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Catch of Billfish by Thai tuna longliners during 2010-2014

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ABSTRACT

Thai tuna longliners have operated in the Indian Ocean since 2007.This report was based on the data extracted from fishing logsheets by three Thai tuna longliners namely, “Mook Andaman 018” “Mook Andaman 028” and “Ceribu”, which declared to Department of Fisheries, Thailand. Data from their logsheets displayed important information of their fishing operation and effort.

During the years 2010-2014, fishing grounds were mainly in the Western of Indian Ocean with 1,980 fishing day. The total catch by numbers was 61,179 fishes with 2,331.19 tons. The average catch rate (CPUE) of total catch were 11.62 fish/1,000 hooks and 442.71 kg/1,000 hooks. The major species caught were bigeye tuna (*Thunnus obesus*), yellowfin tuna (*T. albacares*), albacore tuna (*T. alalunga*), billfish, sharks and other species constituting 44.40, 20.59, 20.76, 9.82, 3.45 and 0.95% of the total catch, respectively.

During the years 2010-2014, billfish were caught 6,009 fishes with 281.27 tons. The average catch rate of billfish was 1.14 fish/1,000 hooks and 53.42 kg/1,000 hooks. The percentage composition of billfish to the total catch was 9.82% by number and 12.07% by weight. The highest catch found in 2014 was 2,264 fish and 108.72 tons. In 2014, Thailand initiate to collect the data caught of billfish by species. The major species of billfish caught were swordfish, stripped marlin, blue marlin and black marlin constituting 85.22%, 10.10%, 4.54% and 0.13% of the total catch, respectively. The average catch rate of billfish was 2.05 fish/1,000 hooks and 98.49 kg/1,000 hooks.

MATERIALS AND METHODS

Data was collected from logsheets provided to the Department of Fisheries, Thailand. The data included information related to fishing trips and operations. The trip data was composed of dates and ports of vessel departure and return, number and weight of catch and effort (such as the number of hooks used) by species. The fishing operation included data on the time of the operation, location (latitude and longitude), the retained catch of target species and other information related to the operation. The data were provided by the Siam Tuna Fishery Company and Three Wonderful Company. Logsheets were used to estimate annual catches of the longline fleet.

Total catch of billfish, effort and catch rate were analyzed by Excel and illustrated using Surfer software.

RESULT AND DISCUSSION

1. Fishing Operation

The fishing method of three tuna longliners namely, “Mook Andaman 018” “Mook Andaman 028” and “Ceribu” similar to Taiwanese and Japanese longliners because their master fishermen are Japanese and 20 Indonesian crews in each vessel. Mainline and branch line made of monofilament nylon. Float line 30 m long. Branch line interval 32 m each, 40 m long. Between 2 floats contain 20 hooks (called 1 basket) (Figure 1). Used hooksize: No. 4, the bait were squid. The total number of hooks was 2,000-3,400 per set with one of radio buoy at the end of set for convenience to seek. The longline fishing was operated in the back of vessel starting at about 8 am and soaking for 2-4 hour then hauling at the front of vessel with hydraulic equipments.

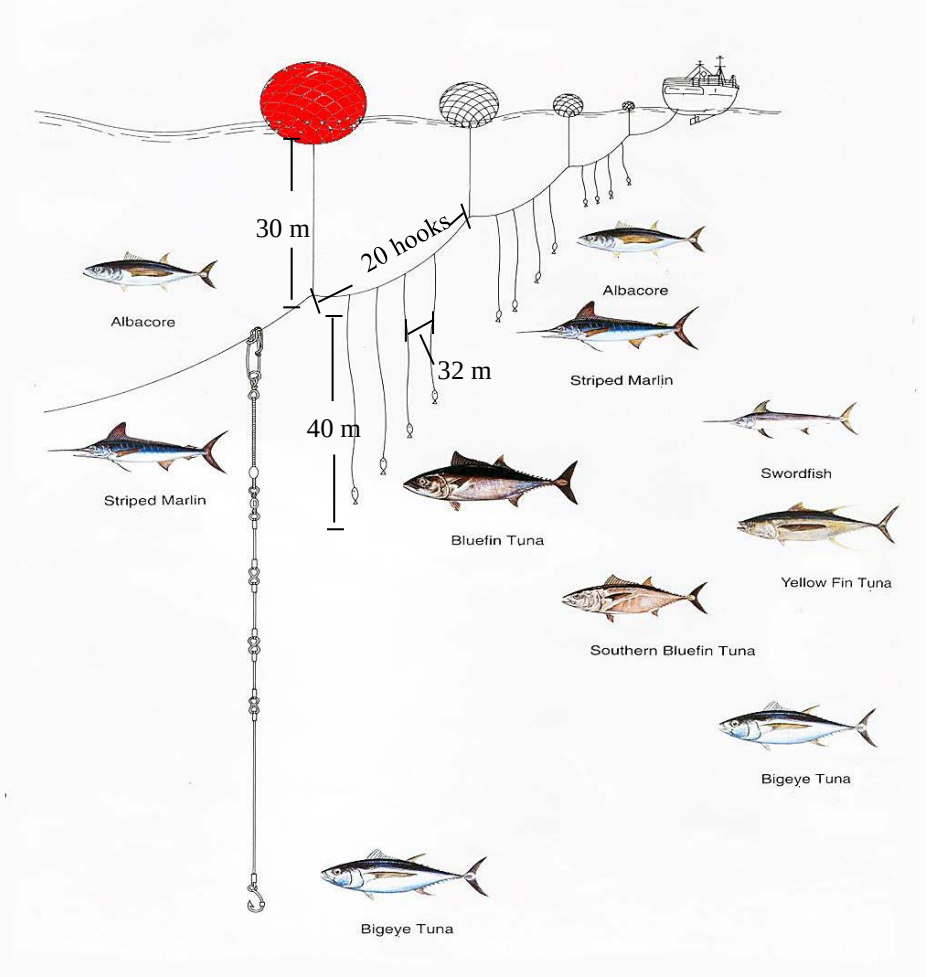


Figure 1 Structure of tuna longline arrangement

2. Fishing Ground

Three Thai tuna longliners namely “Mook Andaman 018” “Mook Andaman 028” and “Ceribu” have operated in the Western Indian Ocean since 2007. The main fishing grounds during 2010-2014 were distributed around central and southern part of the Indian Ocean (Figure 2)

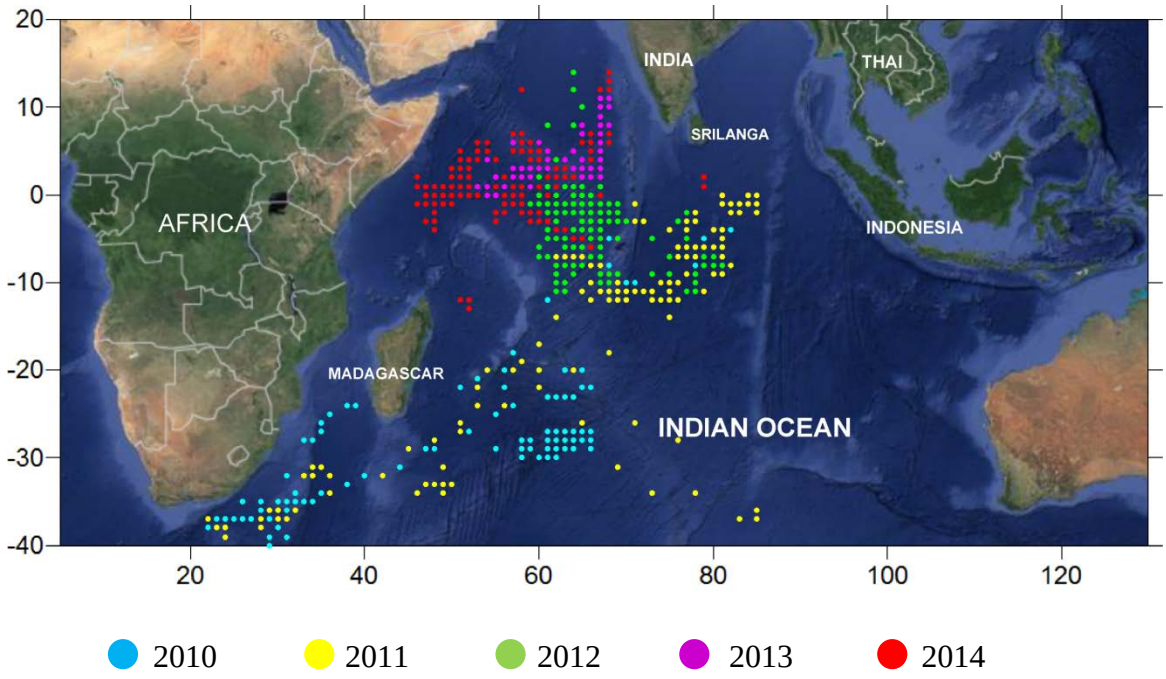


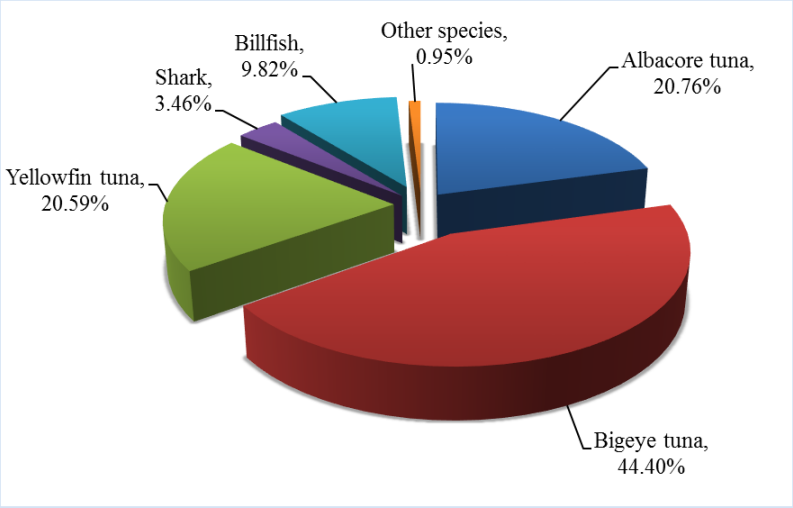
Figure 2 Fishing ground of Thai tuna longliners during 2010-2014

3. Fishing efforts, catches, percentage compositions and CPUEs between 2010-2014

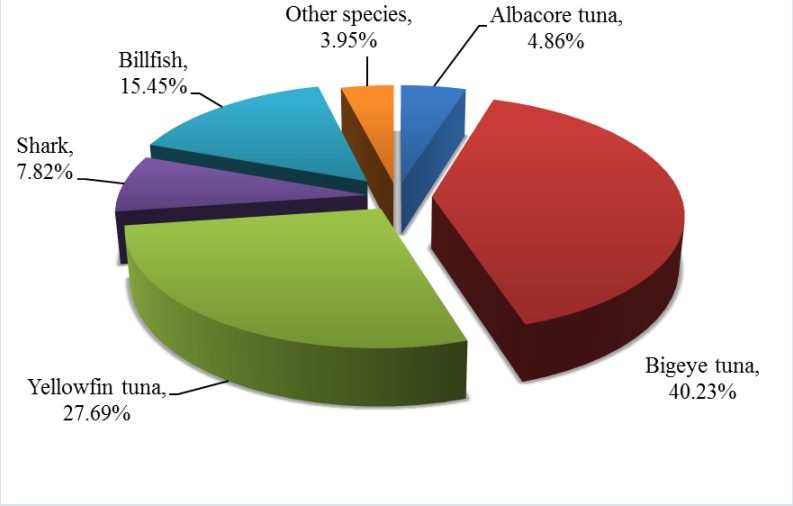
Fishing efforts during 2010-2014 were shown in table 1. In 2010, Thai tuna longliners exerted the highest fishing effort 1,324,400 hooks (473 fishing days).

Annual catches in 2010-2014 were estimated 607.69, 373.44, 470.41, 307.74 and 571.90 tonnes, respectively. The major species caught during 5 years were bigeye tuna (*Thunnus obesus*), yellowfin tuna (*T. albacares*), albacore tuna (*T. alalunga*), billfish, sharks and other species with 1,239.41, 433.43, 292.86, 281.27, 79.66 and 4.54 tonnes, respectively. The average percentage composition by number of bigeye tuna (*Thunnus obesus*), yellowfin tuna (*T. albacares*), albacore tuna (*T. alalunga*), billfish, sharks and other species were 44.40, 20.59, 20.76, 9.82, 3.46 and 0.95%, respectively. (Figure 3A)

Catch composition by number in 2014 of bigeye tuna (*Thunnus obesus*), yellowfin tuna (*T. albacares*), albacore tuna (*T. alalunga*) ,billfish, sharks and other species were 40.23%, 27.69%, 4.86%, 15.45%, 7.82% and 3.95%, respectively. Showing the difference composition from the past, billfish increased from 7.79% to 15.45% in 2014. (Figure 3B)



(A) Catch composition by number during 2010-2014



(B) Catch composition by number in 2014

Figure 3 Catch composition by number

The CPUE of Thai tuna longliners in 2010-2014 ranged between 9.13 and 13.62 fish/1,000 hooks, and the average CPUE was 11.62 fish/1,000 hooks. The lowest CPUE was in 2011, and the highest CPUE was in 2010. However the CPUE increased from 10.16 fish/1,000 hooks in 2013 to 13.28 fish/1,000 hooks in 2014 (Table 1).

In 2014, billfish was caught by number 2,264 fish and weight 108.72 tons. The CPUE were 2.05 fish/1,000 hooks and 98.49 kg/1,000 hooks.

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

Year	Fishing days	Total Number of Hooks	Total Number of fish	Total Number of billfish	Catch weight (Tonnes)							CPUE (fish/1,000 hooks)	CPUE of Billfish (fish/ 1,000 hooks)
					ALB	BET	YFT	Sharks	Billfish	Other species	Total		
2010	473	1,324,400	18,044	1,406	263.41	170.10	93.60	0.00	80.58	0.00	607.69	13.62	1.06
2011	372	1,049,400	9,583	291	11.44	248.48	92.12	5.41	15.99	0.00	373.44	9.13	0.28
2012	388	1,083,600	11,732	736	2.73	342.18	81.92	18.53	25.05	0.00	470.41	10.83	0.68
2013	363	704,400	7,157	1,312	1.38	207.78	41.88	5.78	50.93	0.00	307.74	10.16	1.86
2014	384	1,103,900	14,663	2,264	13.91	270.87	123.91	49.95	108.72	4.54	571.91	13.28	2.05
Total	1,980	5,265,700	61,179	6,009	292.87	1,239.42	433.43	79.66	281.27	4.54	2,331.19	11.62	1.14

4. Billfish

During 2010-2014, the fishing grounds of billfish were distributed around central and southern part of the Indian Ocean (Figure 4). Billfish were caught 6,009 fishes with 281.27 tons. The CPUE of billfish were 1.14 fish/1,000 hooks and 53.42 kg/1,000 hooks. The percentage of billfish to the total catch was 9.82% by number and 12.07% by weight. The highest catch was found in 2014 with 2,264 fish and 108.72 tons.

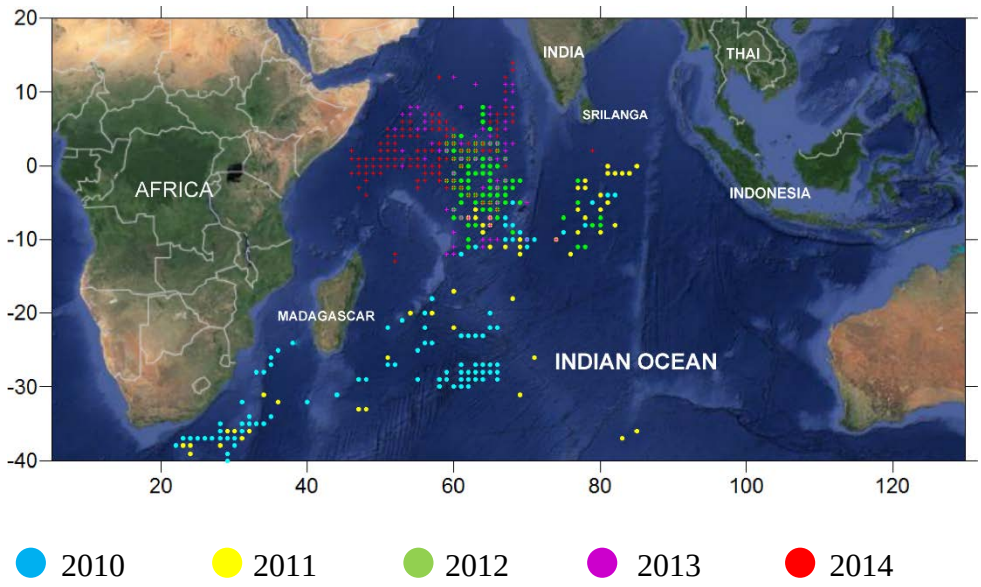


Figure 4 Fishing ground of Billfish during 2010-2014

The fishing grounds of billfish in 2014 were distributed in northern part of the West Indian Ocean (Figure 6). In this year Thailand initiate to collect the data caught of billfish by species, billfish were caught 2,264 fishes with 108.72 tons. The major species of billfish caught were swordfish, stripped marlin, blue marlin and black marlin 73.59% (1,666 fish with 79.06 tons), 14.00% (317 fish with 11.21 tons), 12.06% (273 fish with 17.69 tons) and 0.35% (8 fish with 0.75 tons) of the total catch, respectively. (Figure 5). The average catch rate of billfish was 2.05 fish/1,000 hooks and 98.49 kg/1,000 hooks. The highest catch rate was found in March while the lowest catch rate was in December.

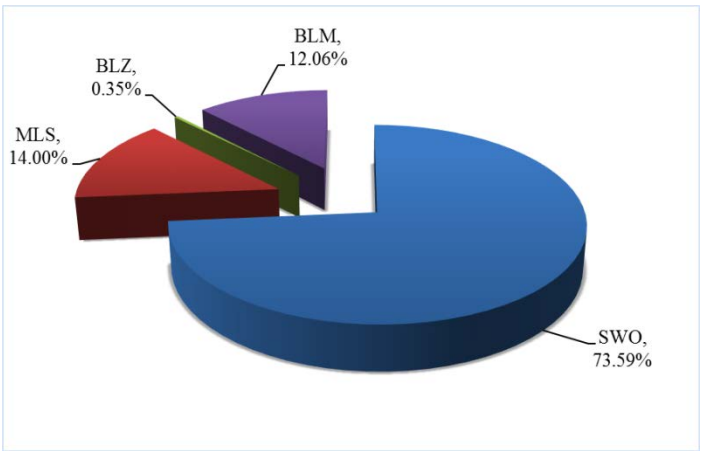
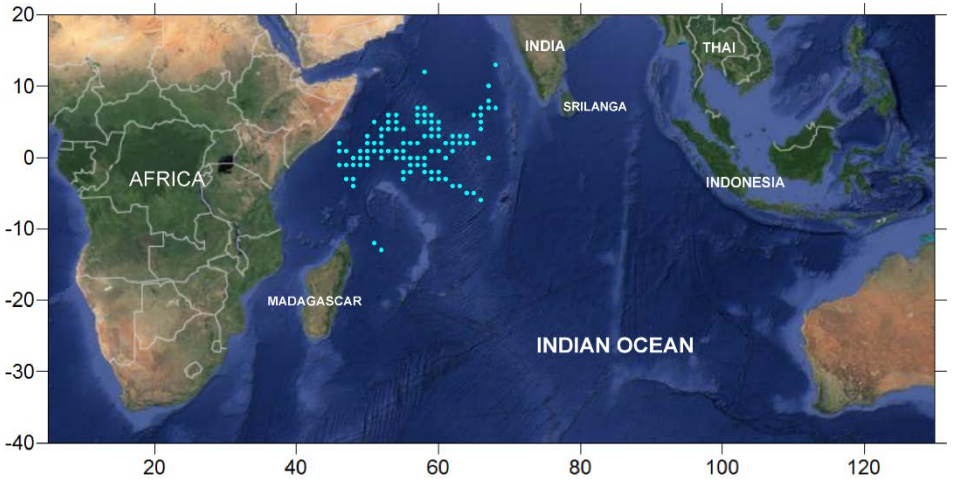
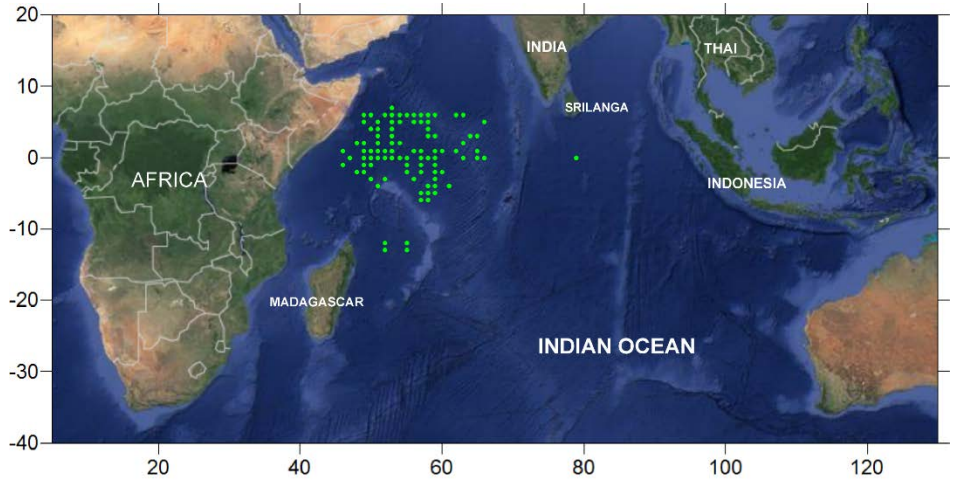


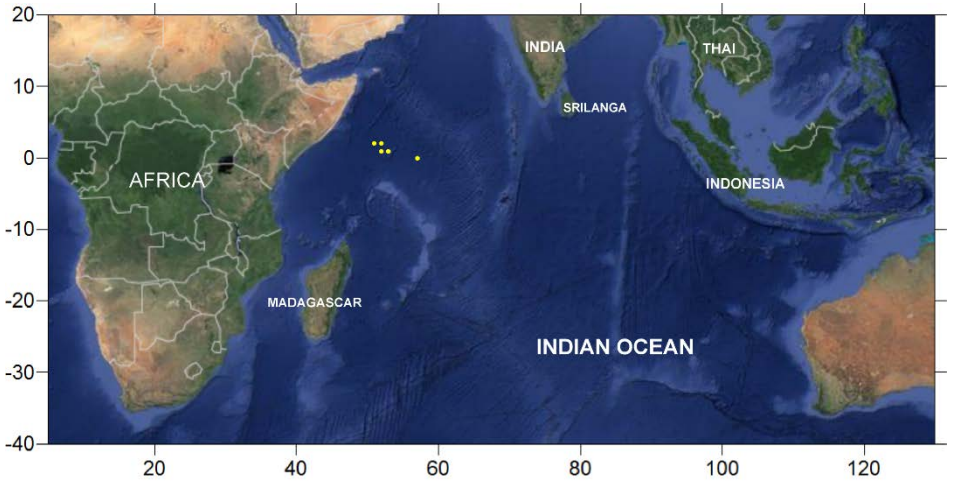
Figure 5 Catch composition of billfish by number in 2014



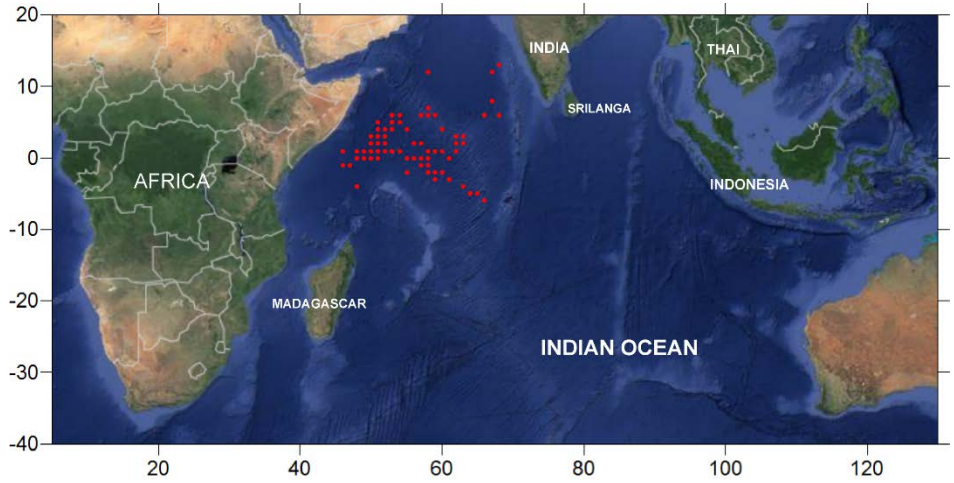
(A) Swordfish



(B) Blue marlin



(C) Black marlin



(D) Stripped marlin

Figure 6 Fishing ground of billfish in 2014

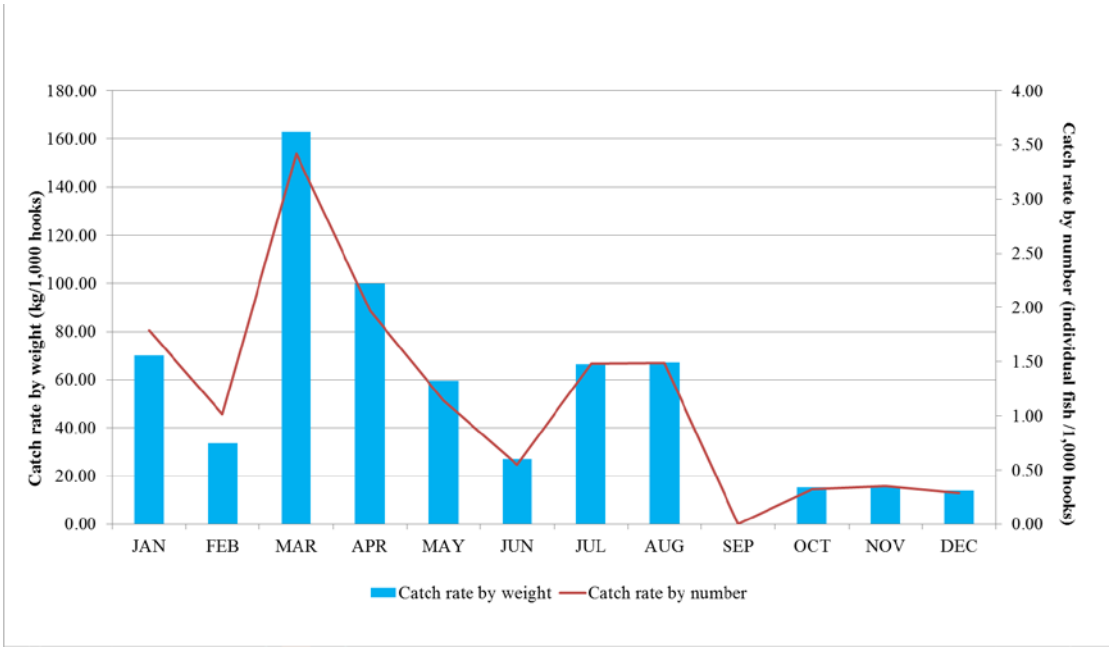
5. Variation of catch rate by species in 2014

The total catch of swordfish was 1,666 fish with 79.06 tons. The highest catch rate was found in March (21.27 tons) followed by April (20.72 tones). The average CPUE of swordfish was 1.51 fish/1,000 hooks and 71.62 kg/1,000 hooks.

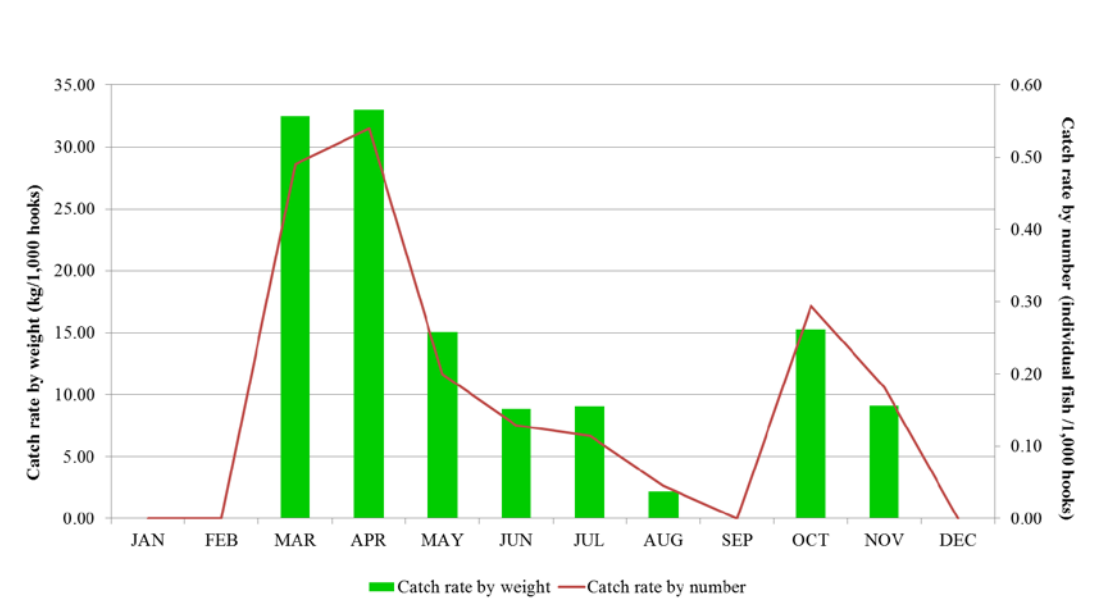
The total catch of blue marlin was 273 fish with 17.69 tons. The highest catch rate was found in April (6.86 tons) followed by March (4.24 tons). The average CPUE of blue marlin was 0.25 fish/1,000 hooks and 16.03 kg/1,000 hooks.

The total catch of black marlin was 8 fish with 0.75 tons. The highest catch rate was found in July (0.31 tons) followed by June (0.23 tons). The average CPUE of black marlin was 0.01 fish/1,000 hooks and 0.68 kg/1,000 hooks.

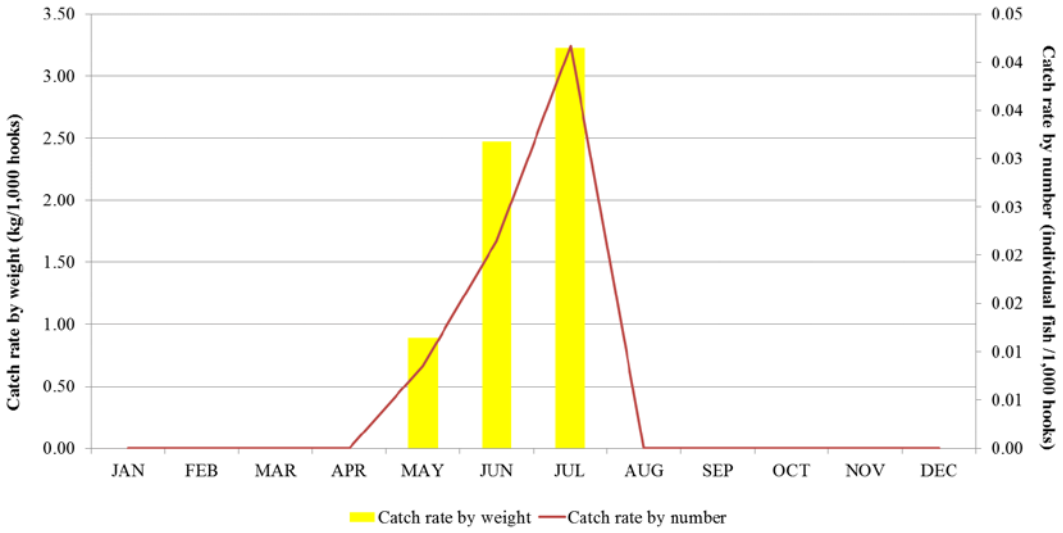
The total catch of stripped marlin was 317 fish with 11.21 tons. The highest catch rate was found in March (4.86 tons) followed by April (3.39 tons). The average CPUE of stripped marlin was 0.29 fish/1,000 hooks and 10.16 kg/1,000 hooks.



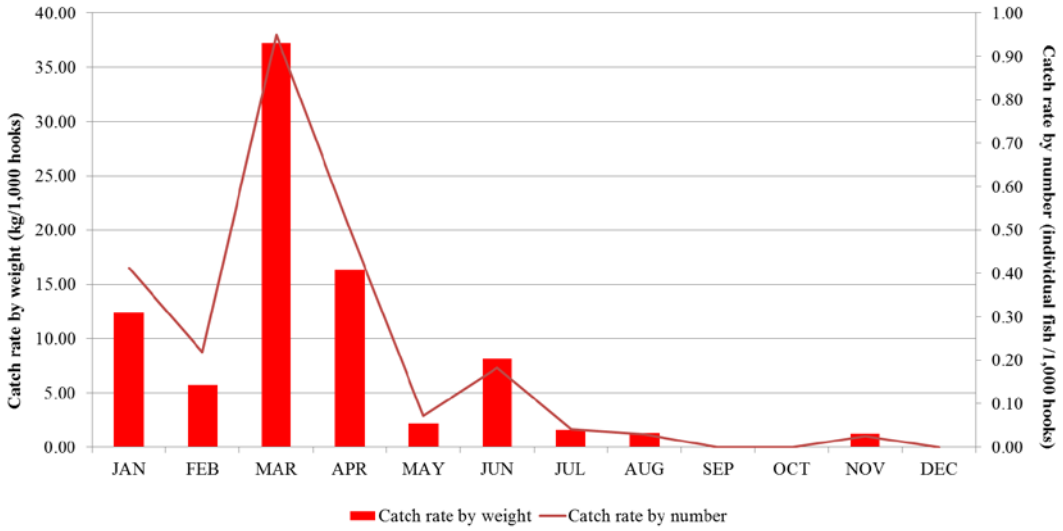
(A) Swordfish



(B) Blue marlin



(C) Black marlin



(D) Stripped marlin

Figure 7 CPUEs of Billfish in 2014

Conclusion

During the year 2010-2014, billfish were caught 6,009 fishes with 281.27 tons. The average catch rate of billfish was 1.14 fish/1,000 hooks and 53.42 kg/1,000 hooks. The percentage of billfish to the total catch was 9.82% by number and 12.07% by weight. The highest catch was found in 2014 with 2,264 fishes and 108.72 tons. The catch rate in this year was 2.05 fish/1,000 hooks and 98.49 kg/1,000 hooks. The major species of billfish caught were swordfish, stripped marlin, blue marlin and black marlin.