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**Catches Of Billfishes By Malaysian Tuna Longliners In The Indian Ocean, 2012-2015.**

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**Abstract**

Malaysian tuna fisheries began with tropical tuna fishing in 2005 to 2011. In 2012, Malaysian tuna longline vessels shifted their operation from tropical tuna to albacore tuna fishing. A total of 5 tuna longline fishing vessels and 1 carrier are currently operating under Malaysian flag and they mainly operated in the southwest of Indian Ocean. Billfishes are considered as by-catch by Malaysian tuna longliners and only accounted 8% of the total catch composition from 2012-2015. In 2014, landings of swordfish was more than 4-fold over that of 2013, showing an increase of more than 300% and continue to increase in 2015. On the contrary, the annual landings of marlin is rather constant from 2012-2015. Peak landing periods of billfishes were observed to be coincide with the peak fishing periods, namely from May – August and October – January.

Keyword : tuna longliner, billfishes, Malaysia, catch

**Introduction**

To date, there are five Malaysian tuna longline vessels operating in the Indian Ocean since 2011. These vessels fished for tuna in waters around southern Madagascar, targeting albacore, yellowfin and bigeye tuna. The purpose of this paper is to examine the catch of albacore by the five Malaysian tuna longline vessels in the last four years.

Malaysian vessels used Port Louis Mauritius for transshipment to export all the catches to buyer countries. These included premium quality tuna for sashimi markets while rejected tuna and by-catch fishes were exported to countries such as Thailand, Singapore and Iran for canning industry. Those vessels that unloaded at the Port Louis Mauritius used to operate in fishing areas in the western Indian Ocean particularly during October to February.

Billfish or sailfish are comprised of two families, Xiphiidae and Isotiophoridae which include three genera with eight identified species (Collete et al., 2006). These two families of billfish are well known as pelagic fish (Fierstine, 1997) in open ocean. Due to their pelagic swimming behaviour, billfish prey on other pelagic fish as their food. Billfish mostly prey on herrings, sardines, shads, smaller mackerels and tuna. Teleosts are common prey for billfish regardless of the distribution of billfish in the ocean (Vaske Jr et al., 2011). Oceanic fast swimming billfishes have large surface areas of gill lamellae that help in gas transfer because it use ram ventilation to pass water through their gill (Wegner et al., 2010). Highly migratory in tropical and temperate waters world-wide (IOTC, 2011), billfish also exhibit sexual dimorphism in maximal size, growth rates, and age at maturity; females reach larger sizes, grow more rapidly, and mature later than males.

## **Materials and Methods**

The billfish catch data and fishing locations presented in this paper were obtained from logbooks submitted weekly via email to the Department of Fisheries Malaysia (DoFM). Data reporting is a condition for licensing Malaysian-flagged tuna fishing vessels. Although there is an onboard observer deployed on the Malaysian-flagged tuna carrier vessel, in accordance to IOTC requirement, no observers are yet deployed on fishing vessels. Thus, the catch data reported are rather general in nature and not detailed. Since the catches are landed in foreign ports, DoFM is unable to verify the catches due to financial and logistical constraints. The Black Marlin catches reported may include other marlin species, since it may not be possible that other marlin species were not caught. Therefore, caution should be exercised when reviewing this data and related analysis.

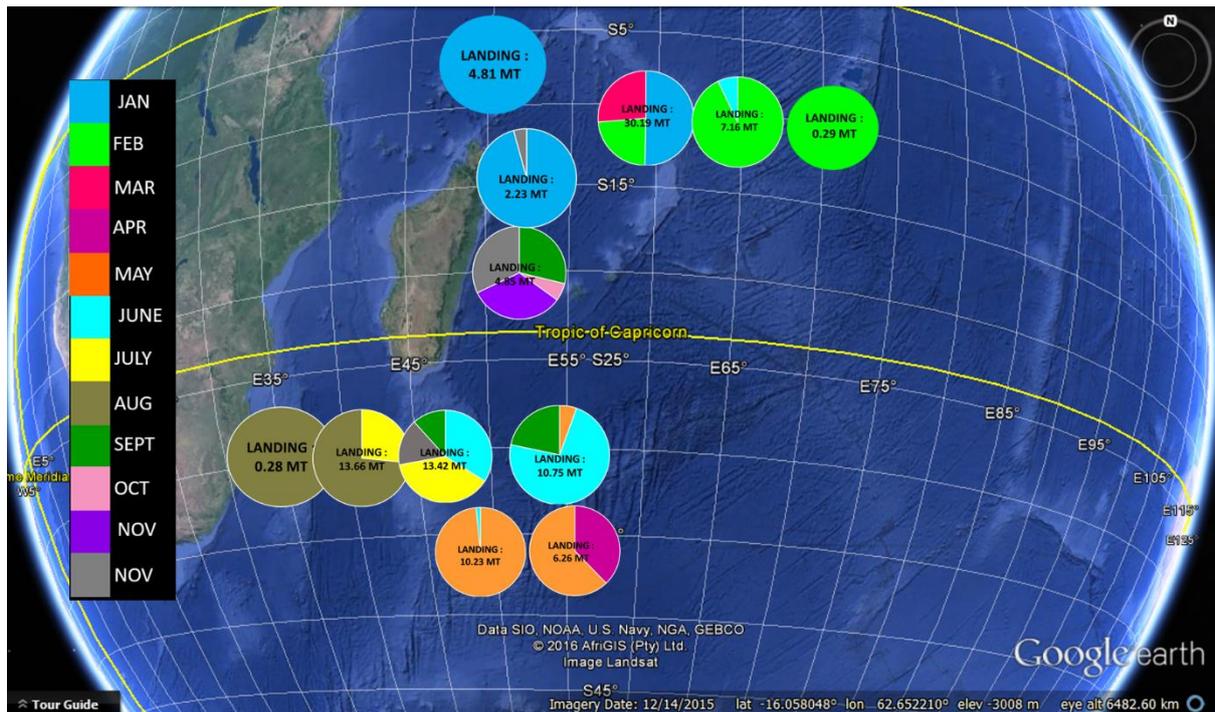
## **Fishing Operation**

A total of five tuna longliners have been registered by Malaysia, ie. Malaysian-flagged, and are fishing in waters off Madagascar and southwards since the 3<sup>rd</sup> quarter of 2011. The primary target of these vessels is Albacore and all catches are landed in Mauritius.

All the Malaysian vessels operate tuna longlines off the eastern coast of Madagascar, lat 10° S to 25° S from January to March and from October to December, for each of the four years they were deployed. For the other months, these vessels operate off southern Madagascar until lat 35° S. Based on the vessels deployment, longlining activities

were carried out at the southern-most fishing area of lat 35° S during the month of May for each year.

A total of 3,000 hooks were used for each fishing operation by each tuna longliner. Immersion time is between 8 to 10 hours for each operation. Generally, fishing efforts were reduced in March and September since 2012. However, fishing efforts appears to be more stable in 2014 compared to the three preceding years.



### Annual Landings and Catch Composition of Billfish

Billfishes are not the target species for Malaysian tuna longliners. The billfishes were considered as by-catch which include black marlin, striped marlin, swordfish and other low value species. Other bycatch species were grouped into mix fishes. From 2011, sailfish catches were not recorded as a single group species, instead were included under mix fishes which attributed 8% from the total catches of the tuna longliners. The average catch composition from Malaysian longliners are shown in Figure 1. From 2012 onwards, the targeted species for Malaysian longliners is albacore. Albacore dominated the catch with 72% or 752.06 mt of the total catch, followed by yellowfin tuna and mix fishes with 8%, swordfish with 6% and bigeye tuna with 4%.

The annual landings in metric tons of swordfish and marlins by the Malaysian tuna longliners are shown in Figure 2. Data for the year 2011 is not shown here since fishing operations commenced in the last quarter of that year. The annual landings of swordfish ranged from 19.61 tons to 103.95 tons and 20.57 to 32.49 tons for marlins. In 2014, landings of swordfish was more than 4-fold over that of 2013, showing an increase of more than 300% and continue to increase in 2015. On the contrary, the annual landings of marlin is rather constant from 2012-2015.

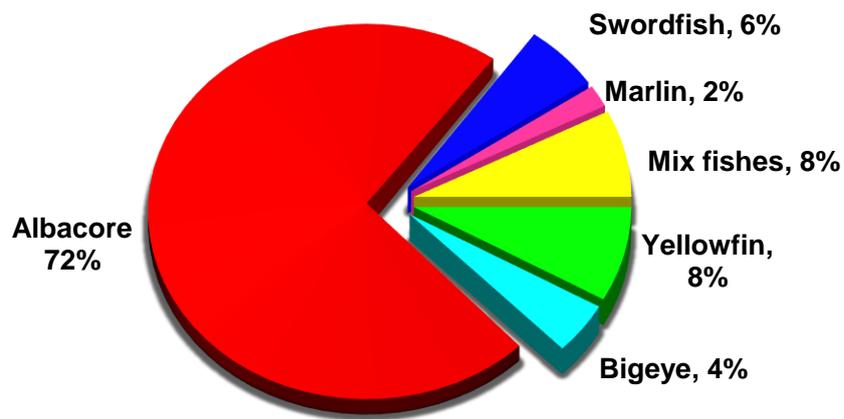


Figure 1 : Average catch composition from 2012-2015

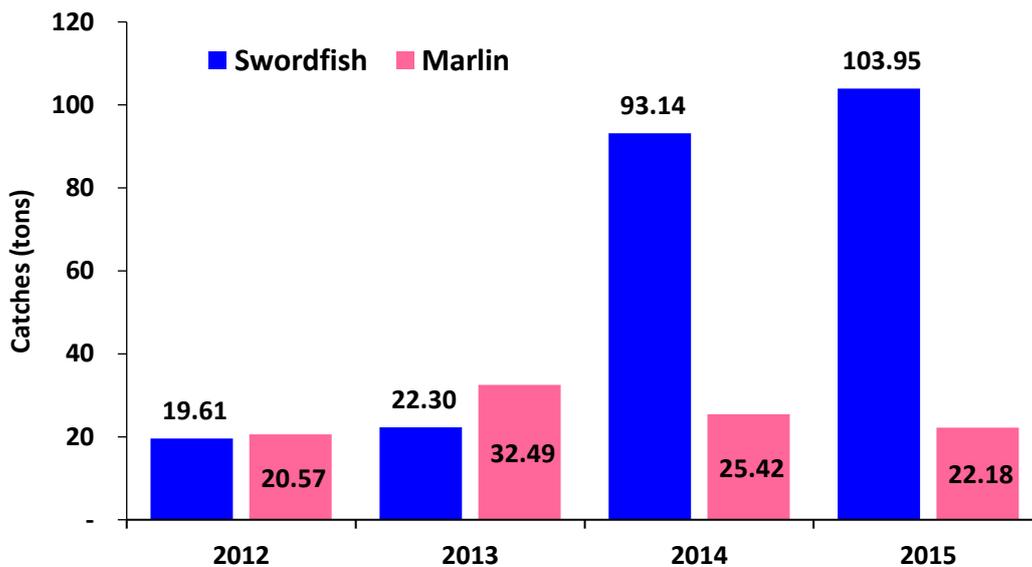


Figure 2 : Total annual landings of swordfish and marlins by Malaysian tuna longline from 2012-2015

### Monthly Catches of Billfish and Fishing Effort

Figure 3 shows the monthly catches of billfish and fishing efforts by Malaysian tuna longliners in the Indian Ocean. From 2014-2015, catches of billfish by Malaysian tuna longliners ranged from 1.03 – 24.61 tons with the average of  $8.96 \pm 7.65$  tons. It appears that there are two peaks of fishing activities, namely from October – January and May – August. This fishing season also coincide with the highest catches of billfish in that period. The highest peak season was during the middle of the year (May to August). Low fishing efforts were recorded during early of the year normally and during April, due to a long holiday to celebrate annual Chinese New Year festival the fishing effort reduced drastically. In overall, the catch of marlin are typically high from Nov – Feb, and then it declined in the middle of year (Fig.4). For swordfish, the catch is high at the end of 2014 but the same situation does not reflected in 2015 as the catch is higher during the mid-year.

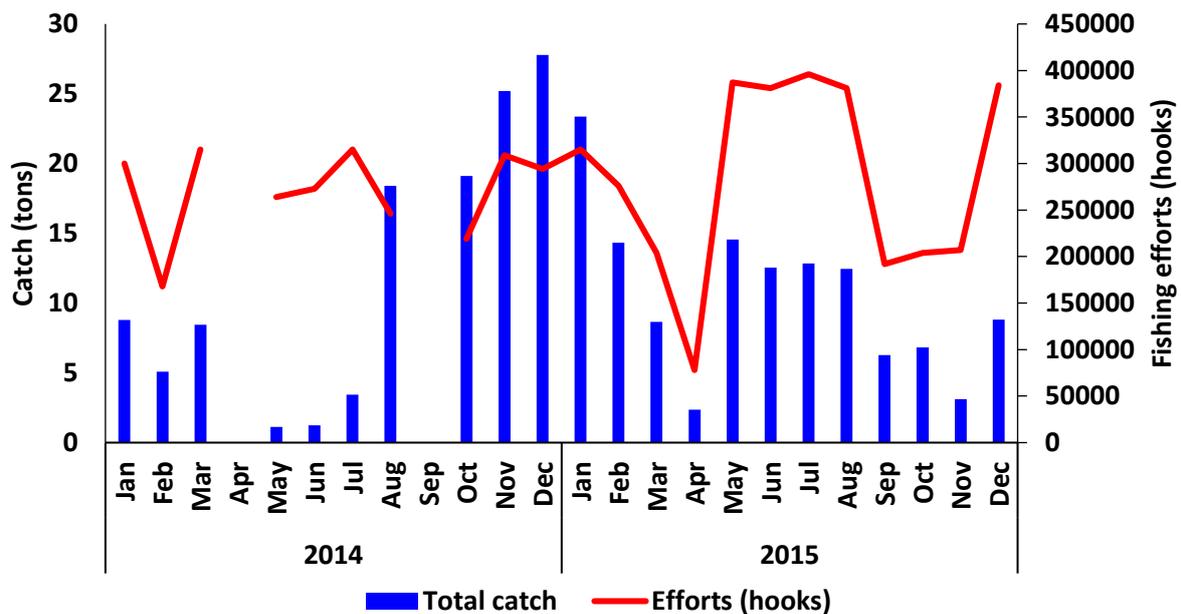


Figure 3: Monthly catches of billfish and fishing efforts by Malaysia tuna longline vessels in 2014-2015.

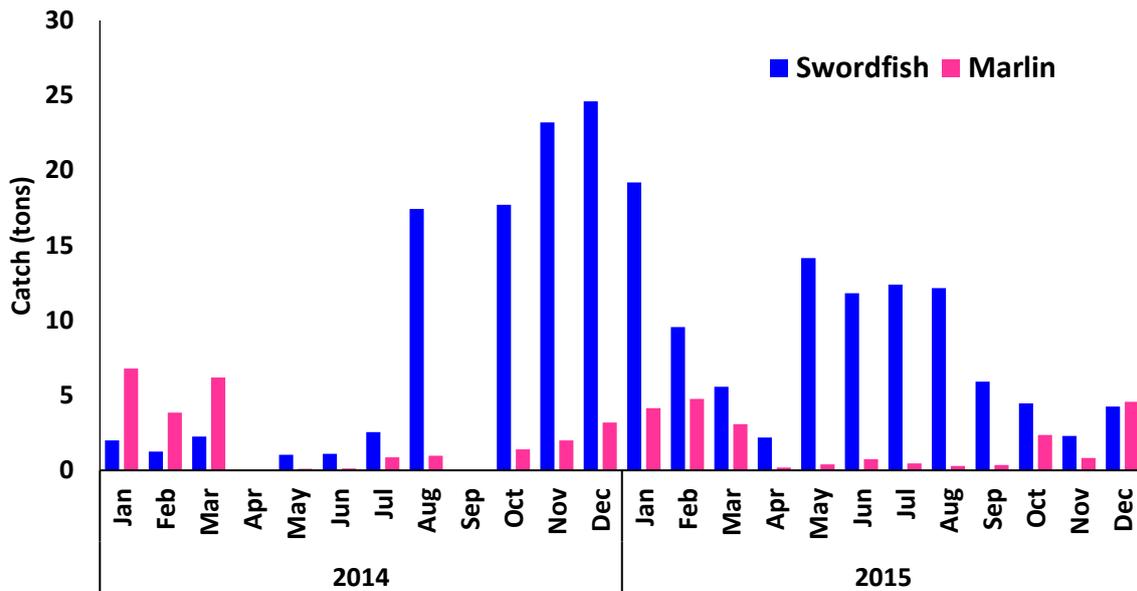


Figure 4: Monthly catches of swordfish and marlin by Malaysia tuna longline vessels in 2014-2015.

## Discussion

In 2014, landings of swordfish was more than 4-fold over that of 2013, showing an increase of more than 300% and continue to increase in 2015. On the contrary, the annual landings of marlin is rather constant from 2012-2015. Although billfishes are not the primary target of tuna longliners, a substantial quantity are being landed. The demand for these fishes will make them an attractive by-catch, since their value is relatively high. As shown above, there are peak periods of billfish landings, namely from October – January and May – August. These peaks, however, do indicate the peak availability of these fishes in some parts of the southern Indian Ocean, which may be in line with their migration pattern. The monthly fishing efforts also increased during this period indicated that the fishing fleet intensify the fishing operations.

Further understanding of their biology, growth, life cycle, location preferences, interaction with environmental parameters, etc., in the southern part of the Indian Ocean will require more data, including oceanographic parameters. However, the small numbers of billfishes caught may be a hindrance to obtaining further information on these fishes.

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