



PROMOTION OF THE REGIONAL PLAN OF ACTION ON SUSTAINABLE UTILIZATION OF NERITIC TUNAS IN THE ASEAN REGION

SEAFDEC/MFRDMD and SECRETARIAT

Executive Summary

The stock and risk assessment for Narrow-barred Spanish mackerel (*Scomberomorus commerson*) and Indo-Pacific king mackerel (*S. guttatus*) resources were conducted in 2018 and 2019 based on the assumption that there are two stocks of each species in the Southeast Asian waters, i.e., Pacific Ocean (FAO fishing area 57) and Indian ocean stocks (FAO fishing area 71). Assessment for each species can be summarized as follows:

A. Pacific Ocean Side of the Southeast Asian Region

- Spanish mackerel: It is suggested that the stock status is in the very serious overfished and subject to overfishing. TAC should be less than the MSY level (129,000 t). This means that the current catch level (163,800 t) (Average of 2014-2016) should be decreased by 65,500 t (40%).
- King mackerel: TAC can be increased to the MSY level (15,100 t). This means that the current catch level (11,600 t) can be increased by 3,500 t (131%).

B. Indian Ocean Side of the Southeast Asian Region

- Spanish mackerel: TAC should be less than the MSY level (55,170 t), This means that the current catch level (54,100 t) should be decreased by 10,800 t (20%).
- King mackerel: TAC can be increased to the MSY level (21,500 t). This means that the current catch level (18,700 t) can be increased by 2,800 t (115%).

There were several challenge issues on the stock assessment such as: CPUE standardization could not be conducted due to lack of fine scale CPUE such as by season and area in the current analysis, which may cause the bias according to the bias level of nominal CPUE

The results of genetic studies using mtDNA suggested Longtail tuna in South China Sea, Andaman Sea, and Sulu Sea is a single stock. Further studies should be conducted using more variable molecular markers such as microsatellite DNA to confirm this finding.

There arise several recommendations toward sustainable management of neritic tuna in Southeast Asian waters, such as a) Indonesian scientists are recommended to actively participate relevant meetings in the future because effectiveness of management advices will highly depend upon the domestic management scheme with large amount catch, b) Each Member Country needs to consider multi-gears and multi-species nature of fisheries in developing optimum management strategies in the future. Regarding to the recommendation by the 50th CM (Para 54), SEAFDEC's work on the stock assessment are intended to enhance the capacity of Member Countries.

The Council is requested to take note the progress on implementations of the RPOA-Neritic Tunas, especially on the results of 2018 to 2019 stock and risk assessment of the Spanish and king mackerel, management measures for these stocks, challenges on the stock assessment and genetic study on Longtail tuna. The Council is also requested to provide directive guidance in order to raise the issues on management of these two species as referred to the major findings from the study mentioned above.

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I. BACKGROUND

1) Recognizing the importance of neritic tuna fisheries in the Southeast Asian waters, the regional or sub-regional cooperation to promote the sustainable utilization of neritic tunas is therefore addressed at the 45th Meeting of the Council in 2013, while the Council requested SEAFDEC to develop of the Regional Plan of Action for neritic tuna fisheries. In response to this, SEAFDEC with funding support from the SEAFDEC-Sweden Project together with ASEAN-SEAFDEC Member Countries drafting the RPOA-Neritic Tunas through a series of Expert meetings and Regional Technical Consultation since 2013. The draft RPOA-Neritic Tunas resulted from the consultative meetings was circulated to all SEAFDEC Member Countries for comments before it was addressed and endorsed as amended by the 17th Meeting of the FCG/ASSP in December 2014. The Final RPOA-Neritic Tunas was adopted at the 47th Meeting of the Council (47CM) in April 2015, and later endorsed by the 23rd Meeting of the ASEAN Sectoral Working Group on Fisheries in June 2015 with the notification by SOM-37th AMAF in the same year.

2) To facilitate implementation of the RPOA-Neritic tuna, the Scientific Working Group on Stock Assessment (SWG-Neritic Tunas) established in 2014 plays an important role to provide scientific evidence on the status of neritic tuna stock in the Southeast Asia. Up to date, five meetings of the Scientific Working Group on stock assessment are conducted in Malaysia (2014 and 2017), Viet Nam (2015), and Thailand (2016 and 2019). The meetings aimed to review the current stock status of neritic tunas, discussion for development of the Standard Operating Procedures (SOPs) for data and information collection, genetic study, capacity development through the training program, and required management measures.

3) Based on stock and risk assessments in 2016 study using ASPIC, “Kobe plot” and “Risk assessment” software, the resource statuses (2013-2014) of Kawakawa (*Euthynnus affinis*) in both Indian and Pacific Ocean sides of the Southeast Asian Region were still safe situation. While for Longtail tuna (*Thunnus tonggol*), the resource status was un-safe situation for Indian Ocean side but still safe situation for Pacific Ocean side.

II. PROGRESS ON THE STOCK AND RISK ASSESSMENT FOR SPANISH MACKEREL AND KING MACKEREL

4) The stock and risk assessment for Narrow-barred Spanish mackerel (*Scomberomorus commerson*) and Indo-Pacific king mackerel (*S. guttatus*) resources were conducted in 2018 and 2019 based on the assumption that there are two stocks of each species in the Southeast Asian waters, i.e., Pacific Ocean (FAO fishing area 57) and Indian ocean stocks (FAO fishing area 71). Stock status (2016) and management advices (TAC) were made based on stock and risk assessments using ASPIC, “Kobe plot” and “Risk assessment” software. In ASPIC, two types data are used, i.e., (a) annual total nominal catch by stock (1950-2016) and (b) CPUE (catch and effort) by stock, country, gear and area, provided by FAO, IOTC, and SEAFDEC Member countries.

Assessment for each species can be summarized as follows:

A. Pacific Ocean Side of the Southeast Asian Region

- Spanish mackerel: It is suggested that the stock status is in the very serious overfished and subject to overfishing. TAC should be less than the MSY level (129,000 t). This means that the current catch level (163,800 t) (Average of 2014-2016) should be decreased by 65,500 t (40%).

- King mackerel: It is suggested that the stock status is very safe situation. TAC can be increased to the MSY level (15,100 t). This means that the current catch level (11,600 t) (Average of 2014-2016) can be increased by 3,500 t (131%).

B. Indian Ocean Side of the Southeast Asian Region

- Spanish mackerel: It is suggested that the stock status is not safe situation. TAC should be less than the MSY level (55,170 t), This means that the current catch level (54,100 t) (Average of 2014-2016) should be decreased by 10,800 t (20%).
- King mackerel: It is suggested that the stock status is very safe situation. TAC can be increased to the MSY level (21,500 t). This means that the current catch level (18,700 t) (Average of 2014-2016) can be increased by 2,800 t (115%).

C. Comparison of the stock status of Spanish mackerel with in the IOTC area

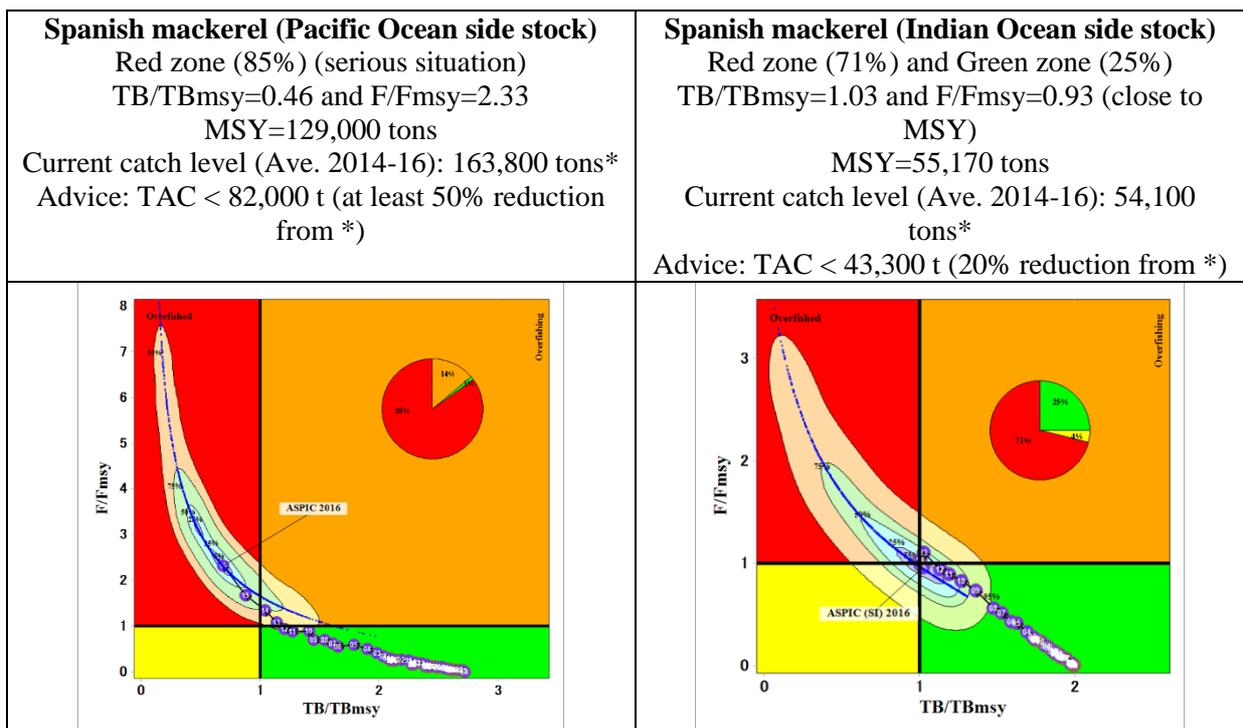
The latest stock assessment using data poor method conducted by IOTC in 2015 is much more un-safe situation than our Southeast Asian Area in the same year, which implies that the stock in other areas of the Indian Ocean than Southeast Asian Waters (Australia, South Asia, Middle-east and Africa) have been harvested more heavily.

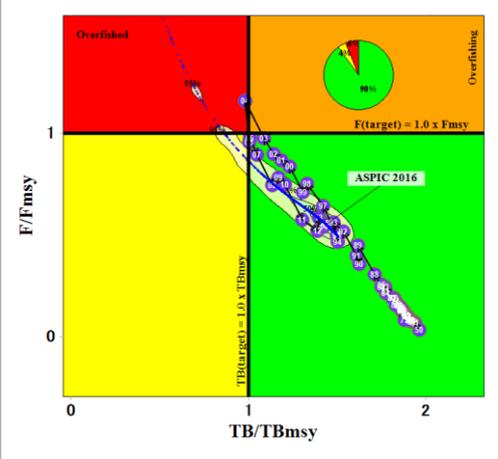
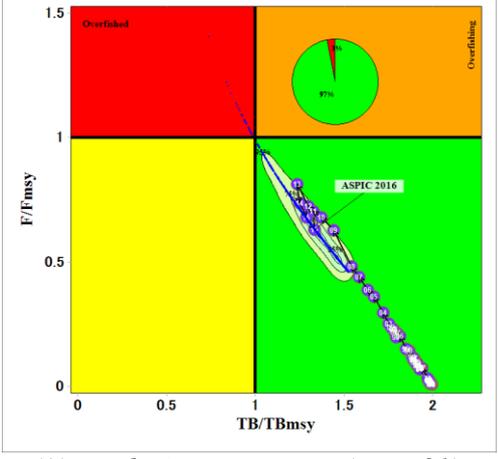
III. CHALLENGE ISSUES ON STOCK ASSESSMENT AND MANAGEMENT ADVICE

5) Lack of fine scale CPUE data

Although Indonesia produces the largest catch for both species, no nominal CPUE are available. It is suggested for Indonesia and other countries not collecting nominal CPUE to start collecting catch and effort data following the standard of Procedures (SOP) for data collection agreed in 2015 (SEAFDEC, 2015). In addition, CPUE standardization could not be conducted due to lack of fine scale CPUE such as by season and area. As nominal CPUE include biases in different levels, results of sock and risk assessments may be biased according to the bias level of nominal CPUE. Thus, the collection of fine scale (set by set) nominal CPUE (stipulated in the SOP) enable to conduct CPUE standardization is recommended.

Stock status (2016) and management advices (TAC) based on stock and risk assessments by ASPIC for Spanish and king mackerel in the Southeast Asian Waters



<p>King mackerel (Pacific Ocean side stock) Green zone (90%) (healthy condition) TB/TBmsy=1.45 and F/Fmsy=0.63 MSY=15,100 tons Current catch level (Ave. 2014-16): 11,600 tons* Advice: TAC < MSY (15,100 t) (31% increase from *)</p>	<p>King mackerel (Indian Ocean side stock) (*) Green zone (97%) (healthy condition) (TB/TBmsy=1.33 and F/Fmsy=0.63) MSY=21,500 tons Current catch level (Ave. 2014-16): 18,700 tons* Advice: TAC < MSY (21,500 t) (15% increase from *)</p>
	 <p>(*) see the important note (page 31).</p>

6) Lack of model fitness

Spanish mackerel (Indian Ocean Side) and king mackerel (Pacific Ocean Side) did not fit well to ASPIC and CPUE, which may be caused by a problem on the un-balanced statistical design, i.e. very short time series of CPUE (10-15 years) fitted to long-term stock assessment period (57 years).

7) Difficulties of practical management advices due to multispecies situation

The practical management advices in each Member Country will be difficult to implement because Spanish and king mackerel are exploited together with other species by different gears and TAC advices of these two species are completely different, i.e. catch of Spanish mackerel needs to be decreased, while king mackerel increased. Therefore, multispecies managements should be developed in the future.

IV. GENETIC STUDIES OF LONGTAIL TUNA

8) SEAFDEC/MFRDMD with the support from SEAFDEC-Sweden project conducted the population study of neritic tunas in Southeast Asia which aimed to identify the level of genetic diversity of *Thunnus tonggol* (Longtail tuna, LOT) in the South China Sea and Andaman Sea, and to identify the genetic structure of LOT between both sub-regional areas by using mitochondrial DNA (mtDNA) displacement loop (*D-loop*) marker.

9) About 500 samples of LOT from 12 locations in Andaman Sea, South China Sea and Gulf of Thailand, and Sulu Sea had been analyzed by using mtDNA *D-loop* gene. The result showed no significant structures, which suggests the Longtail tuna in South China Sea, Andaman Sea, and Sulu Sea is a single stock. Analysis using mtDNA *Cyt b* gene also supported the results from mtDNA *D-loop* analysis.

10) This study is only based on one type of marker (mtDNA). Further studies should be conducted using more variable molecular markers such as microsatellite DNA to confirm this finding.

V. RECOMMENDATION

11) SEAFDEC Member Countries should consider recommendations made by SWG meetings in the national levels. Especially Indonesia exploits large amount of catch for both species, thus effectiveness of management advices (TAC) for these two stocks will highly depend upon the Indonesian domestic management scheme. In this regards, Indonesian scientists are recommended to actively participate relevant meetings in the future.

12) The stock and risk assessment should be conducted routinely, especially species with serious un-safe stock status need to be monitored ever year until the stock status changes to the safe condition.

13) Following SOP of data collection, Member Countries should improve data collection for stock assessments especially for catch and CPUE through logbooks, port sampling, observer programs etc.

14) In considering TAC, each Member Country needs to consider multi-gears and multi-species nature of fisheries, thus optimum management strategies need to be developed by Member Countries.

15) SEAFDEC is not RFMO, thus the management advices are not binding nor mandatory, but the sustainable utilization of neritic tuna fisheries is very important thus it is strongly recommended for SEAFDEC to have a function and budgets to conduct the routine stock and risk assessments in the future.

VI. RESPONSES TO THE RECOMMENDATIONS BY THE 50TH CM

16) Recommendation made by Council (Para 54): SEAFDEC should not duplicate the efforts of these RFMOs in controlling the amount of catch in the Southeast Asian waters based on the results of the stock and risk assessment of economically-important fishes such as the neritic tunas.

Follow-up Actions: SEAFDEC intention is not to duplicate the effort made by RFMOs. It should be noted that not all SEAFDEC Member Countries are members of the RFMOs. Therefore, SEAFDEC's work on Stock Assessment particularly for neritic tuna are intended to enhance the capacity on stock assessment of MCs, in addition, to promote the regional cooperation on managing fishing capacity based on the results from stock assessment.

18) Recommendation made by Council (Para 56): Myanmar supported the scientific cooperation for management of fishing capacity among Member Countries and requested SEAFDEC to continue extending the activities that contribute to such scientific cooperation to Myanmar and other AMSs in the future.

Follow-up Actions: It is noted that the SWG-Neritic tunas will continue work on stock assessment.

VII. REQUIRED CONSIDERATION BY THE COUNCIL

The Council is requested to take note the progress on implementations of the RPOA-Neritic Tunas, especially on the results of 2018 to 2019 stock and risk assessment of the Spanish and king mackerel, management measures for these stocks, challenges on the stock assessment and genetic study on Longtail tuna. The Council is also requested to provide guidelines in order to raise the issues on management of these two species as referred to the major findings from the study mentioned above.

The meeting is also invited to provide directive guidance to SEAFDEC on the following:

- Support the extending works of the existing Scientific Working Group on Stock Assessment (SWG) to support other shared stock species such as anchovy, sardines, scads, etc.; and
- Securing the budget to support the operation of secretariat and administration works for the Scientific Working Group activities.