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Small Tuna Fisheries in the Malacca Strait; west coast of Peninsular Malaysia

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Abstract

The purse seines contributed more than 80% of the annual catches of neritic tuna and as the most important fishing gear in neritic tuna fisheries. Two type of purse seines operating in Malaysia; using FADs and light luring and large purse seines > 70 GRT contributed more than 61% of total neritic tuna catches and their catch rates were higher than of small purse seines. The Strait of Malacca contributed 45% of the neritic tuna in Malaysia and the rest from the South China Sea and Sulu and Celebes seas, east coast of Borneo continent. The main species of neritic tuna found in the Malacca Strait are longtail (*Thunnus tonggol)* and kawakawa (*Euthynnus affinis*) while frigate tuna (*Auxis thazard*) were rarely caught. The fishing areas for Malaysia purse seines concentrated within one areas near border of Thailand and Indonesia. A few months size data collection showed that length distributions of kawakawa shifted to the left and the average size gradually decreasing from 339 mm in March to 235 mm in June. The activities of cross border fishing and landing by large purse seines (>70 GRT) between Malaysia and Thailand undermined the accuracy of catch and effort data from both countries. Collaboration among the member countries through IOTC and BOBLME is one of the practical approach to manage the shared stocks such as neritic tuna species.

INTRODUCTION

Marine fish production from Malaysian waters was 1,428,881mt had a value of RM 6,651.89 million in 2010. In 2011, production of marine fish had declines by 3.9% to 1,373,105 mt from the previous year. Coastal fisheries has contributed more than 78% of the total marine fish landings and the rest from the deep sea catches beyond 30 nm offshore. Since the coastal fisheries had long reached over MSY level, the catch from the coastal fisheries will only be maintained not above the presence level as to avoid further pressure on the coastal fisheries resources.

From the total annual catch of marines fishes, catch contributed by the deep sea fisheries is only catch from the deep sea of offshore fisheries are still quite low (22%) and therefore the government is aiming to increase the catch from the deep sea and open sea. Tuna fisheries (oceanic and neritic) are one of the targeted fisheries to be developed in near future. The second strategic development plan for tuna fisheries is to be launched before end of 2013.

Neritic tuna fishery began in the 80s as by-catch and with the use of tuna purse seine, neritic tuna industry continued to increase since 1987. Neritic tuna were caught by several fishing gears including trawl net and gill nets in the west coast of Peninsular Malaysia, but the catch by these gears were relatively low compared with catches by purse seiners.

The increase in neritic tuna catches in Malaysia has continued in line with the growth of the processing industry (canning fish) locally. Other than for domestic use, there is also an increasing demand from the canning industry in Thailand. Neritic tuna continuous improvement is aided by increased effort and the use of Fish Aggregating Device (FADS), including the use of light luring technique.

Fishing Areas in Malaysian Waters

Fishing areas in Malaysia are divided into several sub-regions, namely the West Coast and East Coast of Peninsular Malaysia, Sabah and Sarawak. The Straits of Malacca is located on the West Coast of Peninsular Malaysia and in the north it overlooks the Andaman Sea and the Indian Ocean (Figure 1). Perlis State is the main landing spot for neritic tuna followed by Kedah, Pulau Pinang, Perak and Selangor. Perlis advantage in neritic tuna fisheries is due to the open seas facing Andaman Sea and Indian Ocean.

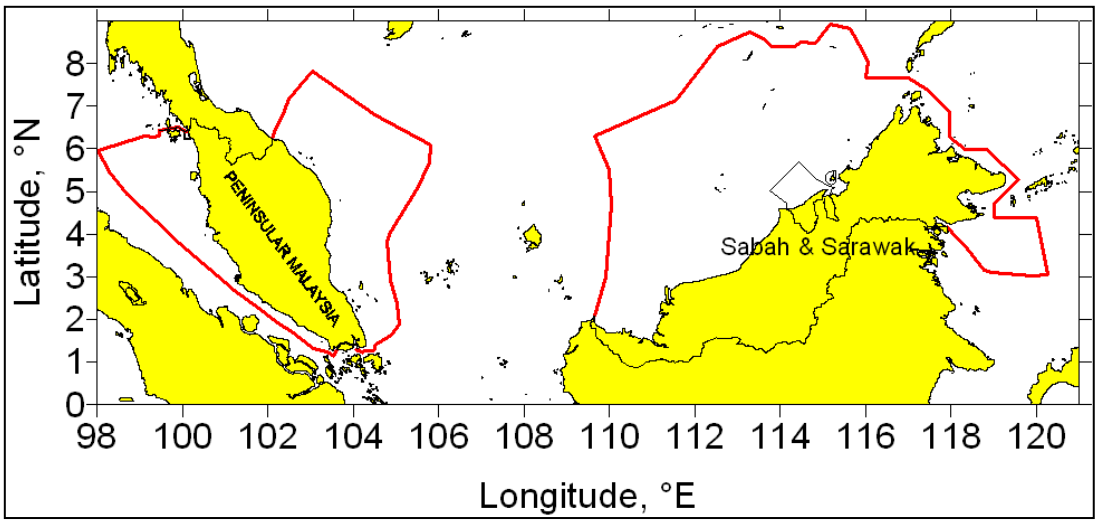

Figure 1 : Malaysia EEZ area

ANNUAL CATCHES OF THE NERITIC TUNA

The annual catch of neritic tuna from Malaysian waters in 2012 was 58,838 tons, an increase by 13.5 % from the previous year which was 51,937 tons (Fisheries Statistic, 2012). Over the years since 2000 to 2012, the annual catch of neritic tuna ranged from 40,000 – 65,000 tons showing an increasing trend (Figure 2). The highest catch was recorded in 2008 and 2002 with 65,000 tons and 62,000 tons respectively. The lowest catch was recorded in 2005 at 40,000 tons. During the same period, from 2000 to 2012, there were also an increase in number of vessels fishing the neritic tuna. The main commercial fishing gears that contributed over 80% of the neritic tuna annual catch were purse seines and trawlers.

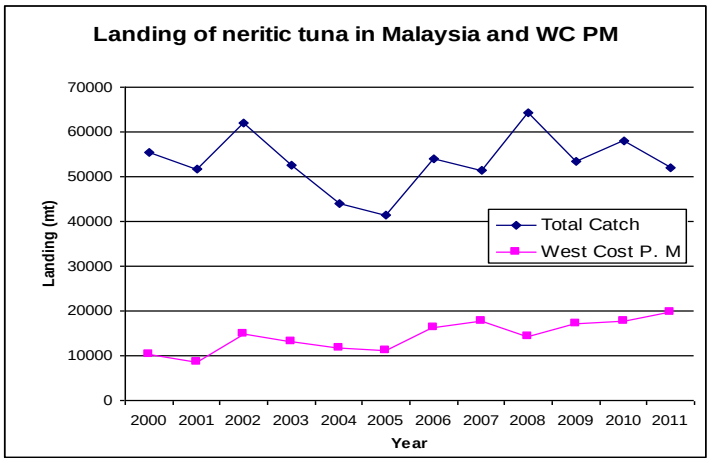

Figure 2 .Total landings of neritic tuna in Malaysia and West Coast of Peninsular Malaysia.

Neritic Tuna Landing in Malacca Straits

In average, the Strait of Malacca contributed 45% of the neritic tuna catches in Malaysia and 55% was from the South China Sea and Sulu and Sulawesi sea (Samsudin, B. and A.B. Noraisyah, 2011). Sabah waters alone formed 10% of the annual catch. Figure 3 shows the annual catches of neritic tuna in the Malacca Straits from 1970 to 2012. The catches showed an increasing trend and the drastic increased occurred from 2000 with some fluctuations throughout the period to 2012. The highest catch was recorded in 2012 at 23,767 tons an increased by 9% from the previous year.

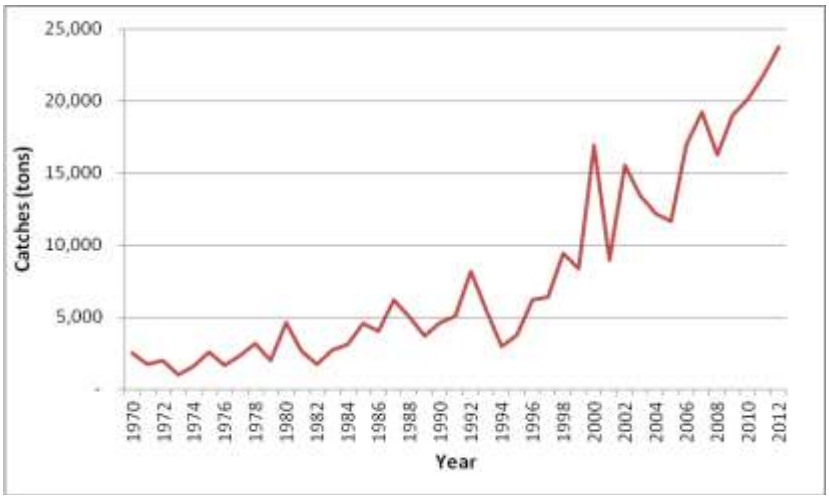

Figure 3 : Annual catches of neritic tuna from the Malacca Strait.

The catch of neritic tuna in the Malacca Straits were dominated by longtail and kawakawa (Figure 4). The ratio of catch composition longtail and kawakawa on average was 3:1. Recent years, the catch ratio of these two species getting closer to 2:1. For kawakawa, there were a moderate increasing since 2008 but for longtail, the catch seemed to be constant within 14,000 tons. The catch of frigate tuna was too low and only found from the catch toward offshore.

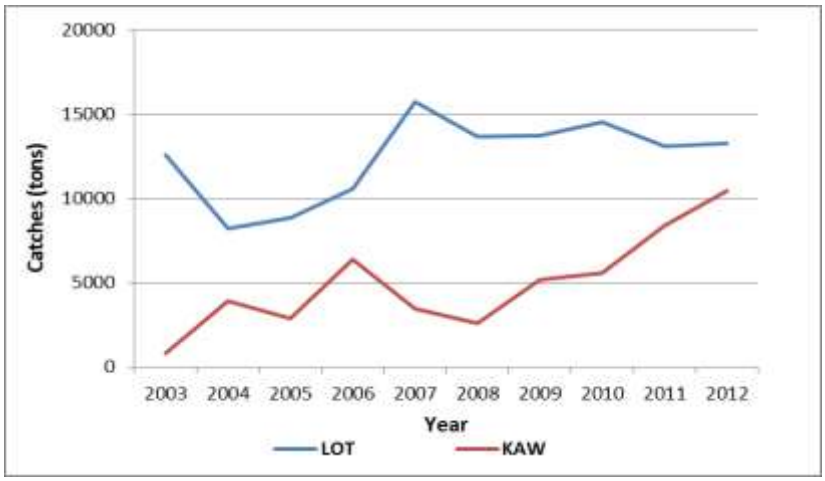

Figure 4 : Annual catch of longtail and kawakawa in the Malacca Strait.

There was a moderate increase in registered purse seine vessels since 2000 to 2011 (Figure 5). From 250 vessels in year 2000 to over 350 vessels in 2011 accounted about 40% increase and the parallel to the increase of neritic tuna over the same period from 16,929 tons to 23,767 tons which also accounted about 40% increase.

Samsudin, B. and J. Sallehudin, (2012) estimated that the CPUEs of vessels >70 GRT was constantly increased from 2000 to 2011 at 6-10 tons/vessel while for vessels between 40 – 69.9GRT showed a very modest increased below 4tons/vessels.

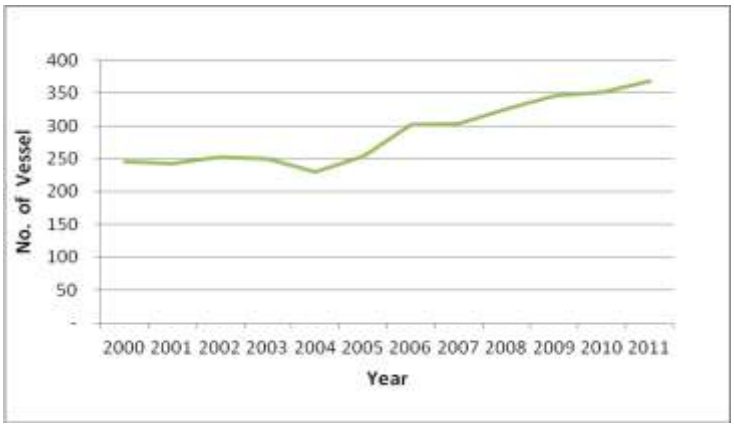

Figure 5 : Number of registered vessels (purse seines) fishing in the Malacca Straits

Monthly landings of neritic tuna

Throughout the year, the monthly catch of neritic tuna in the Malacca Straits showed two different modes that may represented major fish seasons. The first seasons was after the northeast monsoon which started from end of January to March and the second was pre northeast monsoon started which started from July till end of the year (Figure 6). For most of pelagic fishes, post monsoon showed the increase in catches not only in the Malacca Straits but also in the east coast of peninsular Malaysia.

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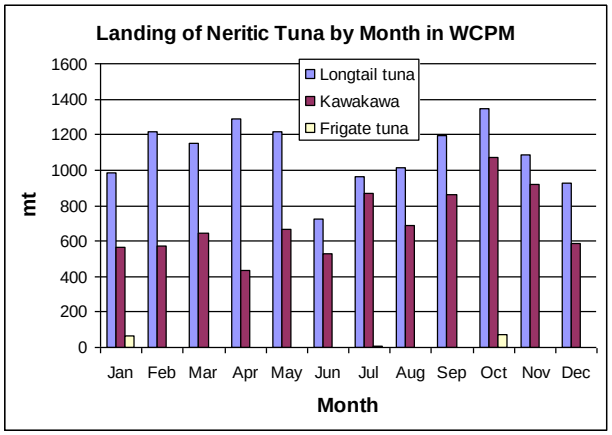

Figure 6 : Monthly landings of neritic tuna in the Malacca Straits.

Purse seine catch composition

The total catch of marine fish by all gears in the Malacca Strait in 2011 was 725.064 mt, about 50% of total marine catch in Malaysia. Purse seines were the second most effective commercial fishing gears after trawlers and the catch by purse seines accounted nearly 20% of the total catch in the Malacca Straits.

The neritic tuna comprise of 14.17% of the purse seines catch in the Malacca Straits and oceanic tuna (skipjack) was only (0.06% (Figure 7). .

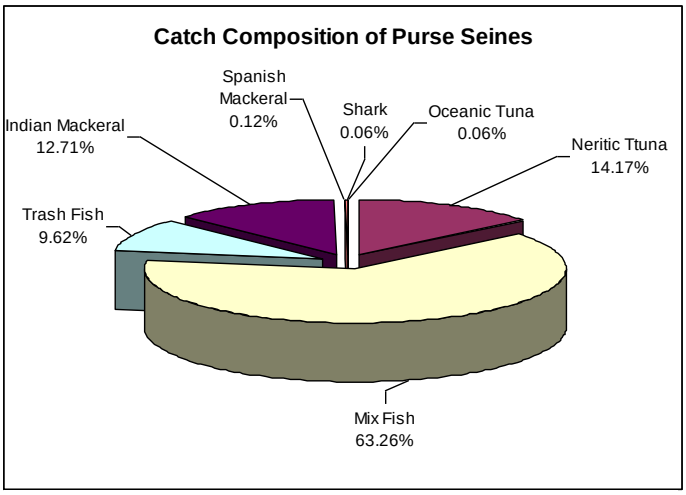

Figure 7 : Fish composition by purse seine on the West Coast of Peninsular Malaysia

Neritic Tuna Species

There are 3 major types of neritic tuna caught by purse seiners from West Coast of Peninsular Malaysia, Long tail tuna (*Thunnus tonggol*), Kawakawa or Eastern little tuna (*Euthynnus affinis*) and Frigate tuna (*Auxis thazard*). In 2011, longtail tuna dominated the catch in the West Coast followed by Kawakawa but in contrast, the catch of kawakawa and frigate tuna in the east coast of Peninsular Malaysia were more significant than Long tail (Figure 8).

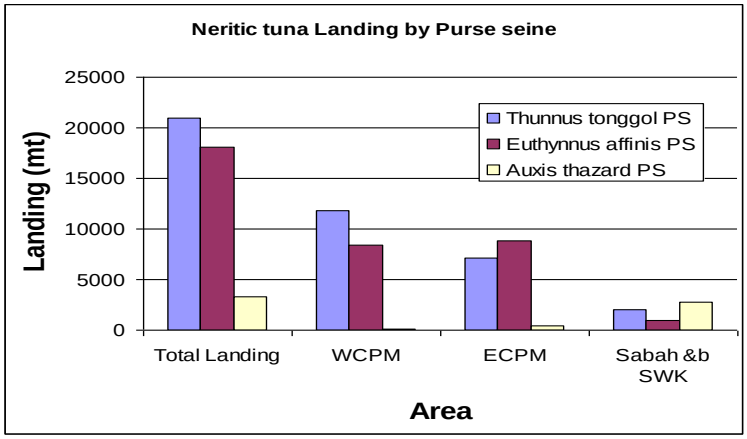

Figure 8 : Composition of neritic tuna caught by purse seine

Catch by Vessels tonnage

The catch of neritic tuna in the Malacca Strait by vessel size of more than 70 GRT and less than 70 GRT were 39.3% and 60.7% respectively but in the East Coast in contrast, the catch by these two different size were 33.8% and 66.2% respectively (Figure 9).

Most of kawakawa were caught by purse seine vessels > 70 GRT in both Malacca Strait and East Coast of Peninsular Malaysia. This indicated that the kawakawa are more abundant toward the offshore areas compared to the Long tail .

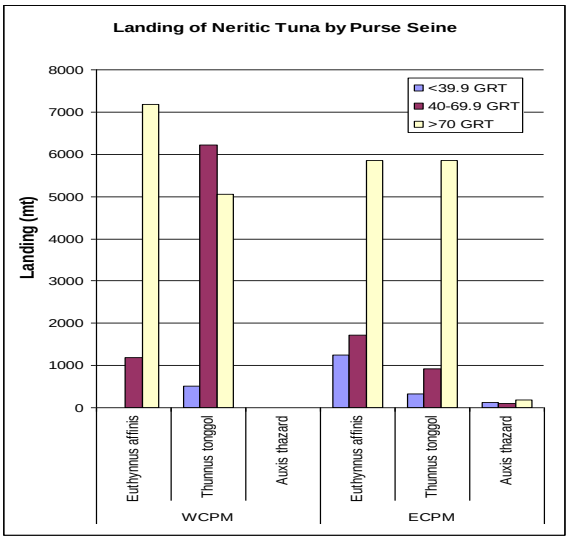

Figure 9 : Landings by species landed by purse seine vessels with different GRT.

Fishing Area and FADs

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Figure 10 shows fishing areas where most of the deep sea purse seines operated. The areas of more than 100 depth are considered as the hotspot of the Malaysian small pelagic fishing areas. These are also the only fishing areas deeper than 100 m in within the Malaysia EEZ in the Malacca Straits. The purse seine vessels above 70GRT from the 3 northern states; Perlis, Kedah, and Perak are targeting their fishing operation within these areas. As mentioned before, the purse seiners are operating using either FADs or lamps. The FADs are made of coconut leaf and anchored by several concrete sacks. Most of the FADs are maintained and some of the owners employed fishermen to look after their FADs to prevent stealing or encroached by other fishermen. According to Sakri (1991), neritic tuna species in Malaysians waters are captures or commonly found associating with floating materials including surface water and FADs.

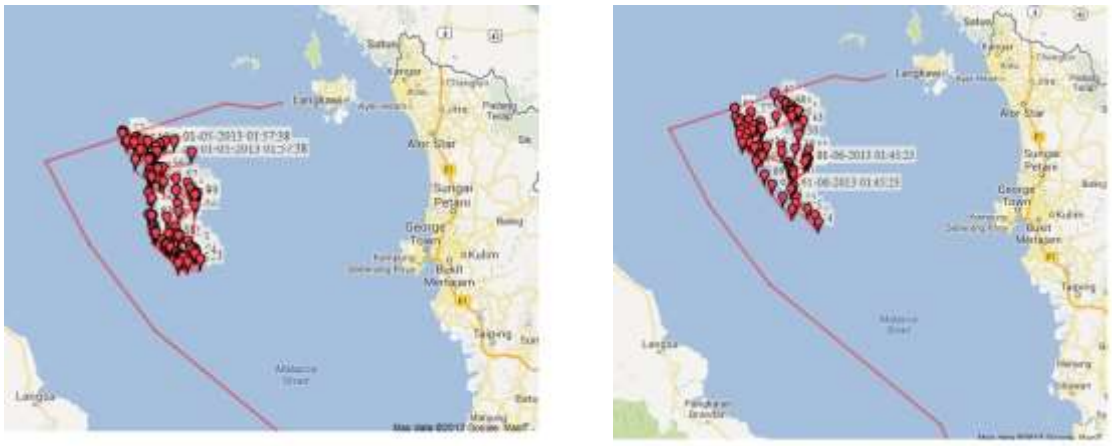

Figure 10. The same C2 purse seine boats operating in early May and June 2013

Since nearly all of the vessels' crews working in Malaysian purse seiners were from Thailand, the type of fishing operations resemble that of the Thailand purse seiners. There were also cases where Malaysian purse seiners fishing beyond the Malaysian border into Thailand or Indonesian waters. Similar cases occurred for Thailand purse seiners where their vessels entering and fishing in the Malaysian waters. These were the frequent cases occurred in the fishing areas near the border. This activities which are considered "IUU" were detected through the VMS records and have long taken place.

Size Distribution

Size sampling is not part of the national sampling program. Even though the size data are important for stock analysis, the size sampling program have yet be implemented. The proposal to include size data collection for certain important species in national sampling program in progress. During the 4 months samplings, only the size of kawakawa were recorded from the vessels above 70GRT. Table 1 shows the size ranges of kawakawa from March to June 2012. The average sizes of kawakawa obviously showed a decreasing trend from 339 mm in March to 235 mm in June. The range of kawakawa size caught during that period were 185 – 530 mm. The biggest kawakawa caught weight 2.3 kg and 530 mm length.

Table 1: Average size of kawakawa landed at the Kuala Perlis fishing port in 2013.

Month	Length (mm)			Wgt (g)		
	Min	Max	Ave	Min	Max	Ave
Mar	260	400	338.79	100	1205	737.2
Apr	221	276	254.32	200	400	258.06
May	223	298	247.32	100	550	273.73
June	185	530	235	100	2300	288.67

Figure 11 shows the decreasing size distributions of kawakawa caught during the March to June. The normal distributions seemed to shift toward the left side which contrast to the expected distributions. Two things may imply from these data; the bias sampling of the data or there were different recruitment of kawakawa stocks entering the fishing areas in Malaysia at every different month. No information available to relate the decreasing size of kawakawa with the use of FADs and lamps. Further study has to be carried out and the size sampling for the following months may provide more conclusive information.

Figure 12 shows a length-weight relationship of kawakawa landed at Kuala Perlis. The value of a = 0.0932 and b = 0.025 with r = 0.854.

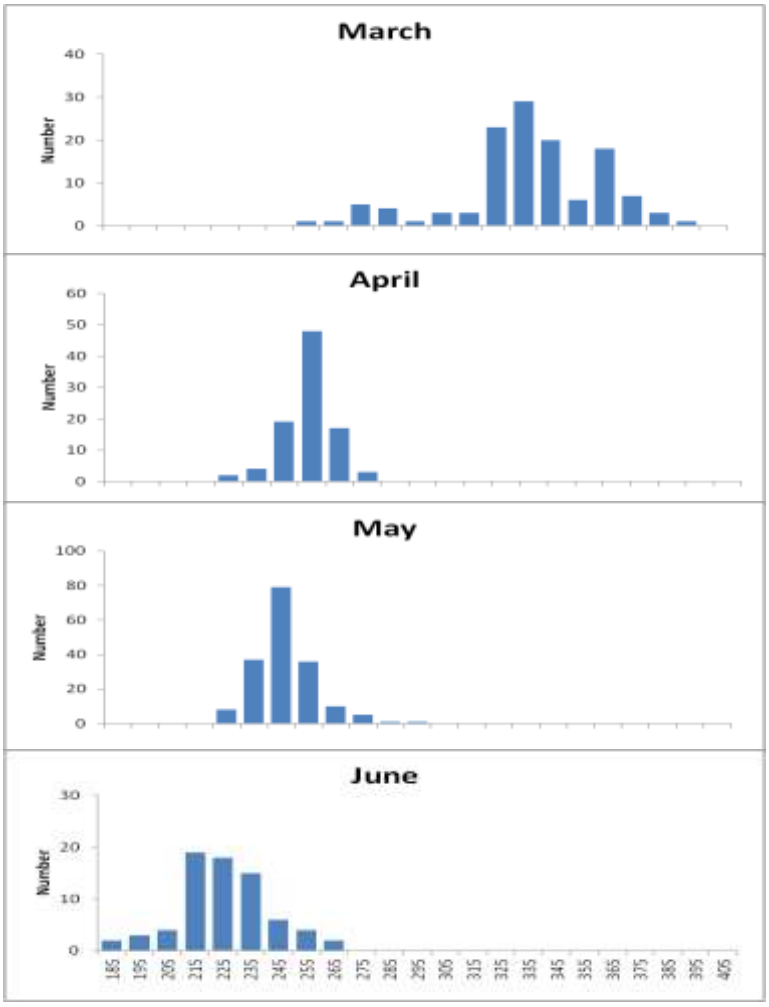

Figure 11 : Length size distributions of neritic tuna from Kuala Perlis landing center from March-June.

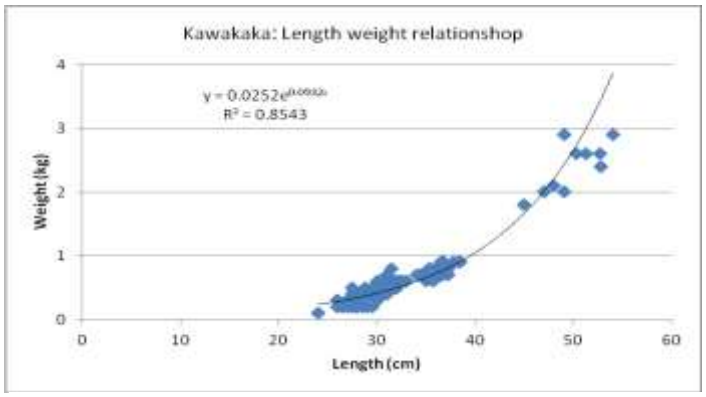

Figure 12: Length –weight relationship of kawakawa

ISSUES OF NERITIC TUNA FISHERIES

Several issues related to the management of the neritic tuna in Malaysia waters were identified;

i. Actual catch and effort data from vessels fishing neritic tuna. Presently, the catch and effort data are insufficient for analysis of stock indicator. The implementation of "vessels operation records (VOR)" which resemble the logbooks, for vessels >70GRT is a good start but still not sufficient as there are lack of cooperation from the fishermen. In most cases, the data from the VOR were of rough estimate, not based on actual catches.
ii. Effort data are from registered vessels and also from very rough estimate of other efforts unit such as days, trips and hours.
iii. Lack of time series size data of neritic tuna and their biological information.
iv. Cross boundary fishing and landings by larger purse seine vessels. Can category as IUU activities and undermining accuracy of catch and effort data recording from the countries involved.
v. Data on catches and efforts from individual countries, may not be sufficient to estimate the stocks size and status of fishing mortalities.

CONCLUSION

Managing neritic tuna stocks need regional cooperation. Way forward activities to implement joint conservation and management measures for neritic tuna resources have to seriously considered by member countries. With the IOTC and probably to certain extend BOBLME can play the role as a platform to coordinate and assist the member countries in research program, managing and streamline data collection format and conducting relevant capacity buildings.

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