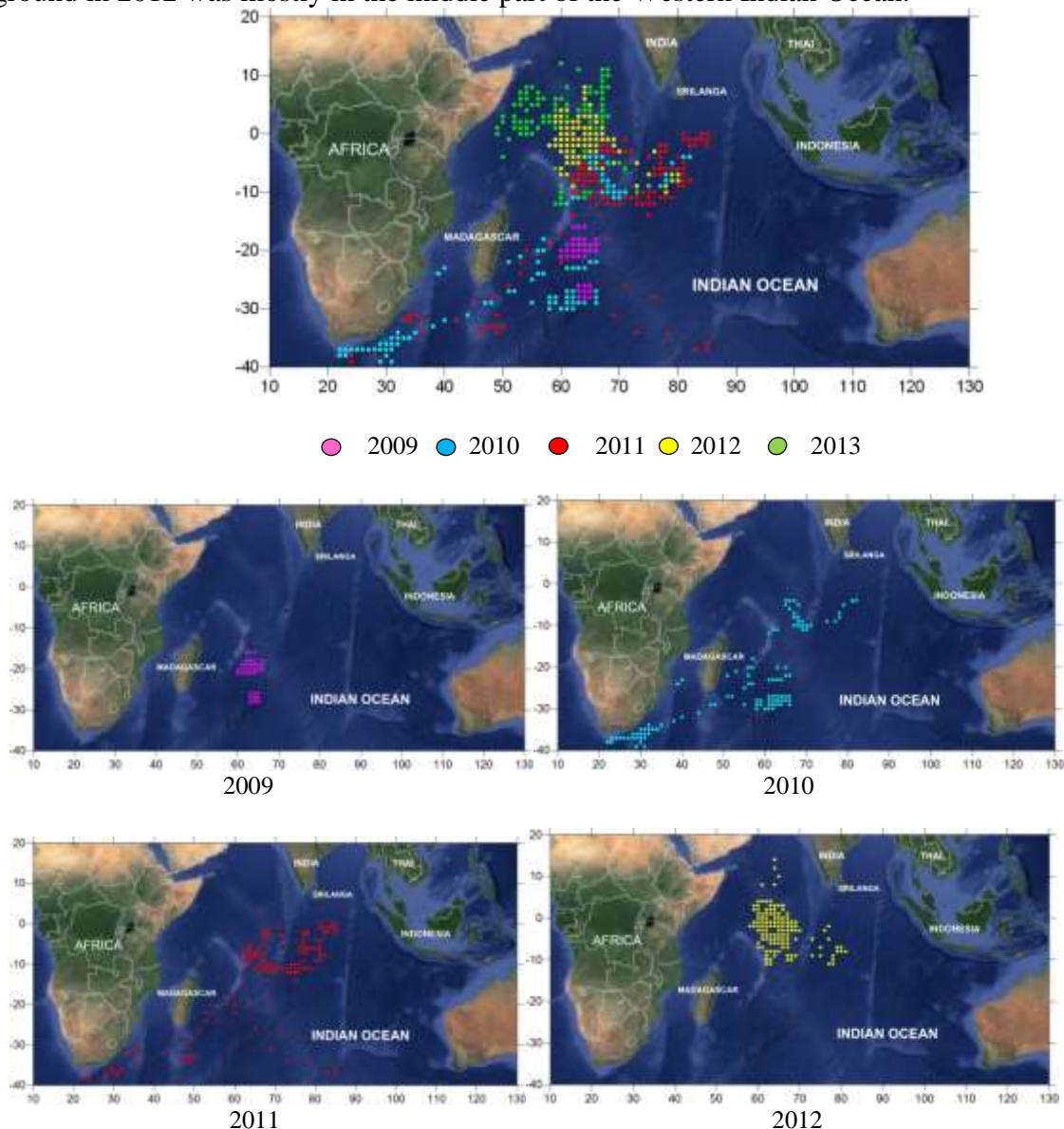
The composition of yellowfin tuna by zone during 2009-2013 was also the highest catch in the 2<sup>nd</sup> zone (5,527 fish and 190.62 tonnes) and the lowest catch in the 1<sup>st</sup> zone (84 fish and 3.07 tonnes).

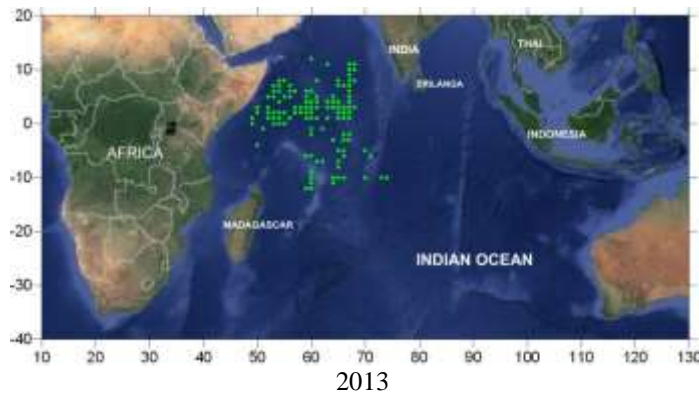
## Introduction

Regarding tuna longline fishery, Thailand had initially three distance tuna longliners that had operated in the Indian Ocean since 2000 but from 2008 only two Thai tuna longliners namely Mook Andaman 018 and Mook Andaman 028 are still operating. In 2014, the new Thai tuna longliner namely Ceribu works together in the Indian Ocean. For this paper we took only data from year 2009-2013.

## Fishing grounds

The study on tropical tuna (bigeye tuna, *Thunnus obesus*; yellowfin tuna, *T. albacares*) by Thai tuna longline fishery in the Indian Ocean was based on data collected from logbook during 2009-2013 which included information about fishing operations 2,073 fishing days. The main fishing grounds were distributed in the east coast and south Madagascar and around central and southern part of the Indian Ocean (Figure 1). The fishing ground in 2012 was mostly in the middle part of the Western Indian Ocean.





**Figure 1** Fishing ground by Thai tuna longliners in the Indian Ocean during 2009-2013

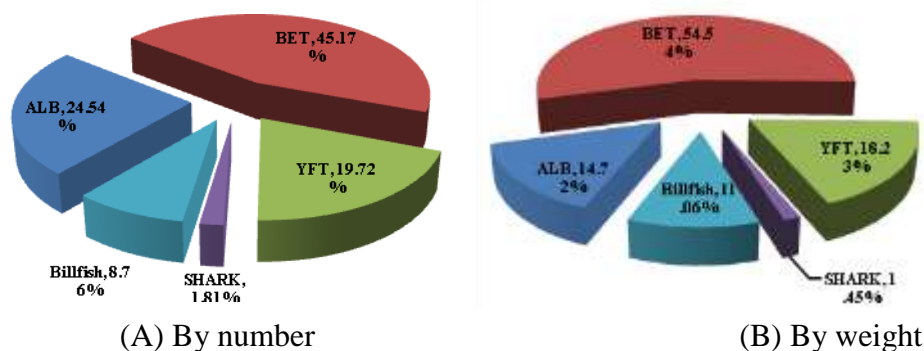
### Fishing efforts, catches, percentage compositions and CPUEs between 2009-2013

Fishing efforts during 2009-2013 were shown in table 1. In 2009, Thai tuna longliners exerted the highest fishing effort 1,335,600 hooks (477 fishing days). On the otherhand, fishing efforts in 2013 were decrease to 704,400 hooks (363 fishing days).

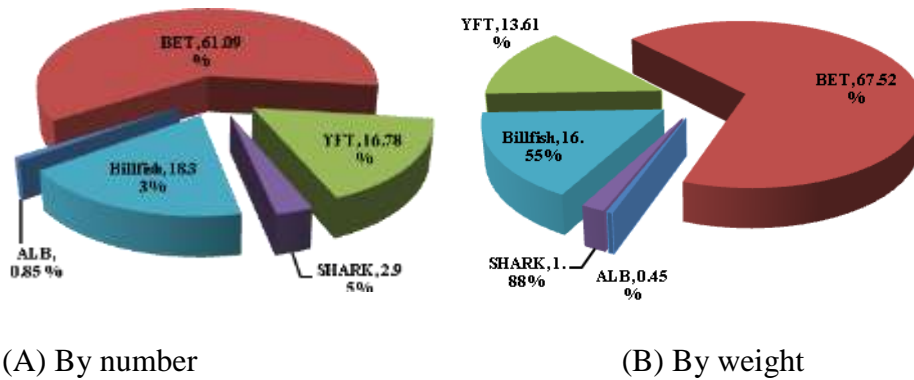
Annual catches in 2009-2013 were estimated to 295.23, 607.69, 373.44, 470.41 and 307.74 tonnes, respectively. The major species caught during 5 years were bigeye tuna (*T. obesus*), yellowfin tuna (*T. albacares*), albacore tuna and billfish and shark. Their total catches were 1,120.61, 374.47, 302.53, 227.18 and 29.71 tonnes, respectively (Table 1).

During 2009-2013, the average percentage composition by number of bigeye tuna, yellowfin tuna, albacore tuna, billfish and shark were 45.17%, 19.72%, 24.54%, 8.76% and 1.81%, respectively (Figure 2A). In contrast, catch composition by weight of bigeye tuna, yellowfin tuna, albacore tuna, swordfish and shark were 54.54%, 18.23%, 14.72%, 11.06% and 1.45%, respectively (Figure 2B).

In 2013, bigeye tuna and yellowfin tuna were shown in figure 2 with 77.87 % by number and 81.13 % by weight of the total catch composition. The percentage composition by number of bigeye tuna and yellowfin tuna were found 61.09 % and 16.78 %, respectively (Figure 3A). The percentage composition by weight of bigeye tuna and yellowfin tuna were found 67.52 % and 13.61 %, respectively (Figure 3B).



**Figure 2** Catch composition by number (A) and by weight (B) during 2009-2013



**Figure 3** Catch composition by number (A) and by weight (B) in 2013

During 5 years, The highest CPUE was found in 2010 with 13.62 fish/1,000 hooks followed by 2012 and 2013, respectively (10.83 and 10.16 fish/1,000 hooks). The average CPUE of tropical tuna species (bigeye tuna and yellowfin tuna) was 6.30 fish/1,000 hooks. In 2013, total CPUE of these 2 species was 7.91 fish/1,000 hooks. In 2009, total CPUE of these species was lowest 3.63 fish/1,000 hooks. In 2013, the CPUE of bigeye tuna was 6.21 fish/1,000 hooks whilst the CPUE of yellowfin tuna was 1.70 fish/1,000 hooks (Table 2).

**Table 1** Fishing efforts, annual catches and CPUEs of Thai tuna longliners

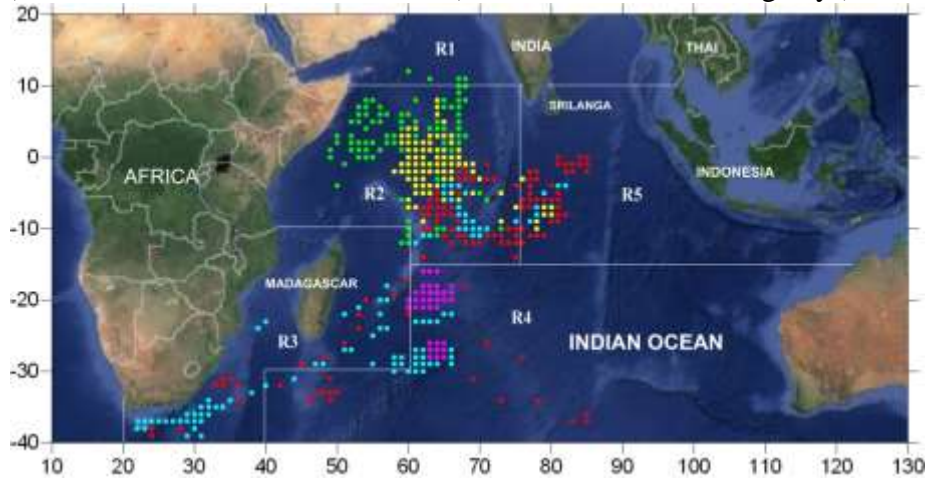
Year	Fishing days	Total Number of Hooks	Total fish		Total catch by No. and Weight										Total CPUE (fish/1,000 hooks)	
			No.	Tonnes	ALB		BET		YFT		Billfish		Sharks		By No.	By Weight
					No.	Tonnes	No.	Tonnes	No.	Tonnes	No.	Tonnes	No.	Tonnes		
2009	477	1,335,600	6,897	295.22	1,117	23.56	2,856	152.07	1,989	64.95	935	54.63	-	-	5.16	221.04
2010	473	1,324,400	18,044	607.69	11,456	263.4	2,994	170.09	2,188	93.6	1,406	80.58	-	-	13.62	458.84
2011	372	1,049,400	9,583	373.44	353	11.44	5,883	248.48	2,842	92.12	291	15.99	214	5.4	9.13	355.86
2012	388	1,083,600	11,732	470.41	120	2.72	8,021	342.18	2,311	81.92	736	25.05	544	18.52	10.83	434.12
2013	363	704,400	7,157	307.74	61	1.38	4,372	207.78	1,201	41.87	1,312	50.92	211	5.77	10.16	436.88
<b>Total</b>	<b>2,073</b>	<b>5,497,400</b>	<b>53,413</b>	<b>2,054.50</b>	<b>13,107</b>	<b>302.50</b>	<b>24,126</b>	<b>1,120.60</b>	<b>10,531</b>	<b>374.46</b>	<b>4,680</b>	<b>227.17</b>	<b>969</b>	<b>29.69</b>	<b>9.72</b>	<b>373.72</b>

**Table 2** Fishing efforts, annual catches and CPUE of BET and YFT during 2009-2013

Year	Fishing days	Total Number of Hooks	Total catch	BET	YFT	CPUE of BET	CPUE of YFT	CPUE of BET&YFT
						(per 1,000 hooks)	(per 1,000 hooks)	(per 1,000 hooks)
			No.	No.	No.	No.	No.	No.
2009	477	1,335,600	6,897	2,856	1,989	2.14	1.49	3.63
2010	473	1,324,400	18,044	2,994	2,188	2.26	1.65	3.91
2011	372	1,049,400	9,583	5,883	2,842	5.61	2.71	8.31
2012	388	1,083,600	11,732	8,021	2,311	7.4	2.13	9.53
2013	363	704,400	7,157	4,372	1,201	6.21	1.7	7.91
<b>Total</b>	<b>2,073</b>	<b>5,497,400</b>	<b>53,413</b>	<b>24,126</b>	<b>10,531</b>	<b>4.39</b>	<b>1.92</b>	<b>6.30</b>

**Catches of bigeye tuna and yellowfin tuna by zone during 2009-2013**

During 2009-2013, Thai tuna longliners were operated in the 1<sup>st</sup> - 5<sup>th</sup> zone (R 1-5) as shown in figure 4. The highest fishing effort was in the 2<sup>nd</sup> zone (2,285,000 hooks, 921 fishing days), but it was lowest in the 1<sup>st</sup> zone (21,000 hooks, 11 fishing days).

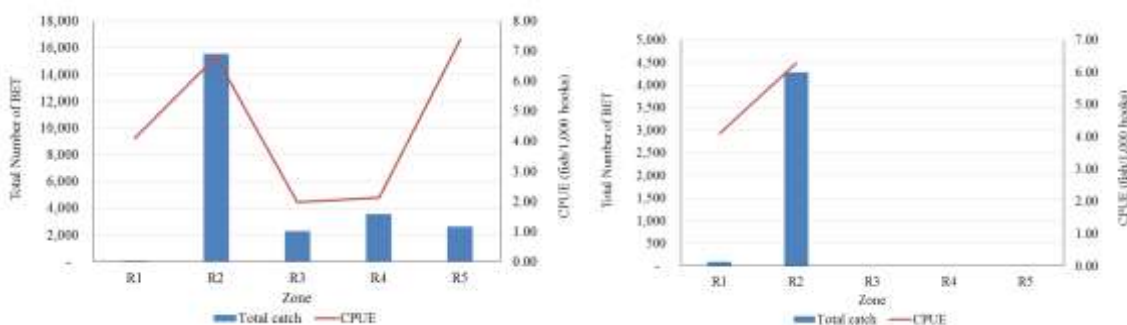


**Figure 4** Fishing ground of bigeye tuna and yellowfin tuna by zone during 2009-2013

**Bigeye tuna**

Bigeye tuna caught during 2009-2013 was found the highest catch by number and weight in the 2<sup>nd</sup> zone (15,571 fish, 690.85 tonnes ) and the lowest in the 1<sup>st</sup> zone (86 fish, 3.70 tonnes). However, the highest CPUE was in the 5<sup>th</sup> zone (7.39fish/1,000 hooks) and the lowest in the 3<sup>rd</sup> zone (1.97 fish/1,000 hooks). (Figure 5A, 5B; Table 3)

In 2013, Thai tuna longliners were operated only in the 1<sup>st</sup> zone and the 2<sup>nd</sup> zone. The fishing effort in the 1<sup>st</sup> zone was 21,000 hooks with 11 fishing days and the 2<sup>nd</sup> zone was 683,400 hooks with 352 fishing days. Total catch of the 1<sup>st</sup> zone and the 2<sup>nd</sup> zone were 86 fish and 4,286 fish, respectively. Average CPUE of bigeye tuna in this year was 6.21 fish/1,000 hooks (Table 4).



(A) Number and CPUE during 2009-2013

(B) Number and CPUE in 2013

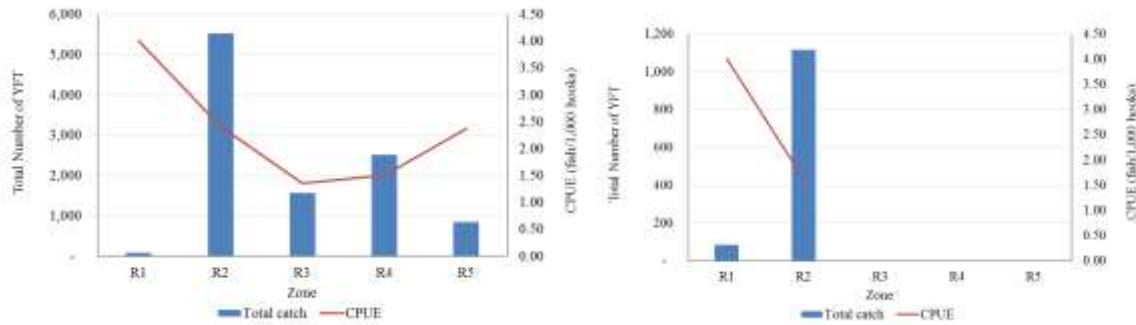
**Figure 5** Number and CPUE of bigeye tuna by thai tuna longliner fishery during 2009-2013



**Yellowfin tuna**

The catch of yellowfin tuna during 2009-2013 was recorded the highest by number and weight in the 2<sup>nd</sup> zone (5,527 fish, 190.62 tonnes ) and lowest in the 1<sup>st</sup> zone (84 fish, 3.07 tonnes). Contrarily, the CPUE was highest in the 1<sup>st</sup> zone (4.00fish/1,000 hooks) and lowest in the 3<sup>rd</sup> zone (1.35 fish/1,000 hooks). (Figure 6A, 6B; Table 3)

In 2013, total catch of yellowfin tuna in the 1<sup>st</sup> zone and the 2<sup>nd</sup> zone were 84 fish and 1,117 fish, respectively. Average CPUE of this species was 1.70 fish/1,000 hooks (Table 4).



(A) Number and CPUE during 2009-2013

(B) Number and CPUE in 2013

**Figure 6** Number and CPUE of bigeye tuna by thai tuna longliner fishery during 2009-2013

**Table 3** Fishing efforts, catches and CPUE by zone during 2009-2013

Year	Fishing days	Total Number of Hooks	Total catch			YFT		ALB	Billfish	Shark	CPUE (fish/1,000 hooks)	CPUE of BET (per 1,000 hooks)		CPUE of YFT (per 1,000 hooks)	
			No.	No.	tonnes	No.	tonnes					No.	tonnes	No.	tonnes
R1	11	21,000	196	86	3.70	84	3.07	0	26	0	9.33	4.10	0.18	4.00	0.15
R2	921	2,285,000	24,938	15,571	690.85	5,527	190.62	622	2321	897	10.91	6.81	0.30	2.42	0.08
R3	416	1,159,200	15,725	2,287	126.02	1,566	67.39	10788	1084	0	13.57	1.97	0.11	1.35	0.06
R4	599	1,677,200	8,689	3,560	189.74	2,513	83.75	1522	1094	0	5.18	2.12	0.11	1.50	0.05
R5	126	355,000	3,865	2,622	110.31	841	29.65	175	155	72	10.89	7.39	0.31	2.37	0.08
Total	2,073	5,497,400	53,413	24,126	1,120.6	10,531	374.5	13,107	4,680	969	9.72	4.39	0.20	1.92	0.07

**Table 4** Fishing efforts, catches and CPUE by zone in 2013

Year	Fishing days	Total Number of Hooks	Total catch			YFT		ALB	Billfish	Shark	CPUE (fish/1,000 hooks)	CPUE of BET (per 1,000 hooks)		CPUE of YFT (per 1,000 hooks)	
			No.	No.	tonnes	No.	tonnes					No.	tonnes	No.	tonnes
R1	11	21,000	196	86	3.70	84	3.07	-	26	-	9.33	4.10	0.18	4.00	0.15
R2	352	683,400	6,961	4,286	204.09	1,117	38.81	61	1286	211	10.19	6.27	0.30	1.63	0.06
R3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	363	704,400	7,157	4,372	207.8	1,201	41.9	61	1,312	211	10.2	6.21	0.29	1.70	0.06