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# Sharks : Bycatch in the tuna longline fishery in the Indian Ocean by Thai tuna longliners in 2012

Prasit Luesrithawornsin* and Aekkarat Wongkeaw

Deep Sea Fishery Technology Research and Development Institute, Marine Fisheries Research and Development Bureau, Department of Fisheries, Thailand

*Corresponding author: prasit_kim@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.

In 2012, fishing grounds were mainly in the Western coast of Indian Ocean. The total catches were 470.40 tons with 387 days of fishing effort. The average catch rate of total catch was 10.83 individual fish/1,000 hooks. The major catch species were bigeye tuna (*Thunnus obesus*), yellowfin tuna (*T. albacares*), swordfish and shark.

Sharks are present as an important role in the ocean ecosystem. The fishing operation was reduced their population. Among the bycatch of tuna longline fishery, The percentage of sharks to the total catch is 4.64% by weight and 3.94% by number. Numbers of shark were 544 individual fishes with 18,528 kg. The catch rate was 0.5 individual fish/1,000 hooks, 17.10 kg/1,000 hooks. Catch data of sharks are classed into a single group of "sharks", due to species unidentification.

## INTRODUCTION

Three Thai tuna longliners were operated in the Indian Ocean in 2007 and in 2008-present only two Thai tuna longliners namely, "Mook Andaman 018" and "Mook Andaman 028" kept on fishing there. The longline fishing is practiced targeting Yellowfin and Bigeye tunas, generally shark are mainly caught as bycatch.

Recently, shark population decreasing quickly, which mainly due to the high increasing rate of human consumer, in term of shark fin, flesh, skin including other products. Furthermore, shark have low growth rate and long time for maturation, long time for embryo development and few number of new born. The conservation and management of shark is considered as one of the important issue. Shark data collection is needed to be done which aiming to provide preparation of the accurate basic information for shark management.

These preliminary reports will contribution to conservation and management of shark to conserve shark sustainability.

## MATERIALS AND METHODS

Data was collected from logsheets and 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. Logsheets were used to estimate annual catches of the longline fleet.

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

## RESULT AND DISCUSSION

*1. Fishing Operation*

The fishing method of both of "Mook Andaman" longliners 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 hook size : No. 4, the bait were squid. The total 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 have been set in the back of vessel about 8 am and soaked for 2-4 hour then hauling at the front of vessel, hydraulic equipments have been used.

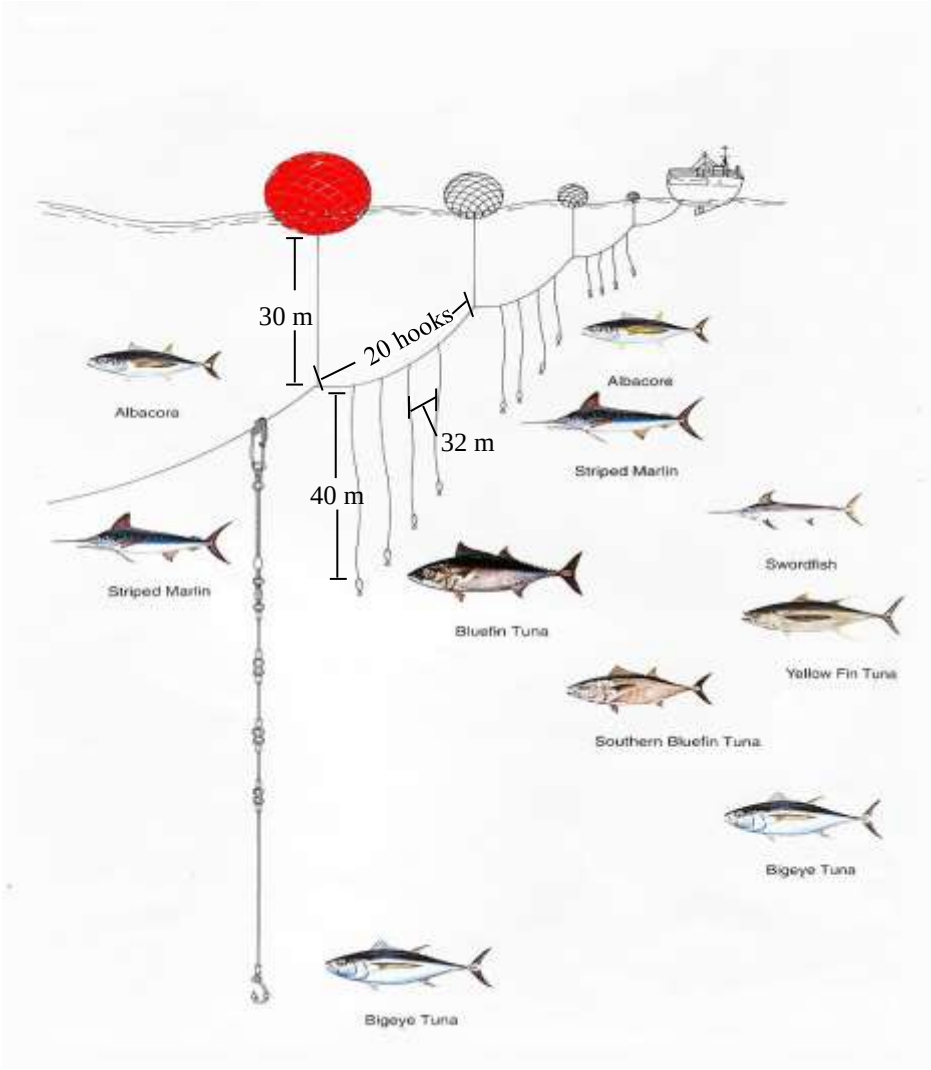



**Figure 1** Structure of tuna longline arrangement

*2. Fishing Ground*

In 2012, the main fishing ground in Western Indian Ocean, latitude 08°N - 11°S longitude 058 - 081°E. (Figure 2). Shark catching area mostly found in Somalia and the Seychelles (Figure 3).

The fishing effort were 387 days. Total numbers of hooks deployed were 1,083,600 hooks. Numbers of hook were 2,800 hooks in an operation.

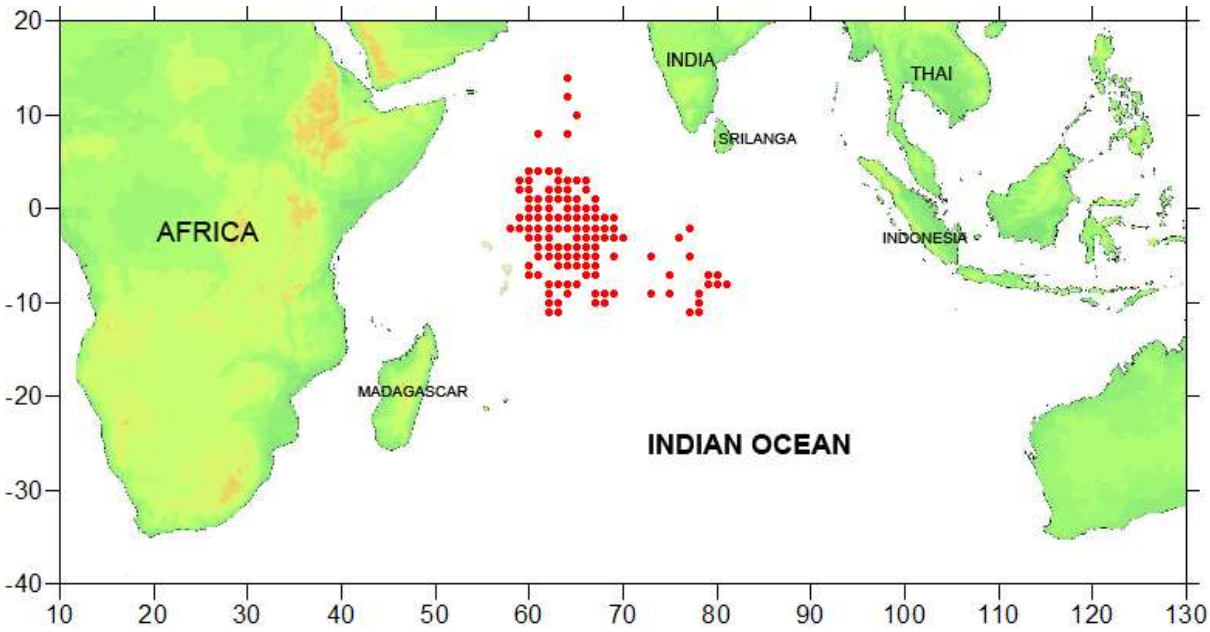



**Figure 2** Fishing ground of Thai tuna longliners in 2012

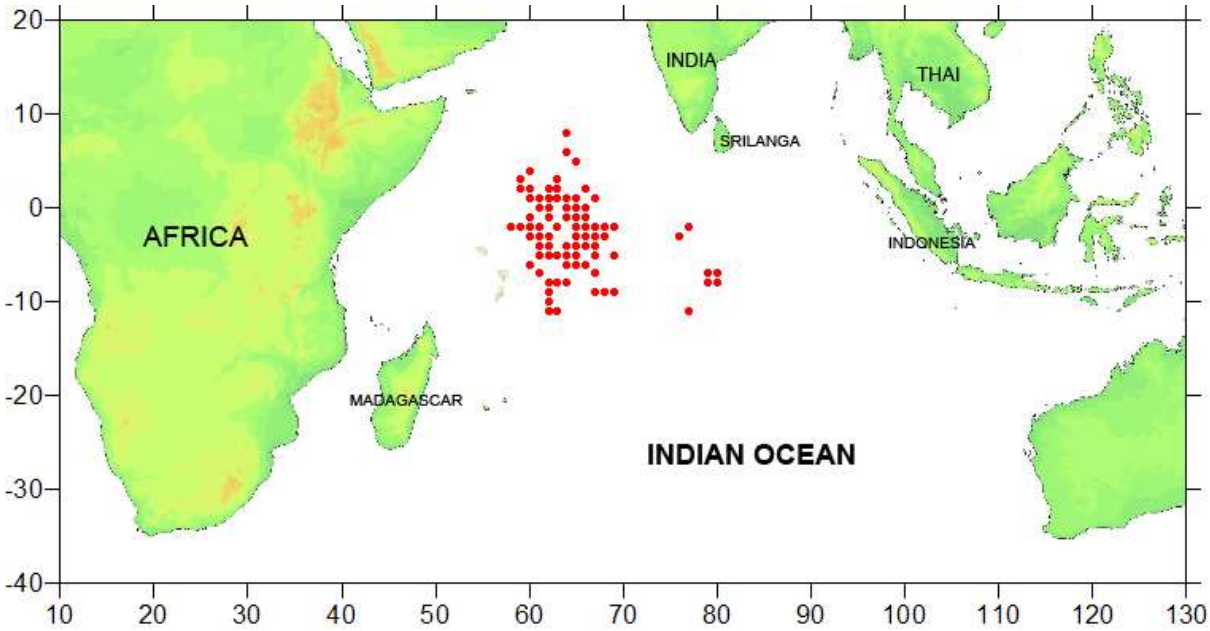
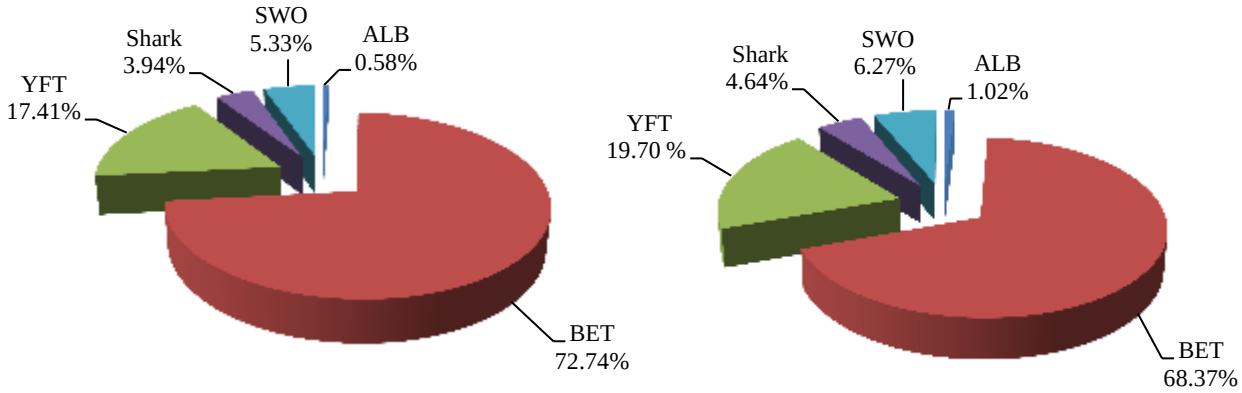



**Figure 3** Shark catching area of Thai tuna longliners in 2012

*3. Total catch and fish composition*

The total catches were 11,732 individual fishes with 470.40 tons. The catch rate of total catch was 10.83 individual fish/1,000 hooks, 434.12 kg/1,000 hooks.

The major species caught were bigeye tuna (*Thunnus obesus*), yellowfin tuna (*Thunnus albacores*), swordfish, shark and albacore tuna (*Thunnus alalunga*) comprising 72.74, 17.41, 5.33, 3.94 and 0.58% of the total catch by weight and 68.37, 19.70, 6.27, 4.64 and 1.02% by number. (Figure 4)




(A) Catch composition by weight (B) Catch composition by number

**Figure 4** Catch composition from Thai tuna longliners in 2012

*4. Shark*

In 2012, total catch of sharks were 544 individual fishes with 18,528 kg. The total catch rate of shark was 0.50 individual fish/1,000 hooks, 17.10 kg/1,000 hooks. The highest catch rate were found in March (1.06 individual fish/1,000 hooks) while the lowest catch rate were found in January (0.30 individual fish/1,000 hooks). (Table 1, Figure 5)

**Table 1** Catch data of shark from Thai tuna longliners in 2012

| Month | Caught of sharks | | Catch rate of shark | |
|---|---|---|---|---|
| | Number (fish) | Weight (kg) | fish/1,000 hooks | kg/1,000 hooks |
| January | 38 | 985 | 0.30 | 7.82 |
| February | 91 | 2,341 | 0.74 | 19.00 |
| March | 101 | 2,854 | 1.06 | 29.98 |
| April | 25 | 737 | 0.99 | 29.25 |
| May | 49 | 1,964 | 0.76 | 30.50 |
| June | 23 | 993 | 0.32 | 13.64 |
| July | 23 | 794 | 0.48 | 16.68 |
| August | 61 | 2,624 | 0.45 | 19.52 |
| September | 49 | 2,137 | 0.35 | 15.26 |
| October | 33 | 1,157 | 0.33 | 11.48 |
| November | 44 | 1,618 | 0.31 | 11.56 |
| December | 7 | 324 | 0.50 | 23.14 |
| Total | 544 | 18,528 | 0.50 | 17.10 |

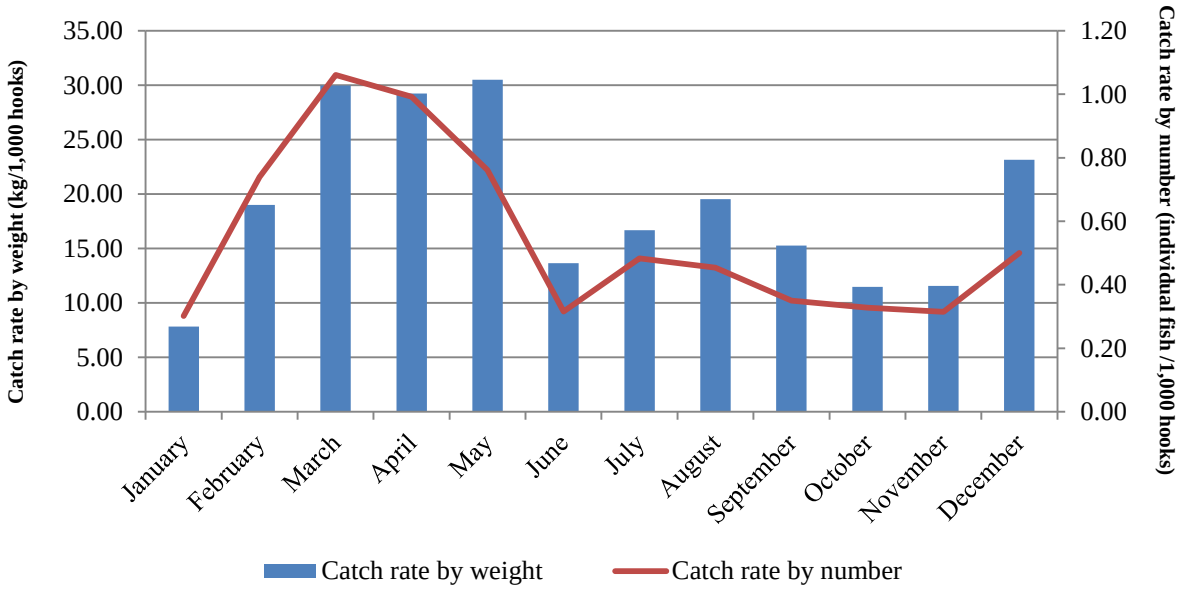



**Figure 5** Catch rate of sharks from Thai tuna longliners in 2012

## CONCLUSION

Sharks constitute one of the major bycatch component in tuna longline fishing. The percentage of sharks in Thai tuna longliner in the Western Indian Ocean is 3.94% by weight and 4.64% by number. The total catch rate of shark is 0.50 individual fish/1,000 hooks and 17.10 kg/1,000 hooks. The highest catch rate were found in March while the lowest catch rate were found in January.

The catch data of sharks of Thai tuna longliners initiate collected in September 2011, therefore inadequate is used for comparing the annual catch rate of shark. Catch statistics for sharks are classified into a single group of “sharks” due to difficulties in species identification by the fisherman.