Report of the 15th Session of the IOTC Working Party on Neritic Tunas

Eden Bleu Hotel, Seychelles, 7 – 11 July 2025

DISTRIBUTION:	**BIBLIOGRAPHIC ENTRY**
Participants in the Session Members of the Commission Other interested Nations and International Organizations FAO Fisheries Department FAO Regional Fishery Officers	IOTC–WPNT15 2025. Report of the 15th Session of the IOTC Working Party on Neritic Tunas. Seychelles, 7-11 July 2025. *IOTC–2025–WPNT15–R[E]: 70 pp.*

Contact details:

Indian Ocean Tuna Commission
ABIS Center
PO Box 1011
Victoria, Mahé, Seychelles
Email: IOTC-secretariat@fao.org
Website: http://www.iotc.org

ACRONYMS

aFAD	Anchored Fish Aggregating Device
B	Biomass (total)
BLT	Bullet tuna
B_{MSY}	Biomass which produces MSY
CMM	Conservation and Management Measure (of the IOTC; Resolutions and Recommendations)
C-MSY	Catch and Maximum Sustainable Yield data limited stock assessment method
COM	Narrow-barred Spanish mackerel
CPCs	Contracting parties and cooperating non-contracting parties
CPUE	Catch per unit of effort
current	Current period/time, i.e., $F_{current}$ means fishing mortality for the current assessment year.
EEZ	Exclusive Economic Zone
F	Fishing mortality: F_{2023} is the fishing mortality estimated in the year 2023
FAD	Fish aggregating device
F_{MSY}	Fishing mortality at MSY
FRI	Frigate tuna
GLM	Generalised Linear Model
GUT	Indo-Pacific king mackerel
IO	Indian Ocean
IOTC	Indian Ocean Tuna Commission
KAW	Kawakawa
LL	Longline
LOT	Longtail tuna
M	Natural mortality
MPF	Meeting Participation Fund
MSY	Maximum sustainable yield
n.a.	Not applicable
OCOM	Optimised Catch Only Method
PS	Purse seine
ROS	Regional Observer Scheme
SB	Spawning Biomass (sometimes expressed as SSB)
SB_{MSY}	Spawning stock Biomass which produces MSY
SC	Scientific Committee of the IOTC
SEAFDEC	Southeast Asian Fisheries Development Center
SRA	Stock Reduction Analysis
SWIOFP	South West Indian Ocean Fisheries Project
VB	Von Bertalanffy (growth)
WPDCS	Working Party on Data Collection and Statistics
WPNT	Working Party on Neritic Tunas of the IOTC
WWF	World Wide Fund for Nature (a.k.a World Wildlife Fund)

STANDARDISATION OF IOTC WORKING PARTY AND SCIENTIFIC COMMITTEE REPORT TERMINOLOGY

SC16.07 (para. 23) The SC **ADOPTED** the reporting terminology contained in Appendix IV and **RECOMMENDED** that the Commission considers adopting the standardised IOTC Report terminology, to further improve the clarity of information sharing from, and among its subsidiary bodies.

HOW TO INTERPRET TERMINOLOGY CONTAINED IN THIS REPORT

Level 1: From a subsidiary body of the Commission to the next level in the structure of the Commission:

RECOMMENDED, RECOMMENDATION: Any conclusion or request for an action to be undertaken, from a subsidiary body of the Commission (Committee or Working Party), which is to be formally provided to the next level in the structure of the Commission for its consideration/endorsement (e.g. from a Working Party to the Scientific Committee; from a Committee to the Commission). The intention is that the higher body will consider the recommended action for endorsement under its own mandate, if the subsidiary body does not already have the required mandate. Ideally this should be task specific and contain a timeframe for completion.

Level 2: From a subsidiary body of the Commission to a CPC, the IOTC Secretariat, or other body (not the Commission) to carry out a specified task:

REQUESTED: This term should only be used by a subsidiary body of the Commission if it does not wish to have the request formally adopted/endorsed by the next level in the structure of the Commission. For example, if a Committee wishes to seek additional input from a CPC on a particular topic, but does not wish to formalise the request beyond the mandate of the Committee, it may request that a set action be undertaken. Ideally this should be task specific and contain a timeframe for the completion.

Level 3: General terms to be used for consistency:

AGREED: Any point of discussion from a meeting which the IOTC body considers to be an agreed course of action covered by its mandate, which has not already been dealt with under Level 1 or level 2 above; a general point of agreement among delegations/participants of a meeting which does not need to be considered/adopted by the next level in the Commission's structure.

NOTED/NOTING: Any point of discussion from a meeting which the IOTC body considers to be important enough to record in a meeting report for future reference.

Any other term: Any other term may be used in addition to the Level 3 terms to highlight to the reader of and IOTC report, the importance of the relevant paragraph. However, other terms used are considered for explanatory/informational purposes only and shall have no higher rating within the reporting terminology hierarchy than Level 3, described above (e.g. **CONSIDERED**; **URGED**; **ACKNOWLEDGED**).

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The 15th Session of the Indian Ocean Tuna Commission's (IOTC) Working Party on Neritic Tunas (WPNT15) was held in a hybrid format in Seychelles and online using the Zoom online platform from 7-11 July 2025. A total of 40 participants (47 in 2024, 35 in 2023, 36 in 2022, 33 in 2021 and 43 in 2020) attended the Session. The list of participants is provided at Appendix I. The meeting was opened by the WPNT Vice-Chairperson, Bram Setyadji from Indonesia, who welcomed participants to the meeting.

4.1 Review of the statistical data available for neritic tunas

WPNT15.01 (para. 42) The WPNT **RECOMMENDED** that the Scientific Committee consider supporting a consultancy to review existing systems for qualifying datasets — including, but not limited to, those used in fisheries data — with a view to identifying best practices and proposing improvements to the current data quality scoring system used by the Secretariat.

WPNT15.02 (para. 43) **ACKNOWLEDGING** the difficulties associated with deriving geo-referenced size-frequency data at the spatial resolution of 5° grids in most coastal fisheries, and the fact that most analyses, including stock assessments, do not require such fine resolution, the WPNT **RECOMMENDED** the SC to urge the Commission to align the spatial resolution of size-frequency data with that of geo-referenced catch and effort data. Consequently, the data may be provided using an alternative geographical area if it better represents the fishery concerned.

7.1 Revision of the WPNT Program of Work 2026–2030

WPNT15.03 (para. 174) The WPNT **RECOMMENDED** that the SC consider and endorse the WPNT Program of Work (2026–2030), as provided in Appendix VI.

8.1 Date and place of the 16th and 17th Working Party on Neritic Tunas

WPNT15.04 (para. 177) **NOTING** the decline in participation and the reduced number of paper submissions in recent years, which has resulted in shorter meetings, the WPNT **RECOMMENDED** that the SC consider setting the WPNT meeting duration to four days as a standard. However, it also suggested retaining flexibility to extend the meeting when necessary, such as when a training workshop is requested by CPCs for inclusion in the agenda.

8.2 Review of the draft, and adoption of the Report of the 15th Working Party on Neritic Tunas

WPNT15.05 (para. 185) The WPNT **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPNT15, provided in Appendix XIII, as well as the management advice provided in the draft resource stock status summary for each of the six neritic tuna (and seerfish) species under the IOTC mandate, and the combined Kobe plot for the species assigned a stock status in 2025:

- Bullet tuna (*Auxis rochei*) – Appendix VII
- Frigate tuna (*Auxis thazard*) – Appendix VIII
- Kawakawa (*Euthynnus affinis*) – Appendix IX
- Longtail tuna (*Thunnus tonggol*) – Appendix X
- Indo-Pacific king mackerel (*Scomberomorus guttatus*) – Appendix XI
- Narrow-barred Spanish mackerel (*Scomberomorus commerson*) – Appendix XII

Table 1. Status summary for species of neritic tuna and tuna-like species under the IOTC mandate: 2025

Neritic tunas and seerfish: these six species have become as important or more important as the three tropical tuna species (bigeye tuna, skipjack tuna and yellowfin tuna) to most IOTC coastal states with a total estimated catch of 683,000 t landed in 2022. They are caught primarily by coastal fisheries, including small-scale industrial and artisanal fisheries. They are almost always caught within the EEZs of coastal states. Historically, catches were often reported as aggregates of various species, making it difficult to obtain appropriate data for stock assessment analyses.

Stock	Indicators	2019	2020	2021	2022	2023	2024	2025	Advice to the Commission
Bullet tuna *Auxis rochei*	Catch 2023: 28,540 t Average catch 2019-2023: 30,724 t MSY (1,000 t) unknown F_{MSY}: unknown B_{MSY} (1,000 t): unknown $F_{current}/F_{MSY}$: unknown $B_{current}/B_{MSY}$: unknown $B_{current}/B_0$: unknown								No new stock assessment was conducted in 2025 for bullet tuna and so the results are based on the results of the assessment carried out in 2024 which examined a number of data-limited methods include C-MSY, LB-SPR, and fishblicc models (based on data up to 2022). However the catch data for bullet tuna are very uncertain given the high percentage of the catches that had to be estimated due to a range of reporting issues. The size-based assessment methods LB-SPR and FishBlicc using size data from gillnet and purse seine fisheries both estimated the current spawning potential ratio to be below the reference level of SPR40% (a proxy for 40% depletion often considered as the risk averse target in many data-poor fisheries). Due to a lack of fishery data for several fisheries, only preliminary stock status indicators (CPUE and average weight) can be used. Aspects of the fisheries for bullet tuna combined with the lack of data on which to base an assessment of the stock are a cause for concern. Stock status in relation to the Commission's B_{MSY} and F_{MSY} reference points remains **unknown.** For assessed species of neritic tunas and seerfish in the Indian Ocean (longtail tuna, kawakawa and narrow-barred Spanish mackerel), the MSY was estimated during early assessments to have been reached between 2009 and 2011 and both F_{MSY} and B_{MSY} were breached thereafter. It is worth noting that the catch in 2023 was estimated to be 28,429t and there has been significant variability in estimated catches of this species in recent years. This variation is perhaps due to issue of mis-identification of this species among other reasons. In the absence of a stock assessment of bullet tuna a limit to the catches should be considered by the Commission, by ensuring that future catches do not continue to exceed the average catches estimated between 2009 and 2011 (8,590 t). This catch advice should be maintained until an assessment of bullet tuna is available. Considering that MSY-based reference points for assessed species can change over time, the stock should be closely monitored. Mechanisms need to be developed by the Commission to improve current statistics by encouraging CPCs to comply with their recording and reporting requirements, so as to better inform scientific advice. Click here for a full stock status summary: Appendix VII
Frigate tuna *Auxis thazard*	Catch 2023: 129,555 t Average catch 2019-2023: 97,723 t								No new stock assessment was conducted in 2025 for frigate tuna and so the results are based on the results of the assessment carried out in 2024 which examined a number

Stock	Indicators		2019	2020	2021	2022	2023	2024	2025	Advice to the Commission
	MSY (1,000 t) F_{MSY} : B_{MSY} (1,000 t): $F_{current}/F_{MSY}$: $B_{current}/B_{MSY}$: $B_{current}/B_0$:	unknown unknown unknown unknown unknown unknown								of data-limited methods include CMSY, OCOM, LB-SPR and fishblicc models (based on data up to 2022). However the catch data for frigate tuna are very uncertain given the high percentage of the catches that had to be estimated due to a range of reporting issues. Due to a lack of fishery data for several gears, only preliminary stock status indicators can be used. However, the size-based assessment showed results with considerable uncertainty - LB-SPR estimated a SPR greater than the reference level of SPR40%, (a proxy for 40% depletion often considered as risk averse target in many data-poor fisheries) whereas the fishblicc estimated a SPR below the reference level. Aspects of the fisheries for frigate tuna combined with the lack of data on which to base an assessment of the stock are a cause for considerable concern. Stock status in relation to the Commission's B_{MSY} and F_{MSY} reference points remains **unknown.** For assessed species of neritic tunas in Indian Ocean (longtail tuna, kawakawa and narrow-barred Spanish mackerel), the MSY was estimated during early assessments to have been reached between 2009 and 2011 and both F_{MSY} and B_{MSY} were breached thereafter. It is worth noting that the catch in 2023 was estimated to be 130,815t and there has been significant variability in estimated catches of this species in recent years. This variation is perhaps due to issue of mis-identification of this species among other reasons. In the absence of an accepted stock assessment for frigate tuna, a limit to the catches should be considered by the Commission, by ensuring that future catches do not continue to exceed the average catches estimated between 2009 and 2011 (101,260 t). The reference period (2009-2011) was chosen based on the most recent assessments of those neritic species in the Indian Ocean for which an assessment is available under the assumption that MSY for frigate tuna was also reached between 2009 and 2011. This catch advice should be maintained until an assessment of frigate tuna is available. Considering that MSY-based reference points for assessed species can change over time, the stock should be closely monitored. Mechanisms need to be developed by the Commission to improve current statistics by encouraging CPCs to comply with their recording and reporting requirements, so as to better inform scientific advice. Click here for a full stock status summary: Appendix VIII
Kawakawa *Euthynnus affinis*	Catch 2023[2]: Average catch 2019-2023: MSY(80% CI) F_{MSY} (80% CI) B_{MSY} (80% CI) $F_{current}/F_{MSY}$ (80% CI) $B_{current}/B_{MSY}$ (80% CI)	148,721 t 130,855 t 154 (122 –193) 0.60 (0.48–0.74) 258 (185–359) 0.98 (0.82–2.20) 0.99 (0.45–1.20)					**27%**			No new stock assessment was conducted in 2024 for kawakawa and so the results are based on the results of the assessment carried out in 2023 which examined a number of data-limited methods include C-MSY, OCOM, and JABBA models (based on data up to 2021). These models produced stock estimates that are not drastically divergent because they shared similar dynamics and assumptions. The C-MSY model has been explored more fully and therefore is used to obtain estimates of stock status. The C-MSY model indicated that the fishing mortality F was very close to F_{MSY} (F/F_{MSY}=0.98) and the current biomass B was also very close to B_{MSY} (B/B_{MSY}=0.99). The estimated probability of the stock currently being in yellow quadrant of the Kobe plot is about 27%. The analysis using OCOM model is more pessimistic and using JABBA incorporating gillnet CPUE indices is more optimistic. Due to the quality of the data being used, the simple modelling approach employed in 2020 and 2023, and the large increase in kawakawa catches over the last decade, measures need to be taken in order to reduce the level of catches which have surpassed the estimated MSY levels for most years since

Stock	Indicators	2019	2020	2021	2022	2023	2024	2025	Advice to the Commission
									2011. While the precise stock structure of kawakawa remains unclear, recent research (IOTC-2020-SC23-11_Rev1) provides strong evidence of population structure of kawakawa within the IOTC area of competence, with at least 4 genetic populations identified. This increases the uncertainty in the assessment, which currently assumes a single stock of kawakawa. Based on the weight-of-evidence available, the kawakawa stock for the Indian Ocean is classified as **overfished** but **not subject to overfishing**. However, the assessment using catch-only method is subjected to high uncertainty and is highly influenced by several prior assumptions. The assessment models rely on catch data, which are considered to be highly uncertain. The catch in 2022 was just above the estimated MSY. The available gillnet CPUE of kawakawa showed a somewhat increasing trend although the reliability of the index as abundance indices remains unknown. Despite the substantial uncertainties, the stock is probably very close to being fished at MSY levels and that higher catches may not be sustained in the longer term. A precautionary approach to management is recommended. Click here for a full stock status summary Appendix IX
Longtail tuna *Thunnus tonggol*	Catch 2023: 135,221 t Average catch 2019-2023: 127,208 t MSY (80% CI) 133 (108–165) F_{MSY} (80% CI) 0.31 (0.22–0.44) B_{MSY} (80% CI) 433 (272–690) $F_{current}/F_{MSY}$ (80% CI) 1.05 (0.84–2.31) $B_{current}/B_{MSY}$ (80% CI) 0.96 (0.44–1.19)					**35%**			No new stock assessment was conducted for longtail in 2025 and so the results are based on the results of the assessment carried out in 2023 which examined a number of data-limited methods including C-MSY, OCOM, and JABBA models (based on data up to 2021). These models produced stock estimates that are not drastically divergent because they shared similar dynamics and assumptions. The C-MSY model has been explored more fully and therefore is used to obtain estimates of stock status. The C-MSY analysis indicates that the stock is being exploited at a rate that exceeded F_{MSY} in recent years and that the stock appears to be below B_{MSY} and above F_{MSY} (35% of plausible models runs). Catches between 2017 and 2021 were slightly above MSY but steadily declined from 2012 to less than 113,000 t in 2019. The F_{2021}/F_{MSY} ratio is lower than previous estimates and the B_{2021}/B_{MSY} ratio was higher than in previous years. The analysis using the OCOM model is more pessimistic and using JABBA incorporating gillnet CPUE indices is more optimistic. The JABBA model, however, is unable to estimate carrying capacity with a fair degree of certainty without additional prior constraints, indicating the fact that the CPUE is either not informative or is conflicting with catch data. While the precise stock structure of longtail tuna remains unclear, recent research (IOTC-2020-SC23-11_Rev1) provides strong evidence of population structure of longtail tuna within the IOTC area of competence, with at least 3 genetic populations identified. This increases the uncertainty in the assessment, which currently assumes a single stock of longtail tuna. Based on the C-MSY assessment, the stock is considered to be both **overfished** and **subject to overfishing**. However, the assessment using catch-only method is subjected to high uncertainty and is highly influenced by several prior assumptions. The catch in 2023 was above the estimated MSY and the exploitation rate has been increasing over the last few years, as a result of the declining abundance. Despite the substantial uncertainties, this suggests that the stock is being fished above MSY levels and that higher catches may not be sustained. A precautionary approach to management is recommended. Click here for a full stock status summary: Appendix X

Stock	Indicators	2019	2020	2021	2022	2023	2024	2025	Advice to the Commission
Indo-Pacific king mackerel *Scomberomorus guttatus*	Catch 2023: 45,518 t Average catch 2019-2023: 38,088 t MSY (1,000 t) 47 (39–56) F_{MSY} 0.74 (0.56–0.99) B_{MSY} (1,000 t) 63.1 (43.1–92.4) $F_{current}/F_{MSY}$ 0.95 (0.82–2.13) $B_{current}/B_{MSY}$ 1.02 (0.46–1.19) $B_{current}/B_0$ 0.51 (0.23–0.60)			35%			27%		No new stock assessment was conducted for Indo-Pacific king mackerel in 2025 and so the results are based on the results of the assessment carried out in 2023 which examined a number of data-limited methods including CMSY and CMSY++ (based on data up to 2022). Analysis using the catch only method CMSY indicates the stock is being exploited at a rate that is below F_{MSY} in recent years and that the stock appears to be above B_{MSY}, although the estimates would be more pessimistic if the stock productivity is assumed to be less resilient. An assessment using CMSY++was also explored in 2024. The stock estimates with CMSY++ are estimated to be very close to the biomass target even though the stock status is more pessimistic than with CMSY. Despite some of the caveats of the underlying assumptions, the catch-only model has provided a more defensible approach in addressing the uncertainty of key parameters and the currently available catch data for the Indo-Pacific king mackerel appear to be of sufficient quality. Based on the weight-of-evidence currently available, the stock is considered to be **not overfished and not subject to overfishing.** Reported catches of Indo-Pacific king mackerel in the Indian Ocean has increased considerably since the late 2000s with recent catches fluctuating around estimated MSY, although the catch in 2021 and 2023 was below the estimated MSY. This suggests that the stock is close to being fished at MSY levels and that higher catches may not be sustained despite the substantial uncertainty associated with the assessment, a precautionary approach to management is recommended. Click here for a full stock status summary: Appendix XI
Narrow-barred Spanish mackerel *Scomberomorus commerson*	Catch 2023: 162,401 t Average catch 2019-2023: 138,316 t MSY (80% CI) 161 (132–197) F_{MSY} (80% CI) 0.60 (0.48–0.74) B_{MSY} (80% CI) 271 (197–373) $F_{current}/F_{MSY}$ (80% CI) 1.07 (0.88–2.38) $B_{current}/B_{MSY}$ (80% CI) 0.98 (0.44–1.19)					31%			No new stock assessment was conducted in 2025 for narrow-barred Spanish mackerel and so the results are based on the results of the assessment carried out in 2023 which examined a number of data-limited methods including C-MSY, OCOM, and JABBA models (based on data up to 2021). These models produced stock estimates that are not drastically divergent because they shared similar dynamics and assumptions. The C-MSY model has been explored more fully and therefore is used to obtain estimates of stock status. The C-MSY analysis indicates that the stock is being exploited at a rate that exceeded F_{MSY} in recent years and that the stock appears to be below B_{MSY} and above F_{MSY} (31% of plausible models runs). The analysis using OCOM model is more pessimistic and using JABBA incorporating gillnet CPUE indices is more optimistic. The JABBA model, however, is unable to estimate carrying capacity with a fair degree of certainty without additional prior constraints, indicating that the CPUE is either not informative or is conflicting with catch data. An analysis undertaken in 2013 in the Northwest Indian Ocean (Gulf of Oman) indicated that overfishing is occurring in this area and that localised depletion may also be occurring[1]. While the precise stock structure of Spanish mackerel remains unclear, recent research (IOTC-2020-SC23-11_Rev1) provides strong evidence of population structure of Spanish mackerel within the IOTC area of competence, with at least 4 genetic populations identified. This increases the uncertainty in the assessment, which currently assumes a single stock of Spanish mackerel. Based on the C-MSY assessment, the stock appears to be **overfished** and

[1] IOTC-2013-WPNT03-27

Stock	Indicators	2019	2020	2021	2022	2023	2024	2025	Advice to the Commission
									subject to overfishing. However, the assessment using catch-only method is subjected to high uncertainty and is highly influenced by several prior assumptions. The catch in 2023 was above the estimated MSY and the available gillnet CPUE shows a somewhat increasing trend in recent years although the reliability of the index as an abundance index remains unknown. Despite the substantial uncertainties, the stock is being fished above MSY levels and higher catches may not be sustained. Click here for a full stock status summary: Appendix XII

*Indicates range of plausible values

Colour key	Stock overfished ($SB_{year}/SB_{MSY}< 1$)	Stock not overfished ($SB_{year}/SB_{MSY}\geq 1$)
Stock subject to overfishing ($F_{year}/F_{MSY}> 1$)		
Stock not subject to overfishing ($F_{year}/F_{MSY}\leq 1$)		
Not assessed/Uncertain		

1. Opening of the Meeting

1. The 15th Session of the Indian Ocean Tuna Commission's (IOTC) Working Party on Neritic Tunas (WPNT15) was held in a hybrid format in Seychelles and online from 7-11 July 2025. A total of 40 participants (47 in 2024, 35 in 2023, 36 in 2022, 33 in 2021 and 43 in 2020) attended the Session. The list of participants is provided at Appendix I. The meeting was opened by the WPNT Vice-Chairperson, Bram Setyadji from Indonesia, who welcomed participants to the meeting.

2. Adoption of the Agenda and Arrangements for the Session

2. The WPNT **ADOPTED** the Agenda provided at Appendix II. The documents presented to the WPNT15 are listed in Appendix III.

3. The IOTC process: Outcomes, updates and progress

3.1 Outcomes of the 27th Session of the Scientific Committee

3. The WPNT **NOTED** paper IOTC–2025–WPNT15–03 which outlined the main outcomes of the 27th Session of the Scientific Committee (SC26), specifically related to the work of the WPNT and **AGREED** to consider how best to progress these issues at the present meeting.

4. The WPNT **NOTED** that in previous meetings the group had recommended the SC to urge CPCs to collect and report more length frequency data but **NOTED** that this data really need to be representative of the fleets, regions etc. in order to be helpful for stock assessments. The WPNT further **NOTED** that CPCs should all have different methods and standards for collecting these data including general guidelines on how sampling should be done using information in logbooks and from port sampling and observers. The WPNT **ENCOURAGED** CPCs to present their size data along with information on their sampling standards so that the WPNT and WPDCS can make recommendations on how these could be improved.

5. The WPNT **NOTED** that Resolution 15/01 provides simple general guidance on the minimum standards for sampling but this is not comprehensive so the WPNT **REQUESTED** the WPDCS to develop standards for collecting these data so they are standardised across all CPCs.

3.2 Outcomes of the 28th Session of the Commission

6. The WPNT **NOTED** paper IOTC–2025–WPNT15–04 which outlined the main outcomes of the 28th Session of the Commission, specifically related to the work of the WPNT. The WPNT further **NOTED** that the 29th Session of the Commission report is currently still unavailable and therefore no new outcomes were available for discussions since the 28th Session.

7. WPNT15 participants were **ENCOURAGED** to familiarise themselves with the previously adopted Resolutions, especially those most relevant to the WPNT.

3.3 Review of Conservation and Management Measures relevant for neritic tunas

8. The WPNT **NOTED** paper IOTC–2025–WPNT15–05 which aimed to encourage participants at the WPNT15 to review the existing Conservation and Management Measures (CMM) relating to neritic tunas.

9. The WPNT **NOTED** that while there are no Conservation and Management Measures specific to neritic species, they are likely to be impacted by other fisheries where they may be caught as bycatch.

10. The WPNT **NOTED** that Pakistan is working on a revision to Resolution 23/06 on the conservation of cetaceans as it is limited to the precautionary approach of only reporting the entangling of cetaceans and ensuring the safe release of these species from fishing gears. The WPNT **NOTED** that this was brough to the attention of the working party as a number of fisheries for neritic tuna are known to have interactions with coastal cetacean species which regularly leads to the mortality of individuals caught so the proposed changes to the Resolution are likely to impact neritic fisheries. The WPNT **NOTED** the intention of Pakistan to present this proposal to the upcoming WPEB for comment.

11. The WPNT **NOTED** that Pakistan is seeking support for their proposed revision to the Resolution but further **NOTED** that Pakistan would be required to propose this revised Resolution during next year's Commission meeting in order for it to be considered for adoption.

3.4 Progress on the Recommendations of WPNT14 and SC27

12. The WPNT **NOTED** paper IOTC–2025–WPNT15–06 which provided an update on the progress made in implementing the recommendations from the 14th Session of the WPNT for the consideration and potential endorsement by participants.

13. The WPNT **NOTED** that good progress had been made on these Recommendations, and that several of these would be directly addressed by the participating scientists when presenting their updated results for 2025.

14. The WPNT participants were **ENCOURAGED** to review paper IOTC–2025–WPNT15–06 during the meeting and report back on any progress in relation to requests or actions by CPCs that have not been captured by the report, and to note any pending actions for attention before the next meeting (WPNT16).

15. The WPNT **REITERATED** its **REQUEST** for CPCs to report size and weight data for neritic (and all) species, to the Secretariat.

4. New Information on Fisheries and Associated Environmental Data for Neritic Tunas

4.1 Review of the statistical data available for neritic tunas

16. The WPNT **NOTED** paper IOTC–2025–WPNT15–07 which provided an overview of the standing of a range of information received by the IOTC Secretariat for the six species of neritic tuna and tuna-like species, in accordance with IOTC Resolution 15/02 *On mandatory statistical reporting requirements for IOTC Members and Cooperating non-Contracting Parties (CPCs)*, for the period 1950–2023. A summary is provided at Appendix IV.

17. The WPNT **NOTED** a continuous increase in global catch data for the four neritic tuna species and two seerfish species under the management mandate of the IOTC. It was further **NOTED** that catches of these species exceeded 2 million tonnes in 2023, with the highest catches reported from fisheries in the Western-Central Pacific Ocean. In contrast, fisheries in the Indian Ocean contributed about one-third of the global catch.

18. The WPNT **NOTED** that historically, neritic species catches in the Indian Ocean were dominated by Spanish mackerel. The WPNT **NOTED** that in recent years, there has been a shift toward higher catches of neritic tunas, specifically longtail tuna and kawakawa, primarily driven by increased landings from the Islamic Republic of Iran, Indonesia, and India.

19. The WPNT also **NOTED** Indonesia's high catches in 2023 across several fisheries, along with trends observed in the revised catch series submitted in 2024. It was **NOTED** that, for most species, revised historical catches (1950–2022) were lower than previous estimates, with the exception of bullet tuna, which showed variability in recent years.

20. The WPNT **NOTED** that the poor quality of neritic species data is largely due to the ongoing inadequacy of catch data collection systems in coastal countries with high levels of neritic species landings. Furthermore, the WPNT **NOTED** that tuna species are generally caught at lower rates compared to other fish species, and that fishing operations of the coastal countries are predominantly multi-gear and multi-species in nature.

21. The WPNT **NOTED** catch data from other fisheries, besides gillnet, line and purse seine fisheries, targeting neritic species, emphasising that small-scale coastal fisheries often catch a wide variety of species, including small neritic tunas. Furthermore, the WPNT **NOTED** that beach seine fisheries in Sri Lanka, Oman, Indonesia, Mozambique, and India have shown increasing catch trends, while trawl fisheries in Bangladesh have also recorded rising catches.

22. The WPNT **NOTED** that variation in catches of bullet tuna from Indonesia could be attributed to the schools of frigate and bullet tunas present in the southern waters of Indonesia, where purse seine fisheries are active.

23. The WPNT **NOTED** that for future re-estimation of Indonesian catch data, less assistance from the Secretariat will be required going forward, as Indonesia intends to conduct preliminary estimates independently. It was **NOTED** that 2023 data is currently being processed, and improvements are anticipated in the data submission for 2024.

24. The WPNT **NOTED** the high level of uncertainty in the datasets, particularly in geo-referenced catch and effort, and size frequency data, highlighting that current quality assessments rely solely on submitted data, without

evaluating the quality of the original data sources. The WPNT further **NOTED** that China was proposing alternative statistical methods to enhance the assessment of data quality during the WPTT26.

25. The WPNT **NOTED** the difficulties in interpreting the color palette gradient used in some charts presented by the Secretariat. The WPNT further **NOTED** that the Secretariat is considering a review of the current quality assessment approach, which is based on a historical methodology.

26. The WPNT **ACKNOWLEDGED** the importance of catch and effort data for generating CPUE series. Despite limited data availability from some key neritic fisheries, the WPNT **NOTED** the potential to generate CPUE series in certain countries, specifically the Islamic Republic of Iran and Sri Lanka where some initial work has already been conducted. The WPNT **NOTED** that while previous CPUE analyses in Islamic Republic of Iran focused on tropical tunas, data disaggregated by set are also available for other species.

27. The WPNT **NOTED** that, to better understand uncertainties in catch and effort data, quality assessments should be conducted at the fleet level, particularly for fleets with high catches of neritic species.

28. The WPNT **NOTED** that SEAFDEC conducted stock assessments for longtail tuna and kawakawa caught in the coastal purse seine fisheries of South-East Asian countries.

29. The WPNT **NOTED** that there is a potential to develop standardised CPUE indices using the data available from Thailand.

30. The WPNT **NOTED** that, with the exception of longline fisheries, IOTC CMMs do not prescribe standardised effort units. As a result, the effort data submitted by CPCs vary across fleets and over time, which hinders the development of consistent CPUE time series and limits the ability to conduct robust analyses of fishing capacity.

31. The WPNT also **NOTED** that "trips", a commonly used effort unit in coastal fisheries, may not be reliable, as vessels can make multiple trips, potentially leading to underestimation of fishing effort.

32. The WPNT **NOTED** that abrupt changes in effort units could complicate the estimation of CPUE series. The WPNT further **NOTED** that while a new time series with consistent effort units will take some time to develop, it will be more useful to the group in the future as it will be easier to include such data in CPUE series' for assessments.

33. The WPNT **NOTED** that long time series of fishing effort are available for certain key gillnet fisheries targeting neritic tunas, such as those of Islamic Republic of Iran and Sri Lanka. However, the WPNT also **NOTED** that, in the case of these fisheries, effort is reported in terms of fishing trips, and that in Sri Lanka, multiple gears may be used during a single trip. This limits the utility of the data in the aggregated format currently available at the Secretariat. The WPNT **ENCOURAGED** the concerned CPCs to explore and analyse these data with a view to assessing their potential for deriving abundance indices based on CPUE.

34. To address the issue relating to effort units, the WPNT **REQUESTED** the WPDCS to review the effort data available at the Secretariat and, where appropriate, to provide recommendations to the SC on standardised effort units to be considered in future data reporting requirements.

35. The WPNT **ACKNOWLEDGED** the efforts of the Secretariat in including a table of recommended effort units for each fishery in the new reporting guidelines and reference documents available on the IOTC website here.

36. The WPNT **NOTED** that a consultancy was undertaken in 2024 in Sri Lanka to collaborate with NARA and assess the availability and relevance of datasets for developing CPUE analyses for tropical tunas, namely skipjack and yellowfin tuna. The WPNT **ACKNOWLEDGED** that the information gathered may also be of relevance for neritic tuna species. However, the WPNT **NOTED** that access to the data was constrained due to confidentiality considerations, which in turn limited the scope and outcomes of the consultancy.

37. The WPNT **ACKNOWLEDGED** that catch and size data must be reported at the species (taxonomic) level and by individual fishing gear; that is, when data are originally available as species- or gear-aggregated, they must be processed and disaggregated by species and gear prior to reporting. In addition, geo-referenced catch, effort, and size data must be reported in accordance with the temporal and spatial resolutions specified in Resolution 15/02, using the effort units defined for longline and surface fisheries in Resolution 15/01, complemented by the number of fishing sets, as recommended for reporting at the 25th Session of the Scientific Committee (SC25; para. 172).

38. The WPNT **NOTED** that the criteria used to define the scores describing the quality of the main IOTC fisheries datasets (retained catches, geo-referenced catches and effort, and size frequencies) vary between datasets. These criteria focus on compliance with reporting standards (i.e., code lists and resolution) and achievement of the sampling target (i.e., one fish per metric tonne landed).

39. The WPNT **NOTED** that the percentage of good-quality data (i.e., scores of 0–2) is expressed relative to the amount of retained catch, for both the catch-and-effort and size datasets, for standardisation purposes. That is, the quality level assigned based on the data is applied to the amount of retained catch corresponding to the relevant data strata.

40. The WPNT **ACKNOWLEDGED** the importance of qualifying fisheries data and **NOTED** that some attempts have been made to incorporate such information into the assessment of yellowfin tuna by applying quality-dependent weights to the size-frequency datasets.

41. Nevertheless, the WPNT **AGREED** that, while the IOTC scoring system has been a valuable tool for several years, it remains somewhat complex and not always straightforward to interpret. Therefore, improvements could be considered—such as adopting a continuous scale with increasing scores reflecting data quality—and extensions to incorporate assessments beyond reporting quality.

42. The WPNT **RECOMMENDED** that the Scientific Committee consider supporting a consultancy to review existing systems for qualifying datasets — including, but not limited to, those used in fisheries data — with a view to identifying best practices and proposing improvements to the current data quality scoring system used by the Secretariat.

43. **ACKNOWLEDGING** the difficulties associated with deriving geo-referenced size-frequency data at the spatial resolution of 5° grids in most coastal fisheries, and the fact that most analyses, including stock assessments, do not require such fine resolution, the WPNT **RECOMMENDED** the SC to urge the Commission to align the spatial resolution of size-frequency data with that of geo-referenced catch and effort data. Consequently, the data may be provided using an alternative geographical area if it better represents the fishery concerned.

4.2 Tools for the improvement of data collection

44. The WPNT **NOTED** paper IOTC–2025–WPNT15–13 on Digital ID tool for IOTC tuna and tuna-like species using ODK (Open Data Kit), including the following abstract provided by the author:

"The IOTC-OFCF Japan project has developed "ID tool for IOTC tuna and tuna-like species"(ID tool), a smartphone/tablet available digital tool which facilitates species identification of tuna and tuna-like IOTC target species. The tool utilizes Open Data Kit (ODK), a free and open-source platform that helps data collection using mobile phones or tablets."

45. The WPNT **NOTED** that OFCF, in collaboration with the Secretariat, has been developing additional species identification materials. This includes translating the IOTC identification guides into various languages and creating online tools, such as videos, which explain key differences between species that can be difficult to distinguish. The WPNT **ENCOURAGED** the continuation of this valuable work. The WPNT **NOTED** that in the past the burden of dealing with species identification issues has fallen on the CPCs themselves without a huge amount of support so thanked OFCF for their hard work in developing these valuable tools.

46. The WPNT **NOTED** that at the moment, the ODK digital species identification (ID) tool is focused on large adult fish as there are some distinct morphological characteristics which change as a fish grows. The WPNT **NOTED** that is it quite difficult to differentiate between smaller fish still.

47. The WPNT **NOTED** the work of OFCF to develop a photo library and **ENCOURAGED** CPCs to collaborate to develop this further. The WPNT **NOTED** the intent of OFCF to start collecting photos of larvae and small individuals to include in the photo library.

48. The WPNT **NOTED** that repositories such as iNaturalist already exist and host a large number of photos where the species have been verified by 'expert researchers' on the site. However, the WPNT **NOTED** that it is helpful to have all of OFCF's ID resources in one place where they all be linked together.

49. The WPNT **NOTED** that the ODK tool is now live and available to be used and further **NOTED** that the tool can be accessed through OFCF's species identification website here.

50. The WPNT **NOTED** that for species such as yellowfin and bigeye tuna where the skin pattern fades over time, these characteristics were not included in the ODK tool. However, for other species such as kawakawa where the patterns remain even when the fish is in poor condition then this characteristic was included. The WPNT **NOTED** that the focus of this work is for coastal states where most of the fish will be in fairly good condition as opposed to fisheries where the fish will be frozen and so will be in a worse condition.

5. NERITIC TUNA SPECIES – REVIEW OF NEW INFORMATION ON STOCK STATUS

5.1 Review new information on the biology, stock structure, fisheries and associated environmental data

51. The WPNT **NOTED** paper IOTC–2025–WPNT15–10 on the Status of neritic tuna in Pakistan with special emphasis on the distribution and abundance of longtail tuna (*Thunnus tonggol*) in the coastal and offshore waters of Pakistan, including the following abstract provided by the authors:

"Neritic tuna are an important component of the tuna fisheries of Pakistan. Neritic tuna has a share of about 45.94 % in the total tuna landings in 2024. Of the five species of neritic tunas, the longtail tuna (Thunnus tonggol) contributes 4,328 m. tons in 2024 and 4,987 m. tons in 2023. Landings of frigate tuna (Auxis thazard thazard) during 2024 were recorded to be 7,651 m. tons whereas it was 8,873 m. tons in 2023. Landings of kawakawa (Euthynnus affinis) in 2024 was 1,689 m. tons and 1,782 m. tons in 2023. The other two species, i.e., bullet tuna (Auxis rochei) and striped bonito (Sarda orientalis) contributed insignificantly to the total tuna landings of Pakistan.

Landings of neritic tuna were observed to have decreased in 2024 by 12.62 % as compared to 2023. This decrease in landings can be attributed to many factors, including the early closure of the fishing season in April 2024, and late start in August 2023. This decrease is also on account of lower prices prevailing in Gwadar which was main landing centre in 2024 which compelled fishermen to undertake shorter fishing trips. Overall annual tuna landings (including both tropical and neritic tuna) of Pakistan have shown an increase of 3.62 % during 2024 as compared to year 2023.

The longtail tuna (Thunnus tonggol) is the most dominant species of neritic tuna found in Pakistan. Its landings were reported to be 5,918 m. tons in 1987, which steadily increased to the highest level of 21,000 in 2016 and 2017, but a major decrease was observed in 2019 when its landings plunged to a level of 3,342 m. tons. A recovery in the landings of longtail tuna was observed in 2022 when it reached 4,781, but again decreased to 4,328 m. ton in 2024."

52. The WPNT **NOTED** that the maximum recorded length of longtail varied between the two time-series' studied (October-December 2022 compared with January-August 2023) and **NOTED** that this is thought to be due to higher abundance and more favourable environmental conditions in the January-August 2023 period when the maximum length was larger. The WPNT **NOTED** that there were no changes to mesh sizes between the two periods or for targeting different species, so this did not impact the fish length.

53. The WPNT **NOTED** that the duration of the multi-day fishing trips varies depending on the availability and price of the products – if the fish prices are low then the fishermen may shorten their trips.

54. The WPNT **NOTED** that bullet tuna is very rare off the coast of Pakistan (Arabian Sea) which is why the catches have been very low. The WPNT **NOTED** that this is not thought to be an issue of misidentification.

55. The WPNT **NOTED** that the study used the effort unit of kg/vessel/month. The WPNT **NOTED** that many CPCs use different units for effort which makes it difficult to compare across different CPCs and years or develop a single CPUE series across the whole region. The WPNT therefore **REQUESTED** that the WPDCS develop standards on the best effort units to be applied to each gear type.

56. The WPNT **NOTED** paper IOTC–2025–WPNT15–11 on Neritic Tuna and Seerfish Fisheries from Small-scale Purse Seiners in the Andaman Sea of Thailand, including the following abstract provided by the authors:

"A study of neritic tuna and seerfish fisheries in the Andaman Sea of Thailand was carried out by collecting data from small-scale purse seiners landing at fishing ports along the Andaman Sea Coast of Thailand from January to December 2024. The objectives of the study were to analyze the catch per unit effort (CPUE), species composition, and fishing ground of neritic tunas and seerfishes. The results showed that the overall CPUE of small-scale purse seines was 3,997.49 kg/day. The CPUEs of neritic tunas and seerfishes were 514.44 and 15.21 kg/day, accounting for 12.87% and 0.38% of the total catch, respectively. The species composition of neritic tunas, namely bullet tuna (Auxis rochei), kawakawa (Euthynnus affinis), frigate tuna (A. thazard),

and longtail tuna (Thunnus tonggol), were 6.34%, 3.16%, 1.85%, and 1.52% of the total catch, respectively. While the species composition of seerfishes, namely Indo-Pacific king mackerel (Scomberomorus guttatus) and narrow-barred Spanish mackerel (S. commerson), were 0.27% and 0.11% of the total catch, respectively. The fishing grounds for neritic tunas were mainly located within 50 nautical miles from the shoreline across the Andaman Sea and Strait of Malacca. In contrast, the fishing grounds for seerfishes were found closer to the shore, mainly within the Strait of Malacca."

57. The WPNT **NOTED** that Thai purse seine vessels target small pelagic fish including mackerels, sardines and scads so only really catch neritic tunas opportunistically which is why the catch of these species is small relative to the total catch in these fisheries.

58. The WPNT **NOTED** that the mesh size of the purse seine nets is very small at 25 mm and the mesh size is not changed in different seasons or to target certain species. The WPNT **NOTED** that the length of the net varies depending on the size of the vessel but is limited to 1,500 m maximum length in Thailand.

59. The WPNT **NOTED** that logbooks are required for all purse seine vessels and information from these is recorded by set and further recorded in the Thai-flagged Catch Certification System by trip for traceability purposes. However, for scientific purposes the system does not include all the information from the logbook due to the time required to enter all of this information so this can't be used for estimating CPUE. The WPNT **NOTED** that logbooks must record the species, location and amount by set.

60. The WPNT **NOTED** that approximately 10% of vessels are sampled each month for scientific purposes. The WPNT **NOTED** that the sampling plan aims to ensure that different vessel sizes and fishing grounds are covered by the sampling process as well as a wide range of fish sizes.

61. The WPNT **NOTED** that electronic monitoring is not required for Thai vessels operating within the EEZ but is required for those operating outside the EEZ. The WPNT **NOTED** that there are currently no vessels registered in the IOTC RAV as there are only a few vessels operating in the southern Indian Ocean targeting demersal species.

62. The WPNT **NOTED** that the unit used for effort in Thailand is fishing days and that the total catch is divided by this effort to estimate the CPUE. The WPNT **NOTED** that the number of vessels is not used as a unit of effort as this can very between years so it would be difficult to have an accurate timeseries using this unit.

63. The WPNT **NOTED** that SEAFDEC calculate their CPUE for assessments differently to how the author did this. The WPNT **NOTED** that as the author has information on vessels and catch locations so there should be sufficient data to conduct a CPUE standardisation and so **ENCOURAGED** the authors to conduct this work in the future. The WPNT **ENCOURAGED** the authors to do this on a 1x1 grid basis so it is more standardised with how geo-referenced data should be reported to the IOTC.

64. The WPNT **NOTED** that the market for neritic species varies depending on the species – some are sold to canneries (longtail), some are processed and some sold fresh (Indo-Pacific king mackerel and Narrow-barred Spanish mackerel). Bullet tuna and frigate tuna are also sold fresh.

65. The WPNT **NOTED** that not all purses seine vessels operating in Thai waters catch neritic species due to variations in fishing techniques – neritic species are generally caught in free schools which can be detected with echosounders but some vessels only target schools around Fish Aggregating Devices (FADs) where a small amount of neritic species are caught.

66. The WPNT **NOTED** that logbooks should reflect different fishing methods, such as fishing around FADs, which typically catch several small pelagic species, and differ from other fishing methods.

67. The WPNT **NOTED** paper IOTC–2025–WPNT15–12 on Monitoring neritic tuna exploitation by foreign vessels in Madagascar's EEZ (2024-2025), including the following abstract provided by the authors:

"Neritic tunas (Auxis thazard, Euthynnus affinis), vital for Madagascar's artisanal fisheries, also appear as bycatch in the catches of foreign industrial fleets operating within the country's Exclusive Economic Zone (EEZ). According to ERS data, their share in total catches remains low but shows a slight increase: 0.22% in 2024 and 0.66% in 2025. Although marginal, this presence raises questions about the sustainability of industrial practices, particularly in relation to the use of fish aggregating devices (FADs). The low reported

bycatch rate (1–2%) suggests either underreporting or partial effectiveness of control measures. The study recommends strengthening monitoring systems to protect coastal fishery resources."

68. The WPNT **NOTED** that on the large purse seine vessels operating in Madagascar (and elsewhere in the Indian Ocean), there is often a large problem of misidentification between bullet and frigate tuna and these are regularly aggregated when reported.

69. The WPNT **NOTED** that many purse seine vessels land their catches in Diego Suarez but **NOTED** that this may include catches from outside the EEZ of Madagascar so this would need to be considered if carrying out any analyses due to the difficulties in identifying the catch location.

70. The WPNT **NOTED** that landings in Diego Suarez consist mainly of bycatch of small pelagic species, including neritic species caught by the foreign vessels.

71. The WPNT **NOTED** that Madagascar only started to have access to Electronic Reporting System (ERS) data from 2024.

72. The WPNT **NOTED** that only five vessels are registered on the IOTC RAV for Madagascar but further **NOTED** that there are a large number of smaller vessels operating in the EEZ that are not registered in the RAV.

73. The WPNT **NOTED** that the foreign vessels specifically target tropical tunas which are not regularly encountered within the Madagascar EEZ which is why the reported catches vary significantly.

74. The WPNT **NOTED** that the foreign vessels are not allowed to operate within 20nm of the coast and local vessels rarely operate outside this area so there are minimal conflicts between the national and foreign fleets.

75. The WPNT **NOTED** that catches from gillnets are higher than for any other gears by local vessels, but other gears do also catch neritic species.

76. The WPNT **NOTED** that there is low sampling coverage across the country due to a lack of observers at landing sites.

77. The WPNT **NOTED** paper IOTC-2025-WPNT15-19 on Spatial and temporal size of kawakawa (*Euthynnus affinis*) caught by artisanal gears, including the following abstract provided by the authors:
"The overall objective of the Catch Assessment Survey (CAS) data collection system is to test if data collection through CAS would generate data for monitoring trends in fish catches, fishing effort for use in management planning, policy formulation and decision making. A survey was conducted to determine the impact of different gears on the size structure of Kawakawa (Euthynnus affinis)." – see paper for full abstract.

78. The WPNT **NOTED** that sampling is focused on areas with historically high catches.

79. The WPNT **NOTED** that the length at 50% maturity is based on macroscopic analyses of the gonads to estimate the level of maturity.

80. The WPNT **NOTED** that the IOTC has a set of standards for the collection of size data which state that Fork Length (FL) should be the measurement taken (not Total Length) and sets out the size intervals that should be used for the data and so **ENCOURAGED** CPCs to follow these standards. The WPNT **NOTED** that these standards can be found on the IOTC website here. The WPNT **NOTED** that Total Length should only be used for sharks.

81. The WPNT **NOTED** that vessels regularly carry several gear types so enumerators are required to ask fishermen which is their primary gear.

82. The WPNT **NOTED** that monofilament gillnets are prohibited in Kenya but are known to still be in used further **NOTING** that fishermen may not cooperate with enumerators if their gears are confiscated. The WPNT further **NOTED** that it is difficult to monitor the mesh size of the gillnets being used.

83. The WPNT **NOTED** paper IOTC-2025-WPNT15-20 on Neritic tuna with special reference to the fishery and biology of *Thunnus tonggol* in the Indian Waters, including the following abstract provided by the authors:

"The neritic tuna fishery of India is supported by five key species: longtail tuna (Thunnus tonggol), kawakawa, striped bonito, bullet tuna, and frigate tuna. These species are of high economic value and provide significant livelihood support, especially to the coastal states. They are exploited by mechanized, motorized, and non-mechanized fishing units operating within the Indian Exclusive Economic Zone (EEZ), primarily along the

continental shelf. Gillnetters are the primary gear targeting larger individuals of this group. An analysis of the neritic tuna catches along the Indian coast from 2018 to 2023 revealed annual landings ranging from 56,464 t to 73,732 t, with an average of 55,398 t. Neritic tunas contributed 51–65% to the total tuna catch in India. Among them, Thunnus tonggol (longtail tuna) is widely distributed along the Indian mainland coast and the Andaman and Nicobar Islands. However, its fishery is particularly significant along the northwest coast, accounting for 83% of the national longtail tuna catch. During the study period, annual landings of T. tonggol varied from 7,678 tonnes (2018) to 4,348 tonnes (2023), averaging 4,399 tonnes, and comprising approximately 8% of the total neritic tuna catch. Length measurements of T. tonggol specimens ranged from 34.0 cm to 94.5 cm, with a mean length of 58.7 cm. The observed sex ratio (male:female) was 1:1.96, indicating a strong dominance of females. The population was predominantly composed of immature individuals, with only 8% showing maturity, creating uncertainty in determining the precise size at first sexual maturity. The average fecundity was estimated at 316,568 oocytes, with ova diameters ranging between 189 and 335 µm. Gut content analysis (IRI%) indicated that Acetes spp. (13%), Sardinella spp. (12%), squid (9%), and Solenocera spp. (6%) were the dominant prey groups."

84. The WPNT **NOTED** a map from Griffiths et al., 2019[2] showing the estimated stock structure of longtail tuna around the Indian Ocean. The WPNT **NOTED** that this shows just one stock in the whole Indian EEZ and **NOTED** that the authors of the current paper consider this to be correct despite the large size of this area.

85. The WPNT **NOTED** that the spawning grounds of longtail tuna are still not well known in the waters of India, Arabian Sea or the Arabian Gulf.

86. The WPNT **NOTED** that 500 re-sampling boot-straps were used to run the ELEFAN growth and mortality model and **NOTED** that while more boot-straps would improve the estimations, the model would take a long time to run.

87. The WPNT **NOTED** that India has CPUE for longtail tuna and other neritic tunas in its waters.

88. The WPNT **NOTED** that the length-weight relationships currently held and used by the IOTC Secretariat are outdated as they are based on historical data so **ENCOURAGED** CPCs to provide length frequency data so these relationships can be updated.

89. The WPNT **NOTED** that the Secretariat is in the process of starting a project that will develop a regional sampling programme that can be used to collect more length data as well as collect samples that can be used for population structure and ageing analyses in the future.

90. The WPNT further **NOTED** that the Secretariat will engage with CPCs to review the sampling designs for the regional sampling programme, which maybe vary by country, and will progressively collect the necessary samples.

91. The WPNT **NOTED** paper IOTC-2025-WPNT-22 on Studies on some aspects of biology, population dynamics and proximate composition of Thunnus tonggol (Longtail Tuna) occurring in the North-West coast of Indian EEZ, including the following abstract provided by the authors:

"Studies on Length-weight relationship, age, growth, mortality parameters, food & feeding habits, maturity & spawning and proximate composition of longtail Tuna, Thunnus tonggol occurring along the north-west coast of Indian EEZ were attempted for the present research work. A total of 1214 specimens were collected from the major fish landing centers of Gujarat and Maharashtra, India during the period 2018 - 2022. The fork length of this species ranged between 22 and 86 cm, regression coefficient (b) is 2.65, and correlation coefficient 'r2' is 0.9 indicating a high degree of correlation and better fit of the length-weight relationship. The asymptotic length (L∞), Curvature parameter (K) of the VBGF are 98.65, 0.39 respectively and age at zero length (to) is -0.33 and the growth performance index (f) is 3.72. The natural mortality (M), fishing mortality (F) and total mortality rate for estimated at 0.73 year-1, 0.49 year-1 and 1.22 year-1 respectively. The gut content of longtail tuna is dominated with small pelagic fishes, particularly carangids, myctophids, anchovies, clupeids, crustaceans (mostly of Acetes indicus) and Cephalopods (only squids). In T. tonggol, the proportion of maturing females (stage III) was found to be high in Jan - March and decreased to the lowest levels in May-August and thereafter increased to the highest level in December. Matured females were found during

[2] Griffiths, S.P., Leadbitter, D., Willette, D. *et al.* Longtail tuna, *Thunnus tonggol* (Bleeker, 1851): a global review of population dynamics, ecology, fisheries, and considerations for future conservation and management. *Rev Fish Biol Fisheries* **30**, 25–66 (2020). https://doi-org.fao.idm.oclc.org/10.1007/s11160-019-09589-5

January - April and also during August - September. Spent females were observed in January and February and again during April and May. This implies that there are two district spawning seasons for longtail tuna. The species T. tonggol attain maturity at 480 mm and the minimum size at maturity (50%) for females of T. tonggol reported at 240 mm F.L. The sex ratio (male to female) for T. tonggol was recorded found to be 1:1.3. The Gonado Somatic Index (GSI) values of females ranged from 0.042 to 0.573 in T. tonggol. The fecundity of Thunnus tonggol varies from 1,43,230 to 22,30,000. The proximate composition indicated the moisture content of 71.0%, protein (23.2%), lipid (4.2%), glycogen (0.4%) and ash (1.4%). The results derived from this study would be helpful in deriving strategies for improving the exploitation of this species with a sustainable approach."

92. The WPNT **NOTED** that the authors estimated the relative age from the length frequency data. The WPNT **NOTED** that epigenetic techniques have been used for ageing of tropical tuna species which uses readings from muscle or other tissues which are generally easier to collect than otoliths. However, the WPNT **NOTED** that it is still necessary to conduct age validations against otolith or dorsal spine readings and that the calibration process is still complicated. The WPNT **NOTED** that the authors may consider conducting this type of work with longtail tuna and other neritic species in the future.
93. The WPNT **NOTED** a summary table provided by the authors showing a variety of studies comparing growth parameters from different geographical areas but **NOTED** that the length type is not determined in this table so **ENCOURAGED** the authors to include the length type information in the future.
94. The WPNT **ENCOURAGED** the authors to investigate the differences in growth between sexes as it may help to explain some differences seen in the Linf values.
95. The WPNT **NOTED** that the fishing mortality rate is lower than the natural mortality rate, which, according to the author, means that the stock in question is sustainable. The WPNT further **NOTED** that there may be regional variability in stock status of the species.
96. The WPNT **NOTED** paper IOTC-2025-WPNT15-21 on Biological characteristics and spawning potential of neritic tunas (*Euthynnus affinis* and *Thunnus tonggol*) in the West Coast of Peninsular Malaysia, including the following abstract provided by the authors:

"This study examines the biological characteristics Euthynnus affinis (Kawakawa) and Thunnus tonggol (Longtail tuna) from the West Coast of Peninsular Malaysia, focusing on length-weight relationships, length frequency distribution (LFD), condition factors, and spawning potential. Length-weight relationships showed strong allometric growth: W = 0.00002L^2.98 (R^2 = 0.985) for Kawakawa and W = 0.00004L^2.87 (R^2 = 0.969) for Longtail tuna. LFD analysis indicated gear-specific selectivity. Trawl-caught individuals were generally larger and more uniform in size compared to purse seine. Kawakawa ranged from 109–614 mm, with purse seine catches dominated by smaller sizes (mode: 205 mm) and trawl catches showing a mode of 290 mm. Longtail tuna ranged from 131–572 mm, with larger modes in trawl (405 mm) compared to purse seine (355 mm). Condition factor (K) trends showed that Longtail tuna were consistently in better condition than Kawakawa. A declining K was observed from 2022 to 2024, particularly in purse seine catches, possibly due to spawning activity, environmental changes, or fishing pressure. Length-Based Spawning Potential Ratio (LBSPR) analysis suggests both species are under growth overfishing. Kawakawa SPR declined from 0.23 (F/M = 2.46) in 2022 to 0.20 (F/M = 1.54) in 2024. Longtail tuna showed a sharper SPR drop from 0.37 to 0.14, with F/M peaking at 6.49 in 2023. In summary, Longtail tuna showed better overall condition, but both species exhibited declining reproductive potential. These findings highlight the importance of gear-based monitoring and targeted management to ensure sustainable exploitation of neritic tuna along the West Coast of Peninsular Malaysia."

97. The WPNT **NOTED** that the trawl fishery that has been catching some neritic species is a trawl which can catch pelagic species including neritic tunas.
98. The WPNT **NOTED** that bullet tuna is very rare in Malaysia but there have been some issues of misidentification with frigate tuna.
99. **NOTING** the limited length data held by the Secretariat for these species, the WPNT **CONGRATULATED** the authors on collecting good length frequency data for this study. The WPNT **NOTED** that good, representative length data collected by gear and species is important for running the size-based assessments that the Secretariat has been running for some of the neritic species. The WPNT therefore **ENCOURAGED** Malaysia and all CPCs to collect good length data and report these to the Secretariat.

5.2 Stock assessment updates

100. The WPNT **NOTED** paper IOTC–2025–WPNT15–15 on A multi-species ratio approach to estimate eastern little tuna abundance independent of fishing effort, including the following abstract provided by the authors:

"Catch-per-unit-of-effort (CPUE) as index of abundance can serve as a valuable indicator of trends in stock biomass, particularly for calibrating the stock assessment. However, obtaining a reliable index becomes challenging in fisheries interacted with fish aggregating devices (FADs), as effort is no longer easily defined. FADs are designed to maintain catchability, thereby violating the assumption that CPUE is proportional to stocks size. To address this, a simple alternative approach is proposed that estimates stock abundance using the ratio of catches between target and reference species. The catch-ratio estimator performs well when its assumptions are met, and including multiple reference species can improve estimation accuracy. In this case, yellowfin tuna, particularly when combined with skipjack tuna, appears to be a suitable predictor for eastern little tuna. However, further research is needed before this method can be applied in formal stock assessments."

101. The WPNT **NOTED** the presentation, and the inherent challenges associated with developing abundance indices for neritic tuna in the IOTC due to their interactions with FADs, **NOTING** that these interactions may violate assumptions that the CPUE is proportional to stock abundance.

102. The WPNT **NOTED** that benchmarking from the EU fleets include drifting FAD density as a variable in CPUE standardisation, however this is difficult in Indonesian waters (eastern IOTC Area) as information is not available on either FAD density or number of sets completed around FADs. Hence, the testing of a new method to generate a CPUE that may be reflective of eastern little tuna abundance.

103. The WPNT **DISCUSSED** the assumptions associated with this approach, **NOTING** that in order to use catch data from other species (e.g. SKJ, BET, YFT) to inform CPUE indices for kawakawa, other variables need to be proportional between the catch data, and the location of individual sets from which catch data are derived. The WPNT **NOTED** that selectivity had been taken into account (all catch data were from purse seine operations), however catchability is unlikely to be constant between all species in the analyses.

104. The WPNT **NOTED** that abundance of kawakawa is estimated using the catch ratio of tropical tunas, and that the ratios are stable over time, providing support for this methodology. The WPNT **NOTED** that the catch data were representative of average catch by set by month. However, the author also suggested that next steps would be to not use PS CPUE, but to use the 'vulnerable biomass' for each species as this may provide a more accurate estimate of kawakawa abundance.

105. The WPNT **NOTED** paper IOTC–2025–WPNT15–14 entitled Assessment on Kawakawa (*Euthynnus affinis* Cantor, 1849) using data limited approach in the eastern Indian Ocean, including the following abstract provided by the authors:

"*Kawakawa (Euthynnus affinis Cantor, 1849) is a significant species targeted by small-scale fishers in the eastern Indian Ocean, specifically using purse seine. However, limited data on this species pose challenges for effective fisheries management. This study aims to assess the stock status of kawakawa in Indonesian waters using Length-Based Spawning Potential Ratio (LBSPR) analysis. LBSPR is a reliable biological reference point often used to guide management decisions in data-limited fisheries. The analysis utilized 7,619 length-frequency data points from kawakawa specimens landed in Fisheries Management Areas 572 and 573. Data were collected monthly from 2015 to 2021, with fish lengths ranging between 25 and 73 cm. The stock assessment was conducted using a length-based spawning potential ratio (LBSPR) method. Results indicated an estimated SPR of 21%, under the management target of 40%. This suggests that the kawakawa stock is currently overexploited in Indonesian waters. Consequently, local authorities may consider advising the fishers reducing their fishing efforts for this species.*"

106. The WPNT **NOTED** the presentation and the work that has gone into producing a LBSPR reference point for the time period 2015-2021, acknowledging that the work estimated that the SPR (spawning potential ratio) was 0.21 (or 21 %), under the management target of 0.40 (40 %).

107. The WPNT **DISCUSSED** the methods and the very low sample size in 2018 (only 38 samples), which lead to the SPR not being estimated in that year. In the latest year, 2021, the model did not converge and the WPNT **NOTED** that this may have been due to the growth parameters used in the LBSPR, **NOTING** that measurements

were taken from Indonesian waters (so will be representative), however these have not been updated in some years.

108. The WPNT **DISCUSSED** the possibility of using size data from other fisheries, **NOTING** that the LBSPR method relies on length measurements from across the size spectrum – therefore if any large fish are missing, the results may be biased. The WPNT **NOTED** that the analysis will be extended to include data from gillnet fisheries.

109. The WPNT **NOTED** paper IOTC–2025–WPNT15–18 on Length based data limited methods: Application on the Narrow barred Spanish mackerel in the Persian Gulf & Oman Sea, including the following abstract provided by the authors:

"Narrow – barred Spanish mackerel, Scomberomorus commerson, is a species of economic and artisanal importance throughout the Indo-West Pacific region. In this study a total of 2973 S. commerson were examined in a comprehensive study of length frequency structure and maturity assessment along the northern Persian Gulf & Oman Sea. Length maturity 50% was estimated. LBSPR, and LIME were used to analyze length frequency distributions from commercial gill net catches between 2011 and 2023. The results indicate that the stock is overfished, with low proportions of mature and optimal- sized individuals and an excessive harvest of juveniles, as shown by the model estimates of F/M ratios and SPR values below target levels. this study highlights the importance of using multiple models and choosing appropriate priors to improve the quality of stock assessments in data-limited fisheries."

110. The WPNT **NOTED** the presentation, including the management measures of this species in the RECOFI Area (Persian Gulf and Oman Sea) where there is a temporal closure for the species between 15 August and 15 October every year.

111. The WPNT **NOTED** the results of the analysis that suggested that the stock appeared to be overfished and subject to overfishing in 2024, **NOTING** the context that this is one of perhaps at least four different genetic populations of *S. commerson* in the IOTC Area of Competence.

112. The WPNT **DISCUSSED** the high variation in life history parameters presented in the study and **NOTED** that there could be many reasons for these differences, including sampling timing and location (e.g. on a spawning ground or further away), and the lack of length-stratification within the sampling methods.

113. The WPNT **NOTED** that the fishery is targeting undersized individuals, and that the LBSPR methods indicate that the SPR is low (< 0.4 or 40 %). The WPNT **NOTED** that it is likely that recruitment overfishing is occurring as F/M > 1 for the period of the study.

114. The WPNT **NOTED** that the presenter will test other length-based methods to provide greater certainty in these results.

115. The WPNT **DISCUSSED** the life history parameters used in the study, and **AGREED** that there could be a range of reasons that the length at which 50 % of the fish are mature (L_{50}) was shorter in this study than in previous work.

116. The WPNT again **ACKNOWLEDGED** the regional management measures in place within the Persian Gulf and Oman Sea (temporal closure to fishing).

5.3 Development of management advice for neritic tuna species

117. The WPNT **NOTED** that as new assessments were not conducted in 2025, the management advice remains the same as in 2024.

118. The WPNT therefore **ADOPTED** the management advice developed for the species under its mandate as provided in the draft resource stock status summaries in the Appendices, and **REQUESTED** that the summary be provided to the SC as part of the draft Executive Summaries, for its consideration.

6. STOCK IDENTIFICATION METHODS AND FISHERIES MANAGEMENT

6.1 Population structure and connectivity in stock assessments

119. The WPNT **NOTED** paper IOTC-2025-WPNT15-INF02 on Identification unit stock and fisheries management which provided a summary of some of the studies carried out in the Indian Ocean on determining stock structure of neritic species.

120. The WPNT **NOTED** paper IOTC-2025-WPNT15-INF03 on the Importance of connectivity in stock assessment.

121. The WPNT **NOTED** and **DISCUSSED** the definitions of populations vs. stocks in fisheries science and the importance of knowing how stocks are connected to each other.

122. The WPNT **NOTED** that when stocks are discrete, and they don't mix they should be managed and assessed separately, however if there is evidence of mixing (through tag recaptures, Close-Kin Mark-Recapture (CKMR) or other methods), then connectivity rates need to be estimated and included in any stock assessment framework.

123. The WPNT **NOTED** that if connectivity rates were not accounted for in such a stock assessment, all relevant impacts on a fish population biomass would not be accounted for appropriately. The WPNT further **NOTED** that it is important to consider movements across all life stages within an assessment

124. The WPNT **DISCUSSED** different genetic methods for identifying movement between two stocks, **NOTING** that there are multiple methods that can detect movement, but that more recent methods (e.g. CKMR, and epigenetics) may provide more detailed information compared to assessing Single Nucleotide Polymorphisms (SNPs).

125. The WPNT **NOTED** that an advantage of CKMR is that genetic markers are carried across generations so the full life cycle is accounted for which would be very difficult to detect using other techniques.

126. The WPNT **NOTED** that epigenetics is a promising tool in which genetic markers evolve quicker than other genetic markers which could help to assign fish to one stock of origin.

127. The WPNT **DISCUSSED** the assessment of individual stocks of the same population in other tuna RFMOs, **NOTING** the example from SPC where the assessment of albacore stocks is split between the north and south Pacific, with separate assessments, and separate management regulations (two separate stocks). The WPNT also **NOTED** that Atlantic bluefin is assessed using a two-area stock assessment where east and west Atlantic bluefin are separate stocks, but there is some degree of mixing and movement that is captured within the assessment framework. This is the only stock assessment where there is a true spatial component with connectivity between multiple stocks within a single assessment.

128. The WPNT **NOTED** that as each stock assessment is tailored to the stock under assessment, the parameters included in each (including those relating to connectivity) may vary.

6.2 Recent and ongoing genetic studies relevant to IOTC's neritic species

129. The WPNT **NOTED** paper IOTC–2025–WPNT15–16 on Molecular identification, feeding and reproductive parameters of neritic tuna species occurring in Sri Lanka, including the following abstract provided by the authors

> *"The tuna fishery is a very important fishery in Sri Lanka. Neritic tunas are a group of tunas which are commonly found in the Indian ocean in large numbers. Out of the 5 species of neritic tuna and tuna-like species found in Sri Lankan waters, the 3 species, kawakawa (Euthynnus affinis), frigate tuna (Auxis thazard) and bullet tuna (Auxis rochei) represent the highest percentages in the neritic tuna catches. This study was conducted to carry out molecular identification and to determine the feeding habits and reproductive biology of these three neritic tuna species. Samples were collected from 5 fishery provinces of Sri Lanka: Northwestern, Western, Southern, Southwestern and Northeastern provinces The species identification accomplished by DNA barcoding using the mitochondrial COI region sequences, identified the individual samples to species level with more than 99% similarity. This also showed 7 samples had been misidentified using morphological features. This highlights the importance of molecular identification of species, when morphological features are not clear, specifically in juvenile stages of these fish. Reproductive studies on these species revealed that the male:female ratio for all three species is approximately 1. The spawning*

season for E. affinis was seen to be March to June and August to October for females and June to July and in November for males. For A. thazard the GSI values have peaked during May to July and in October for females and in May to August and in February for males. The length at first maturity (L_{50}) values for female male E. affinis were 40.8 cm and 35.1 cm respectively. These values for female and male A. thazard were 33.0 cm and 32.1 cm respectively and the values for female and male A. rochei were 27.5 cm and 27.7 cm respectively. E. affinis and A, rochei stomachs revealed they were feeding mainly on small fin fish such as herrings (Amblygaster sirm), sardines (Sardinella spp.), bigeye scad (Selar crumenophthalmus) and lizard fish (58.28% and 38.46% respectively). The second highest percentage was seen to be crustaceans for these two species (18.10% and 19.23% respectively). For A. thazard, the prey percentage was shown to be crustaceans (77%) followed by small fish (31.21%). Furthermore, the analysis showed that they have ingested a combination of prey items. This information on E. affinis, A. thazard and A. rochei will be of importance when management plans for these species are being implemented."

130. The WPNT **NOTED** the presentation on the genetic analyses of three species of tuna – *E. affinis*, *A. thazard*, and *A. rochei* noting the morphological features normally used for the identification of kawakawa, frigate, and bullet tuna.

131. The WPNT **NOTED** that there were two spawning periods for these species between May-July and August-November, **NOTING** that males entered the reproductive window slightly after females.

132. The WPNT **REQUESTED** that measurements for tuna be changed to fork length for consistency with other studies.

133. The WPNT **NOTED** paper IOTC–2025–WPNT15–17 on Genome scans reveal extensive population structure in three neritic tuna and tuna-like species in the Indian Ocean, including the following abstract provided by the authors:

"Neritic tunas and tuna-like species are an important resource for many coastal nations worldwide supporting both commercial and artisanal fisheries, but little is known about their population structure at a spatial scale required for effective fisheries management.In this study, we use Next Generation Sequencing methods to investigate the genetic connectivity of three major neritic tuna and tuna-like species in the Indian Ocean: Longtail Tuna (Thunnus tonggol), Kawakawa (Euthynnus affinis), and narrow-barred Spanish mackerel (Scomberomorus commerson). We sampled 293 Longtail Tuna from three locations, 362 Kawakawa from seven locations, and 210 narrow-barred Spanish mackerel from six locations. Genetic data showed clear evidence of heterogeneity in all three species, and patterns of isolation-by-distance were detected in Kawakawa and narrow-barred Spanish mackerel. Pairwise FST estimates of population differentiation and model-based grouping (mixture models) revealed that (i) individuals of Longtail Tuna from each sampling location belonged to a distinct genetic group, (ii) at least two different groups of Kawakawa were identified, and (iii) at least four groups of narrow-barred Spanish mackerel were identified across the sampled range within the north and eastern Indian Ocean. These results demonstrate that neritic tunas exhibit genetic structuring at small to medium spatial scales that need to be considered in the design of monitoring and assessment systems for fisheries management purposes in the northern and eastern parts of their range in the Indian Ocean. Further sampling, at a finer spatial resolution within the range of the current study, and across the north-western and western parts of their range of the Indian Ocean that were not covered in the current study, is required to provide a comprehensive understanding of the number of populations present and the spatial extent of individual populations in the Indian Ocean and adjacent seas."

134. The WPNT **NOTED** the presentation that focused on results from a project looking at tuna, tuna-like, and billfish species and their stock identification, using genetic methods (single nucleotide polymorphisms, or SNPs). The WPNT **NOTED** that SNPs can be used to infer population structure, and that most populations will have similarities at the nucleotide sites studied in SNP analyses, as opposed to differences.

135. The WPNT **NOTED** the challenges with an oceanwide project, **NOTING** that organising the sampling was the most challenging part of the project.

136. The WPNT **NOTED** the results from the study, showing that there was likely population structure (e.g. stocks) within longtail tuna (three hypothesised stocks); kawakawa (two hypothesised stocks, showing a gradient across the Indian Ocean); and narrow-barred Spanish mackerel (at least five hypothesised stocks).

137. The WPNT **NOTED** that when new sampling locations were provided, at least for longtail tuna and narrow-barred Spanish mackerel, new stocks were identified using the methods presented, emphasising the importance of representative coverage from all species across the Indian Ocean.

138. The WPNT **DISCUSSED** regional complexities relating to the likelihood of population structure (and stock identification) within the data presented, noting the **ENCOURAGEMENT** from the authors to provide further samples in any follow-up or extension studies.

139. The WPNT **DISCUSSED** the possibility of population structure within the tropical tunas, and the complexities surrounding whether genetic differences represent isolated breeding populations that occasionally mixed, or truly separate stocks within a population, or perhaps an indication of speciation. The WPNT **DISCUSSED** and **NOTED** the difficulty of collecting good data for tropical species where individuals can swim 1000s of kilometres and likely mix with different parts of the population, preventing clear differences in SNPs being detected.

140. The WPNT **DISCUSSED** sampling strategies for the project and **AGREED** that it was important to have samples from the spatial extent of the study area (e.g. there were few samples collected from the western Indian Ocean).

141. The WPNT **DISCUSSED** the pros and cons of various methods used to sequence the SNPs, **NOTING** that all methods should provide the same answers, and that it was a question of preference or resourcing as to whether a study used DaRTSeq or RADseq.

142. The WPNT **DISCUSSED** sample sizes and **NOTED** that a study requires at least five (5) samples to detect population structure, but that greater coverage would provide better accuracy and lower uncertainty.

143. The WPNT **DISCUSSED** implications for stock assessment of neritic tunas, particularly with, for example, narrow-barred Spanish mackerel, where at least five hypothesised stocks are likely within the IOTC, **NOTING** that there are few data available for this species. The WPNT **NOTED** that stock assessments should be carried out on discrete stocks, and that if there is substantial evidence that one stock is not interacting with another stock, that these should be treated as separate stocks that make up one population of a species. However, if the individual stocks are connected (e.g. possibility of this being the case in the kawakawa population), it would be better to have a stock assessment that accounted for movement rates between two areas, as used in tropical tuna assessments.

144. The WPNT **NOTED** the benefits of Close-Kin-Mark-Recapture methods in neritic tunas, as these methods could not only identify population structure, but also provide information on connectivity at the fine scale between stocks and provide abundance indices.

145. The WPNT **NOTED** information paper IOTC-2025-WPNT15-INF01 on *Scomberomorus guttatus* and *S. lineolatus* identified in Sri Lanka by DNA barcoding, including the following abstract provided by the authors:

"The mitochondrial COI (Cytochrome c oxidase subunit I) region was sequenced for 8 fish samples of genus Scomberomorus in Sri Lanka. Comparison with the COI region sequences registered in NCBI Genbank identified 6 samples as Scomberomorus guttatus and 2 samples as Scomberomorus lineolatus. Comparison with COI region sequences registered with clear indication of sampling location also indicated the existence of a new species, possibly occurring in India, whose appearance is similar to S. guttatus."

146. The WPNT **NOTED** that it is difficult to distinguish between the two species discussed using physiological measurements as eye and jaw measurements are not consistent. The WPNT **NOTED** that the morphological features are very similar and that investigating the bending points in the intestines of each species can help to distinguish between *S. guttatus* and *S. koreanus.* Genetic analyses can be very valuable in determining which is the correct species.

147. The WPNT **NOTED** that it is important to correctly identify the species before investigating its stock structure to avoid errors.

148. The WPNT **NOTED** that a similar species to that described in this paper has been found off the West Coast of India by Abdussamad et al., 2024[3] and **NOTED** that there is a potential for these individuals to belong to a different species under the genus *Scomberomorus.*

6.3 Approaches to determining population structure

149. The WPNT **NOTED** paper IOTC-2025-WPNT15-INF04 on Methods for determining stock structure, connectivity and assessment.

150. The WPNT **NOTED** that generally the first step to better understanding a stock is to determine the boundaries between stocks then to determine the amount of connectivity between separate stocks and the potential implications for assessment, and management. The WPNT **NOTED** that most studies have focused on the first step of locating the stock boundaries as this is easier to determine.

151. The WPNT **NOTED** that the majority of work on stock structure and connectivity has been focused on tropical tuna species so there is much more to research into for neritic species which generally migrate less than tropical species and so are more likely to be composed of smaller sub-populations or stocks.

152. The WPNT **NOTED** that at this stage, any information about stock structure of IOTC's neritic species is important and a first step would be to determine the main boundaries between different stocks if they exist. The WPNT further **NOTED** that knowing some information about stock connectivity can help to determine the level of impact that fishing in one area would have on another area.

153. The WPNT **NOTED** that tagging studies are not very common as it is an expensive process. The WPNT **NOTED** that the recovery rate for tagging studies is very variable and depends on the effort put into the recovery of tags as well as the proportion of a population that is tagged.

154. The WPNT **NOTED** that although tagging studies are expensive, they provide a range of information that is useful in stock assessments – not just movement or stock connectivity, but also information on growth, natural mortality, and fishing mortality.

155. The WPNT **NOTED** a stock structure study conducted in Indonesia in 2013 which compared results obtained from a genetic, otolith chemistry and parasite approach. The WPNT **NOTED** that the study indicated that there were some differences in stocks in Indonesia compared with the Pacific but there was insufficient information to be certain so there is a new project being developed by Indonesia, Vietnam and the Philippines to better understand how the stocks in their region compare to the rest of the Pacific Ocean.

156. The WPNT **NOTED** that we are not yet in a position to estimate the impact of climate change on stock connectivity. The WPNT **NOTED** a large project that is ongoing in the Pacific led by SPC which is dedicated to understanding the impacts of and preparing fisheries for climate change with the ultimate goal of predicting how fisheries will change. The WPNT **NOTED** that this project is a multidisciplinary collaboration over seven years with significant funding associated with the project.

157. The WPNT **NOTED** paper IOTC-2025-WPNT15-INF05 on New techniques for determining stock structure and connectivity.

158. The WPNT **NOTED** that for CKMR studies it is not necessary to know the distribution or movement of the parents and siblings in the population **NOTING** that through the course of a CKMR study this information as well as an estimate of abundance will become clearer. However, the WPNT **NOTED** that it is beneficial to have a rough idea of where it would be best to sample in terms of areas that contain either adults and/or juveniles.

159. The WPNT **NOTED** that the FAD ecological trap theory hypothesis that the vertical and horizontal movement of individuals may be more limited when associated with a FAD than when they are free swimming. The WPNT **NOTED** that this should not pose an issue for CKMR studies as a range of parameters that may be affecting the distribution and rate of kin-pairs found can be investigated.

160. The WPNT **NOTED** paper IOTC-2025-WPNT15-INF06 on Close-kin mark-recapture (CKMR) design studies for Australian Spanish mackerel populations.

[3] Abdussamad, E.M., Toji, T., Margaret, A.M., Mini, K.G., Rajesh, K.M., Azeez, P.A., Ramar, V., Retheesh, T.B., Abbas, A.M., Shihab, I. and George, S.M., 2024. Untangling the taxonomic ambiguities of the spotted seerfish Scomberomorus guttatus with the description of a new species from India. Journal of Fish Biology, 104(3), pp.662-680.

161. The WPNT **NOTED** that CKMR techniques can be applied to obtain an estimate of stock size/abundance as well as connectivity between stocks.

162. The WPNT **NOTED** that while it is possible to conduct CKMR without having some understanding of the population structure of a species, it is beneficial to have a rough estimate of population structure as this will help to determine the most efficient sampling design.

163. The WPNT **NOTED** examples of CKMR studies carried out in the Pacific Ocean where over the course of the study, a population structure emerged where it was not previously known, and this helped to tailor the design of the rest of the project in order to provide the best value for time and money.

164. The WPNT **NOTED** that for the species covered in the study presented in paper IOTC-2025-WPNT15-17, the results from the study would give a good starting point for knowing where to sample for a CKMR study.

165. The WPNT **NOTED** that it is also beneficial to have an estimate of the abundance of a stock that CKMR will be applied to. The WPNT **NOTED** that this may pose a challenge in the Indian Ocean as there are currently no established abundance indices that cover the population of narrow-barred Spanish mackerel. Additionally, there are no integrated stock assessment frameworks that have been developed for neritic species in the IOTC.

166. The WPNT **NOTED** that localised indices of abundance or catch data which gives an indication of the stock size could be used where these are available. The WPNT further **NOTED** that comparing catch information with other fisheries that do have assessments may also give a range of biomass scenarios that can be used to inform sampling design.

167. The WPNT **NOTED** that where a population is believed to be smaller, or if the area to be sampled is smaller than another area, fewer samples are required to carry out a CKMR study

168. The WPNT **NOTED** that CKMR can be used to form an index of abundance in place of the traditional CPUE index. The WPNT further **NOTED** that CKMR provides an estimate of abundance for the year in which the parents were born so it back-calculates a few years from when the study is being conducted.

169. The WPNT **NOTED** that CKMR can be used to ground-truth estimates of abundance from stock assessment modelling outputs if long-term sampling is not feasible.

170. The WPNT **NOTED** that finding 100 kin pairs would provide a good amount of certainty around the connectivity and size of a stock and **NOTED** that this is easier to achieve in a smaller population as fewer samples are required to find kin-pairs. The WPNT also **NOTED** that previous studies have been successful with fewer kin pairs.

7. PROGRAMME OF WORK (RESEARCH AND PRIORITIES)

7.1 Revision of the WPNT Program of Work 2026–2030

171. The WPNT **NOTED** paper IOTC–2025–WPNT15–08 on Revision of the WPNT Program of Work (2026-2030).

172. The WPNT **SUGGESTED** that both stock structure work and the collection and analysis of length-frequency data should again be priority topics for the coming year and for inclusion on next year's agenda.

173. The WPNT **NOTED** that it is important to assign high priority to the most important work that is required from the WPNT in order to secure funding for this work when the Program of Work is presented by the SC to the Commission. The WPNT **AGREED** that the following work streams will be presented as high priority in the Program of Work:

- Stock structure: Genetic research to determine the connectivity of neritic tunas throughout their distributions;
- Improvement of stock assessment methodology, in particular further investigations of the effect of input priors and parameters on model outputs and further model validation analyses;
- Data mining and collation to improve stock assessments;
- Biological information (parameters for stock assessment): Review and summarise information on key biological parameters for neritic species.

174. The WPNT **RECOMMENDED** that the SC consider and endorse the WPNT Program of Work (2026–2030), as provided in Appendix VI.

7.2 Development of priorities for an Invited Expert at the next WPNT meeting

175. The WPNT **NOTED** that the invited expert for the 2025 meeting was an expert in genetics and stock structure and **NOTED** their valuable contribution to the discussions. The WPNT **NOTED** that it could be useful to continue with this kind of work and suggested that the following topics could be discussed in the future:

- How to use information from CKMR to build population dynamics information and to estimate biomass for assessments and how to introduce these parameters into assessments
- Sampling design for stock structure projects and how this could be integrated into the IOTC regional sampling programme.

176. The WPNT **AGREED** to the following core areas of expertise and priority areas for contribution that need to be enhanced for the next meeting of the WPNT in 2026, by an Invited Expert:

1) data poor assessment approaches (e.g., catch only methods, length-based approaches);

2) Stock structure/genetics.

8. OTHER BUSINESS

8.1 Date and place of the 16th and 17th Working Party on Neritic Tunas

177. **NOTING** the decline in participation and the reduced number of paper submissions in recent years, which has resulted in shorter meetings, the WPNT **RECOMMENDED** that the SC consider setting the WPNT meeting duration to four days as a standard. However, it also suggested retaining flexibility to extend the meeting when necessary, such as when a training workshop is requested by CPCs for inclusion in the agenda.

178. The WPNT **SUGGESTED** holding the meeting during the first two weeks in July as per the usual schedule.

179. The WPNT gratefully **ACCEPTED** an invitation from Malaysia to host the 16th Working Party on Neritic tunas in 2026.

180. The WPNT **REQUESTED** CPCs that may be interested in hosting the 17th Working Party on Neritic tunas to contact the Secretariat.

8.2 Nomination of the Chair and Vice-Chair of the Working Party on Neritic Tunas

Chairperson

181. The WPNT **NOTED** that the first term of the current Chairperson, Dr Farhad Kaymaran (IRN) expired at the close of the WPNT15 meeting and, as per the IOTC Rules of Procedure (2014), participants were required to elect a new Chairperson of the WPNT for the next biennium.

182. **NOTING** the Rules of Procedure (2014), the WPNT **CALLED** for nominations for the position of Chairperson of the IOTC WPNT for the next biennium. Dr Farhad Kaymaram (IRN) was nominated, seconded and elected as Chairperson of the WPNT for the next biennium.

Vice-Chairperson

183. The WPNT **NOTED** that the first term of the current Vice-Chairperson, Mr Bram Setyadji (IDN) expired at the close of the WPNT15 meeting. As per the IOTC Rules of Procedure (2014), participants were required to elect a new Vice-Chairperson of the WPNT for the next biennium.

184. **NOTING** the Rules of Procedure (2014), the WPNT **CALLED** for nominations for the positions of Vice-Chairperson of the IOTC WPNT for the next biennium. Mr Bram Setyadji (IDN) was nominated, seconded and elected as Vice-Chairperson of the WPNT for the next biennium.

8.3 Review of the draft, and adoption of the Report of the 15th Working Party on Neritic Tunas

185. The WPNT **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPNT15, provided in Appendix XIII, as well as the management advice provided in the draft resource stock status summary for each of the six neritic tuna (and mackerel) species under the IOTC mandate, and the combined Kobe plot for the species assigned a stock status in 2025:

- Bullet tuna (*Auxis rochei*) – Appendix VII
- Frigate tuna (*Auxis thazard*) – Appendix VIII
- Kawakawa (*Euthynnus affinis*) – Appendix IX

- Longtail tuna (*Thunnus tonggol*) – Appendix X
- Indo-Pacific king mackerel (*Scomberomorus guttatus*) – Appendix XI
- Narrow-barred Spanish mackerel (*Scomberomorus commerson*) – Appendix XII

186. The report of the 15th Session of the Working Party on Neritic Tunas (IOTC–2025–WPNT15–R) was **ADOPTED** by correspondence.

APPENDIX I
LIST OF PARTICIPANTS

CHAIRPERSONS					
Title	**First name**	**Last name**	**Affiliation**	**CPC**	**E-mail**
Mr.	Bram	Setyadji	National Research and Innovation Agency (BRIN)	INDONESIA	bram.setyadji@gmail.com
Mr	Farhad	Kaymaram	Iranian Fisheries Science Research Institute	IRAN, ISLAMIC REPUBLIC OF	farhadkaymaram@gmail.com
Title	**First name**	**Last name**	**Affiliation**	**CPC**	**E-mail**
Ms.	Effarina	Abdullah	Department of Fisheries	MALAYSIA	effarina@dof.gov.my
Ms.	Deka Abdi	Alasow	Ministry of Fisheries and Blue Economy	SOMALIA	dekaabdi039@gmail.com
Mr.	Isaac	Barasa	Kenya Fisheries Service	KENYA	barasawafula71@gmail.com
Mr.	Daniel	Bristol	Seychelles Fisheries Authority	SEYCHELLES	daniel.bristol@sfa.sc
Dr.	Don	Bromhead	ABARES	AUSTRALIA	Don.Bromhead@aff.gov.au
Mr.	Emmanuel	Chassot	IOTC Secretariat		Emannuel.Chassot@fao.org
Mr.	Thomas	Chevrier	Ifremer	FRANCE(OT)	thomas.chevrier@ifremer.fr
Ms.	Cynthia	Fernandez Diaz	IOTC Secretariat		Cynthia.FernandezDiaz@fao.org
Mr.	Dan	Fu	IOTC Secretariat		Dan.Fu@fao.org
Dr.	Tadanori	Fujino	OFCF Japan	JAPAN	ofcf.fujino@gmail.com
Ms.	Chika	Fukugama	Fisheries Agency of Japan	JAPAN	chika_fukugama740@maff.go.jp
Dr.	Deishini	Herath	National Aquatic Resources Research and Development Agency (NARA)	SRI LANKA	deishini.herath@yahoo.com
Mr.	Yusuke	Kakutani	Overseas Fishery Cooperation Foundation of Japan	JAPAN	kakutani@ofcf.or.jp
Mr.	Moazzam	Khan	WWF-Pakistan	PAKISTAN	mmoazzamkhan@gmail.com
Mr.	Naomasa	Kugimoto	Overseas Fishery Cooperation Foundation of Japan	JAPAN	kugimoto@ofcf.or.jp

Mr.	Marolova	Rasolomampionona	Ministry of Fishery and Blue Economy	MADAGASCAR	lovastat.mrhp@gmail.com
Ms.	Yuka	Matsuzawa	Fisheries Agency of Japan	JAPAN	yuka_matsuzawa450@maff.go.jp
Mr.	Abdirizak Abdirahman	Mohamed	Ministry of Fisheries and Blue Economy	SOMALIA	Abdirizakmohamed@cu.edu.so
Dr.	Vinod Kumar	Mudumala	Fishery Survey of Inda	INDIA	vmudumala@gmail.com
Mr.	Raju	Nagpure	Fishery Survey of India	INDIA	rajusnagpure@gmail.com
Ms.	Lauren	Nelson	IOTC Secretariat		Laure.Nelson@fao.org
Dr.	Pavarot	Noranarttragoon	Department of Fisheries	THAILAND	pavarotn@gmail.com
Dr.	Abdul Azeez	P	ICAR-CMFRI	INDIA	azeez.cr7@gmail.com
Mr.	W.A.M	Pathmandra	Department of Fisheries and Aquatic Resources	SRI LANKA	AD_matara@fisheriesdept.gov.lk
Dr.	Rajashree Umesh	Pawar	Fishery Survey of India	INDIA	rajashree.sanadi@fsi.gov.in
Ms.	Genevieve	Phillips	IOTC Secretariat		Genevieve.Phillips@fao.org
Ms.	Lucia	Pierre	IOTC Secretariat		Lucia.pierre@fao.org
Ms.	Elisa	Radegonde	Seychelles Fisheries Authority	SEYCHELLES	esocrate@sfa.sc
Ms.	Salma	Saeed	Marine Fisheries Department	PAKISTAN	dua_saeed75@hotmail.com
Dr.	Surya	S	CMFRI	INDIA	revandasurya@gmail.com
Ms.	Mariyam	Shama	Maldives Marine Research Institute	MALDIVES	mariyam.shama@mmri.gov.mv
Mr.	Swapnil	Shirke	Fishery Survey of India	INDIA	swapnil.shirke@fsi.gov.in
Mr.	Solly	Solomon	Fishery Survey of India	INDIA	lazarsolly@hotmail.com
Mrs.	Ririk	Sulistyaningsih	National Research and Innovation Agency	INDONESIA	rk.sulistyaningsih11@gmail.com
Mr.	Rahulkumar	Tailor	Fishery Survey of India	INDIA	rt311280@gmail.com
Ms.	Sayako	Takeda	Fisheries Agency of Japan	JAPAN	sayakosayako_takeda590@maff.go.jp
Dr.	Arezoo	Vahabnezhad	Iranian fisheries research institute	IRAN, ISLAMIC REPUBLIC OF	avn9400@gmail.com
Dr.	Ashley	Williams	CSIRO	AUSTRALIA	ashley.williams@csiro.au

APPENDIX II
AGENDA FOR THE 15TH WORKING PARTY ON NERITIC TUNAS

Date: 7–11 July 2025
Location: Seychelles
Venue: Eden Bleu Hotel, Seychelles
Time: 09:00 – 17:00 daily (Seychelles time)
Chair: Dr Farhad Kaymaram; **Vice-Chair:** Mr Bram Setyadji

1. **OPENING OF THE MEETING** (Chair)
2. **ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION (Chair)**
3. **THE IOTC PROCESS: OUTCOMES, UPDATES AND PROGRESS**
   - **3.1.** Outcomes of the 27th Session of the Scientific Committee (IOTC Secretariat)
   - **3.2.** Outcomes of the 28th Session of the Commission (IOTC Secretariat)
   - **3.3.** Review of Conservation and Management Measures relevant to neritic tunas (IOTC Secretariat)
   - **3.4.** Progress on the recommendations of WPNT14 and SC27 (IOTC Secretariat)
4. **NEW INFORMATION ON FISHERIES AND ASSOCIATED ENVIRONMENTAL DATA FOR NERITIC TUNAS**
   - **4.1.** Review of the statistical data available for neritic tunas (IOTC Secretariat)
   - **4.2.** Tools for the improvement of data collection (all)
5. **NERITIC TUNA SPECIES – REVIEW OF NEW INFORMATION ON STOCK STATUS**
   - **5.1.** Review new information on the biology, stock structure, fisheries and associated environmental data (all)
   - **5.2.** Stock assessment updates (all)
   - **5.3.** Development of management advice for neritic tuna species (all)
6. **STOCK IDENTIFICATION METHODS AND FISHERIES MANAGEMENT** (all)
   - **6.1.** Population structure and connectivity in stock assessments (all)
   - **6.2.** Recent and ongoing stock structure studies relevant to IOTC's neritic species (all)
   - **6.3.** Approaches to determining population structure (all)
7. **PROGRAM OF WORK (RESEARCH AND PRIORITES)**
   - **7.1.** Revision of the WPNT Program of Work 2026–2030 (Chair)
   - **7.2.** Development of priorities for an Invited Expert at the next WPNT meeting
8. **OTHER BUSINESS**
   - **8.1.** Date and place of the 16^{th} and 17^{th} Working Party on Neritic Tunas (Chair)
   - **8.2.** Nomination of the Chair and Vice-Chair of the Working Party on Neritic Tunas (all)
   - **8.3.** Review of the draft, and adoption of the Report of the 15^{th} Working Party on Neritic Tunas (Chair)

APPENDIX III
LIST OF DOCUMENTS

Document	Title
IOTC–2025–WPNT15–01a	Agenda of the 15th Working Party on Neritic Tunas
IOTC–2025–WPNT15–01b	Annotated agenda of the 15th Working Party on Neritic Tunas
IOTC–2025–WPNT15–02	List of documents of the 15th Working Party on Neritic Tunas
IOTC–2025–WPNT15–03	Outcomes of the 27th Session of the Scientific Committee (IOTC Secretariat)
IOTC–2025–WPNT15–04	Outcomes of the 28th Session of the Commission (IOTC Secretariat)
IOTC–2025–WPNT15–05	Review of current Conservation and Management Measures relating to neritic tuna species (IOTC Secretariat)
IOTC–2025–WPNT15–06	Progress made on the recommendations and requests of WPNT14 and SC27 (IOTC Secretariat)
IOTC–2025–WPNT15–07	Review of the statistical data available for the neritic tuna species (IOTC Secretariat)
IOTC–2025–WPNT15–08	Revision of the WPNT Program of Work (2026–2030) (IOTC Secretariat)
IOTC–2025–WPNT15–09	The Status of Tuna Stocks with Special Reference to Neritic Tunas in Pakistan (S. Saeed, S. A. Hassan, M. Tariq, M. A. Wassan and M. F. Khan)
IOTC–2025–WPNT15–11	Neritic Tuna and Seerfish Fisheries from Small-scale Purse Seiners in the Andaman Sea of Thailand (S. Pheaphabrattana, P. Noranarttragoon, K. Maeroh)
IOTC–2025–WPNT15–12	Monitoring neritic tuna exploitation by foreign vessels in Madagascar’s EEZ (2024-2025) (M. A. Rasolomampionona)
IOTC–2025–WPNT15–13	Digital ID tool for IOTC tuna and tuna-like species using ODK (Open Data Kit (T. Fujino)
IOTC–2025–WPNT15–14	Assessment on Kawakawa (Euthynnus affinis Cantor, 1849) using data limited approach in the eastern Indian Ocean (R. K. Sulistyaningsih, L. Sadiyah, F. Satria, B. Setyadji, and P. Suadela)
IOTC–2025–WPNT15–15	A multi-species ratio approach to estimate eastern little tuna abundance independent of fishing effort (B. Setyadji, M. Spencer, L. Kell, S. Wright and S. Ferson)
IOTC–2025–WPNT15–16	Molecular identification, feeding and reproductive parameters of neritic tuna species occurring in Sri Lanka. (D. Herath, H. A. C. C. Perera and G. H. C. M. Hettarachchi)
IOTC–2025–WPNT15–17	Genome scans reveal extensive population structure in three neritic tuna and tuna-like species in the Indian Ocean (P. Feutry, S. Foster, P. M. Grewe, J. Aulich, M. Lansdell, N. Clear, A. Williams, G. Johnson, T. D. Wudianto, U. Shahid, M. Ahusan, P. Lestari, M. Taufik, A. Priatna, A. Zamroni, H. B. Usmani, J. Farley, H. Murua, F. Marsac and C. R. Davies)

Document	Title
IOTC–2025–WPNT15–18	Length based data limited methods: Application on the Narrow barred Spanish mackerel in the Persian Gulf & Oman Sea (F. Kaymaram, A. Vahabnezhad, S. A. Hossainy and M. Darvishi)
IOTC–2025–WPNT15–19	Spatial and temporal size of kawakawa (*Euthynnus affinis*) caught by artisanal gears (I. W. Barasa and S. Ndegwa)
IOTC–2025–WPNT15–20	Neritic tuna with special reference to the fishery and biology of Thunnus tonggol in the Indian Waters (P. Abdul Azeez, E. M. Abdussamad, M. K. Koya, K. M. Rajesh, S. Surya, S. J. Kizhakudan, G. George)
IOTC-2025-WPNT15-21	Biological characteristics and spawning potential of neritic tunas (*Euthynnus affinis* and *Thunnus tonggol*) in the West Coast of Peninsular Malaysia (E. M. Faizal)
IOTC-2025-WPNT15-22	Studies on some aspects of biology, population dynamics and proximate composition of Thunnus tonggol (Longtail Tuna) occurring in the North-West coast of Indian EEZ. (V. K. Mudumala, S. Shirke, N. Umralkar, H. Joshi, D. Uikey, R. Tailor, M. K. Sinha, A. Das, A. Siva, A. V. Tamhane, R. Sanadi, A. Mishra, A. Tiburtius, K. R. Sreenath)
Information papers	
IOTC–2025–WPNT15–INF01	Scomberomorus guttatus and lineolatus identified in Sri Lanka by DNA barcoding (D. R. Herath, T. Fujino, S. Yatawaka, T. Balawardhana and R.P.P.K. Jayasinghe)
IOTC–2025–WPNT15–INF02	Identification unit stock and fisheries management (F. Kaymaram)
IOTC–2025–WPNT15–INF03	Importance of connectivity in stock assessment (P. Feutry)
IOTC–2025–WPNT15–INF04	Methods for determining stock structure, connectivity and assessment (P. Feutry)
IOTC–2025–WPNT15–INF05	New techniques for determining stock structure and connectivity (P. Feutry)
IOTC–2025–WPNT15–INF06	Close-kin mark-recapture (CKMR) design studies for Australian Spanish mackerel populations (A. Williams)

APPENDIX IV
STATISTICS FOR NERITIC TUNAS AND SEERFISH

Extract from IOTC–2025–WPNT15–07

Historical trends (1950-2023)

In the past two decades, the contribution of neritic tunas and seerfish species to the total catch has shown a significant increase, rising from 25% in the 1990s to 32% by 2010, with increasing catch in 2023. This shift in the composition of catch can be attributed to two primary factors:

1. **Operational Changes in Fisheries**: Starting in the late 2010s, there was a notable transition in the operational activities of fisheries. Semi-industrial fishing activities, particularly those operating near Somali waters, reduced significantly. Vessels began focusing more on their national jurisdiction areas, potentially leading to a redistribution of fishing effort towards neritic tuna and seerfish species in coastal waters.

2. **Changes in Large Pelagic Fisheries**: Concurrently, industrial vessels from Distant Water Fishing Nations (DWFNs) that traditionally targeted large pelagic tuna species in the Western Indian Ocean also reduced their operations in the late 2010s. This reduction may have further facilitated an increase in relative catch of neritic tunas and seerfish species.

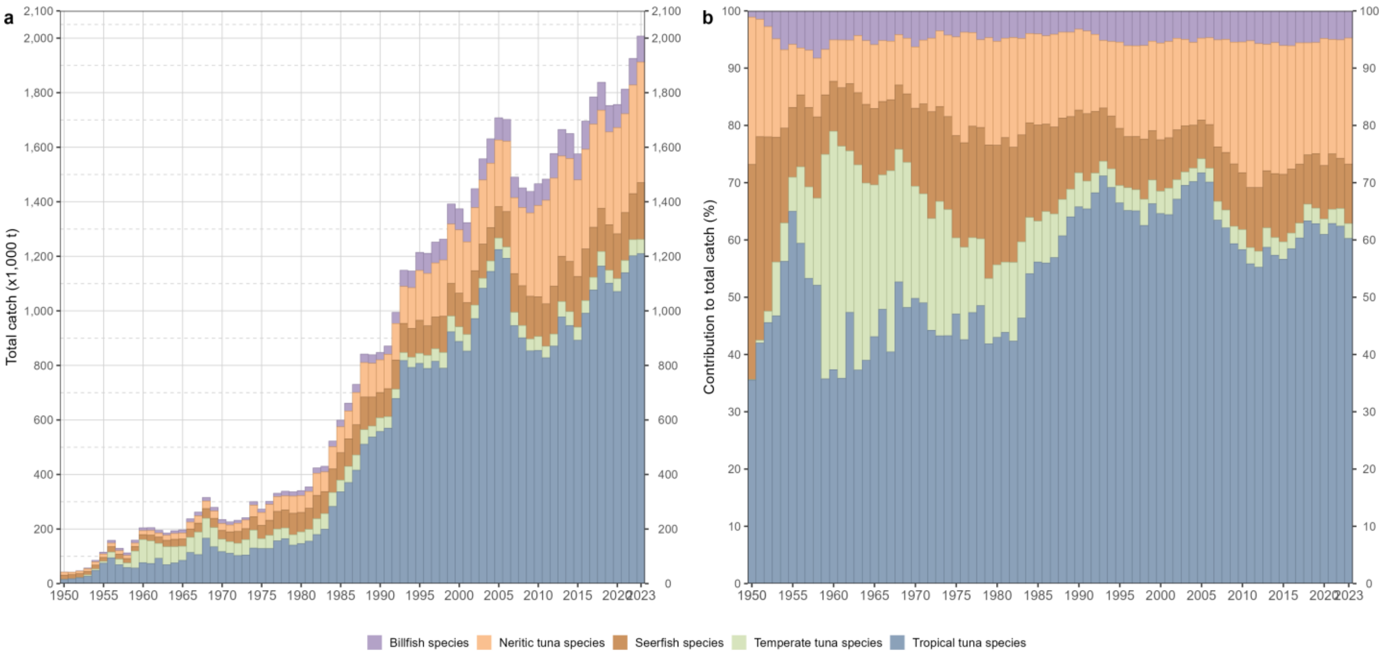

Fig. A 1: Annual time series of (a) cumulative retained catches (metric tonnes; t) and (b) contribution to the total retained catches (percentage; %) of IOTC tuna and tuna-like species by species category for the period 1950-2023

Since 1950, neritic tunas and seerfish species are primarily caught by coastal fisheries, with drifting gillnets playing a predominant role, accounting for over 62% of the catch. This method has remained the major fishery targeting neritic tunas and seerfish species since the 1950s, especially for mackerel species across all sizes of gillnet fisheries (Nguyen et al. 2023). In addition to drifting gillnets, other fishing gears are increasingly operating in coastal waters of the Indian Ocean:

1. **Surrounding Nets**: This category includes purse seines and ring nets, which together contributed 13% of the catch between 2010 and 2023. These nets are effective in targeting schools of fish near the surface, including neritic tunas. Besides coastal encircle fisheries, records show that such nets fishing offshore, are catching neritics tunas, although at lower rates.

2. **Line Fisheries**: Line fisheries, including handlines and longlines operated in coastal areas, contributed 15% to the catch during the same period. These methods are selective and often target specific species, including neritic tunas and seerfish.

3. **Smaller Coastal Fisheries**: Techniques such as beach seines, Danish seines, and trawlers have also reported increased catches of neritic species in recent years. These methods vary in scale and specificity but contribute significantly to local fisheries.

The catch trend of neritic and seerfish species show increasing catch from 1950, with the highest catch at 650,000 t in 2023, following a decline in 2019 (**Fig. A 2**). Iranian fisheries show significant increase from early 2000s, from around 44,000t in 2004 to reach 132,000t in 2012. Catches from Indonesian and Indian fisheries, however, fluctuated in recent years, although with continuous increasing trends from the 1950s. Indonesia neritic catch in 2023, inflated due to inconsistencies with estimation method prior to 2023, hence increased by 72%. Catches from Indian, on the other hand, following a drop in 2021 to 79,000t from 88,000in 2020, increased again in the last two years, averaging 131,000t between 2022 and 2023.

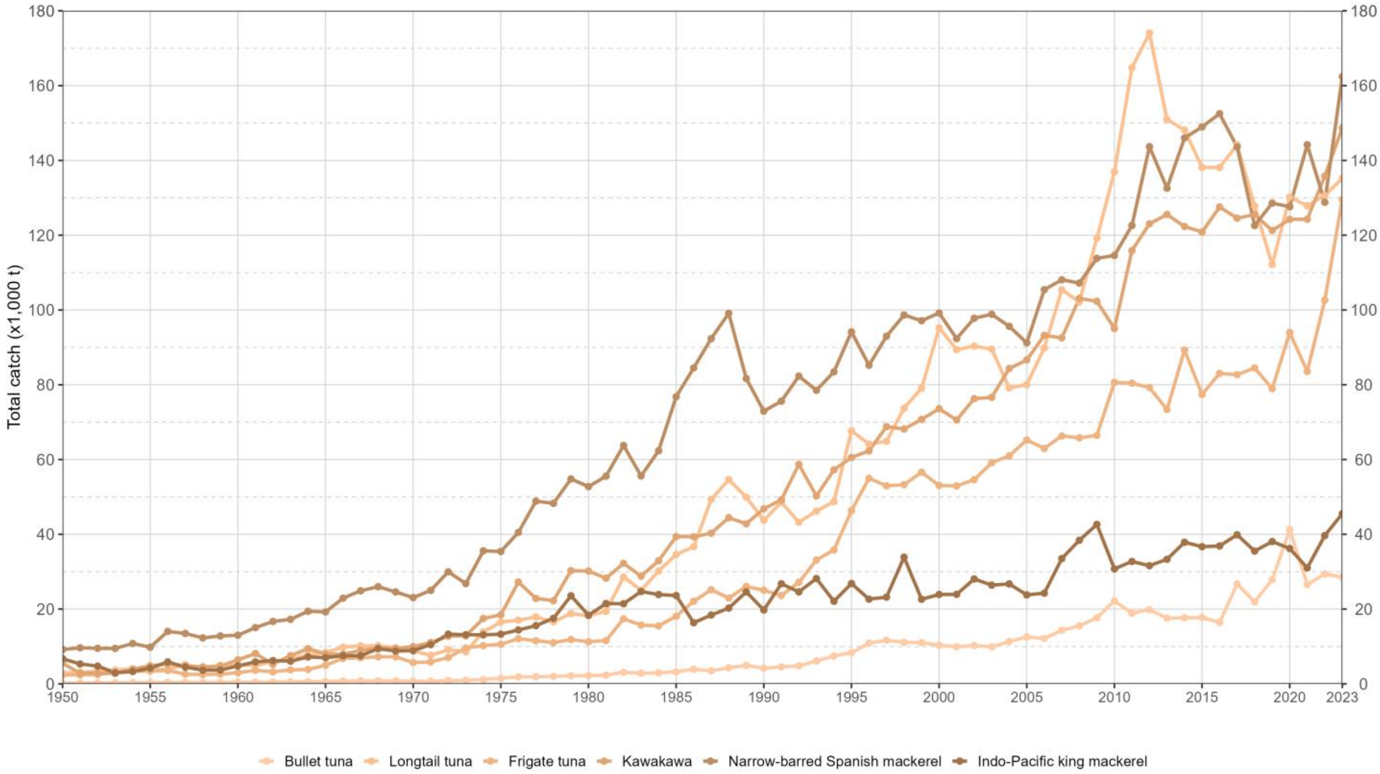

Fig. A 2: Annual time series of retained catches (metric tonnes; t) of IOTC neritic tunas and seerfish by species for the period 1950-2023

Recent fishery features (2018-2023)

Indonesia, India and I.R. Iran, accounted for most of the neritic catches in the Indian Ocean, contributing 67% between 2019 and 2023. Fisheries from Indonesia and India are characterised by diverse fishing gear of multipurpose small-scale vessels, whereas Iranian fisheries are generally gillnet, although with seasonal gear changes of some vessels (**Fig. A 3**).

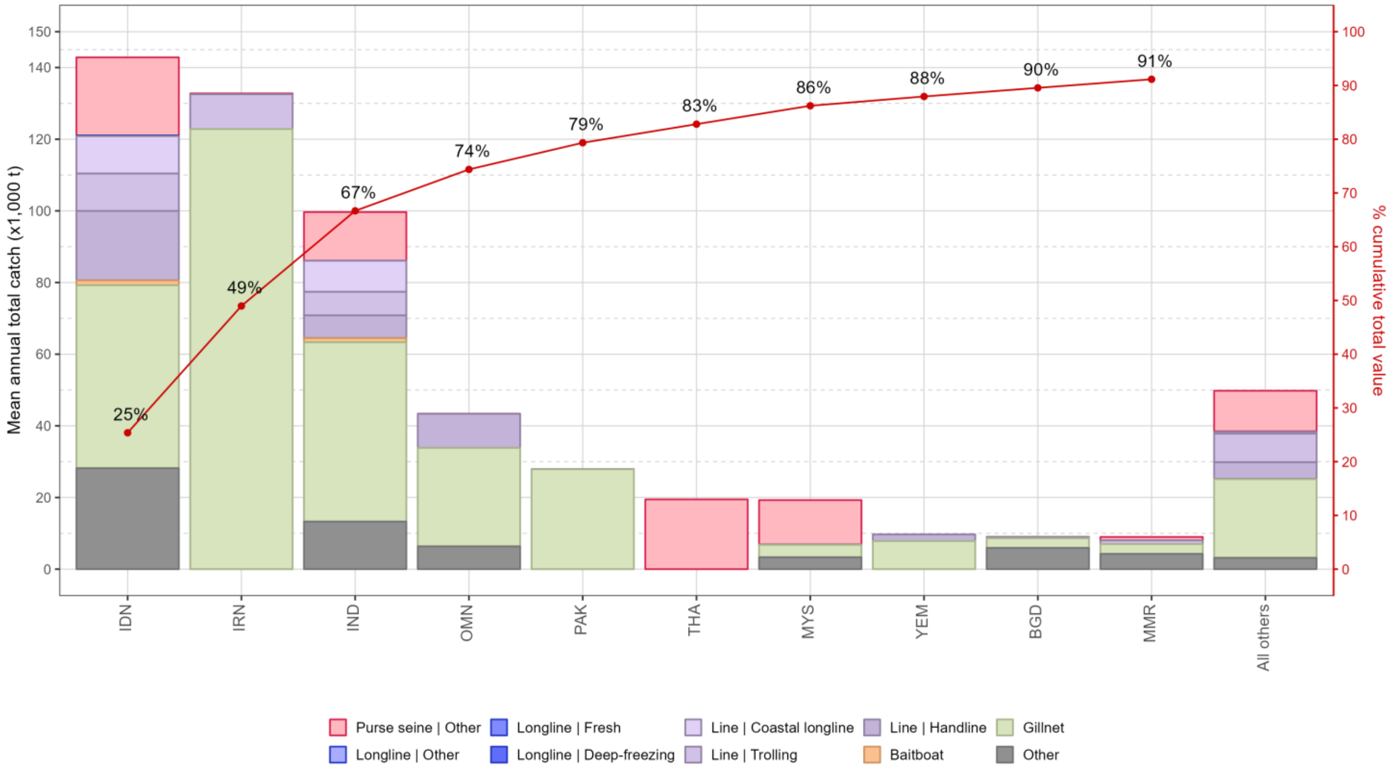

Fig. A 3: Mean annual retained catches (metric tonnes; t) of IOTC neritic tunas and seerfish by fleet and fishery between 2018 and 2023, with indication of cumulative contribution (percentage; %) of catches by fleet

Although neritic tunas and seerfish species are caught by multiple coastal fisheries, gillnet fishing has remained the dominant method. In recent years, the overall catch from gillnet fisheries has shown an increasing trend. Catches from other coastal fisheries, such as line fishing and surrounding nets, have fluctuated, but showed an increase in 2023 (**Fig. A 4**).

In summary, recent year catch trend by fishery are as follows:

(i) Gillnet fisheries increased from 297,000t and 345,000t

(ii) Line fisheries showed a consistent trend between 2019 and 2022, averaging 89,000t, but recorded their highest catch of 131,000t in 2023.

(iii) Catches from purse seine fisheries fluctuated over the years, reaching a low of 63,000t in 2021, but recovering significantly to 103,000t in 2023.

(iv) Baitboat and industrial longline fisheries recorded limited catches of neritic tuna and seerfish species. Neritic species are occasionally caught as bycatch in industrial longline fisheries, although these catches are typically underreported.

In addition to the main fishing gears mentioned, other coastal fisheries operating in the region also catch neritic tuna and seerfish species. While these fisheries contribute less to the overall catch volume, they play a role in the broader exploitation of neritic resources in coastal waters.

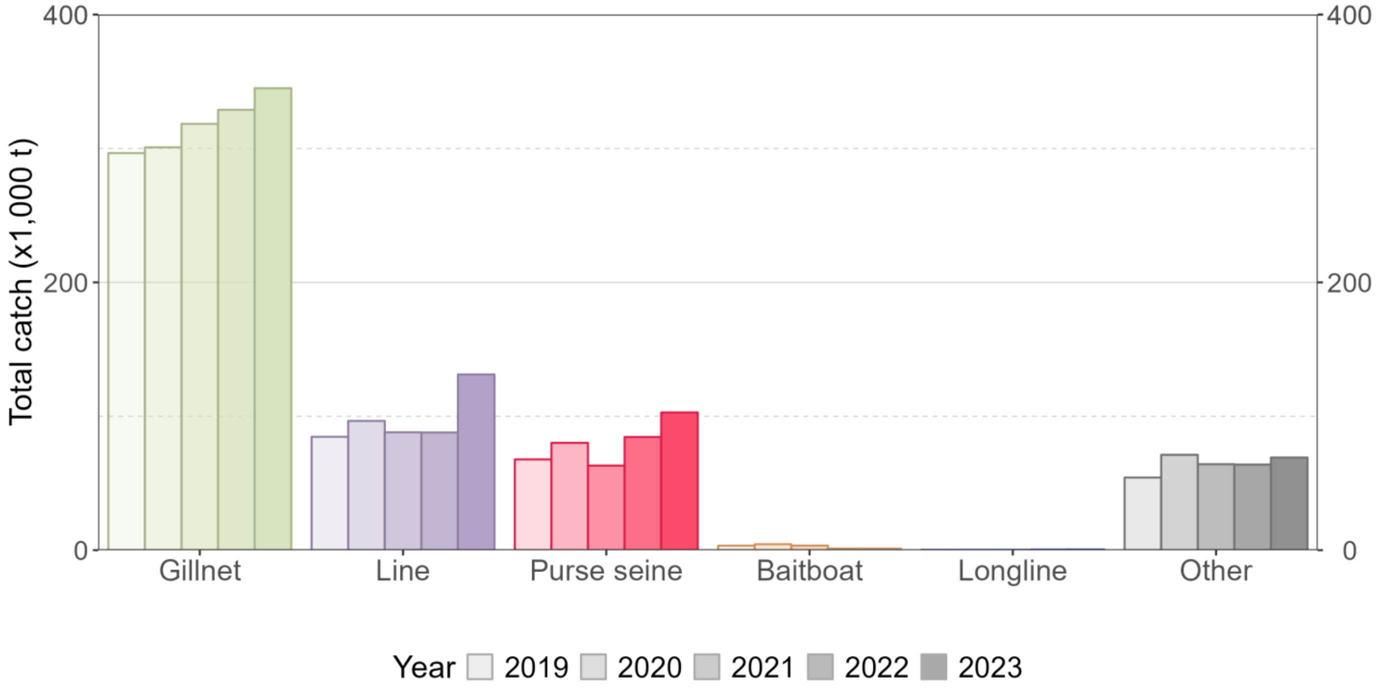

Fig. A 4: Annual trends in retained catch (metric tonnes; t) of IOTC neritic tunas and seerfish by fishery group between 2018 and 2023

Historical revision of Indonesia catch data

Indonesia for some time, have been trying to re-estimate the historical catch data, which were mainly estimated catch based on findings of a data review done in 2012 by IOTC consultant. The new estimation methodology for Indonesia is based on information collected from landing sites, logbooks and other sources between 2010 and 2019. The (Marine Affairs and Fisheries 2024) described the methodology used by Indonesia for the estimation. The revising led to changes in the catch of neritic species, where the overall catch of these species reduced considerably (**Fig. A 5**).

Species wise, the differences vary, where some species show fluctuated catch series (bullet tuna) and some species the differences are minimal (**Fig. A 6**)

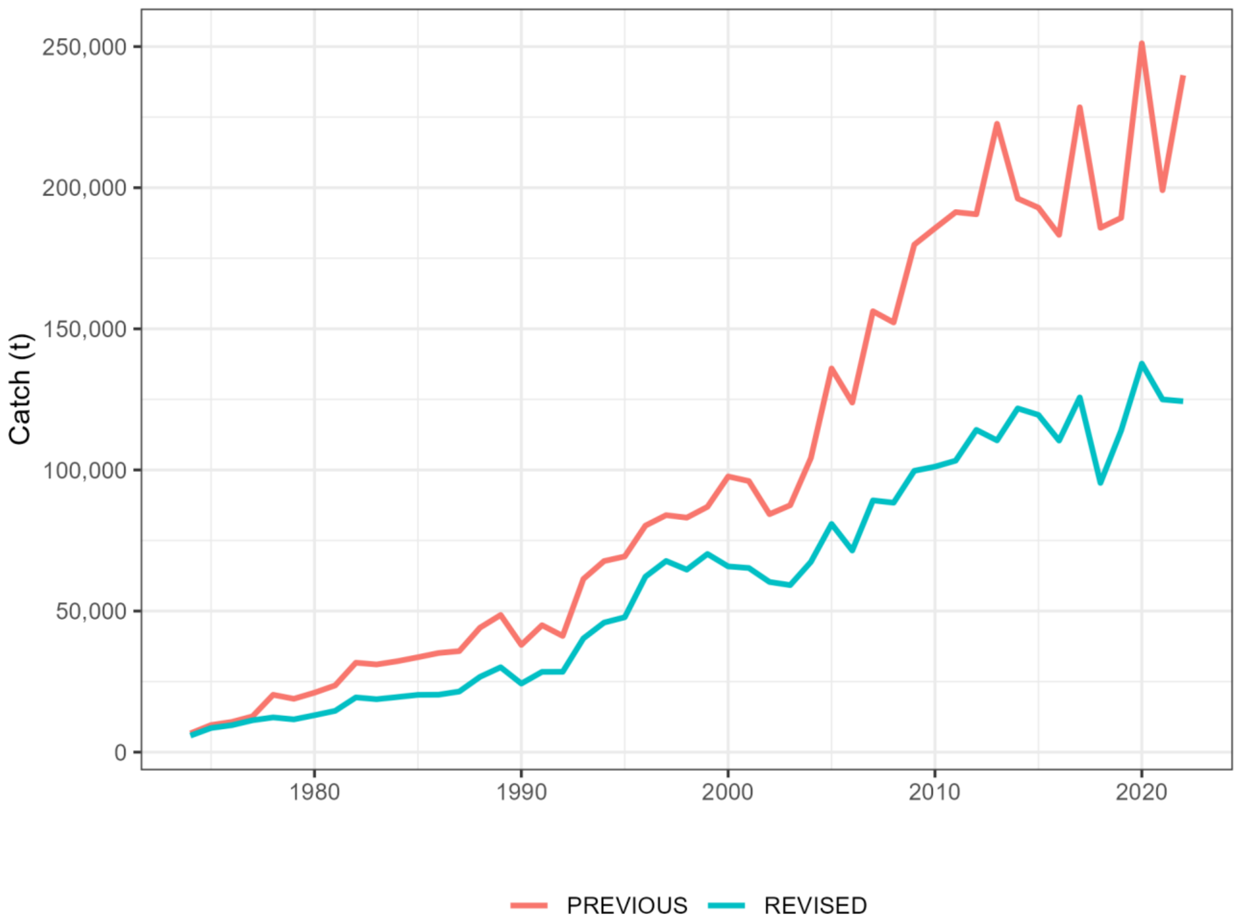

Fig. A 5: Differences in the annual retained catches (metric tonnes; t) of neritic tuna and seerfish of Indonesia between the previous catch and revised catch

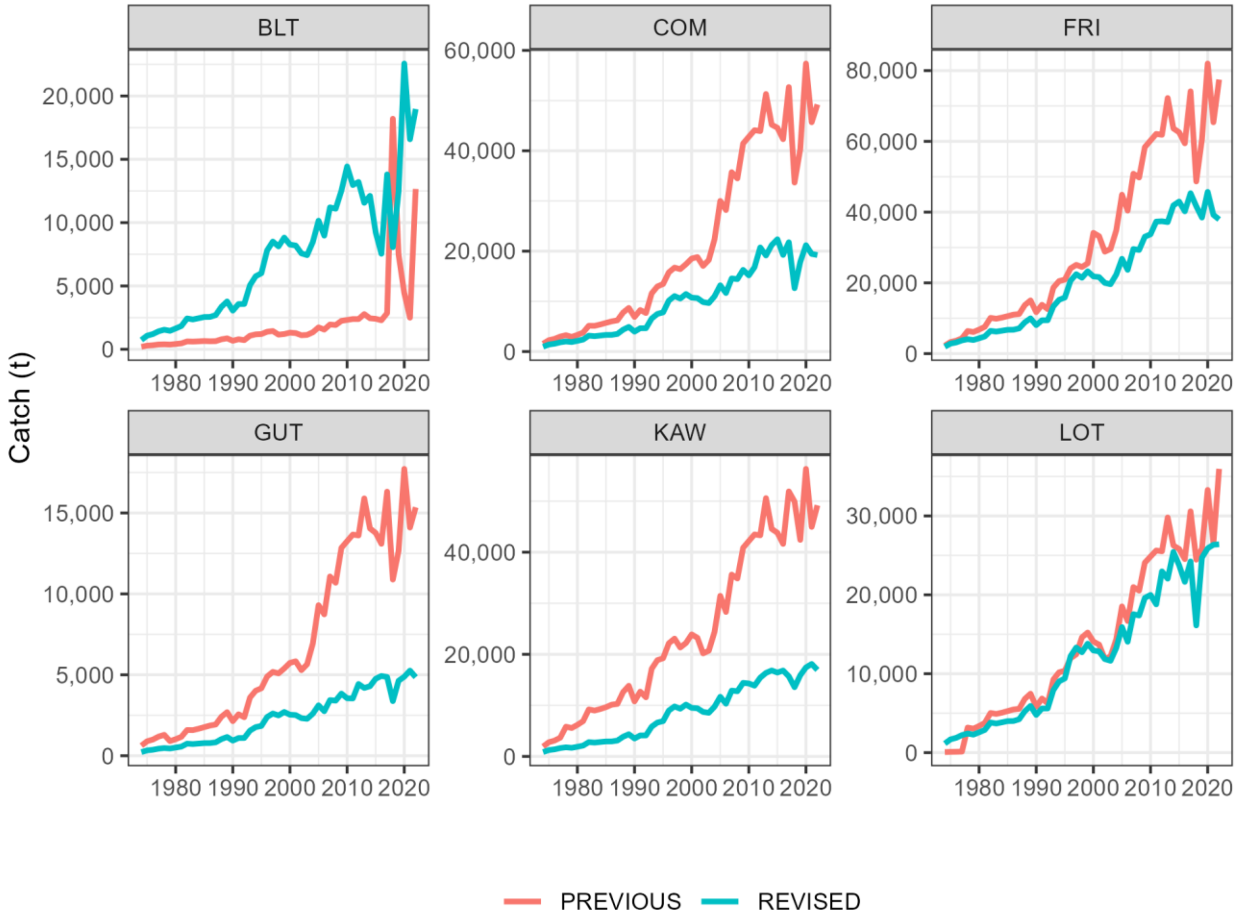

Fig. A 6: Differences in the annual retained catches (metric tonnes; t) of neritic tuna and seerfish of Indonesia between the previous catch and revised catch

Uncertainties in nominal catch data

Uncertainty in the catch data available in the IOTC databases is becoming an increasing concern for scientists relying on this information (Cappa et al. 2024). To address this issue, the Secretariat—supported by supplementary funding from member states—has been working closely with CPCs (Contracting Parties and Cooperating Non-Contracting Parties) that face challenges in meeting reporting requirements. This support includes multiple in-country missions and workshops conducted by the Data Section as part of the Capacity Development in Support of IOTC Developing Coastal States initiative. The recent supports provided to CPCs can be viewed in (Capacity Development in Support of IOTC Developing Coastal States). These efforts aim to improve data reporting quality and provide CPCs with various tools to support their reporting processes.

Although annual catch data indicate increasing catches from coastal fisheries operating within national jurisdictions, and highlight the importance of these catches in decision-making processes, such as quota setting, the level of uncertainty for these data remains high. This persistent uncertainty is largely attributed to challenges in data collection, including:

- Inadequate data processing systems for estimating catch volumes
- Inefficient or absent data collection frameworks
- Limited focus on recording catches of tuna and tuna-like species, primarily due to their low catch rates
- Frequent aggregation and misidentification of tuna species
- Concurrent use of multiple fishing techniques, complicating effective monitoring
- Shortage of trained personnel for data collection tasks

Recently, CPCs such as Indonesia and the Islamic Republic of Iran have undertaken revisions of their historical catch data, aiming to reduce discrepancies and improve overall data quality. Despite these efforts, uncertainties in coastal fisheries data persist, largely due to limitations in the original data sources. The recent revisions primarily involved replacing earlier estimated catch figures with data collected by liaison officers, an important step in enhancing the reliability of the dataset. As a result, these revised datasets are expected to be assessed as having lower uncertainty in the final uncertainty analysis.

Data collection in national jurisdictions primarily relies on landing surveys, which have inherent limitations. Annual changes in the composition of retained catches, as indicated by quality scores, provide insights into data uncertainty at the IOTC Secretariat. Quality scores for the nominal catches of six IOTC neritic tunas and seerfish reflect: Non-reporting of data; estimation of species and gear composition when reporting aggregate figures; and persistent data quality issues in major countries such as India.

The percentage of nominal catches fully or partially reported to the Secretariat (quality score between 0 and 2) has varied between 44.7% and 97.4% of total catches over time, showing an encouraging increasing trend since the mid-1990s. However, the reporting quality has decreased since then and 66% of all retained catch was fully or partially reported to the Secretariat in 2023.

Spatial distribution of catch and effort

In 2024, catch revision efforts focused primarily on retained catch, rather than geo-referenced catch from major neritic fishing fleets. The Islamic Republic of Iran was the only CPC to make improvements to both catch and effort data. Although Iran revised its geo-referenced catch data for 2023, these revisions were limited to offshore gillnet fisheries. Coastal gillnet fisheries—which account for over 80% of neritic species catches, were not included, and their data remain non-compliant with reporting requirements. Consequently, uncertainty in the geo-referenced catch data for Iran remains significant.

Despite the improvement in the uncertainty of retained catch, uncertainty in geo-referenced catch and effort data from fisheries catching neritic tunas, remain low in the data submitted to the Secretariat. Data from I. R Iran, although not fully by standard, slightly improved the quality of the geo-referenced data from 2007. Thailand and Sri Lanka provide quality geo-referenced data from mid-2010s. Whereas Indonesia and India, the two main neritic tuna fleets, do not provide geo-referenced catch for all their fisheries. In 2023, the percentage of retained catches with sufficient geo-referenced catch and effort data (scores 0-2) stood at 52.9% in 2023, increased from 39.2% in 2022.

Size composition of the catch

Over the years, size samples of neritic species have been collected primarily by main neritic fleets such as I.R. Iran and Sri Lanka, with recent contributions from Indonesia and Thailand. Despite consistent data reporting from some fleets, meeting quality standards has proven challenging, even though samples are gathered from multiple fisheries.

The size samples available for neritic tunas and seerfish are predominantly from gillnet fisheries, comprising 75.7% of all size data in the IOTC database. Additionally, size samples are available from purse seine (1985-2023), baitboat (1983-2023), and trolling line (1983-2023) fisheries, albeit in smaller numbers compared to gillnet fisheries, while very few samples are available from all other fisheries (Fig. 5.13). Interestingly, size data have been available since the 1980s, primarily from projects conducted under the Indo-Pacific Tuna Programme (IPTP). Early samples were collected in Indonesia, Maldives, and Malaysia, and later in Sri Lanka, I.R. Iran, and Pakistan.

Recently, although there are several projects collecting size data, these projects focus on endangered species such as sharks or species with high commercial value, like large palagic species. Sampling of neritic species are rare for research, or if collected data not publicly available. The number of samples collected recently for neritic species, as part of routine data collection, are low compared to the year 1990s where IPTP project collected high number samples of neritic species. In recent years, coastal fisheries have collected very few samples. For example, Sri Lanka averaged sampling about 194,000 fish annually between 1985 and 1993, but less than 6,000 samples annually between 2019 and 2023. In contrast, I.R. Iran has increased the number of neritic fish sampled over the last decade, reaching around

130,000 in 2019, but decreasing recently to reach 117,000 fish in 2023 while the total catch levels have remained quite stable.

The number of size samples by species is very unbalanced and not representative of the importance of each species in the retained catches (Fig. 5.14). About two thirds of all samples available are for kawakawa (32.4%) and frigate tuna (30.6%). Samples for narrow-barred Spanish mackerel only represent 15.3% of the samples even though this species has been the most abundant in the catch over the last four decades, i.e., representing almost 30% of all catches of neritic species between 1980 and 2020. Only 1794 fish samples are available for Indo-Pacific kingfish when more than 1.3 million t of catch have been reported for this species since 1980.

Uncertainties in size-frequency data

The reporting quality of size-frequency data remians the lowest among all IOTC species groups. The overall quality – as measured by the percentage of nominal catches with data of quality scores between 0-2 – of size data available for neritic tunas and seerfish is poor. Almost no size data are available prior to the 1980s and the fraction of data of acceptable quality has averaged around 7.2% over the last decade, with only 19.7% in 2023.

Size frequency data are often not reported by the IOTC standards and as such cannot be processed and included in the database. Recently the Secretariat has put more emphasis on complying with IOTC reporting requirements, such as including appropriate spatial information and using the recommended size bins for tuna and tuna-like species. In some instance however, data are included in the database but cannot be used due to poor quality. In particular, several size data sampled from neritic and seerfish species have been reported with large size bins and/or sizes exceeding the known maximum length of the species, e.g., size frequency data from Madagascar artisanal fisheries. Such data are filtered out in the IOTC processing, generating species-specific standard size data sets.

APPENDIX V

MAIN ISSUES IDENTIFIED RELATING TO THE STATISTICS OF NERITIC TUNAS AND SEERFISH

Data type(s)	Fisheries	Issue	Progress
Nominal catch, catch-and-effort, size data	Coastal fisheries of Madagascar, Myanmar, and Yemen	Non-reporting countries Catches of neritic tunas and seerfish for these fisheries have been entirely estimated by the IOTC Secretariat in recent years – however the quality of estimates is thought to be poor due to a lack of reliable information on the fisheries operating in these countries	• Madagascar: a new sampling programme was in place in Madagascar from 2017 to 2021. The country submitted nominal catch, catch and effort and size data for the years 2017 to 2020. However, the sampling level is very low, and the data do not cover all fishing regions. Furthermore, there are variations in the data over the years, due to annual changes in sampling regions triggered by socio-economic factors: for these reasons, the information is still pending incorporation in the IOTC database as it cannot be adequately raised by the Secretariat. The sampling programme ended in 2021, and Madagascar has not collected any sample since the termination of the project. The Secretariat staff conducted a mission in Madagascar in March 2025 to review the data collection and reporting systems. • Myanmar (non-reporting, non-IOTC member): catch data for some years are based on estimates published by SEAFDEC and FAO • Yemen: catches are systematically based on information provided by FAO
Nominal catch, catch-and-effort, size data	Coastal fisheries of India, Indonesia, Kenya, Malaysia, Mozambique, Oman, Tanzania, and Thailand	Partially reported data These fisheries do not fully report catches of neritic tunas and seerfish by species and/or gear, as per the reporting standards of IOTC Res. 15/02. For example: ● Nominal catches may have been partially allocated by gear and species by the IOTC Secretariat, where necessary. ● Catch -and-effort and size data may also be missing, or not fully reported according to Res. 15/02 standards	• India: catch-and-effort and size data for coastal fisheries have not been reported at all or are not reported according to standards • Indonesia: catch-and-effort and size data have been collected for coastal fisheries (with support from the IOTC-OFCF pilot sampling project), albeit for a very small number of landing sites (i.e., less than 10). Catch-and-effort data have been reported by Indonesia for some industrial, semi-industrial, and coastal fisheries since 2019 (reference year 2018) but the coverage remains very low (<5% of total catches). • Kenya: Kenya is establishing a new fisheries management platform to consolidate all collected data into a single repository. This integrated system will support consistent data estimation and validation within the same database, helping to eliminate discrepancies between datasets. In June 2025, the Secretariat provided capacity-building support to Kenya to assist with the reporting of statistical datasets across all fisheries • Mozambique: an IOTC Data Compliance mission was conducted by the IOTC Secretariat in June 2014 and data reporting has improved since then, although some issues remain with the reporting of catch-and-effort data for coastal fisheries and Mozambique is currently facing difficulties to submit the coastal fisheries statistics. Mozambique received assistance in 2024 to review their data collection and reporting

			systems. The data collection systems are in transition from manual to an electronic format, however there are still gaps in the reporting of data. • <u>Oman</u>: no size data have been submitted, although it is understood that some data have been collected. In fact, biological information for some neritic species is known to have been collected in the past by national research institutions and could potentially be shared with the IOTC Secretariat. Oman is coordinating with the Secretariat through virtual meetings to receive assistance with dataset reporting, besides actively participating in the data reporting workshops held by the Secretariat. In addition, Oman is working with a consultant to review and validate historical catch data. • <u>Tanzania</u>: following a compliance mission held in 2019 and liaison between a compliance expert and Tanzanian liaison officers, Tanzania managed to report catch-and-effort data for the different artisanal fisheries for the year 2019 only, although some key information is still missing, and there are some variations in catch data between sources. It is also still important to confirm if catches for Zanzibar are included in the reported data. Although Tanzania has introduced an e-CAS system to collect data directly through mobile phones at the landing sites, the system does not cover the entire country's fishing regions and data is still collected through paper forms at Zanzibar landing sites. Overall, data from Tanzania – when reported – is thought to be very incomplete. Following the latest compliance mission to Tanzania in 2024, efforts are underway to centralize the data processing system on a single platform to capture data from all landing sites. Tanzania is currently providing data for its coastal fisheries, primarily retained catch, as well as catch and effort, but gaps still remain in the datasets.
	<u>Coastal fisheries</u> of Indonesia, Malaysia, and Thailand	<u>Reliability of catch estimates</u> Several issues have been identified for the following fisheries, which compromise the quality of the data in the IOTC database	• <u>Indonesia (nominal catch)</u>: catch estimates for neritic tunas are considered highly uncertain due to issues of species misidentification and aggregation of juvenile neritic and tropical tunas species reported as commercial category *tongkol*. Between 2014-2017 the IOTC Secretariat supported a pilot sampling project of artisanal fisheries in North and West Sumatra to improve estimates of neritic tunas and juvenile tuna species in particular. Following a recent data compliance mission in Indonesia, Indonesia is in the process of revising the catch data allocated by fisheries and species. It is important to note that the logbook coverage in coastal fisheries is low and estimates of neritic species are highly uncertain and likely under-estimated. Indonesia completed a historical review of the nominal catch for the period between 1950 and 2022.

			• Malaysia (catch-and-effort): issues regarding the reliability of catch-and-effort reported in recent years have been raised by the IOTC Secretariat and, to date, remain unresolved (e.g., large fluctuations in the nominal CPUE, and inconsistencies between different units of effort recorded in recent years). Data submitted for 2019 included two fishing regions, however Malaysia was unable to break down the catch and effort data by region, and data for 2021 and 2022 were processed using one single area as reported by the national focal points. Malaysia needs therefore to revise their data for previous years and re-submit the time series to the Secretariat. On-going
Catch and effort, size data	(Offshore) Surface and longline fisheries: I.R. Iran and Pakistan	Non-reported or partially reported data A substantial component of these fisheries is thought to operate in offshore waters, including waters beyond the EEZs of the flag countries concerned: although the fleets have reported total catches of neritic tunas, they have not reported catch-and-effort data as per the reporting standards of IOTC Res.15/02	• Islamic.Republic. Iran – drifting gillnets (coastal / offshore): Following an IOTC Data Compliance mission in November 2017, I.R. Iran started submitting catch-and-effort data in accordance with the reporting requirements of Resolution 15/02 leading to substantial improvements in the data available for the Iranian fisheries in the IOTC database also for what concerns the newly developed coastal-longliners fleet. Since 2023, the Islamic Republic of Iran has been submitting spatial-temporal catch and effort data for its offshore gillnet fisheries. Catch and effort data for the coastal-longline only records catch of yellowfin tuna. • Pakistan – drifting gillnets: Only in 2018 Pakistan reported size data for some neritic tuna species (e.g., frigate tuna and kawakawa). However, no catch-and-effort has been reported to date, due to deficiencies in port sampling and absence of logbooks on-board vessels. WWF-Pakistan has been coordinating a crew-based data collection programme for over four years, which includes information on total enumeration of catches and fishing location (for sampled vessels) that could potentially be used to estimate catch-and-effort for Pakistan gillnet vessels in the absence of a national logbook program for its gillnet fleet. The information collected through this programme has been used to re-estimate the total catches of several species from 1987 onwards, and the IOTC Secretariat is currently liaising with WWF-Pakistan to evaluate the quality of the fine-grained data collected by the programme to determine whether it could be effectively used to officially provide C-E data according to Resolution 15/02. WWF-Pakistan informed WPNT that data are available, and they will try to provide it for Scientific use only. Although Pakistan has participated in the data reporting workshops organized by the Secretariat since 2024, challenges remain in reporting catch and effort data, primarily due to issues in data collection. In the process to develop sampling program to collect size frequency data.
Nominal catch, catch-and-effort, size data	All industrial purse seine fisheries	The total catches of frigate tuna, bullet tuna and kawakawa reported for industrial purse seine fleets are considered to be very incomplete, as they do not account for all catches retained onboard or include	There is a general lack of information on retained catches, catch-and-effort, and size data for neritic tunas retained by all purse seine fleets – in particular frigate tuna, bullet tuna, and kawakawa. Discard levels of neritic tunas by purse seiners are also only available for the EU purse seine fisheries during 2003-2021. The increasing number of

		amounts of neritic tunas discarded. The same applies to catch-and-effort data.	industrial purse seine vessels from coastal countries, namely Oman, Kenya, and Tanzania are not reporting catches of neritic tunas accordingly. Update: reporting coverage of the ROS is increasing, and this might trigger an improvement in the estimates of catches for neritic species (both retained and discarded). In 2019 (with 2018 as reference year) Indonesia started reporting nominal catches as well as catch-and-effort data for a new industrial purse seine component of their fleet that seems to explicitly target neritic tunas (leading to remarkable increases in catches of bullet tuna reported for the year). Considering the relatively small dimensions (on average) of the Indonesian purse seine vessels listed in the IOTC Record of Authorised Vessels, it is still questionable whether this component of the fleet (as well as its associated catches) shall be properly considered as 'industrial' purse seiners rather than small, coastal ones; in any case, further clarification is required to properly attribute these catches to the originating fishery and determine the accuracy of the reported estimates. In 2024, EU-Italy revised the RC and CE data from 2016 to 2022, which also included the bycatch data of neritic tunas. The coastal countries with industrial purse seine vessels are being trained into reporting of retained catch from the industrial purse seine vessels. Following three data support mission in Indonesia undertaken by the Secretariat from July to March 2023, Indonesia is in the process of revising their catches using georeferenced data from their national logbooks, which could change the catch allocated to industrial fisheries. Indonesia has revised its retained catch data series for the period from 1950 to 2022; however, there are uncertainty, including in the data for 2023.
Discards	All fisheries	Although discard levels of neritic species are believed to be low for most fisheries, with the exception of industrial purse seiners, very little information is available on the level of discards.	The total amount of neritic tunas discarded at sea remains unknown for most fisheries and time periods, other than EU, Seychelles, and Mauritian purse seine fisheries during 2003–2021. Lack of discarded catch data from new industrial purse seine fleets Update: no update, although as reporting coverage of the ROS improves, there is the potential for an improvement in the estimates of catches of neritic species (retained and discarded).
Biological data	All fisheries	There is a general lack of biological data for neritic tuna and seerfish species in the Indian Ocean, in particular basic data that can be used to establish	Collection of biological information, including size data, remains very low for most neritic species.

		length-weight-age keys, non-standard measurements-fork length keys and processed weight-live weight keys.	Update: The IOTC has been coordinating a Stock Structure Project, which commenced in 2016 and was completed in 2020. The project aimed to supplement gaps in the existing knowledge on biological data and provide an insight on whether neritic tuna and tuna like species should be considered as a single Indian Ocean stock.

APPENDIX VI
WORKING PARTY ON NERITIC TUNAS PROGRAM OF WORK (2026–2030)

The following is the Draft WPNT Program of Work (2026 to 2030) and is based on the specific requests of the Commission and Scientific Committee as well as topics identified during the WPNT15. The Program of Work consists of the following, noting that a timeline for implementation would be developed by the SC once it has agreed to the priority projects across all of its Working Parties:

- **Table 1**: Priority topics for obtaining the information necessary to develop stock status indicators for neritic tunas in the Indian Ocean;
- **Table 2**: Stock assessment schedule.

In selecting the priority projects, the SC is **REQUESTED** to take into consideration the data poor nature of the neritic tuna species and the potentially already fully exploited status of the species. Improved length frequency as well as improved abundance time series would improve stock assessments for these stocks so is a high priority.

Table 1. Priority topics for obtaining the information necessary to develop stock status indicators for neritic tunas in the Indian Ocean

Topic in order of priority	Sub-topic and project	Timing				
		2026	2027	2028	2029	2030
1. Stock structure (connectivity)	Genetic research to determine the connectivity of neritic tunas throughout their distributions (This should build on the stock structure work conducted in other previous studies): 1. Review of stock structure methodologies with genetic expert during WPNT15 in order to determine the best approach to regional stock structure studies. Based on discussions develop and implement regional genetic sampling collection programme: • Sampling of tissue samples • DNA extraction and storage for preservation • Carry out genetic sequencing on extracted DNA					
2. Stock assessment / Stock indicators	Explore alternative assessment approaches and develop improvements where necessary based on the data available to determine stock status for longtail tuna, kawakawa and Spanish mackerel					

	1. The Weight-of-Evidence approach should be used to determine stock status, by building layers of partial evidence, such as CPUE indices combined with catch data, life-history parameters and yield-per recruit metrics, as well as the use of data poor assessment approaches (e.g. CMSY, OCOM, LB-SPR, Risk based methods). 2. Exploration of priors and how these can be quantifiably and transparently developed. 3. Review size data and their suitability for monitoring stock status. Improve the presentation of management advice from different assessment approaches to better represent the uncertainty and improve communication between scientists and managers in the IOTC.					
3. Data mining and collation	Improved collation and characterization of operational level data for the main neritic tuna fisheries in the Indian Ocean to investigate their suitability to be used for developing standardised CPUE indices. Improved characterisation of fisheries when CPCs present information to WPNT. The following data should be collated and made available for collaborative analysis: ➢ catch and effort by species and gear by landing site; ➢ operational data: stratify this by vessel, month, and year for the development as an indicator of CPUE over time; and ➢ operational data: collate other information on fishing techniques (i.e. area fished, gear specifics, depth, environmental condition (near shore, open ocean, etc.) and vessel size (length/horsepower)). ➢ Reconstruction of historical catch by CPCs using recovered or captured information. ➢ Re-estimation of historic catches (with consultation and consent of concerned CPCs including India, Pakistan, Bangladesh, Mozambique, Tanzania, Madagascar, Kenya) for assessment purposes (taking into account updated identification of uncertainties and knowledge of the history of the fisheries. ➢ Improvements to species identification					

Other Future Research Requirements		**2026**	**2027**	**2028**	**2029**	**2030**
4. Biological information (parameters for stock assessment)	1. Review and summarise information on key biological parameters for neritic species. 2. Review of studies for all neritic tunas throughout their range to determine key biological parameters including age-at-maturity, and fecundity-at-age/length relationships, age-length keys, age and growth, longevity which will be fed into future stock assessments. 3. Increase ecological traditional knowledge of all neritic tunas throughout their range. 4. Exploring the development of tools and other methods which can be used to improve species identification. 5. Exploring improved methods for ageing of neritic species including exploration of epigenetic techniques.					

5. Social economic study	1. Undertake quantitative studies on socio-economic aspects (including traditional knowledge) to determine and explore other sources of data, such as but not limited to trade data from individual countries, nominal catch or other catch data on neritic tuna, information on important and significance of neritic for food security (animal protein), nutrition, contribution to national GDP. (priority countries, Indonesia, Iran, India, Malaysia, Thailand, Pakistan) 2. Identify and utilise other sources of information, by engaging with other bodies such as SEAFDEC, SEAFO, RECOFI, BOBLME, SWIOFC, IOC, among others. 3. Integrate or evaluate market support and recognition for neritic tuna (sub-regional markets) with a focus on data acquisition. 4. Explore alternate sources of data collection, including the rapid use of citizen science-based approaches which are reliable and verified by the SC. 5. Assess/scope/explore the significance and importance of neritic species for food security, nutrition and contribution to national GDP. 6. Strengthen the data collection of catches and species complexes and develop socio-economic indicators of neritic species, related to the national and regional livelihoods and economics of coastal CPCs. 7. Collate information and address data gaps and challenges by taking advantage of regional programmes or joint collaboration with NGOs/CPCs in order to support and facilitate data collection for neritic species.					

Table 2. Proposed assessment schedule for the IOTC Working Party on 2026-2030

Working Party on Neritic Tunas					
Species	**2026***	**2027***	**2028**	**2029***	**2030**
Bullet tuna	Data preparation	**Assessment**	Data preparation	Data preparation	**Assessment**
Frigate tuna	Data preparation	**Assessment**	Data preparation	Data preparation	**Assessment**
Indo-Pacific king mackerel	Data preparation	**Assessment**	Data preparation	Data preparation	**Assessment**
Kawakawa	**Assessment**	Data preparation	Data preparation	**Assessment**	Data preparation
Longtail tuna	**Assessment**	Data preparation	Data preparation	**Assessment**	Data preparation
Narrow-barred Spanish mackerel	**Assessment**	Data preparation	Data preparation	**Assessment**	Data preparation

* Including data-limited stock assessment methods.
** Including species-specific catches, CPUE, biological information and size distribution as well as identification of data gaps and discussion of improvements to the assessments (stock structure); one day may be reserved for capacity building activities.

Note: the assessment schedule may be changed dependent on the annual review of fishery indicators, or SC and Commission requests

APPENDIX VII
EXECUTIVE SUMMARY: BULLET TUNA

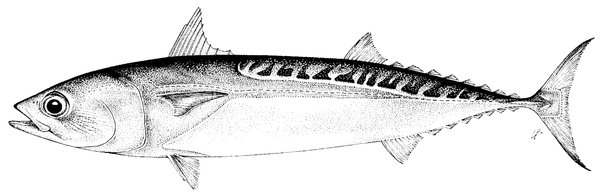

TABLE 1. Status of bullet tuna (*Auxis rochei*) in the Indian Ocean

Area[1]	Indicators		2024 stock status determination[3]
Indian Ocean	Catch 2023[2] (t) Mean annual catch (2019-2023) (t)	28,540 30,724	
	MSY (1,000 t) (80% CI) F_{MSY} (80% CI) B_{MSY} (1,000 t) (80% CI) $F_{current}/F_{MSY}$ (80% CI) $B_{current}/B_{MSY}$ (80% CI) $B_{current}/B_0$ (80% CI)	Unknown	

[1]Stock boundaries defined as the IOTC area of competence; [2]Proportion of catch fully or partially estimated for 2023: 57.2%; [3] 2022 is the final year that data were available for this assessment.

Colour key	Stock overfished (SB_{year}/SB_{MSY}< 1)	Stock not overfished (SB_{year}/SB_{MSY}≥ 1)
Stock subject to overfishing (F_{year}/F_{MSY}> 1)		
Stock not subject to overfishing (F_{year}/F_{MSY}≤ 1)		
Not assessed/Uncertain		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was conducted in 2025 for bullet tuna and so the results are based on the results of the assessment carried out in 2024 which examined a number of data-limited methods include C-MSY, LB-SPR, and fishblicc models (based on data up to 2022). However the catch data for bullet tuna are very uncertain given the high percentage of the catches that had to be estimated due to a range of reporting issues. The size-based assessment methods LB-SPR and FishBlicc using size data from gillnet and purse seine fisheries both estimated the current spawning potential ratio to be below the reference level of SPR40% (a proxy for 40% depletion often considered as the risk averse target in many data-poor fisheries). Due to a lack of fishery data for several fisheries, only preliminary stock status indicators (CPUE and average weight) can be used. Aspects of the fisheries for bullet tuna combined with the lack of data on which to base an assessment of the stock are a cause for concern. Stock status in relation to the Commission's B_{MSY} and F_{MSY} reference points remains unknown (**Table 1**).

Outlook. Annual catches of bullet tuna have steadily increased from around 2,000 t in the early 1990s to around 13,000 t in 2015-2017. In 2018, catches sharply increased to 33,000 t – mostly due to an increase in catches reported by Indonesian industrial purse seine fisheries (**Fig. 1**). In 2019, the catches of bullet tuna decreased to less than 24,000 t despite a major increase in the number of Indonesian industrial purse seiners in operation. There is considerable uncertainty around bullet tuna catches and insufficient information to evaluate the effect that these catch levels may have on the resource. Research emphasis should be focused on improving the data collection and reporting systems in place and collating catch per unit effort (CPUE) time series for the main fleets, size compositions and life trait history parameters (e.g., estimates of growth, natural mortality, maturity, etc.).

Management advice. For assessed species of neritic tunas and seerfish in the Indian Ocean (longtail tuna, kawakawa and narrow-barred Spanish mackerel), the MSY was estimated during early assessments to have been reached between 2009 and 2011 and both F_{MSY} and B_{MSY} were breached thereafter. It is worth noting that the catch in 2023 was estimated to be 28,429t and there has been significant variability in estimated catches of this species in recent years. This variation is perhaps due to issue of mis-identification of this species among other reasons. In the absence of a stock assessment of bullet tuna a limit to the catches should be considered by the Commission, by ensuring that future catches do not continue to exceed the average catches estimated between 2009 and 2011 (8,590 t). This catch advice should be maintained until an assessment of bullet tuna is available. Considering that MSY-based reference points for assessed species can change over time, the stock should be closely monitored. Mechanisms need to be developed by the Commission to improve current statistics by encouraging CPCs to comply with their recording and reporting requirements, so as to better inform scientific advice.

The following should be also noted:

- The Maximum Sustainable Yield estimate for the Indian Ocean stock is unknown;
- Limit reference points: the Commission has not adopted limit reference points for any of the neritic tunas under its mandate;
- Further work is needed to improve the reliability of the catch series. Reported catches should be verified or estimated, based on expert knowledge of the history of the various fisheries or through statistical extrapolation methods;
- Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets, size compositions and life trait history parameters (e.g. estimates of growth, natural mortality, maturity, etc.).
- Species identification, data collection and reporting urgently need to be improved;
- There is limited information submitted by CPCs on total catches, catch and effort and size data for neritic tunas, despite their mandatory reporting status. In the case of 2022 catches (reference year 2021), 50.3% of the total catches was either fully or partially estimated by the IOTC Secretariat, which increases the uncertainty of the stock assessments using these data. Therefore, the management advice to the Commission includes the need for CPCs to comply with IOTC data requirements per Resolution 15/01 and 15/02.

Fisheries overview.

- **Main fisheries (mean annual catch 2019-2023)**: bullet tuna are caught using purse seine (51.7%), followed by line (20%) and gillnet (15.2%). The remaining catches taken with other gears contributed to 13.1% of the total catches in recent years (**Fig. 1**);
- **Main fleets (mean annual catch 2019-2023)**: the majority of bullet tuna catches are attributed to vessels flagged to Indonesia (50.5%) followed by India (24.4%) and Thailand (16.5%). The 19 other fleets catching bullet tuna contributed to 8.6% of the total catch in recent years (**Fig. 2**).

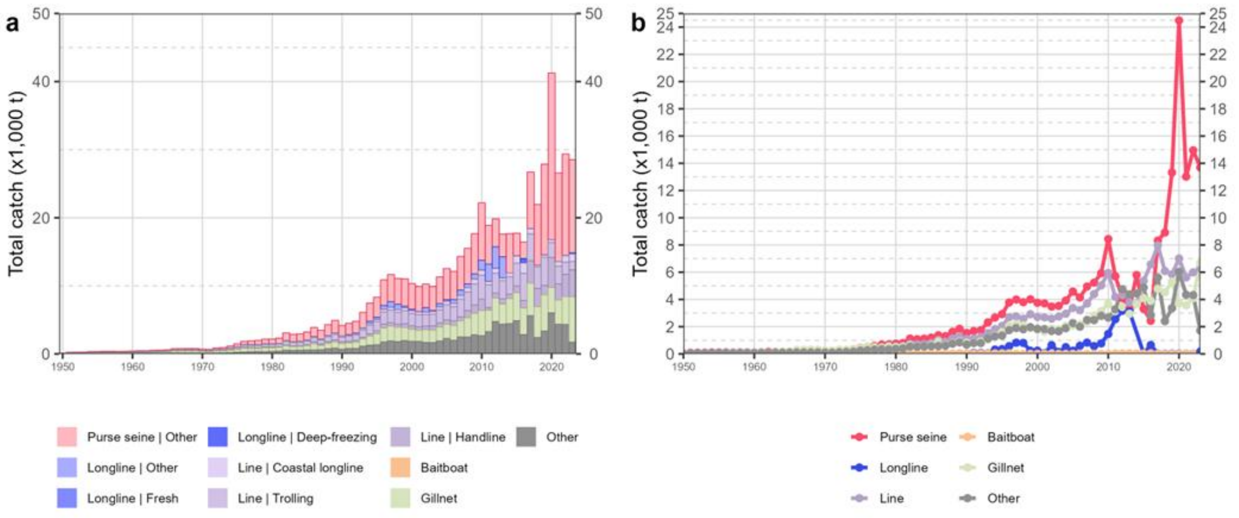

Fig. 1. Annual time series of (a) cumulative nominal catches (t) by fishery and (b) individual nominal catches (t) by fishery group for bullet tuna during 1950-2023

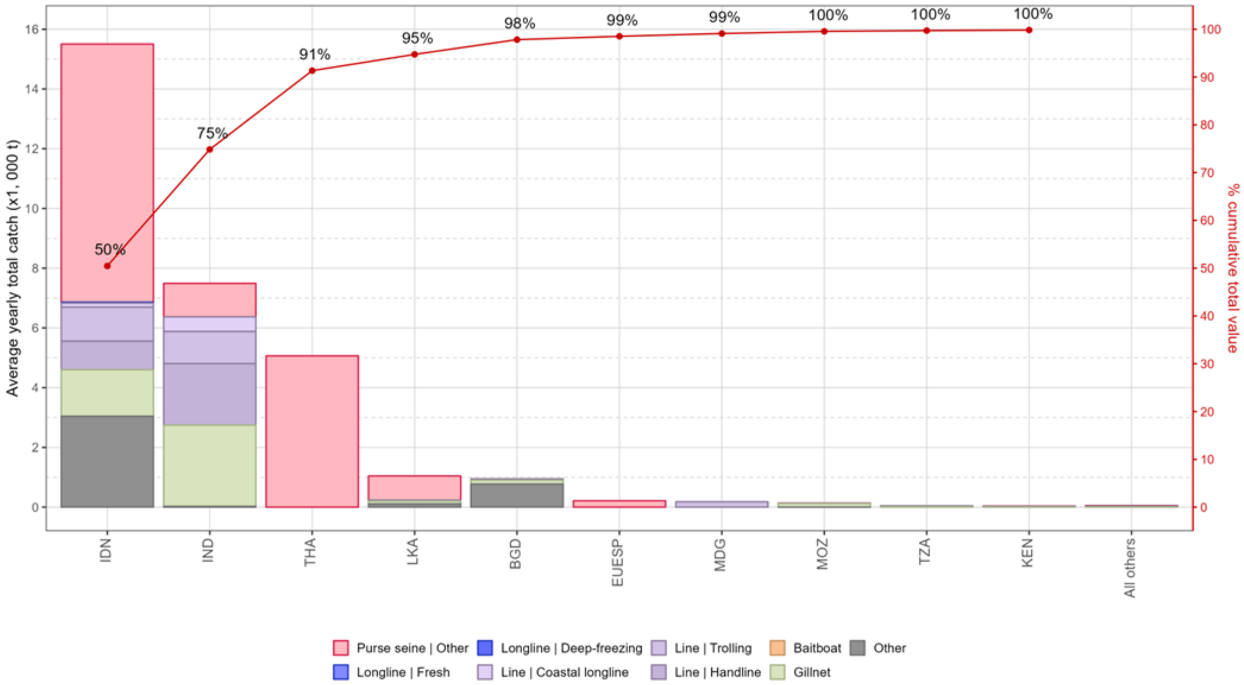

Fig. 2. Mean annual catches (t) of bullet tuna by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet

APPENDIX VIII
EXECUTIVE SUMMARY: FRIGATE TUNA

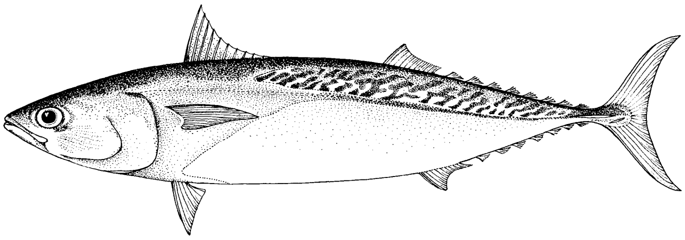

TABLE 1. Status of frigate tuna (*Auxis thazard*) in the Indian Ocean

Area[1]	**Indicators**		**2024 stock status determination**[3]
Indian Ocean	Catch (2023) (t)[2]	129,555	
	Mean annual catch (2019-2023) (t)	97,723	
	MSY (1,000 t) (80% CI)	Unknown	
	F_{MSY} (80% CI)		
	B_{MSY} (1,000 t) (80% CI)		
	$F_{current}/F_{MSY}$ (80% CI)		
	$B_{current}/B_{MSY}$ (80% CI)		
	$B_{current}/B_0$ (80% CI)		

[1]Stock boundaries defined as the IOTC area of competence; [2]Proportion of catch fully or partially estimated for 2023: 69.8%; [33]2022 is the final year that data were available for this assessment

Colour key	Stock overfished (SB_{year}/SB_{MSY}< 1)	Stock not overfished (SB_{year}/SB_{MSY}≥ 1)
Stock subject to overfishing (F_{year}/F_{MSY}> 1)		
Stock not subject to overfishing (F_{year}/F_{MSY}≤ 1)		
Not assessed/Uncertain		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was conducted in 2025 for frigate tuna and so the results are based on the results of the assessment carried out in 2024 which examined a number of data-limited methods include CMSY, OCOM, LB-SPR and fishblicc models (based on data up to 2022). However the catch data for frigate tuna are very uncertain given the high percentage of the catches that had to be estimated due to a range of reporting issues. Due to a lack of fishery data for several gears, only preliminary stock status indicators can be used. However, the size-based assessment showed results with considerable uncertainty - LB-SPR estimated a SPR greater than the reference level of SPR40%, (a proxy for 40% depletion often considered as risk averse target in many data-poor fisheries) whereas the fishblicc estimated a SPR below the reference level. Aspects of the fisheries for frigate tuna combined with the lack of data on which to base an assessment of the stock are a cause for considerable concern. Stock status in relation to the Commission's B_{MSY} and F_{MSY} reference points remains **unknown (Table 1)**.

Outlook. Estimated catches have increased steadily since the late-1970s, reaching around 30,000 t in the late-1980s, to between 51,000 and 58,000 t by the mid-1990s, and steadily increasing to over 90,000 t in the following ten years. Between 2010 and 2014 catches have increased to over 105,000 t, rising to the highest levels recorded, although catches have since decline marginally to between 90,000 – 141,000 t since 2014. There is insufficient information to evaluate the effect that this level of catch or a further increase in catches may have on the resource. Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets, size compositions and life trait history parameters (e.g., estimates of growth, natural mortality, maturity, etc.).

Management advice. For assessed species of neritic tunas in Indian Ocean (longtail tuna, kawakawa and narrow-barred Spanish mackerel), the MSY was estimated during early assessments to have been reached between 2009 and

2011 and both F_{MSY} and B_{MSY} were breached thereafter. It is worth noting that the catch in 2023 was estimated to be 130,815t and there has been significant variability in estimated catches of this species in recent years. This variation is perhaps due to issue of mis-identification of this species among other reasons. In the absence of an accepted stock assessment for frigate tuna, a limit to the catches should be considered by the Commission, by ensuring that future catches do not continue to exceed the average catches estimated between 2009 and 2011 (101,260 t). The reference period (2009-2011) was chosen based on the most recent assessments of those neritic species in the Indian Ocean for which an assessment is available under the assumption that MSY for frigate tuna was also reached between 2009 and 2011. This catch advice should be maintained until an assessment of frigate tuna is available. Considering that MSY-based reference points for assessed species can change over time, the stock should be closely monitored. Mechanisms need to be developed by the Commission to improve current statistics by encouraging CPCs to comply with their recording and reporting requirements, so as to better inform scientific advice.

The following should be also noted:

- The Maximum Sustainable Yield estimate for the Indian Ocean stock is unknown;
- Limit reference points: the Commission has not adopted limit reference points for any of the neritic tunas under its mandate;
- Further work is needed to improve the reliability of the catch series, such as verification or estimation based on expert knowledge of the history of the various fisheries or through statistical extrapolation methods;
- Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets, size compositions and life trait history parameters (e.g., estimates of growth, natural mortality, maturity, etc.)
- Species identification, data collection and reporting urgently need to be improved;
- There is limited information submitted by CPCs on total catches, catch and effort and size data for neritic tunas, despite their mandatory reporting status. In the case of 2022 catches (reference year 2021), 80% of the total catches were either fully or partially estimated by the IOTC Secretariat, which increases the uncertainty of the stock assessments using these data. Therefore, the management advice to the Commission includes the need for CPCs to comply with IOTC data requirements per Resolution 15/01 and 15/02.

Fisheries overview.

- **Main fisheries (mean annual catch 2019-2023)**: frigate tuna are caught using gillnet (47.7%), followed by line (19.3%) and purse seine (18.4%). The remaining catches taken with other gears contributed to 14.6% of the total catches in recent years (**Fig. 1**);
- **Main fleets (mean annual catch 2019-2023)**: the majority of frigate tuna catches are attributed to vessels flagged to Indonesia (46.7%) followed by India (11.3%) and Pakistan (10.4%). The 23 other fleets catching frigate tuna contributed to 31.6% of the total catch in recent years (**Fig. 2**).

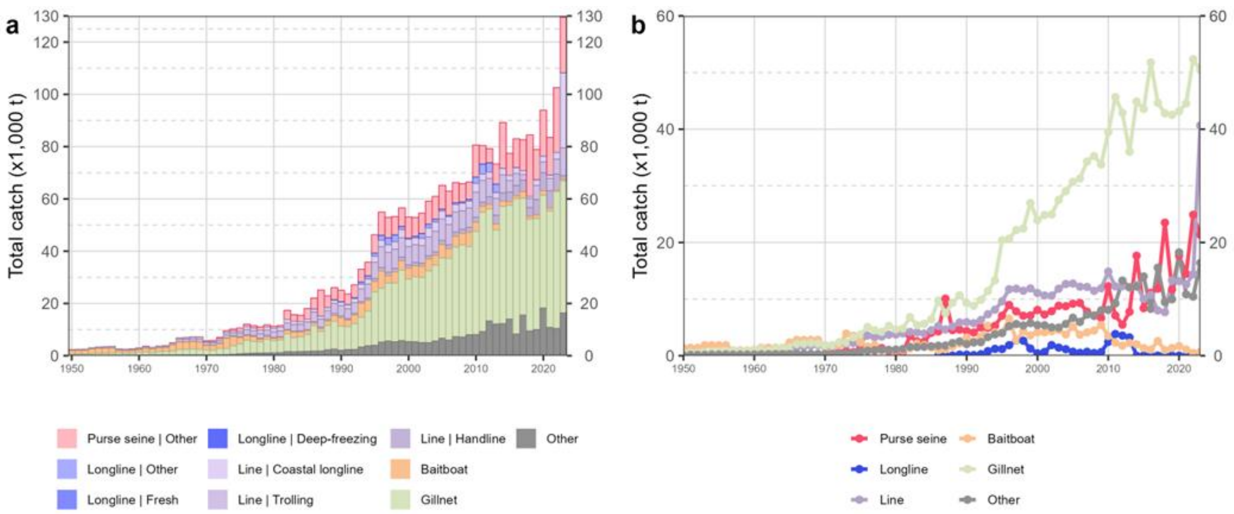

Fig. 1. Annual time series of (a) cumulative nominal catches (t) by fishery and (b) individual nominal catches (t) by fishery group for frigate tuna during 1950-2023

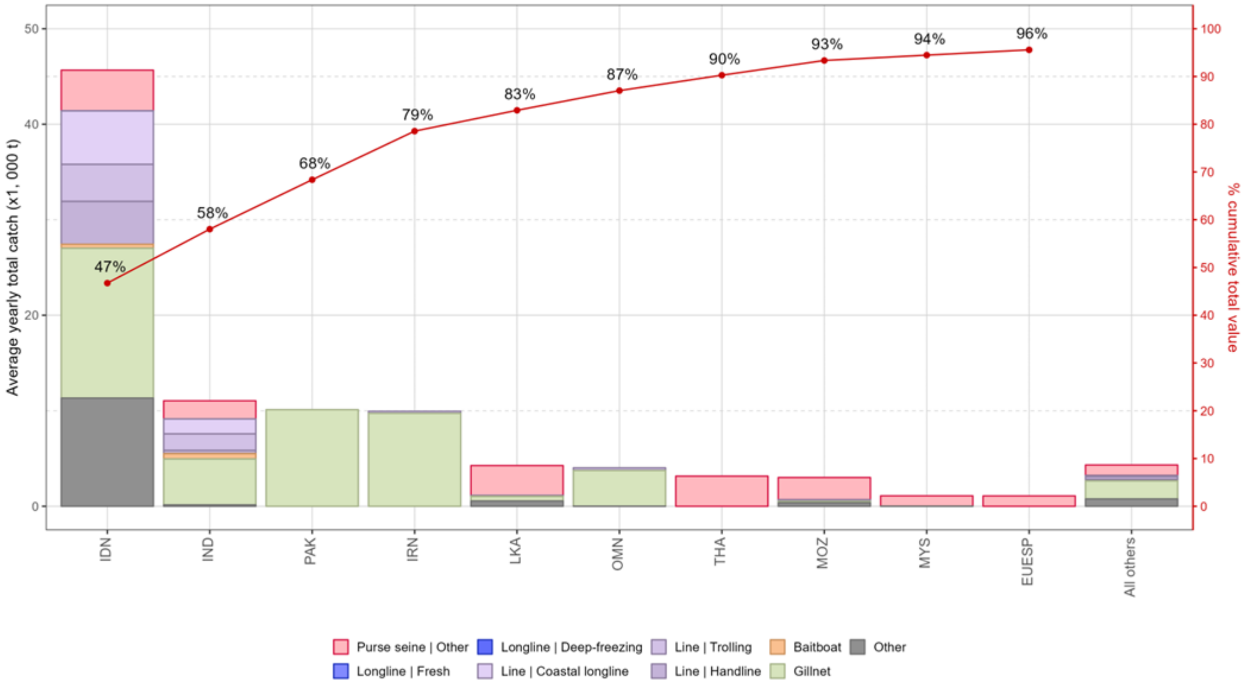

Fig. 2. Mean annual catches (t) of frigate tuna by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet

APPENDIX IX
EXECUTIVE SUMMARY: KAWAKAWA

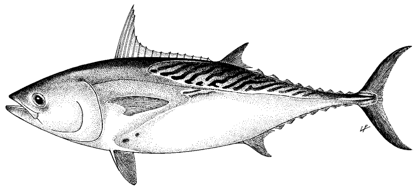

TABLE 1. Status of kawakawa (*Euthynnus affinis*) in the Indian Ocean

Area[1]	Indicators		2023 stock status determination[3]
Indian Ocean	Catch 2023[2] (t) Mean annual catch 2019-2023 (t)	148,721 130,855	**27%**
	MSY (t) (80% CI) F_{MSY} (80% CI) B_{MSY} (t) (80% CI) $F_{current}/F_{MSY}$ (80% CI) $B_{current}/B_{MSY}$ (80% CI)	154,000 (122,000 – 193,000) 0.60 (0.48 – 0.74) 258,000 (185 – 359) 0.98 (0.82–2.20) 0.99 (0.45 – 1.20)	

[1]Stock boundaries defined as the IOTC area of competence; [2]Proportion of catch fully or partially estimated for 2023: 66.7%; [3]2021 is the final year that data were available for this assessment.

Colour key	Stock overfished (SB_{year}/SB_{MSY}< 1)	Stock not overfished (SB_{year}/SB_{MSY}≥ 1)
Stock subject to overfishing (F_{year}/F_{MSY}> 1)	25%	23%
Stock not subject to overfishing (F_{year}/F_{MSY}≤ 1)	27%	25%
Not assessed/Uncertain		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was conducted in 2025 for kawakawa and so the results are based on the results of the assessment carried out in 2023 which examined a number of data-limited methods include C-MSY, OCOM, and JABBA models (based on data up to 2021). These models produced stock estimates that are not drastically divergent because they shared similar dynamics and assumptions. The C-MSY model has been explored more fully and therefore is used to obtain estimates of stock status. The C-MSY model indicated that the fishing mortality F was very close to F_{MSY} (F/F_{MSY}=0.98) and the current biomass B was also very close to B_{MSY} (B/B_{MSY}=0.99). The estimated probability of the stock currently being in yellow quadrant of the Kobe plot is about 27%. The analysis using OCOM model is more pessimistic and using JABBA incorporating gillnet CPUE indices is more optimistic. Due to the quality of the data being used, the simple modelling approach employed in 2020 and 2023, and the large increase in kawakawa catches over the last decade (**Fig. 1**), measures need to be taken in order to reduce the level of catches which have surpassed the estimated MSY levels for most years since 2011. While the precise stock structure of kawakawa remains unclear, recent research (IOTC-2020-SC23-11_Rev1) provides strong evidence of population structure of kawakawa within the IOTC area of competence, with at least 4 genetic populations identified. This increases the uncertainty in the assessment, which currently assumes a single stock of kawakawa. Based on the weight-of-evidence available, the kawakawa stock for the Indian Ocean is classified as **overfished** but **not subject to overfishing** (**Table 1**, **Fig. 1**). However, the assessment using catch-only method is subjected to high uncertainty and is highly influenced by several prior assumptions.

Outlook. There is considerable uncertainty about stock structure and the estimate of total catches. Due to the uncertainty associated with catch data (e.g., 67.6% of catches partially or fully estimated by the IOTC Secretariat for 2023) and the limited number of CPUE series available for fleets representing a small proportion of total catches, only data poor assessment approaches can currently be used. Aspects of the fisheries for this species, combined with the lack of data on which to base a more complex assessment (e.g., integrated models) are a cause for considerable concern. In the interim, until more traditional approaches are developed, data-poor approaches will be used to assess stock status. Continued increase in the annual catches for kawakawa is also likely to further increase the pressure on the Indian Ocean stock. Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets, size compositions and life trait history parameters (e.g., estimates of growth, natural mortality, maturity, etc.).

Management Advice. The assessment models rely on catch data, which are considered to be highly uncertain. The catch in 2022 was just above the estimated MSY. The available gillnet CPUE of kawakawa showed a somewhat increasing trend although the reliability of the index as abundance indices remains unknown. Despite the substantial uncertainties, the stock is probably very close to being fished at MSY levels and that higher catches may not be sustained in the longer term. A precautionary approach to management is recommended.

The following should be also noted:

- The Maximum Sustainable Yield estimate for the Indian Ocean is estimated to be 154,000 t with a range between 122,000 t and 193,000 t and so catch levels should be reduced in future to prevent the stock becoming overfished;
- Further work is needed to improve the reliability of the catch series. Reported catches should be verified or estimated, based on expert knowledge of the history of the various fisheries or through statistical extrapolation methods;
- Improvement in data collection and reporting is required if the stock is to be assessed using integrated stock assessment models;
- Limit reference points: the Commission has not adopted limit reference points for any of the neritic tunas under its mandate;
- Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets, size compositions and life trait history parameters (e.g., estimates of growth, natural mortality, maturity, etc.);
- Given the limited information submitted by CPCs on total catches, catch and effort and size data for neritic tunas, despite their mandatory reporting status, the IOTC Secretariat was required to estimate 55.6% of the catches (in 2023, with reference year 2021), which increases the uncertainty of the stock assessments using these data. Therefore, the management advice to the Commission includes the need for CPCs to comply with IOTC data requirements per Resolution [15/01]() and [15/02]().

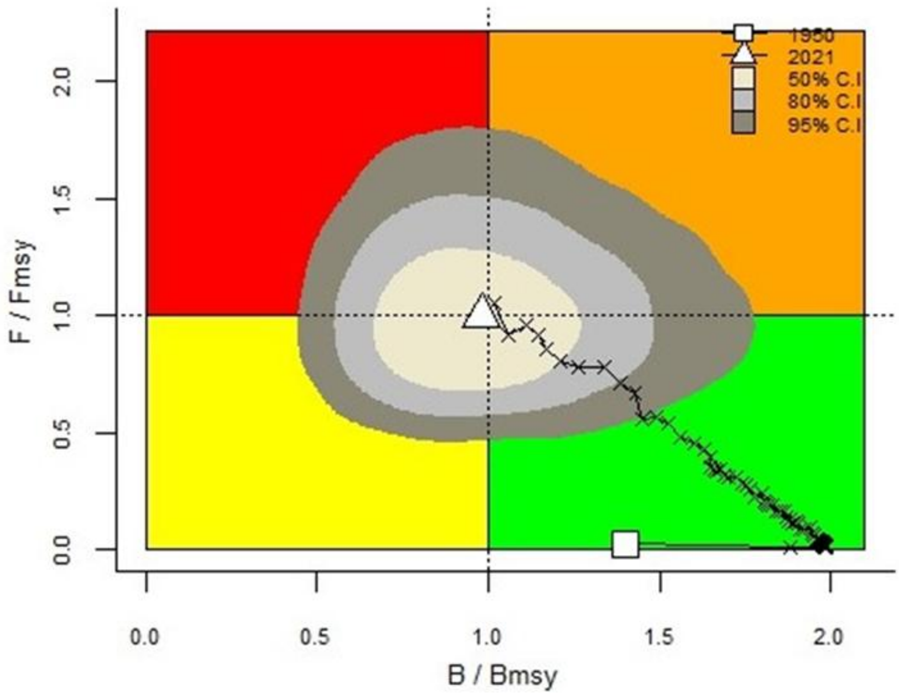

Fig. 1. C-MSY Indian Ocean assessment Kobe plot for kawakawa. The Kobe plot presents the trajectories (median) for the range of plausible model trajectories included in the formulation of the final management advice. The shaded contour lines represent 50%, 80%, and 95% confidence intervals of estimated stock status in 2021

Fisheries overview.

- **Main fisheries (mean annual catch 2019-2023)**: kawakawa are caught using gillnet (56.8%), followed by purse seine (22.6%) and line (15.7%). The remaining catches taken with other gears contributed to 4.8% of the total catches in recent years (**Fig. 2**).

- **Main fleets (mean annual catch 2019-2023)**: the majority of kawakawa catches are attributed to vessels flagged to India (28%) followed by I. R. Iran (26.5%) and Indonesia (17.5%). The 32 other fleets catching kawakawa contributed to 27.8% of the total catch in recent years (**Fig. 3**).

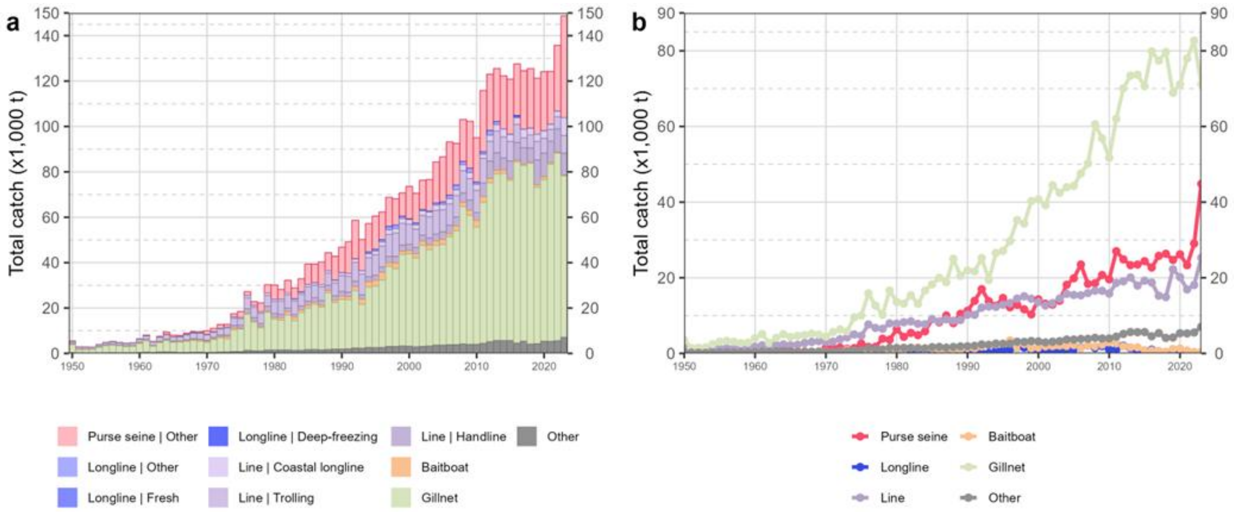

Fig. 2. Annual time series of (a) cumulative nominal catches (t) by fishery and (b) individual nominal catches (t) by fishery group for kawakawa during 1950-2023

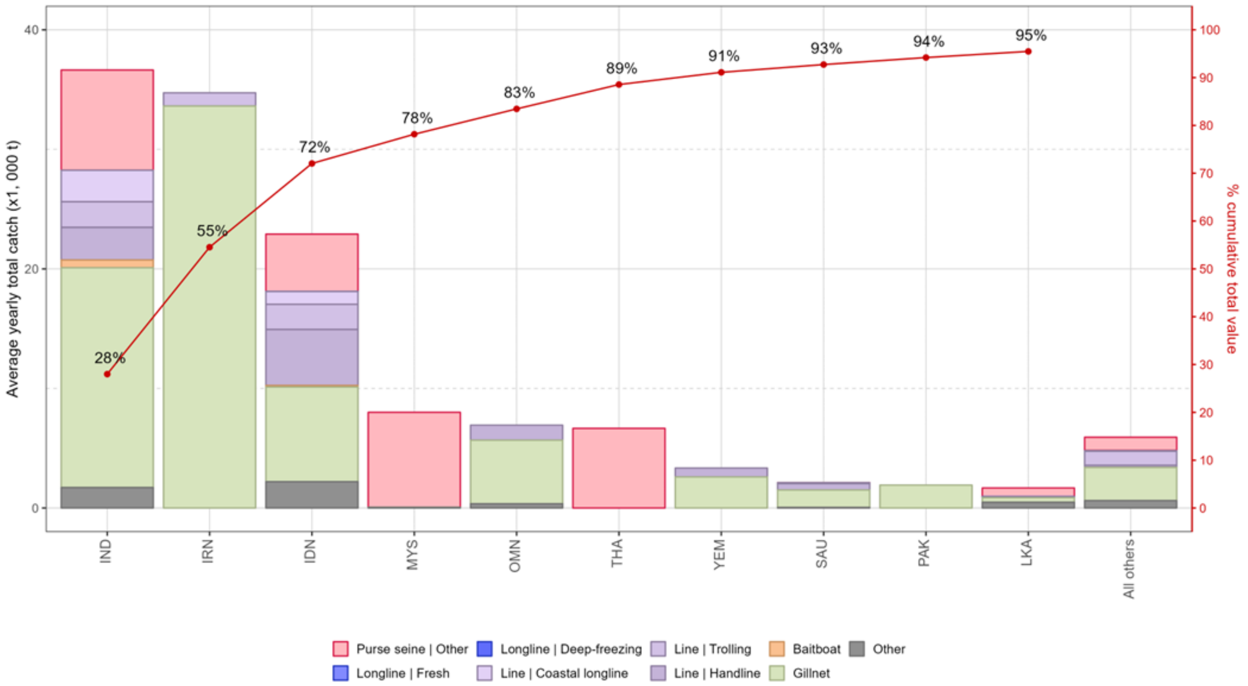

Fig 3. Mean annual catches (t) of kawakawa by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet

APPENDIX X
EXECUTIVE SUMMARY: LONGTAIL TUNA

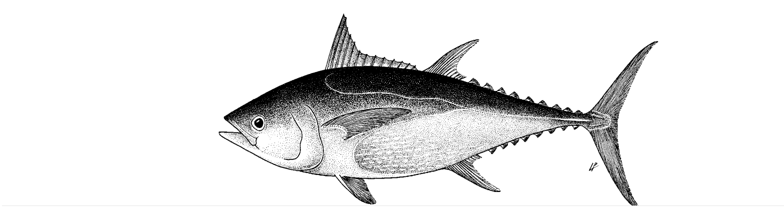

TABLE 1. Status of longtail tuna (*Thunnus tonggol*) in the Indian Ocean

Area[1]	**Indicators**		**2023 stock status determination**[3]
Indian Ocean	Catch 2023[2] (t)	135,221	**34.7%**
	Mean annual catch (2019-2023) (t)	127,208	
	MSY (t) (80% CI)	133,000 (108 –165)	
	F_{MSY} (80% CI)	0.31 (0.22 – 0.44)	
	B_{MSY} (t) (80% CI)	433,000 (272,000 – 690,000)	
	$F_{current}/F_{MSY}$ (80% CI)	1.05 (0.84 – 2.31)	
	$B_{current}/B_{MSY}$ (80% CI)	0.96 (0.44 – 1.19)	

[1]Stock boundaries defined as the IOTC area of competence; [2]Proportion of catch fully or partially estimated for 2023: 44.9%; [3]2021 is the final year that data were available for this assessment

Colour key	Stock overfished (SB_{year}/SB_{MSY}< 1)	Stock not overfished (SB_{year}/SB_{MSY}≥ 1)
Stock subject to overfishing (F_{year}/F_{MSY}> 1)	35%	25%
Stock not subject to overfishing (F_{year}/F_{MSY}≤ 1)	23%	17%
Not assessed/Uncertain		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was conducted for longtail in 2025 and so the results are based on the results of the assessment carried out in 2023 which examined a number of data-limited methods including C-MSY, OCOM, and JABBA models (based on data up to 2021). These models produced stock estimates that are not drastically divergent because they shared similar dynamics and assumptions. The C-MSY model has been explored more fully and therefore is used to obtain estimates of stock status. The C-MSY analysis indicates that the stock is being exploited at a rate that exceeded F_{MSY} in recent years and that the stock appears to be below B_{MSY} and above F_{MSY} (35% of plausible models runs) (**Fig. 2**). Catches between 2017 and 2021 were slightly above MSY but steadily declined from 2012 to less than 113,000 t in 2019, (**Fig. 1**). The F_{2021}/F_{MSY} ratio is lower than previous estimates and the B_{2021}/B_{MSY} ratio was higher than in previous years. The analysis using the OCOM model is more pessimistic and using JABBA incorporating gillnet CPUE indices is more optimistic. The JABBA model, however, is unable to estimate carrying capacity with a fair degree of certainty without additional prior constraints, indicating the fact that the CPUE is either not informative or is conflicting with catch data. While the precise stock structure of longtail tuna remains unclear, recent research (IOTC-2020-SC23-11_Rev1) provides strong evidence of population structure of longtail tuna within the IOTC area of competence, with at least 3 genetic populations identified. This increases the uncertainty in the assessment, which currently assumes a single stock of longtail tuna. Based on the C-MSY assessment, the stock is considered to be both **overfished** and **subject to overfishing** (**Table 1**; **Fig. 1**). However, the assessment using catch-only method is subjected to high uncertainty and is highly influenced by several prior assumptions.

Outlook. There remains considerable uncertainty about the total catches of longtail tuna in the Indian Ocean. The increase in annual catches to a peak in 2012 increased the pressure on the longtail tuna Indian Ocean stock, although the catch trend has reversed since then. As noted in 2015, the apparent fidelity of longtail tuna to particular areas/regions is a matter for concern as overfishing in these areas can lead to localised depletion. Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets, size compositions, exploring alternative approaches for estimating abundance (e.g., close-kin mark-recapture), and gaining a better understanding of stock structure and life trait history parameters (e.g. estimates of growth, natural mortality, maturity, etc.).

Management advice. The catch in 2023 was above the estimated MSY and the exploitation rate has been increasing over the last few years, as a result of the declining abundance. Despite the substantial uncertainties, this suggests that the stock is being fished above MSY levels and that higher catches may not be sustained. A precautionary approach to management is recommended.

The following should be also noted:

- The Maximum Sustainable Yield for the Indian Ocean is estimated to be 133,000t with a range of 108,000 –165,000t and so catch levels should be reduced in future to bring the stock back into the green quadrant;
- Limit reference points: the Commission has not adopted limit reference points for any of the neritic tunas under its mandate;
- Further work is needed to improve the reliability of the catch series. Reported catches should be verified or estimated, based on expert knowledge of the history of the various fisheries or through statistical extrapolation methods;
- Improvements in data collection and reporting are required if the stock is to be assessed using integrated stock assessment models;
- Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets (I.R. Iran, Indonesia, Pakistan, Sultanate of Oman and India), size compositions and life trait history parameters (e.g., estimates of growth, natural mortality, maturity, etc.);
- There is limited information submitted by CPCs on total catches, catch and effort and size data for neritic tunas, despite their mandatory reporting status. In the case of 2022 catches (reference year 2021) 27.2% of the total catches of longtail were either fully or partially estimated by the IOTC Secretariat, which increases the uncertainty of the stock assessments using these data. Therefore, the management advice to the Commission includes the need for CPCs to comply with IOTC data requirements per Resolution 15/01 and 15/02.

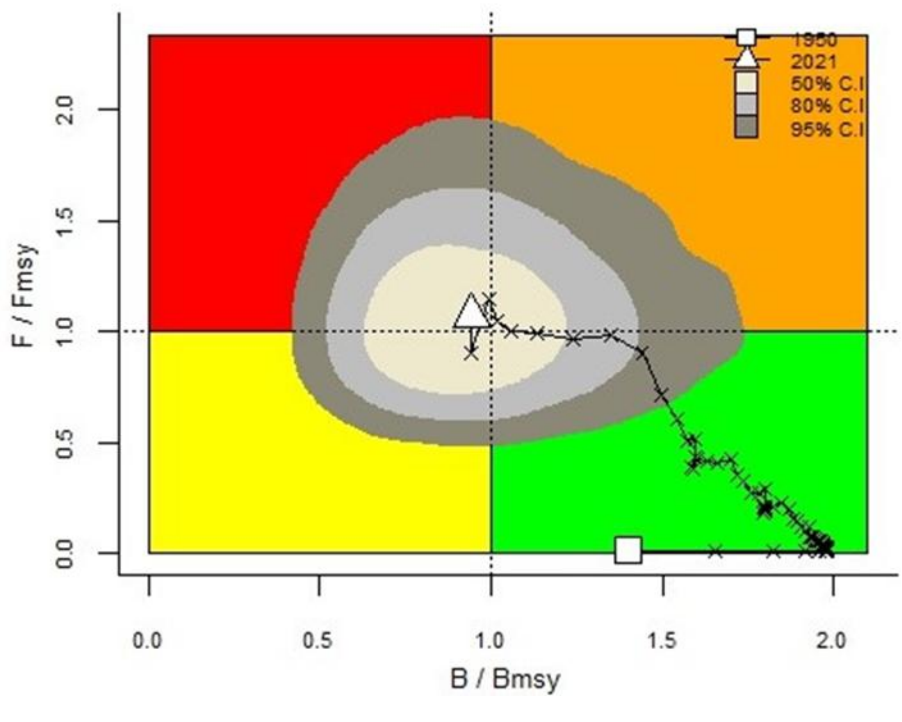

Fig. 1. Longtail tuna C-MSY Indian Ocean assessment Kobe plot. The Kobe plot presents the trajectories (median) for the range of plausible model trajectories included in the formulation of the final management advice. The shaded contour lines represent 50%, 80%, and 95% confidence intervals of estimated stock status in 2021

Fisheries overview.

- **Main fisheries (mean annual catch 2019-2023)**: longtail tuna are caught using gillnet (65.8%), followed by line (16.2%) and other (9%). The remaining catches taken with other gears contributed to 8.8% of the total catches in recent years (**Fig. 2**).
- **Main fleets (mean annual catch 2019-2023)**: the majority of longtail tuna catches are attributed to vessels flagged to I. R. Iran (40.7%) followed by Indonesia (21%) and Sultanate of Oman (20.2%). The 21 other fleets catching longtail tuna contributed to 17.9% of the total catch in recent years (**Fig. 3**).

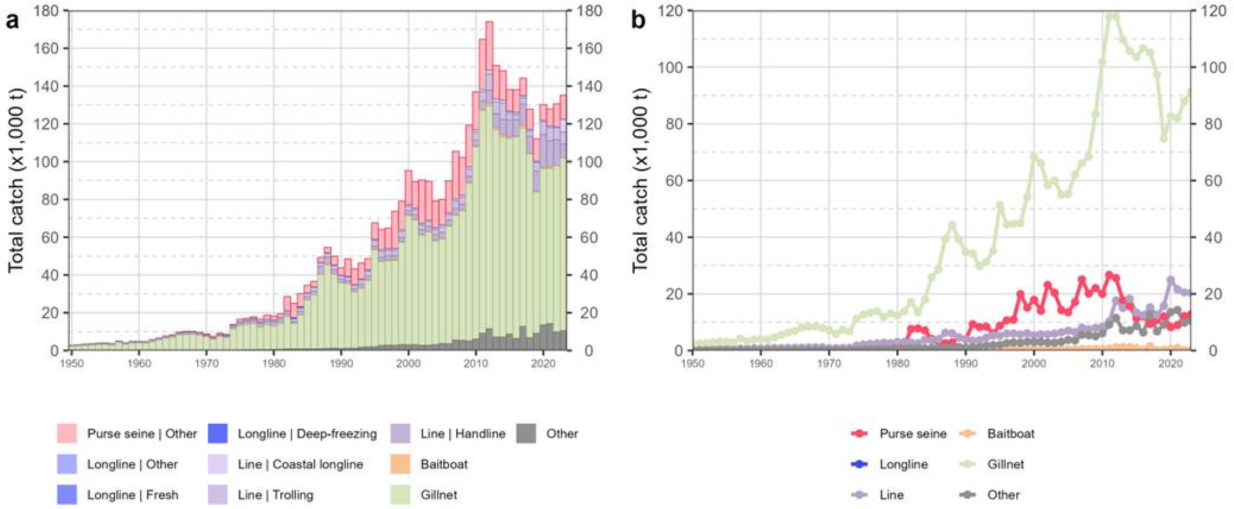

Fig. 2. Annual time series of (a) cumulative nominal catches (t) by fishery and (b) individual nominal catches (t) by fishery group for longtail tuna during 1950-2023

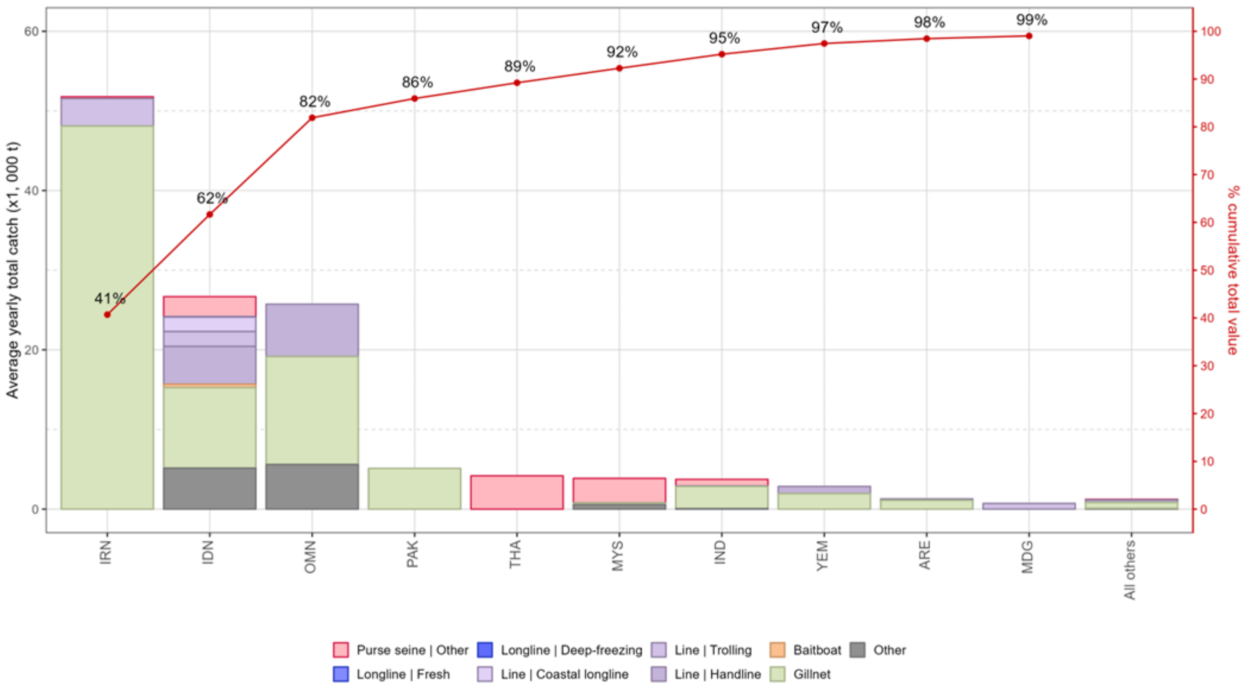

Fig. 3. Mean annual catches (t) of longtail tuna by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet

APPENDIX XI
EXECUTIVE SUMMARY: INDO-PACIFIC KING MACKEREL

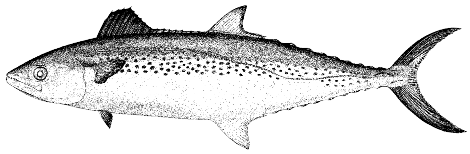

TABLE 1. Status of Indo-Pacific king mackerel (*Scomberomorus guttatus*) in the Indian Ocean

Area[1]	Indicators		2024 stock status determination[3]
Indian Ocean	Catch (2023) (t)[2]	45,518	**27%**
	Mean annual catch (2019-2023) (t)	38,088	
	MSY (1,000 t)	47 (39–56)	
	F_{MSY}	0.74 (0.56–0.99)	
	B_{MSY} (1,000 t)	63.1 (43.1–92.4)	
	$F_{current}/F_{MSY}$	0.95 (0.82–2.13)	
	$B_{current}/B_{MSY}$	1.02 (0.46–1.19)	
	$B_{current}/B_0$	0.51 (0.23–0.60)	

[1]Stock boundaries defined as the IOTC area of competence;
[2]Proportion of catch fully or partially estimated for 2023: 69%;
[3]2022 is the final year that data were available for this assessment

Colour key	Stock overfished (SB_{year}/SB_{MSY}< 1)	Stock not overfished (SB_{year}/SB_{MSY}≥ 1)
Stock subject to overfishing (F_{year}/F_{MSY}> 1)	24%	24%
Stock not subject to overfishing (F_{year}/F_{MSY}≤ 1)	25%	27%
Not assessed/Uncertain		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was conducted for Indo-Pacific king mackerel in 2025 and so the results are based on the results of the assessment carried out in 2023 which examined a number of data-limited methods including CMSY and CMSY++ (based on data up to 2022). Analysis using the catch only method CMSY indicates the stock is being exploited at a rate that is below F_{MSY} in recent years and that the stock appears to be above B_{MSY}, although the estimates would be more pessimistic if the stock productivity is assumed to be less resilient. An assessment using CMSY++was also explored in 2024. The stock estimates with CMSY++ are estimated to be very close to the biomass target even though the stock status is more pessimistic than with CMSY. Despite some of the caveats of the underlying assumptions, the catch-only model has provided a more defensible approach in addressing the uncertainty of key parameters and the currently available catch data for the Indo-Pacific king mackerel appear to be of sufficient quality. Based on the weight-of-evidence currently available, the stock is considered to be **not overfished and not subject to overfishing** (**Table 1; Fig. 1**).

Outlook. Total annual catches for Indo-Pacific king mackerel have increased steadily over time, reaching a peak of 51,600 t in 2009 and have since fluctuated between around 40,000 t and 51,300 t. There is considerable uncertainty about stock structure and total catches. Aspects of the fisheries for this species, combined with the limited data on which to base a more complex assessment (e.g., integrated models), are a cause for concern. Although data-poor methods are used to provide stock status advice, further refinements to the catch-only methods and application of additional data-poor approaches may improve confidence in the results. Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets, size compositions and life trait history parameters (e.g., estimates of growth, natural mortality, maturity, etc.).

Management advice. Reported catches of Indo-Pacific king mackerel in the Indian Ocean has increased considerably since the late 2000s with recent catches fluctuating around estimated MSY, although the catch in 2021 and 2023 was below the estimated MSY. This suggests that the stock is close to being fished at MSY levels and that higher catches may not be sustained despite the substantial uncertainty associated with the assessment, a precautionary approach to management is recommended.

The following should be also noted:

- The Maximum Sustainable Yield for the Indian Ocean is estimated to be 47,000 t with a range between 39,000–56,000 t
- Limit reference points: the Commission has not adopted limit reference points for any of the neritic tunas under its mandate;
- Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets, size compositions and life trait history parameters (e.g. estimates of growth, natural mortality, maturity, etc.).
- Further work is needed to improve the reliability of the catch series. Reported catches should be verified or estimated, based on expert knowledge of the history of the various fisheries or through statistical extrapolation methods;
- Data collection and reporting urgently needed to be improved, given the limited information submitted by CPCs on total catches, catch and effort and size data for neritic tunas, despite their mandatory reporting status. In the case of 2022 74.8% of the total catches of Indo-Pacific king mackerel was either fully or partially estimated by the IOTC Secretariat, which increases the uncertainty of the stock assessments using these data. Therefore, the management advice to the Commission includes the need for CPCs to comply with IOTC data requirements per Resolution 15/01 and 15/02.

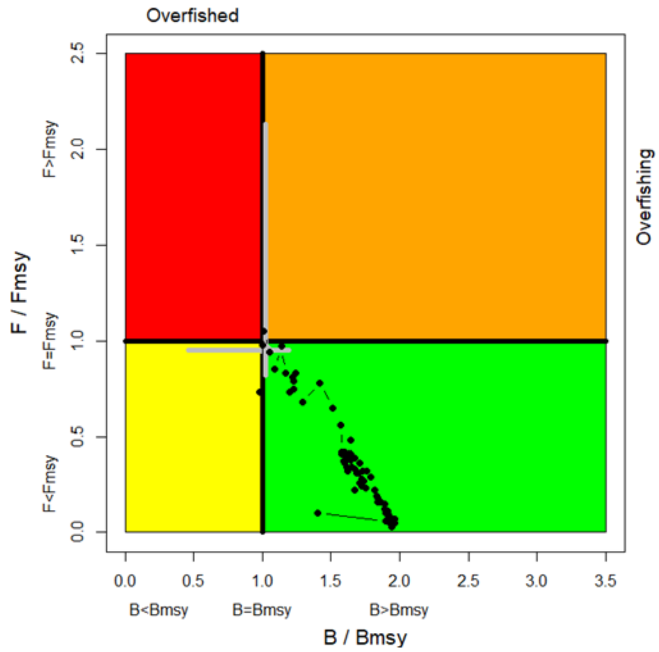

Fig. 1 Kobe plot of the CMSY assessment for the Indian Ocean spotted kingfish. The Kobe plot shows the trajectories (geometric mean) of the range of plausible model options included in the formulation of the final management advice. The grey cross represents the estimated stock status in 2022 (median and 80% confidence interval).

Fisheries overview.

- **Main fisheries (mean annual catch 2019-2023)**: Indo-Pacific king mackerel are caught using gillnet (63.5%), followed by other (23.1%) and line (10.6%). The remaining catches taken with other gears contributed to 2.8% of the total catches in recent years (**Fig. 2**).
- **Main fleets (mean annual catch 2019-2023)**: the majority of Indo-Pacific king mackerel catches are attributed to vessels flagged to India (33.5%) followed by I. R. Iran (26.8%) and Indonesia (17.9%). The 15 other fleets catching Indo-Pacific king mackerel contributed to 21.7% of the total catch in recent years (**Fig. 3**).

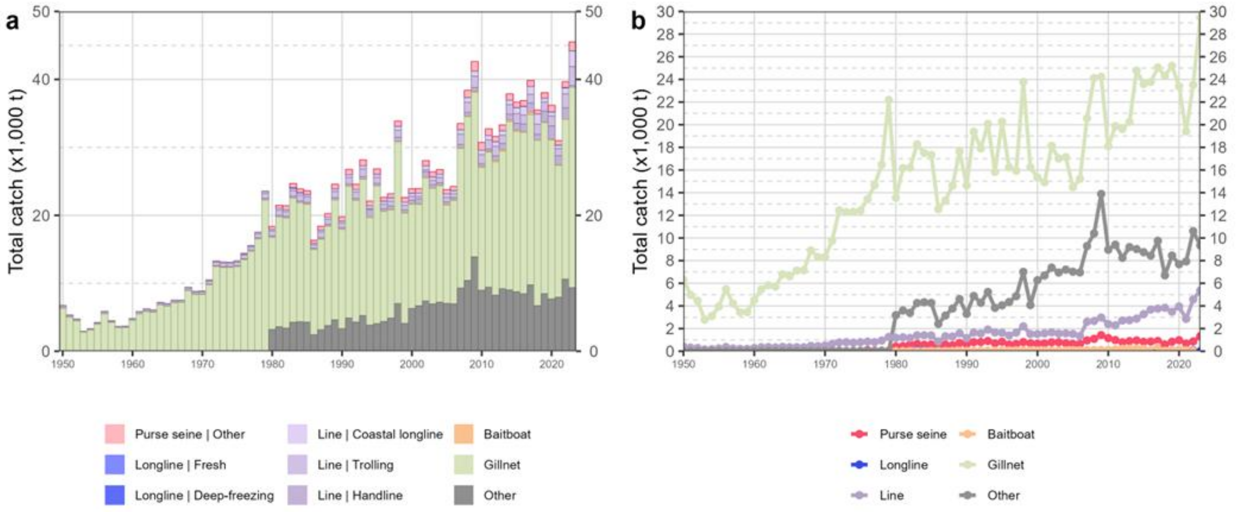

Fig. 2. Annual time series of (a) cumulative nominal catches (t) by fishery and (b) individual nominal catches (t) by fishery group for Indo-Pacific king mackerel during 1950-2023

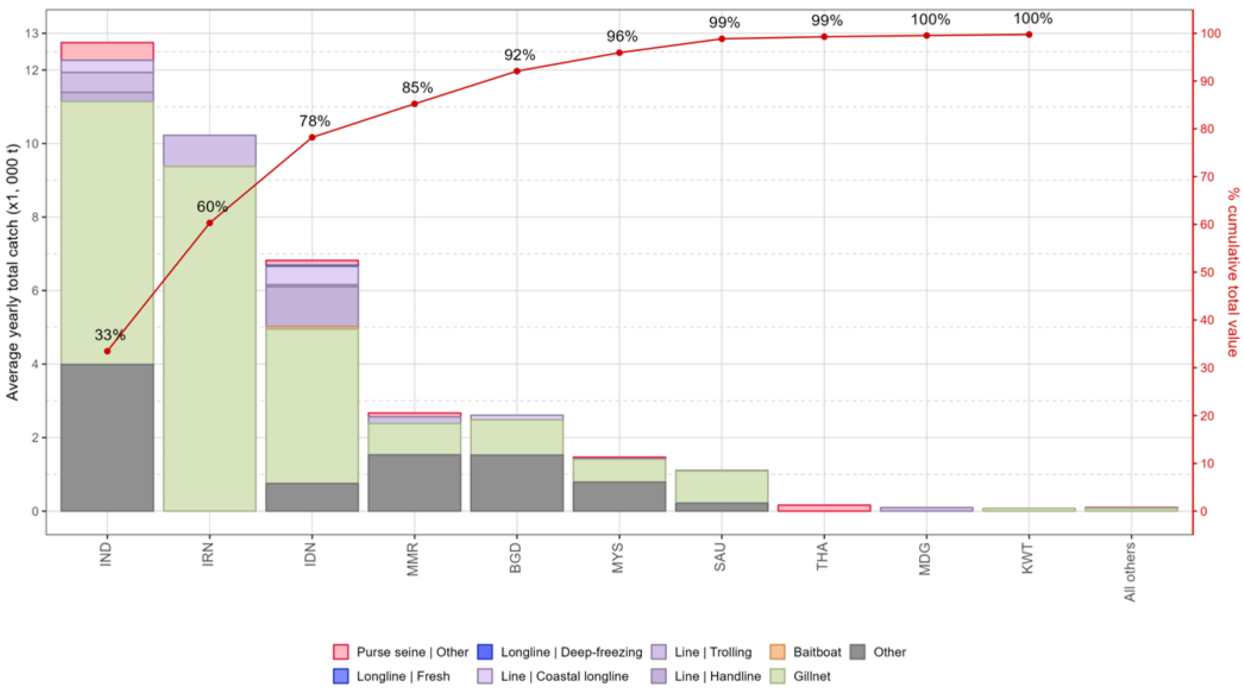

Fig. 3. Mean annual catches (t) of Indo-Pacific king mackerel by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet

APPENDIX XII
EXECUTIVE SUMMARY: NARROW-BARRED SPANISH MACKEREL

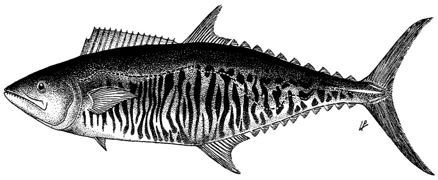

TABLE 1. Status of narrow-barred Spanish mackerel (*Scomberomorus commerson*) in the Indian Ocean

Area[1]	**Indicators**		**2023 stock status determination**[3]
Indian Ocean	Catch (2023)[2] (t) Mean annual catch (2019-2023) (t)	162,401 138,316	**31%**
	MSY (t) (80% CI) F_{MSY} (80% CI) B_{MSY} (t) (80% CI) $F_{current}/F_{MSY}$ (80% CI) $B_{current}/B_{MSY}$ (80% CI)	161,000 (132,000 – 197,000) 0.60 (0.48–0.74) 271,000 (197,000 – 373,000) 1.07 (0.88 – 2.38) 0.98 (0.44 – 1.19)	

[1]Stock boundaries defined as the IOTC area of competence;
[2]Proportion of catch fully or partially estimated for 2023: 62.1%;
[3]2021 is the final year that data were available for this assessment

Colour key	Stock overfished (SB_{year}/SB_{MSY}< 1)	Stock not overfished (SB_{year}/SB_{MSY}≥ 1)
Stock subject to overfishing (F_{year}/F_{MSY}> 1)	31%	28%
Stock not subject to overfishing (F_{year}/F_{MSY}≤ 1)	22%	19%
Not assessed/Uncertain		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was conducted in 2025 for narrow-barred Spanish mackerel and so the results are based on the results of the assessment carried out in 2023which examined a number of data-limited methods including C-MSY, OCOM, and JABBA models (based on data up to 2021). These models produced stock estimates that are not drastically divergent because they shared similar dynamics and assumptions. The C-MSY model has been explored more fully and therefore is used to obtain estimates of stock status. The C-MSY analysis indicates that the stock is being exploited at a rate that exceeded F_{MSY} in recent years and that the stock appears to be below B_{MSY} and above F_{MSY} (31% of plausible models runs). The analysis using OCOM model is more pessimistic and using JABBA incorporating gillnet CPUE indices is more optimistic. The JABBA model, however, is unable to estimate carrying capacity with a fair degree of certainty without additional prior constraints, indicating that the CPUE is either not informative or is conflicting with catch data. An analysis undertaken in 2013 in the Northwest Indian Ocean (Gulf of Oman) indicated that overfishing is occurring in this area and that localised depletion may also be occurring[4]. While the precise stock structure of Spanish mackerel remains unclear, recent research (IOTC-2020-SC23-11_Rev1) provides strong evidence of population structure of Spanish mackerel within the IOTC area of competence, with at least 4 genetic populations identified. This increases the uncertainty in the assessment, which currently assumes a single stock of Spanish mackerel. Based on the C-MSY assessment, the stock appears to be **overfished** and **subject to overfishing** (**Table 1**, **Fig. 1**). However, the assessment using catch-only method is subjected to high uncertainty and is highly influenced by several prior assumptions.

Outlook. There is considerable uncertainty about the estimate of total catches. The continued increase in annual catches in recent years has further increased the pressure on the Indian Ocean narrow-barred Spanish mackerel stock. The apparent fidelity of narrow-barred Spanish mackerel to particular areas/regions is a matter for concern as overfishing in these areas can lead to localised depletion.

[4] IOTC-2013-WPNT03-27

Management advice. The catch in 2023 was above the estimated MSY and the available gillnet CPUE shows a somewhat increasing trend in recent years although the reliability of the index as an abundance index remains unknown. Despite the substantial uncertainties, the stock is being fished above MSY levels and higher catches may not be sustained.

The following should also be noted:

- Maximum Sustainable Yield for the Indian Ocean stock was estimated at 161,000 t (ranging between 132,000 t and 197,000 t, with catches for 2022 (168,167 t) exceeding this level;
- Limit reference points: the Commission has not adopted limit reference points for any of the neritic species under its mandate;
- Further work is needed to improve the reliability of the catch series. Reported catches should be verified or estimated, based on expert knowledge of the history of the various fisheries or through statistical extrapolation methods;
- Improvement in data collection and reporting is required if the stock is to be assessed using integrated stock assessment models;
- Given the increase in narrow-barred Spanish mackerel catch in the last decade, measures need to be taken to reduce catches in the Indian Ocean;
- Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets, size compositions, exploring alternative approaches for estimating abundance (e.g., close-kin mark-recapture), and gaining a better understanding of stock structure and life trait history parameters (e.g. estimates of growth, natural mortality, maturity, etc.);
- There is a lack of information submitted by CPCs on total catches, catch and effort and size data for neritic tunas, despite their mandatory reporting status. In the case of 2022 catches, 65.9% of the total catches of narrow-barred Spanish mackerel were either fully or partially estimated by the IOTC Secretariat, which increases the uncertainty of the stock assessments using these data. Therefore, the management advice to the Commission includes the need for CPCs to comply with IOTC data requirements per Resolution 15/01 and 15/02.

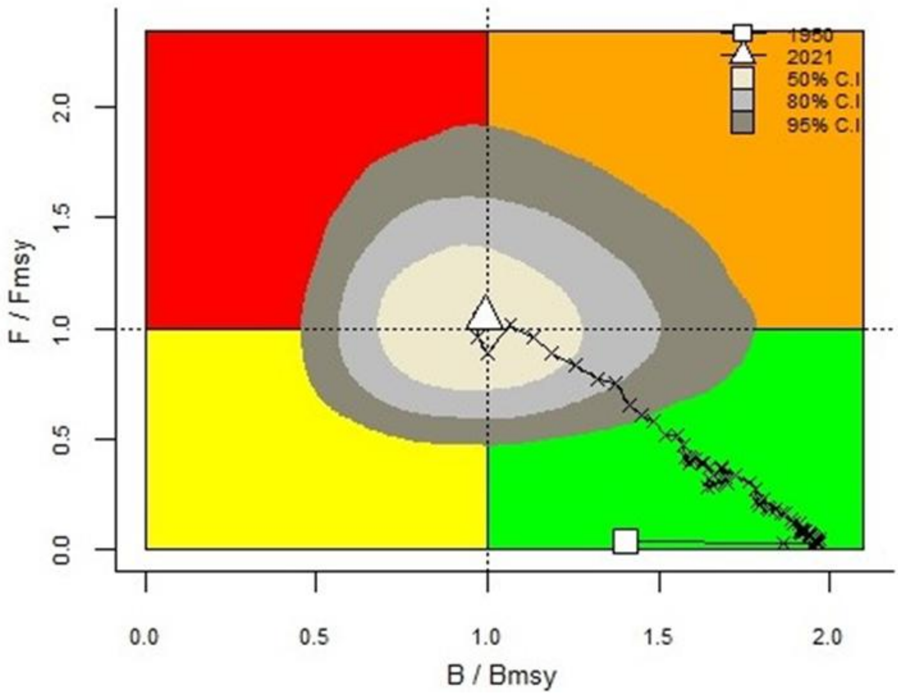

Fig. 1. Narrow-barred Spanish Mackerel OCOM Indian Ocean assessment Kobe plot. The Kobe plot presents the trajectories (median) for the range of plausible model trajectories included in the formulation of the final management advice. The shaded contour lines represent 50%, 80%, and 95% confidence intervals of estimated stock status in 2021

Fisheries overview.

- **Main fisheries (mean annual catch 2019-2023)**: narrow-barred Spanish mackerel are caught using gillnet (61%), followed by line (19.8%) and other (15.7%). The remaining catches taken with other gears contributed to 3.5% of the total catches in recent years (**Fig. 2**).

- **Main fleets (mean annual catch 2019-2023)**: the majority of narrow-barred Spanish mackerel catches are attributed to vessels flagged to India (20.3%) followed by I. R. Iran (18.9%) and Indonesia (18.3%). The 29 other fleets catching narrow-barred Spanish mackerel contributed to 42.4% of the total catch in recent years (**Fig. 3**).

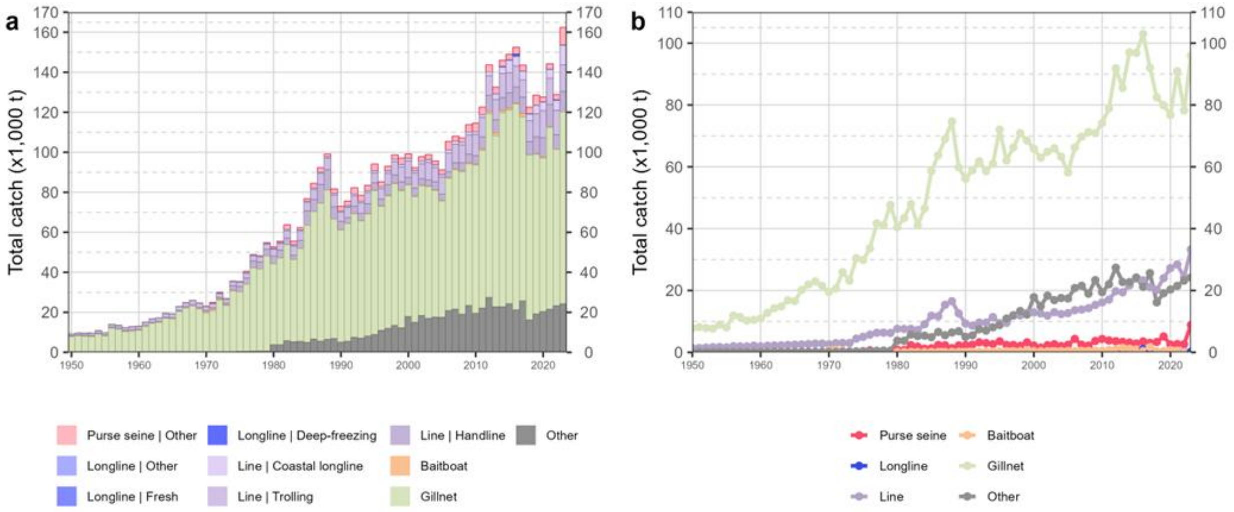

Fig. 2. Annual time series of (a) cumulative nominal catches (t) by fishery and (b) individual nominal catches (t) by fishery group for narrow-barred Spanish mackerel during 1950-2023

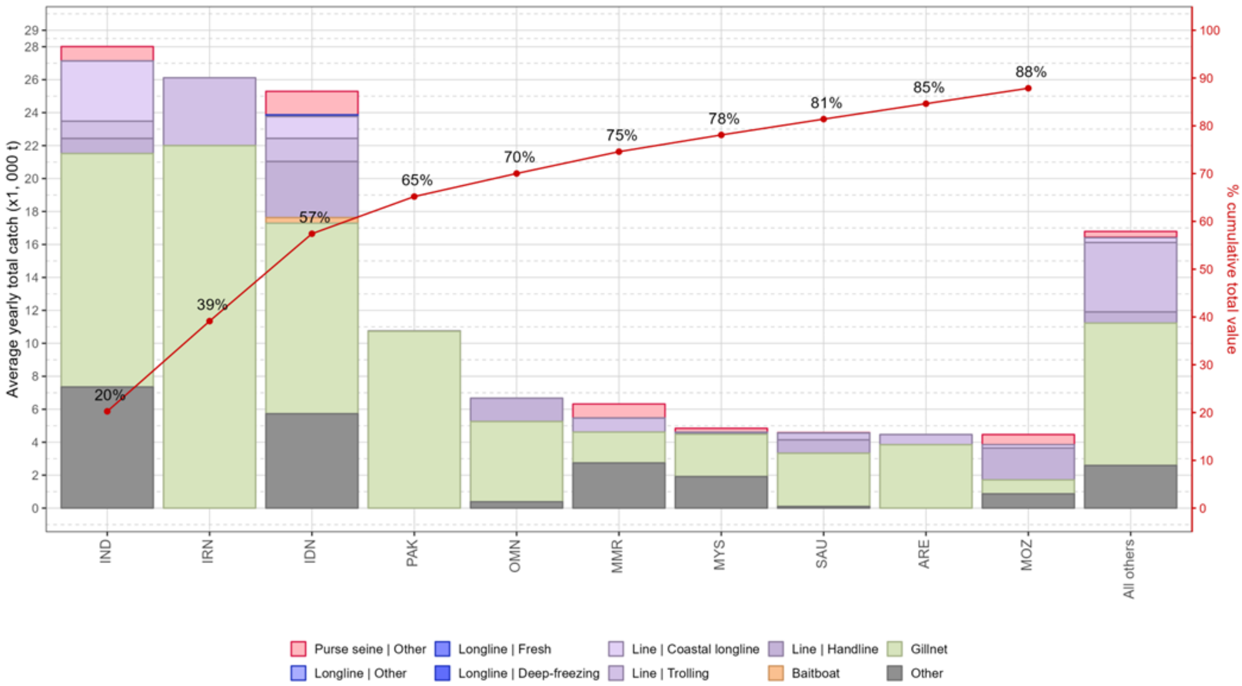

Fig. 3. Mean annual catches (t) of narrow-barred Spanish mackerel by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet

APPENDIX XIII
CONSOLIDATED RECOMMENDATIONS OF THE 15TH SESSION OF THE WORKING PARTY ON NERITIC TUNAS

Note: Appendix references refer to the Report of the 15th Session of the Working Party on Neritic Tunas (IOTC–2025–WPNT15–R)

4.2 Review of the statistical data available for neritic tunas

WPNT15.01 (para. 42) The WPNT **RECOMMENDED** that the Scientific Committee consider supporting a consultancy to review existing systems for qualifying datasets — including, but not limited to, those used in fisheries data — with a view to identifying best practices and proposing improvements to the current data quality scoring system used by the Secretariat.

WPNT15.02 (para. 43) **ACKNOWLEDGING** the difficulties associated with deriving geo-referenced size-frequency data at the spatial resolution of 5° grids in most coastal fisheries, and the fact that most analyses, including stock assessments, do not require such fine resolution, the WPNT **RECOMMENDED** the SC to urge the Commission to align the spatial resolution of size-frequency data with that of geo-referenced catch and effort data. Consequently, the data may be provided using an alternative geographical area if it better represents the fishery concerned.

7.2 Revision of the WPNT Program of Work 2026–2030

WPNT15.03 (para. 174) The WPNT **RECOMMENDED** that the SC consider and endorse the WPNT Program of Work (2026–2030), as provided in Appendix VI.

8.1 Date and place of the 16th and 17th Working Party on Neritic Tunas

WPNT15.04 (para. 177) **NOTING** the decline in participation and the reduced number of paper submissions in recent years, which has resulted in shorter meetings, the WPNT **RECOMMENDED** that the SC consider setting the WPNT meeting duration to four days as a standard. However, it also suggested retaining flexibility to extend the meeting when necessary, such as when a training workshop is requested by CPCs for inclusion in the agenda.

8.2 Review of the draft, and adoption of the Report of the 15th Working Party on Neritic Tunas

WPNT15.05 (para. 185) The WPNT **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPNT15, provided in Appendix XIII, as well as the management advice provided in the draft resource stock status summary for each of the six neritic tuna (and seerfish) species under the IOTC mandate, and the combined Kobe plot for the species assigned a stock status in 2025:

- Bullet tuna (*Auxis rochei*) – Appendix VII
- Frigate tuna (*Auxis thazard*) – Appendix VIII
- Kawakawa (*Euthynnus affinis*) – Appendix IX
- Longtail tuna (*Thunnus tonggol*) – Appendix X
- Indo-Pacific king mackerel (*Scomberomorus guttatus*) – Appendix XI
- Narrow-barred Spanish mackerel (*Scomberomorus commerson*) – Appendix XII