Report of the 16th Session of the IOTC Working Party on Neritic Tunas

UNDP Office, Seychelles, 6 – 9 July 2026

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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
OFCF	Overseas Fishery Cooperation Foundation of Japan
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**).

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EXECUTIVE SUMMARY

The 16th Session of the Indian Ocean Tuna Commission's (IOTC) Working Party on Neritic Tunas (WPNT16) was held in a hybrid format in Seychelles and online using the Zoom online platform from 6-9 July 2026. A total of 35 participants (40 in 2025, 47 in 2024, 35 in 2023, 36 in 2022, and 33 in 2021) 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.

6.1 Stock assessment updates

WPNT16.01 (para. 142) The WPNT **NOTED** an increasing use of data-limited methods in IOTC stock assessments and that recent advances in length-based models, e.g., fishblicc, have expanded options for conducting cost-effective assessments. The WPNT **ENCOURAGED** CPC scientists to apply these tools to available data for neritic tuna stocks. Recognising the need for technical capacity building, the WPNT **RECOMMENDED** that the SC mobilise resources to conduct training workshops on data-limited stock assessment methods.

WPNT16.02 (para. 143) The WPNT also **RECOGNISED** that length-based methods require representative length samples with sufficient spatial coverage and from a wider range of gear groups, whereas currently the data are dominated by a single CPC and one gear group. The WPNT **RECOMMENDED** that the SC **ENCOURAGE** CPCs to implement sampling programmes to collect length data that improve spatial coverage, and to share data collected through their research projects with the IOTC Secretariat for use in assessments.

7.1 Revision of the WPNT Program of Work 2027–2031

WPNT16.03 (para. 162) The WPNT **RECOMMENDED** that the SC consider and endorse the WPNT Program of Work (2027–2031), as provided in Appendix VI.

8.2 Review of the draft, and adoption of the Report of the 16th Working Party on Neritic Tunas

WPNT16.04 (para. 167) The WPNT **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPNT16, 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 2026:

- 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: 2026

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 749,000 t landed in 2024. 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	2020	2021	2022	2023	2024	2025	2026	Advice to the Commission
Bullet tuna *Auxis rochei*	Catch 2024: 94,374 t Average catch 2020-2024: 54,787 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 2026 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 2024 was estimated to be 94,273 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 (19,580 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 2024: 144,447 t Average catch 2020-2024: 108,493 t								No new stock assessment was conducted in 2026 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	2020	2021	2022	2023	2024	2025	2026	Advice to the Commission
	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								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 2024 was estimated to be 144,447t 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 (75,830 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 2024[2]: 169,841 t Average catch 2020-2024: 132,910 t MSY(95% CI) 155 (120 –203) F_{MSY} (95% CI) 0.45 (0.29–0.56) B_{MSY} (95% CI) 346 (266–518) $F_{current}/F_{MSY}$ (95% CI) 0.74 (0.44–1.22) $B_{current}/B_{MSY}$ (95% CI) 1.31 (0.98–1.56)				**27%**			**88%**	A new stock assessment was conducted in 2026 for kawakawa which examined a number of data-limited methods include C-MSY++, LB-SPR and JABBA models (based on data up to 2024). The C-MSY++ and JABBA models produced stock estimates that are not drastically divergent because they shared similar dynamics and assumptions. The length-based methods show promising signs, however, we require more data to get an accurate picture of the stock status for the entire Indian Ocean. 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 below F_{MSY} and the current biomass B was above B_{MSY}.. The estimated probability of the stock currently being in green quadrant of the Kobe plot is 87.8 %. %. The analysis using JABBA incorporating gillnet CPUE indices is more pessimistic. There has been a plateau in kawakawa catches over the last decade, however the final year of catch data represents the largest ever reported nominal catches of kawakawa. It is worth noting, that this final year of data is within the range of previously reported total nominal catches, prior to data revisions. While the precise stock structure of kawakawa remains unclear, recent

Stock	Indicators	2020	2021	2022	2023	2024	2025	2026	Advice to the Commission
									research provides strong evidence of population structure of kawakawa within the IOTC area of competence, with at least 2 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 **not overfished** and **not subject to overfishing**. However, the assessment is subjected to high uncertainty and are highly influenced by several prior assumptions. The catch in 2024 was above the estimated MSY. The available gillnet CPUE of kawakawa (running from 2008-2017) showed a somewhat increasing trend although the reliability of the index as abundance indices remains unknown. Indonesia has recently revised its catch estimates for neritic tuna species. The updated catch for kawakawa differs substantially from those previously reported. These changes have had a significant impact on estimates of stock status (i.e. moving from red to green). A precautionary approach to management is recommended. Click here for a full stock status summary Appendix IX
Longtail tuna *Thunnus tonggol*	Catch 2024[2]: 135,221 t Average catch 2020-2024: 127,208 t MSY(95% CI) 123 (94–152) F_{MSY} (95% CI) 0.16 (0.10–0.22) B_{MSY} (95% CI) 375 (266–518) $F_{current}/F_{MSY}$ (95% CI) 1.43 (0.77–3.41) $B_{current}/B_{MSY}$ (95% CI) 0.88 (0.47–1.27)				35%			72%	A new stock assessment was conducted for longtail tuna in 2026 which examined a number of data-limited methods including C-MSY++, LB-SPR and JABBA models (based on data up to 2024). The C-MSY++ and JABBA 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}. Catches steadily declined from 2012 to less than 113,000 t in 2019 but have been increasing since 2022. The F_{2024}/F_{MSY} ratio is higher than previous estimates and the B_{2024}/B_{MSY} ratio is lower than in previous years. 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 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 is subjected to high uncertainty and is highly influenced by several prior assumptions. The catch in 2024 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
Indo-Pacific king mackerel	Catch 2024[2]: 42,817 t Average catch 2020-2024: 38,817 t		35%			27%			

Stock	Indicators		2020	2021	2022	2023	2024	2025	2026	Advice to the Commission
Scomberomorus guttatus	MSY(95% CI) F_{MSY} (95% CI) B_{MSY} (95% CI) $F_{current}/F_{MSY}$ (95% CI) $B_{current}/B_{MSY}$ (95% CI)	47 (39–56) 0.74 (0.56–0.99) 63.1 (43.1–92.4) 0.95 (0.82–2.13) 1.02 (0.46–1.19) 0.51 (0.23–0.60)								No new stock assessment was conducted for Indo-Pacific king mackerel in 2026 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 in the Indian Ocean have increased considerably since the late 2000s. Indonesia has recently revised its catch estimates for neritic tuna and seerfish species. The updated catch for Indo-Pacific king mackerel differs substantially from those previously reported and used in the stock assessment. These changes are expected to have a significant impact on estimates of stock status and associated MSY-based reference quantities, which were primarily based on the earlier catch data. An updated assessment is therefore urgently required to revise stock estimates and management advice that incorporate and reflect the most recent catch information. A precautionary approach to management is recommended. Click here for a full stock status summary: Appendix XI
Narrow-barred Spanish mackerel *Scomberomorus commerson*	Catch 2024[2]: Average catch 2020-2024: MSY(95% CI) F_{MSY} (95% CI) B_{MSY} (95% CI) $F_{current}/F_{MSY}$ (95% CI) $B_{current}/B_{MSY}$ (95% CI)	162,401 t 138,316 t 155 (127–186) 0.49 (0.32–0.60) 318 (248–457) 0.79 (0.51–1.29) 1.25 (0.91–1.52)				**31%**			**83%**	A new stock assessment was conducted in 2026 for narrow-barred Spanish mackerel. The assessment examined a number of data-limited methods including C-MSY++, LB-SPR and JABBA (based on data up to 2024). The C-MSY++ and JABBA 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 is below F_{MSY} and the stock biomass is estimated to be above B_{MSY}. The analysis using JABBA incorporating the gillnet CPUE indices is more pessimistic. 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 2026 in the Northwest Indian Ocean (Persian Gulf and Oman Sea) indicated that overfishing is occurring in this area and that localised depletion may also be occurring. While the precise stock structure of Spanish mackerel remains unclear, recent research 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 **not overfished** and **not subject to overfishing**. However, the assessment is subjected to high uncertainty and is highly influenced by several prior assumptions.

Stock	Indicators	2020	2021	2022	2023	2024	2025	2026	Advice to the Commission
									The catch in 2024 was above the estimated MSY. Indonesia has recently revised its catch estimates for neritic tuna and seerfish species. The updated catch for narrow-barred Spanish mackerel differs substantially from those previously reported. These changes had a significant impact on estimates of stock status (i.e. moving from red to green). This updated assessment incorporates and reflects the most recent catch information. A precautionary approach to management is recommended. 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}≥ 1)
Stock subject to overfishing (F_{year}/F_{MSY}> 1)		
Stock not subject to overfishing (F_{year}/F_{MSY}≤ 1)		
Not assessed/Uncertain		

1. Opening of the Meeting

1. The 16th Session of the Indian Ocean Tuna Commission's (IOTC) Working Party on Neritic Tunas (WPNT16) was held in a hybrid format in Seychelles and online using the Zoom online platform from 6-9 July 2026. A total of 35 participants (40 in 2025, 47 in 2024, 35 in 2023, 36 in 2022, and 33 in 2021) 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 WPNT16 are listed in Appendix III.

3. The IOTC process: Outcomes, updates and progress

3.1 Outcomes of the 28th Session of the Scientific Committee

3. The WPNT **NOTED** paper IOTC–2026–WPNT16–03 which outlined the main outcomes of the 28th Session of the Scientific Committee (SC28), 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 the main discussions at the SC regarding the work of the WPNT were related to concerns about the catch data received from several CPCs for the neritic tuna species.

3.2 Outcomes of the 29th & 30th Sessions of the Commission

5. The WPNT **NOTED** paper IOTC–2026–WPNT16–04 which outlined the main outcomes of the 29th Session of the Commission, specifically related to the work of the WPNT. The WPNT further **NOTED** that the 30th Session of the Commission report is currently still unavailable and therefore no new outcomes were available for discussions since the 29th Session.

6. WPNT participants were **ENCOURAGED** to familiarise themselves with the newly and previously adopted Resolutions, especially those most relevant to the WPNT.

7. The WPNT **NOTED** new Resolution 26/06 adopted by the Commission in 2026 which updates Resolution 15/02. The WPNT **NOTED** that the changes from 15/02 include:

   - The fishery definitions are now included in the main text rather than in a footnote where they were previously
   - CPCs are now required to report annual catch data for surface and longline fisheries differentiated by (i) areas under national jurisdiction, (ii) high seas, and (iii) areas under the national jurisdiction of other coastal State(s) if their vessels operate in those waters under any arrangements such as access agreements or chartering arrangements
   - By 2030 and annually thereafter, CPCs are required to provide detailed statistics of the fishing vessels contributing to the catches reported to IOTC in the calendar year. Information required includes (a) fishery involved; (b) vessel type; (c) mechanisation type; (d) onboard fish preservation type; and (e) size class.

8. The WPNT **NOTED** that the reporting of catch data by high seas compared with national jurisdiction areas will contribute to the work of the TCAC who wants to use this split to inform future allocation regimes. The WPNT **NOTED** that the Secretariat will include additional columns in the forms 1RC and 1DI to allow CPCs to allocate the location of the catches to either the high seas or jurisdiction area.

9. The WPNT **NOTED** updates to the Rules of Procedure regarding elements relating to the running of Working Parties and other scientific meetings. These include the following rules:

   - All interested participants are required to register online using the web form provided on the meeting webpage. A deadline for registration of 5 days before the meeting commences will be implemented and the ability to register online will be removed at this time.
   - The registration list will be sent by the Secretariat to Heads of Delegations and/or pre-specified Alternates for validation. Only registered and validated participants will be permitted to attend IOTC

meetings. Should a delegation not respond to the Secretariats request for validation, the participants will be informed and asked to contact their delegation to endorse their participation. A non-response will not constitute consent for a participant to attend the meeting for which they have registered. In such cases, participants may be granted provisional attendance status pending endorsement, but will not be able to participate in technical discussions and present documents until validation is received.

- Member states may choose to submit a list of pre-authorized participants (which may be updated at any time) that may register and attend the IOTC meetings. These individuals will still be required to register online, but they will automatically be considered to be validated by the HOD/Alt.
- HODs or pre-specified Alternates may submit in writing, nominations to a meeting after the 5-day deadline as it will be considered that these participants have been pre-approved by their delegations and do not require validation.
- A cover sheet must be attached to each document upon submission, ensuring that the main elements of the document are immediately clear for both the chair and participants. A template for this will be made available on the webpage for each meeting.
- Information papers should not be presented during meetings and should be kept for background information purposes only.
- All documents submitted to the Scientific Committee or its working parties shall be submitted to the IOTC Secretariat no later than 15 days prior to the start of the respective Scientific Committee or working party meeting. Any documents submitted less than 15 days prior, shall be considered for information purposes only. In exceptional circumstances, and with appropriate justification to be recorded in the report of the meeting, the Chair and Vice-Chairperson(s) may decide to accept a document submitted after the deadline as a working paper, provided that it is received no later than ten days prior to the start of the meeting and is deemed essential to the successful outcome of the meeting. Such a document may be presented at the meeting only if no opposition has been expressed by three (3) or more CPCs or delegates, as appropriate.

3.3 Review of Conservation and Management Measures relevant for neritic tunas

10. The WPNT **NOTED** paper IOTC–2026–WPNT16–05 which aimed to encourage participants at the WPNT16 to review the existing Conservation and Management Measures (CMM) relating to neritic tunas.

11. 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.

3.4 Progress on the Recommendations of WPNT15 and SC28

12. The WPNT **NOTED** paper IOTC–2026–WPNT16–06 which provided an update on the progress made in implementing the recommendations from the 15th 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 2026.

14. The WPNT participants were **ENCOURAGED** to review paper IOTC–2026–WPNT16–06 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 (WPNT17).

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

4.1 Review of the statistical data available for neritic tunas

15. The WPNT **NOTED** paper IOTC–2026–WPNT16–07 which provided an overview of the status of information available to the IOTC Secretariat for the six species of neritic tuna and seerfish under the management mandate of the IOTC, based on data available as of June 2026. The paper reviewed retained catches, geo-referenced catch and effort data, size-frequency data, morphometric information and data quality.

16. The WPNT **NOTED** that global catches of neritic tuna and seerfish species continued to increase, exceeding 2.3 million t in 2024, with the Western and Central Pacific Ocean and Indian Ocean accounting for approximately 61% and 30% of total catches, respectively.

17. The WPNT **NOTED** that catches of neritic tuna and seerfish species in the Indian Ocean reached a record high of approximately 748,000 t in 2024. The WPNT further **NOTED** that, although gillnets remained the dominant fishing gear, accounting for more than half of recent catches, the contribution of purse seine fisheries had increased substantially in recent years.

18. The WPNT **NOTED** recent substantial increases in catches of several neritic tuna species, particularly bullet tuna, frigate tuna and kawakawa, and that these increases were partly associated with increasing catches from Indonesian coastal purse seine fisheries. The WPNT further **NOTED** that Indonesian catches of neritic tuna and seerfish species increased substantially in 2023 and 2024, alongside an increase in the number of vessels and reported offshore fishing effort.

19. The WPNT **NOTED** changes in the species composition and spatial distribution of some fisheries, including an apparent shift from seerfish towards neritic tunas. The WPNT further **NOTED** that gillnet fisheries can target both seerfish and tunas and that the observed changes may therefore reflect an increase in fishing effort targeting tunas rather than a direct shift away from seerfish.

20. The WPNT **NOTED** the apparent changes in the spatial extent of the Sri Lankan and Iranian gillnet fisheries and discussed whether these reflected a contraction in their fishing areas. The WPNT **NOTED** that the data presented related specifically to gillnet fisheries and that there was no evidence that fishing activity had shifted to other areas. For the I. R. Iran, the WPNT **NOTED** that data prior to 2023 had been reported using an incorrect spatial grid and that the apparent change in spatial extent may therefore be a data artefact. The WPNT **NOTED** that the available information was insufficient to determine whether an actual contraction in fishing area had occurred.

21. The WPNT **NOTED** that changes in effort reporting practices, including transitions from reporting numbers of fishing trips to fishing days, further complicated comparisons of the spatial distribution of fishing effort over time. The WPNT further **NOTED** that uncertainty in the spatial distribution of fishing effort may have implications for the development of abundance indices and their use in stock assessments.

22. The WPNT **NOTED** that geo-referenced effort data remained limited for several important fisheries targeting neritic tuna and seerfish species. Geo-referenced effort data from the I. R. Iran were available from 2007, while data of sufficient quality for analysis were available from Sri Lanka from 2014 and from Indonesia from 2018, although coverage of Indonesian gillnet fisheries remained limited. The WPNT further **NOTED** that India had not provided effort data disaggregated by fishery and fishing ground.

23. The WPNT **NOTED** that the spatial distribution of neritic tuna and seerfish fisheries presented in the paper should be interpreted with caution due to gaps in geo-referenced reporting from several major fishing nations, including Indonesia, India, Pakistan and Oman, and may therefore not fully represent the true distribution of fishing activities in the Indian Ocean.

24. The WPNT **NOTED** that size-frequency data for neritic tuna and seerfish species have been available since the 1980s, largely as a result of sampling programmes conducted under the Indo-Pacific Tuna Programme (IPTP). Early sampling was concentrated in Indonesia, the Maldives and Malaysia and was subsequently expanded to Sri Lanka, the I. R. Iran and Pakistan. The WPNT further **NOTED** that gillnet fisheries accounted for approximately 70% of all size samples available at the Secretariat.

25. The WPNT **NOTED** that the distribution of size samples among species did not reflect their contribution to catches. Frigate tuna and kawakawa together accounted for more than 60% of all available size samples, while relatively few samples were available for narrow-barred Spanish mackerel, bullet tuna and Indo-Pacific king mackerel. The WPNT further **NOTED** that relatively few recent projects had specifically targeted biological sampling of neritic tuna and seerfish species compared with the level of sampling undertaken during the IPTP period.

26. The WPNT **NOTED** that size data are collected using several measurement types and discussed the use of measurements other than fork length (FL), including total length (TL) and other species-specific length measurements. The WPNT **NOTED** that FL is the preferred standard measurement for tunas and that alternative measurements are converted to the relevant standard length where appropriate conversion equations are available. The WPNT further **NOTED** that weight measurements may also be converted to length where suitable morphometric relationships are available.

27. The WPNT **NOTED** that the morphometric relationships currently available to the IOTC are limited for several neritic tuna and seerfish species and, in some cases, are based on historical data or limited geographical

coverage. The WPNT further **NOTED** that length-length relationships are not currently available in the IOTC database and that additional studies covering broader geographical areas, size ranges and species would improve the standardisation and use of size data.

28. The WPNT **NOTED** discussions regarding whether additional abundance indices were planned for neritic tuna and seerfish species. The WPNT **NOTED** that a previous mission to the I. R. Iran had supported the development of an abundance index intended for use in stock assessment and that a subsequent mission had been planned to continue this work. However, the mission could not proceed due to the war, and the current situation continued to prevent further support.

29. The WPNT **NOTED** that similar support had been provided to Sri Lanka for the development of CPUE indices for neritic and tropical tunas. However, constraints on access to the necessary data limited the scope and outcomes of this work. The WPNT further **NOTED** that additional support could be provided if these data-access constraints were resolved.

30. The WPNT **NOTED** discussions regarding the possibility of applying an approach similar to the joint CPUE standardisation undertaken for tropical tunas. The WPNT **NOTED** that the circumstances differed, as the tropical tuna work had benefited from collaboration among national scientists from participating CPCs. The WPNT further **NOTED** that, for neritic tuna gillnet fisheries, further work was first required to ensure that data collection protocols were consistently followed and that the available data were of sufficient quality.

31. The WPNT **AGREED** that, once data quality is considered adequate, the feasibility of developing joint CPUE trends for key neritic tuna and seerfish fisheries should be investigated.

32. The WPNT **NOTED** the importance of adequate and sustained funding for fisheries data collection and that data collection activities frequently cease when externally funded projects end, resuming only when new project funding becomes available. The WPNT **ENCOURAGED** CPCs to provide adequate and sustained funding for fisheries data collection, **NOTING** that consistent long-term data collection is essential for the development of robust scientific analyses and management advice.

4.2 Review new information on fisheries and associated environmental data

33. The WPNT **NOTED** paper IOTC–2026–WPNT16–09 on Analysis of Neritic Tuna in Malagasy Small-Scale Fisheries of the Mozambique Channel, including the following abstract provided by the author:

> *"This study focuses on neritic tunas and related species exploited by Madagascar's small-scale fisheries in the Mozambique Channel, using data collected through fisheries surveys conducted by several NGOs operating across different coastal regions of the country. The main objective is to develop a harmonized methodology for calculating Catch Per Unit Effort (CPUE) in order to standardize analyses derived from heterogeneous data sources and ensure consistent comparability among the different study sites. Considering the multi-gear and multi-species nature of small-scale fisheries, the study proposes the use of the "fishing unit" concept recommended by the FAO for African small-scale fisheries, defined as the combination of canoe type and the main fishing gear used. This approach aims to minimize methodological biases, duplicate records, and interpretation errors associated with the high diversity of fishing practices observed along the Malagasy coast. The data used cover several landing sites distributed across the main Malagasy coastal regions bordering the Mozambique Channel, including Diana, Boeny, Melaky, Menabe, and Atsimo Andrefana. This broad spatial coverage will provide a better understanding of the dynamics of artisanal fisheries targeting neritic tunas in this strategic area of the Western Indian Ocean, while also providing technical and methodological elements useful for strengthening fisheries statistical monitoring systems and improving the sustainable management of exploited marine resources."*

34. The WPNT **NOTED** that the mean length reported in the study for bullet tuna appeared to be higher than expected, given that the species' L_{inf} is thought to be around 40–45 cm. The WPNT **NOTED** that this may reflect species misidentification, particularly as only a single sample was available for the species.

35. The WPNT **NOTED** that the data presented were collected from small-scale fisheries and that, while precise fishing locations were available for the dataset presented, most datasets only record approximate fishing areas based on landing sites, typically at a 5°×5° resolution. The WPNT **NOTED** that the fisheries consist primarily of one-day fishing trips so the location of the catch can be estimated relatively well.

36. The WPNT **NOTED** that the number of biological samples remained limited - although tuna and tuna-like species had been counted during 2024–2025, relatively few size measurements had been collected for individual species.

37. The WPNT **COMMENDED** Madagascar for presenting the dataset, recognising the challenges associated with collecting small-scale fisheries data in the country. **ACKNOWLEDGING** that the sampling was not fully balanced and that some species identification issues may exist, the WPNT **ENCOURAGED** welcomed the collection of catch, effort, and size data. The WPNT **ENCOURAGED** Madagascar to provide the coordinates of landing sites to assist in better defining fishing areas.

38. The WPNT **NOTED** that Madagascar has been selected along with Comoros as a case study under an EU-funded IOTC project aimed at improving the processing of coastal fisheries data and scaling catches using frame surveys. The WPNT further **NOTED** that a mission by the Secretariat also involving an FAO consultant is planned during the year to support work on Madagascar's small-scale fisheries data.

39. The WPNT **NOTED** that accurate species identification remains an ongoing challenge and so a priority for IOTC. The WPNT **NOTED** ongoing efforts, including the running of two species identification and sampling focused workshops and collaboration with OFCF to develop species identification guides, online resources and picture libraries. The WPNT further **NOTED** that training materials developed during the workshops will eventually be hosted through the FAO website. The WPNT **ENCOURAGED** Madagascar to submit a formal request for additional training on species identification and biological sampling, which could potentially be delivered under a future EU-funded project. The WPNT **NOTED** that further workshops may be organised during 2027–2028 and that the apparent misidentification of bullet tuna highlights the need for continued capacity building.

40. The WPNT **NOTED** that OFCF is developing more user-friendly web-based species identification tools and encouraged CPCs to report any specific identification challenges so these resources can be improved and can address these challenges. The WPNT **RECOGNISED** that differences between field guides and real sampling conditions can make identification difficult, particularly for species such as longtail tuna and small yellowfin tuna which are difficult to differentiate.

41. The WPNT **NOTED** that similar species identification challenges have been experienced in other CPCs, including Indonesia, where ongoing training and identification protocols have been used to reduce uncertainty.

42. The WPNT **NOTED** that the data presented by Madagascar had been collected by a non-governmental organisation (Blue Ventures) and had not been independently validated. The WPNT **NOTED** that continued collaboration with the NGO and improvements to sampling protocols will therefore be important to strengthen future datasets.

43. The WPNT **NOTED** that Blue Ventures intends to continue collecting fisheries data in Madagascar and will work with the government to establish a standardised data collection programme. The WPNT **ENCOURAGED** efforts to align NGO data collection with IOTC priority species through targeted training, **NOTING** that similar situations occur in other CPCs where NGO monitoring programmes do not always focus on species of greatest relevance to the IOTC.

44. The WPNT **NOTED** that the collection of fisheries data in Madagascar is challenging and that the progress made to date is encouraging. The WPNT **ENCOURAGED** Madagascar to examine the size frequency distribution for narrow-barred Spanish mackerel, given the relatively large number of length measurements available.

45. The WPNT **NOTED** that these stocks are likely to be shared with neighbouring countries, particularly Mozambique, and that greater cooperation could facilitate the collection of additional data and future stock assessments. The WPNT **NOTED** that regional collaboration with eastern African countries on stock assessment activities already exists, although not specifically for tuna species under the IOTC framework.

46. The WPNT **NOTED** paper IOTC-2026-WPNT16-10 on Spatial and temporal variability of longtail tuna from Thai purse seine fishery in the Andaman Sea of Thailand, including the following abstract provided by the author:

"Longtail tuna (Thunnus tonggol) is an important neritic tuna species contributing to coastal fisheries and food security in Thailand. However, information on the long-term variability of its fisheries' characteristics remains limited. This study investigated the spatial and temporal variability of longtail tuna in Thai purse seine fishery using fishery-dependent data collected during 2016–2025. Analyses focused on annual changes in fishing grounds, temporal variations in catch contribution and catch per unit effort (CPUE), and seasonal and interannual variability in size structure. Results indicated that the fishing grounds associated with longtail

tuna catches showed noticeable interannual variability over the study period. Catch contribution and CPUE also fluctuated considerably among months and years, suggesting strong temporal dynamics in the availability of the species within the Thai purse seine fishery. Length frequency analysis indicated seasonal and interannual variability in the size composition of longtail tuna, with differences in dominant size classes observed among months and years. These variations may reflect seasonal availability, spatial distribution, and changes in fishing patterns over time. The findings highlight the importance of long-term fishery monitoring for understanding the dynamics of neritic tuna fisheries in tropical ecosystems. Fishery-dependent indicators such as catch contribution, CPUE, fishing ground distribution, and size composition can provide useful information to support ecosystem-based fisheries management and future assessment of data-limited neritic tuna resources in the Indian Ocean region."

47. The WPNT **NOTED** that the recent contraction of the fishery and the apparent reduction in fishing pressure are likely to have been influenced by increasing fuel costs, which may also explain why fishing activity is now largely concentrated in inshore areas.

48. The WPNT **NOTED** that vessel access is restricted by licensing arrangements, with most vessels authorised to fish only within specific areas and relatively few licensed to operate beyond the EEZ.

49. The WPNT **NOTED** that the fishery appears to comprise two distinct seasonal components, with juvenile fish predominantly caught during the winter period and adults during the latter part of the year. While no management measures currently target neritic species specifically, the WPNT **NOTED** that numerous marine protected areas in the Andaman Sea already prohibit fishing. The WPNT **NOTED** that the observed seasonal patterns could provide valuable information to support future fisheries management, including consideration of measures to protect juvenile or spawning fish.

50. The WPNT **NOTED** that the Secretariat has been collaborating with CPCs to develop abundance indices for neritic species and has recently engaged with Thailand to explore analyses of its catch and effort data. The WPNT **NOTED** that although the purse seine fishery accounts for a relatively small proportion of total neritic tuna catches, this proportion has remained stable over time. The WPNT **NOTED** that Thailand has a well-managed database supported by a comprehensive port sampling programme covering approximately 5% of fishing trips, with detailed information collected on catch and effort, species composition, and length frequencies. These data were considered to have strong potential for developing standardised CPUE indices, **NOTING** that management currently relies on unstandardised CPUE.

51. The WPNT **NOTED** that the reported size range of 30–42 cm did not represent the length at maturity but rather the dominant size range observed in the catch, and it was recognised that not all fish within this size range would necessarily be mature.

52. The WPNT **NOTED** that monsoon conditions influence sampling opportunities, as data are collected monthly at landing sites only when fishing operations occur. During periods of strong winds or heavy rainfall, fishing activity may cease, resulting in no samples being collected for those months.

53. The WPNT **NOTED** that Fish Aggregating Devices (FADs) are generally not used in the fishery targeting neritic tuna species. The WPNT **NOTED** that while a small number of FADs are deployed in nearshore fisheries, they are not used to target these species.

54. The WPNT **NOTED** paper IOTC–2026–WPNT16–11 on Artisanal fishing gears efficiency on kingfish species *Scomberomorous commerson*, including the following abstract provided by the author:

"An analysis was undertaken to ascertain the impact of various artisanal fishing gears on King Mackerel (Scomberomorus commerson). The study covered 41 landing sites covered by catch assessment survey exercise. This involved recording the frequency of landing King Mackerel and other species caught by artisanal fishing gear combination returning from fishing voyages. The combinations included gill nets with mashua (GNM), handlines with dau (HLD), Trolling lines with dau (TLD), Long lines with dau (LLD)and long lines with mashua (LLM), gillnets with hori (GNH).

Artisanal fishers operating gillnets with Mashua had the highest impact on King mackerel followed by a combination of Dau with gillnets. There is need to map the fishing grounds frequented by Gill net fishers using Mashua and dau, stock assessment for King Mackerel is recommended, however the importance of understanding seasonal catch variation is significant to guide the management in making a comprehensive decision on management measures to be applied for the fishery"

55. The WPNT **NOTED** that an assessment had been conducted under the Nansen Programme in collaboration with FAO, with acoustic survey methods used to inform stock assessment work. The WPNT further **NOTED** that the Kenya Marine and Fisheries Research Institute had received the outputs and intended to apply them in future analyses covering multiple coastal species.

56. The WPNT **NOTED** that there remains some inconsistency in terminology, with "king mackerel" being used in some contexts. In Kenya it is thought that king mackerel actually refers to narrow-barred Spanish mackerel (*Scomberomorus commerson*) rather than the Indo-Pacific king mackerel (*Scomberomorus guttatus*). The WPNT **ENCOURAGED** CPCs to consistently apply the scientific terminology in IOTC contexts to avoid confusion.

57. The WPNT **NOTED** that boat activity coefficients, derived from the number of active vessels found from frame survey data, may exceed the number of boats recorded in the frame survey itself due to variations in fishing activity over time.

58. The WPNT **NOTED** that the study was primarily based on data from vessels using gillnets, and **NOTED** that while neritic species are also caught in ring net fisheries, these were not included as operations are limited to specific landing sites. The WPNT **NOTED** that some, but not all fishers operate both gillnet and ring net gears, although usage varies by fisher preference and location, and consequently ring net data are not consistently available across all landing sites.

59. The WPNT **NOTED** paper IOTC–2026–WPNT16–13 on Trophic Dynamics and Reproductive Resilience: Implications for the Management of Kawakawa (*Euthynnus affinis*) in Western Sri Lankan Waters, including the following abstract provided by the author:

"This study investigates the feeding ecology and reproductive biology of kawakawa (Euthynnus affinis) along the west coast of Sri Lanka. Samples (n=110) were collected from Negombo and Beruwala harbors situated in the western coast of Sri Lanka between January and December 2025. Results indicate that E. affinis is a predominantly piscivorous predator, with teleost fishes accounting for 93.87% of the Index of Relative Importance (IRI). Feeding intensity showed significant temporal variation, declining during the peak southwest monsoon (July) before recovering in August. Ontogenetic shifts were observed, with mature females (>39.79 cm FL) exhibiting significantly higher feeding activity than immature individuals. Reproductive analysis identified peak spawning periods in June and November to December, an estimated size at first maturity (L50) of 39.79 cm for females and 42.48 cm for males. The population exhibited isometric growth (b = 2.97) and good physiological condition. Management recommendations include seasonal effort reductions during spawning peaks and maturity-based size regulations to ensure long-term stock sustainability."

60. The WPNT **NOTED** that the L_{inf} estimated in this study is consistent with values reported in other studies for the species, particularly those conducted in Indonesia.

61. The WPNT **NOTED** that the study was based on a relatively small sample size of approximately 120 fish collected over a one-year period and that most samples were collected from longline fisheries, with a smaller proportion obtained from gillnet fisheries.

62. The WPNT **ENCOURAGED** the authors to increase the number of samples collected each month, widen the spatial coverage of the sampling and extend the sampling programme duration in order to improve the robustness of the analyses. The WPNT also **ENCOURAGED** the authors to include samples from other gears in further studies as catches of kawakawa by longlines appear to be lower than with some other gears.

63. The WPNT **NOTED** that there are plans to expand sampling to additional fisheries and landing sites, particularly those where catches of kawakawa are more significant, in order to improve understanding of the species across its range.

64. The WPNT **NOTED** that seasonal differences in diet were observed; however, these differences appeared to reflect changes in prey availability rather than differences associated with fish size.

65. The WPNT **NOTED** that the largest fish sampled measured approximately 50–52 cm FL, while the mean FL of sampled females and males were 39 cm and 42 cm, respectively. The WPNT further **NOTED** that the estimated length at maturity was approximately 39 cm.

66. The WPNT **NOTED** that the outcomes from this study are preliminary and that recommendations relating to management measures such as seasonal fishery closures would need to be supported by a stronger evidence

base. The WPNT **NOTED** that the present study should be regarded as providing baseline information rather than sufficient evidence to justify broad management measures across Sri Lanka.

67. The WPNT **NOTED** that the potential implementation of management measures, such as minimum size limits or changes to hook size and seasonal fishing restrictions. While such measures may contribute to stock conservation, uncertainty remains regarding the extent to which they would be accepted by fishers.

68. The WPNT **NOTED** that the apparent decline in the contribution of kawakawa to neritic tuna catches is likely to reflect multiple interacting factors rather than a single cause. Possible contributing factors include declines in coastal fishery resources, a potential decline in kawakawa abundance, changes in fishing activity associated with the country's economic situation, improvements in species identification and catch reporting, and increased fuel prices that have reduced fishing effort. The WPNT **NOTED** that a more detailed investigation would be required to determine the relative importance of these factors.

69. The WPNT **NOTED** paper IOTC–2026–WPNT16–21 on A systematic approach to estimating life-history parameters under data-limited scenarios for kawakawa (*Euthynnus affinis*) in the western and southern part of Indonesian waters, including the following abstract provided by the author:

"Length-based stock assessment of Indian Ocean kawakawa (Euthynnus affinis) requires reliable life-history parameter estimates, yet regional assessments have relied on decades-old growth and mortality parameters derived from a narrow geographic range, with no associated uncertainty estimates. We developed a systematic framework to estimate the von Bertalanffy growth parameters L∞ and K from 3,396 length-frequency samples collected from Sibolga fishing port, North Sumatra during 2016-2017. We used two optimisation algorithms (simulated annealing and genetic algorithm) across seven moving average settings, with fixed and floating L_∞, under both partial and full bootstrapping. For sensitivity analysis, we also applied a Bayesian length-interval catch-curve framework, which estimates L∞ and K without requiring bin number or moving-average specification. The genetic algorithm consistently outperformed simulated annealing in terms of precision and resistance to local optima convergence. The Bayesian approach showed potential but failed to capture the multimodal structure of the length-frequency data and was therefore excluded from the final estimates. The resulting estimates of L_∞ = 79.85 cm FL and K = 0.44 yr^{-1} were broadly comparable to hard-part studies from the similar regions and the ones used in previous Indian Ocean kawakawa assessments, supporting the use of length-frequency data as a viable alternative where hard-part ageing is unavailable."

70. The WPNT **NOTED** that the application of fishblicc diagnostics suggest that despite the model convergence, single selectivity model couldn't capture the multimodality in the length-frequency data. Therefore, the model output was dropped from analysis. The WPNT **NOTED** the fundamental differences between the fishblicc and ELEFAN approaches to interpreting length-frequency data. It was explained that ELEFAN attributes shifting peaks in the length-frequency distribution to changes within the population, whereas fishblicc assumes a smoother underlying population structure and instead explains such peaks through static processes, particularly selectivity.

71. The WPNT **NOTED** that these represent two alternative explanations for the observed length-frequency patterns and that, in this case, the ELEFAN approach was considered less likely to provide the better explanation of the data. However, in cases when the length-frequency data has a strong cohort, ELEFAN is thought to be a better alternative

Commented [SB1]: I am not sure about this one. I think if the length-frequency data has a strong cohort, the ELEFAN is still better alternative than fishblicc.

72. The WPNT **NOTED** that fitting a mixed selectivity model may improve the analysis. Specifically, fitting two normal distributions to the first two peaks and a logistic function to the final peak could provide a better statistical fit to the observed data, although such a model may not necessarily be biologically realistic. Nevertheless, this approach could help identify whether the observed peaks are primarily driven by selectivity, such as the use of multiple fishing gears.

73. The WPNT **NOTED** that, because the study focuses on estimating life-history parameters, it is uncommon to reliably estimate L_∞ or growth coefficient (K) directly from catch curves, as these parameters are strongly confounded by fishing mortality. Consequently, these parameters are generally incorporated as priors in the analysis, with the catch curve itself providing relatively limited information to estimate them independently.

74. The WPNT **NOTED** that the Length Integrated Mixed Effects (LIME) model is available through GitHub and **NOTED** that although mixed models like this had been explored, they require substantial trial and error and incorporating them alongside other model fits resulted in excessively long convergence times. The WPNT

NOTED that while fitting multiple normal distributions improved the fit, this approach was ultimately not adopted because it was considered likely to be over-parameterised.

75. The WPNT **NOTED** that different modelling approaches are available for analysing length-frequency data and discussed which methods may be most appropriate for tuna species. The WPNT **NOTED** that ELEFAN and Bayesian approaches are based on different underlying concepts. ELEFAN is highly dependent on how well the model progresses and can produce parameter estimates even when the observed peaks are not well represented but these values are tied to the determination of moving effort and bin size. In contrast, the Bayesian approach is more appropriate when there is some prior knowledge of biological life-history parameters and can help reduce uncertainty associated with model configuration. However, it was also recognised that Bayesian methods may perform less well when strong individual year classes dominate the length-frequency data.

76. The WPNT **NOTED** that fishblicc is expected to see increasing application in future length-frequency analyses. The WPNT **NOTED** that applying fishblicc to IOTC datasets, with growth parameters fixed and the focus placed on estimating fishing mortality, demonstrated that fishing mortality and selectivity can remain highly confounded, with estimates of one parameter influencing the other. The WPNT **NOTED** that estimates of L_∞ depend on the configuration of other model parameters, particularly selectivity. The WPNT **NOTED** that fishblicc provides considerable flexibility in model configuration. However, many parameters remain confounded, with the extent of confounding depending on the characteristics of the available length-frequency data.

77. The WPNT **NOTED** paper IOTC–2026–WPNT16–22 on Stock structure of kawakawa (*Euthynnus affinis*) in Indonesian waters inferred from parasite communities, including the following abstract provided by the author:

> *"Tuna is a commercially important fish in Indonesia. While large oceanic tunas have been extensively studied, smaller neritic species such as Euthynnus affinis (kawakawa) remain relatively understudied despite being widely consumed. This study examined kawakawa collected from four locations: Palabuhanratu and Prigi (southern Java, within Fisheries Management Area [FMA] 573, Indian Ocean), Pekalongan (northern Java, within FMA 712, Java Sea), and Pemangkat (FMA 711, Karimata Strait). Sampling was conducted between December 2020 and March 2021. Each fish was dissected to recover and identify parasites to the species level. A total of 17 parasite species were identified from 140 fish collected from the viscera and gills. Of these, 11 species belonged to the class Trematoda, two to Chromadorea, two to Palaeacanthocephala, one to Crustacea, and one to Copepoda. Five species were present in all four locations: Didymocystis sp., Didymosulcus sp. C, Kollikeria sp. B, Lecithochirium sp., and Anisakis simplex. Non-metric multidimensional scaling (NMDS) based on Jaccard and Bray–Curtis distances indicated that Palabuhanratu and Prigi shared similar parasite communities, distinct from those of Pemangkat and Pekalongan, which were more alike. Notably, kawakawa from Palabuhanratu were significantly larger (53.8 ± 3.6 cm; 2779 ± 489 g, p < 0.05) than those from Prigi (37.5 ± 1.9 cm; 988 ± 159 g), suggesting that parasite community composition in this coastal region may not depend on the size or age of the host. Overall, parasite community composition revealed spatial patterns indicative of kawakawa population structure. Palabuhanratu and Prigi, both located within FMA 573 and facing the Indian Ocean, exhibited similar parasite assemblages, suggesting connectivity among kawakawa populations within this management area. In contrast, Pemangkat and Pekalongan, despite being located in different seas and Fisheries Management Areas (FMAs), showed comparable parasite communities, indicating ecological connectivity between FMA 711 and FMA 712."*

78. The WPNT **NOTED** that certain parasites associated with kawakawa may be species-specific, while others are generalists occur across multiple host species, including other tunas.

79. The WPNT **NOTED** that, where generalist parasite species are present, similar distribution patterns may be observed across multiple host species, which raises the question of whether observed patterns reflect true stock structure in kawakawa or simply broader parasite distribution dynamics. The WPNT **NOTED** that careful selection of one or two highly host-specific parasite species, rather than all available taxa, would be necessary for robust stock discrimination.

80. The WPNT **NOTED** the proposal to use parasites as a form of biological tag, with potential applications for stock discrimination.

81. The WPNT **NOTED** that evidence from western and southern Indonesia suggests the likely presence of a single kawakawa stock across those areas based on parasite data.

82. The WPNT **NOTED** that integrating parasite data with complementary approaches, such as otolith microchemistry and population genetics, was recommended to strengthen future assessments of stock structure.

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

83. The WPNT **NOTED** paper IOTC–2026–WPNT16–19 on Towards new data for neritic tuna management in the Indian Ocean: a toolbox of genetic and epigenetic approaches, including the following abstract provided by the authors:

"Our paper presents a toolbox of genetic and epigenetic approaches to improve stock assessment of neritic tunas in the Indian Ocean, where key biological data remain poor. It highlights the use of genetics for species identification, molecular sex determination, population structure analysis, and abundance estimation through Close-Kin Mark-Recapture (CKMR). It also describes epigenetic tools, particularly DNA methylation-based approaches, which can accurately estimate fish age (epigenetic clock), length, and weight from a small tissue sample. These complementary molecular approaches provide fisheries-independent biological information while requiring only minimally invasive sampling. We recommend integrating routine tissue collection into existing monitoring programs, standardizing sampling protocols, and expanding genomic and epigenetic applications to improve stock assessments and support more sustainable fisheries management."

84. The WPNT **NOTED** that work has more or less been completed on developing an epigenetic clock for albacore tuna (Chevrier et. al., 2026[1]) but has not yet been attempted for neritic tuna species.

85. The WPNT **NOTED** that there is not thought to be a lot of data available on age readings from otoliths from neritic tuna species which could be used to verify estimates from epigenetic techniques. The WPNT **NOTED** that it can be challenging to read otoliths from neritic tuna species so in some cases the otolith weight is used to estimate a fish's age as there has been seen to be a good correlation between age and the otolith weight. This information can then be used to verify the age estimated by the epigenetic clocks.

86. The WPNT **NOTED** that there are specialists in otolith reading based in Australia, but it is unclear if they have worked on neritic tuna species. The WPNT **NOTED** that for some species age estimates can be found down to the day by the experts in Australia and **NOTED** that DNA can provide age estimates down to the month so it's still very accurate.

87. The WPNT **NOTED** that for chronological ageing it is useful to have information on the length of the fish in question as well as a wide range of fish ages and sizes in the samples (ideally this would cover the entire age and length range of the species in question).

88. The WPNT **NOTED** that researchers in Indonesia have found that it is difficult to read otoliths from Kawakawa and so **NOTED** that alternative techniques such as carbon dating may be required to verify the estimates found from the DNA-based epigenetic clocks.

89. The WPNT **NOTED** paper IOTC–2026–WPNT16–20 on Updates and Simplified Access to the IOTC Species Identification Website: iotcspecies.com, including the following abstract provided by the authors:

"In 2025, OFCF Japan launched an innovative online platform dedicated to the identification of IOTC species (see IOTC-2025-WPDCS21-15_Rev2). Designed specifically for field samplers and observers, the website provides a comprehensive suite of interactive tools to support accurate species identification in the field. The platform features:

- *Photo library*
- *Smartphone Application*

[1] Chevrier, T., Bonhommeau, S., Thompson, M. *et al.* Searching for shared epigenetic clocks: evaluating ultra-conserved markers in a de novo genome assembly of the albacore tuna. *GeroScience* (2026). https://doi-org.fao.idm.oclc.org/10.1007/s11357-026-02192-0

- *YouTube videos*
- *Species Characteristics Guide for confusing species*

By combining visual references with practical identification guidance, the platform not only assists users in making accurate identifications of tuna, neritic tuna, and billfish species on site, but also helps them build their taxonomic knowledge and identification skills over time."

90. The WPNT **NOTED** that OFCF has already developed an ID tool which covers most of the IOTC tropical, temperate and neritic tuna species. The WPNT **NOTED** that OFCF is now in the process of developing an ID tool for billfish species which needs to be tested in the field but should be released by the end of 2026.

91. The WPNT **NOTED** the aim of OFCF to develop more videos to be used by field samplers which will highlight key features to help to identify species.

92. The WPNT **ENCOURAGED** CPCs to collaborate with OFCF by providing species identified photos of fish specimens be included in the photo library, particularly photos of smaller tunas (20-40cm). The WPNT **NOTED** that the condition of the fish is not important as it is beneficial to obtain photos of a range of different conditions to simulate real-world conditions for field samplers.

93. The WPNT **NOTED** a suggestion to add photos of frozen specimens as fish are often landed frozen in Indonesia (including small specimens) and port samplers need to be able to identify specimens in this condition. The WPNT **NOTED** that the IOTC's Port State Measures field guide includes guides to identify medium-large sized fish that have been frozen.

94. The WPNT **NOTED** the need to review the species categories on the species identification guide website as it currently is not organised either by IOTC working party group or by taxonomic family. The WPNT **NOTED** that the primary target users of "Guide for identification of IOTC species" website are field samplers/enumerators who collect data from small scale/coastal fisheries. Thus, the revision of the species category must be easy to understand and user-friendly for them. The WPNT **ENCOURAGED** CPCs and the Secretariat to collaborate with OFCF to discuss the necessary revisions.

95. The WPNT further **NOTED** the need to review the species included as some mackerel species known to be present in Indian waters are not currently included along with other mackerel species (*Rastrelliger brachysoma, Rastrelliger faughni, Rastrelliger kanagurta* are confirmed in the Indian Ocean). The WPNT **NOTED** *Scomberomorus lineolatus* is landed in the coastal states and needs to be distinguished from *Scomberomorus commerson and Scomberomorus guttatus.*

96. The WPNT **NOTED** a suggestion to standardise the background of the photographs in the library, potentially using photoshop, in order to ensure that the morphological characteristics are as clear as possible.

6. Stock Assessment Updates

6.1 Stock assessment updates

97. The WPNT **NOTED** paper IOTC-2026-WPNT16-14 on Assessment of Indian Ocean longtail tuna (*Thunnus tonggol*) using data-limited methods, including the following abstract provided by the authors:

> *"Assessing the status of the stocks of neritic tuna species in the Indian Ocean is challenging due to the paucity of data. There is lack of reliable information on stock structure, abundance and biological parameters. Stock assessments have been conducted for Longtail tuna (Thunnus tonggol) from 2013 through 2017 utilising a variety of data-limited methods (Zhou and Sharma, 2013; Zhou and Sharma, 2014; Zhou, 2020; Fu, 2023). In 2023 the CMSY method (Froese et al. 2016) was used to assess the status of T. tonggol using historical catches. This paper provides an update to the CMSY assessment based on the most recent catch information. This assessment also explored alternative methods including the Just Another Bayesian Biomass Assessment model (JABBA, (Winker, Carvalho and Kapur, 2018)), and the length-based spawning potential ratio model (LB-SPR, (Hordyk et al., 2015)). In addition to examining various population dynamic assumptions, these models allow for the evaluation of the usefulness of alternative data in determining the status of LOT". See the paper for the full abstract.*

98. The WPNT **NOTED** the results from the CMSY++ method (Table 1, Fig. 1).

Table 1. Longtail tuna: Key management quantities from the C-MSY++ model used in 2026.

Management Quantity	Aggregate Indian Ocean
Most recent catch estimate (year)	148 572 (2024)
Mean catch (t) – most recent 5 years	136 853 (2020 - 2024)
MSY (t) (95% CI)	123 000 (94 000 - 152 000)
Data period used in assessment	**1950 - 2024**
F_{MSY} (95% CI)	0.16 (0.10 - 0.22)
B_{MSY} (95% CI)	375 000 (266 000 - 518 000)
$F_{current}/F_{MSY}$ (95% CI)	1.44 (1.22 – 1.66)
$B_{current}/B_{MSY}$ (95% CI)	0.88 (0.47 - 1.27)
$B_{current}/B_0$ (95% CI)	0.33 (0.19 - 0.44)

Commented [SB2]: Should it be revised as well? I think it is 375 000?

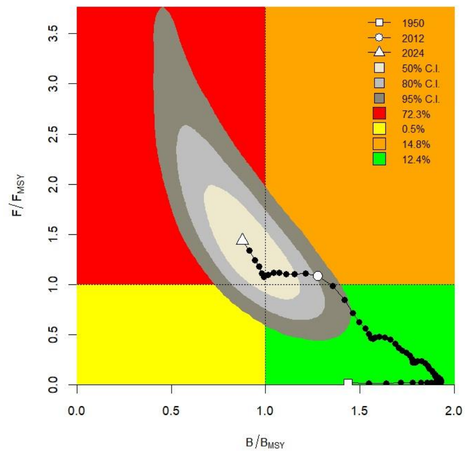

Fig. 1. Longtail tuna C-MSY++ Indian Ocean assessment Kobe plot.

99. The WPNT **THANKED** the author for the extensive explanations of the four data-limited methods used to assess the stocks of neritic species, including: a surplus production model with informative prior distributions on parameters (C-MSY; Martell and Froese 2013, Froese et al. 2017); the new and updated C-MSY approach (C-MSY++; Froese et al., 2023); a Bayesian biomass dynamics model (JABBA; Winker et al. 2018); and a length-based method for estimating the spawning potential ratio (LB-SPR; Hordyk et al. 2015).

100. The WPNT **NOTED** that CMSY++ implemented for the assessment is based on the same modified Schaefer surplus production model as used in CMSY but is using an advanced state-space Bayesian method parameter estimation. The CMSY++ also incorporated an Artificial Neural Network (ANN) to select objective priors for relative stock size, based on patterns from 400 catch time series used to train the model. The CMSY++ model represents a major update and improvement of the CMSY method.

101. The WPNT **NOTED** the results of the C-MSY++ model applied to longtail tuna suggested that the stock is **overfished** ($B_{2024}<B_{MSY}$) and **subject to overfishing** ($F_{2024}>F_{MSY}$). The updated CMSY model produced very similar results.

102. The WPNT **NOTED** that the CMSY++ model requires specification of stock depletion at three points: the initial year, an intermediate year, and the final year. For this assessment, the intermediate year was set at the point where catch reached the maximum and then declined, following the recommended approach. The choice of intermediate year can strongly influence results and warrants careful consideration. The WPNT **NOTED** that the model can estimate the intermediate year internally, but this option was found to perform poorly. The WPNT **REQUESTED** the author include a sensitivity run in the paper to demonstrate the impact of the intermediate year assumption on results.

103. Conversely, the WPNT **NOTED** that the initial depletion assumption has little influence on these assessments as the stock recovers to high levels rapidly regardless of the starting assumption in the absence of intense fishing during that period.

104. The WPNT **NOTED** the different stock status estimates for longtail tuna compared to kawakawa (IOTC-2026-WPNT16-15) and Spanish mackerel (IOTC-2026-WPNT16-16), despite similar overall catch trends and final depletion assumptions. The WPNT **NOTED** that the main reason is that the longtail tuna model assumed a much lower resilience parameter value, based on its biology. The WPNT further **NOTED** that differences in the choice of intermediate year, as well as the catch trajectory immediately following that year (catch declined rapidly for longtail tuna but remained stable for Spanish mackerel), also influence stock status estimates.

105. The WPNT **NOTED** that that the JABBA model incorporated a time series of relative abundance (gillnet standardised CPUE index), together with model parameters and management quantities estimated in a Bayesian framework. The JABBA model is more optimistic than the CMSY++ model which only used the catch data and suggested that the stock is not overfished (B2024 > BMSY) but is subject to overfishing (F2024 < FMSY). The JABBA model also estimated a higher average MSY than the MSY estimated by the CMSY.

106. The WPNT **NOTED** that the CPUE index is increasing, while over the same time, catches are remaining and high). This is likely why the JABBA model estimates a higher MSY than CMSY++ as more data are available, and the CPUE suggests the stock can sustain higher exploitation, as biomass is increasing (the model assumes the CPUE is an abundance index).

107. The WPNT further **REQUESTED** that all CPCs work to develop CPUE series for their own fisheries to improve the data available for use in stock assessments, **NOTING** the availability of the Secretariat to assist with this work. The WPNT **NOTED** that without additional abundance information, stock assessments for all neritic species will continue to be full of uncertainties and so the WPNT will continue to be unable to provide robust management advice to the Commission for these species.

108. The WPNT **NOTED** that the C-MSY++ modelling framework also allows for the inclusion of abundance indices as with JABBA, but further **NOTED** that this latter model offers more flexibility and is considered to be better optimised for that purpose.

109. From a general perspective, the WPNT **NOTED** that the results of the three biomass dynamic models are largely comparable while the JABBA model is more optimistic. The consistency between the models is largely due to the assumptions made about population dynamics and stock productivity which are common across all of the models.

110. The WPNT **ACKNOWLEDGED** the value of extending catch-based assessments with length-composition analyses (i.e., LB-SPR and fishblicc), as this would broaden the stock assessment options available to the WPNT. The WPNT **NOTED** that stock status estimates from LB-SPR (and similarly fishblicc) are not directly comparable to outputs from other models, as they have very different target reference points.

111. The WPNT **AGREED** that length-based assessment models require consistent time series of size data representative of the wider population, which is currently unlikely to be the case for most neritic species. The WPNT **NOTED** that LB-SPR is particularly suited to fisheries with an asymptotic selectivity pattern, as fishing intensity is primarily informed by the older fish component. However, the WPNT **NOTED** that the assumed logistic selectivity may not be appropriate for the gillnet fishery and could consequently overestimate fishing mortality.

112. The WPNT **NOTED** results from the LB-SPR approach indicate a significant shift in the gillnet fishery toward selection of younger fish over time. However, the WPNT **NOTED** that estimated spawning potential ratio (SPR) throughout the time series is well below 0.4, indicating stock depletion relative to the risk-averse target. Although SPR increased after 2009, mirroring the upward CPUE trend over the same period, it has declined from 2017 to 2024.

113. The WPNT **NOTED** that allowing selectivity to vary freely over time could mask the fishing mortality signal unless there is strong evidence that selectivity has changed. The WPNT **SUGGESTED** examining a scenario where selectivity remains constant over the time period, **NOTING** that this option is currently not available in LB-SPR (it is available in fishblicc).

114. The WPNT **NOTED** paper IOTC-2026-WPNT16-15 on Assessment of Indian Ocean kawakawa (*Euthynnus affinis*) using data-limited methods, including the following abstract provided by the authors:

"In this stock assessment for kawakawa (Euthynnus affinis), a pelagic mackerel from the Scombridae, we have implemented the updated CMSY method (CMSY++; (Froese et al., 2023)) that utilises both CMSY and a Bayesian Schaefer Model (BSM) separately, allowing for abundance indices to be incorporated if available, alongside gear creep (Froese et al., 2023). We also implemented the JABBA model and one length-based method: the length-based spawning potential ratio model (LB-SPR, (Hordyk et al., 2015)). The length-based method provides a useful monitoring tool for the stock in the final year of the assessment, rather than a time-series of stock status". See the paper for the full abstract

115. The WPNT **NOTED** the results from the CMSY++ method (Table 2, Fig. 2)

Table 2. Kawakawa: Key management quantities from the CMSY++ used in 2026.

Management Quantity	Aggregate Indian Ocean
Most recent catch estimate (year)	160 841 (2024)
Mean catch – most recent 5 years	132 910 (2020 – 2024)
MSY (95% CI)	155 000 (120 000 – 203 000)
Data period used in assessment	**1950 - 2024**
F_{MSY} (95% CI)	0.45 (0.29 – 0.56)
B_{MSY} (95% CI)	346 000 (266 000 – 518 000)
$F_{current}/F_{MSY}$ (95% CI)	0.74 (0.44 – 1.22)
$B_{current}/B_{MSY}$ (95% CI)	1.31 (0.98 – 1.56)
$B_{current}/B_0$ (95% CI)	0.72 (0.61 – 0.83)

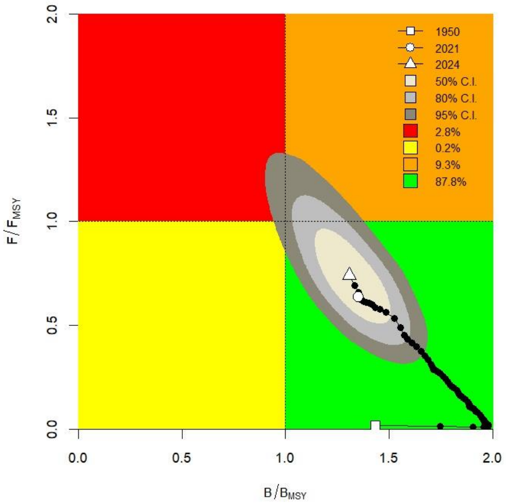

Fig. 2. Kawakawa C-MSY++ Indian Ocean assessment Kobe plot.

116. The WPNT **NOTED** that the estimates from the CMSY++ BSM model suggests that currently the stock of kawakawa in the Indian Ocean is **not overfished** ($B_{2024} > B_{MSY}$) and is **not subject to overfishing** ($F_{2024} < F_{MSY}$). The estimates produced by the JABBA method, suggest that the stock is not overfished ($B_{2024} > B_{MSY}$) but is subject to overfishing ($F_{2024} > F_{MSY}$). The JABBA model estimated a lower average MSY than the MSY estimated by the CMSY++.

117. The WPNT **NOTED** that the CPUE data suggest increasing biomass, as the index is increasing, while over the same time period, catches are remaining constant (and high). As the previous assessment stated, it is likely that the stock is approaching being fished at MSY levels, and higher catches are unlikely to be sustainable.

118. The WPNT **NOTED** that the LB-SPR estimated spawning potential ratio throughout the time series well below 0.4, indicating that the stock is depleted in relation to the risk-averse target (the SPR of 0.4). However, the

WPNT **NOTED** that the assumed logistic selectivity may not be appropriate for the gillnet fishery and could consequently overestimate fishing mortality.

119. The WPNT **NOTED** paper IOTC-2026-WPNT16-16 on Assessment of Indian Ocean narrow-barred Spanish mackerel (*Scomberomorus commerson)* using data-limited methods, including the following abstract provided by the authors:

> *"In this stock assessment for narrow-barred Spanish mackerel (Scomberomorus commerson), a pelagic mackerel from the Scombridae, we have implemented the updated CMSY method (CMSY++; (Froese et al., 2023)) that utilises both CMSY and a Bayesian Schaefer Model (BSM) separately, allowing for abundance indices to be incorporated if available, alongside gear creep (Froese et al., 2023). We also implemented the JABBA model and one length-based method: the length-based spawning potential ratio model (LB-SPR, (Hordyk et al., 2015)). A separate analysis was completed to test a new Bayesian-based length-based model fishblicc (Fu, 2026; github.com/paulhmedley/fishblicc). Both length-based methods provide a useful monitoring tool for the stock in the final year of the assessment, rather than a time-series of stock status." See the paper for the full abstract*

120. The WPNT **NOTED** the results from the CMSY++ method (Table 3, Fig. 3)

Table 3. Narrow-barred Spanish mackerel: Key management quantities from the CMSY++ used in 2026.

Management Quantity	Aggregate Indian Ocean
Most recent catch estimate (year)	157 775 (2024)
Mean catch – most recent 5 years	136 353 (2020 – 2024)
MSY (95% CI)	155 000 (127 000 – 186 000)
Data period used in assessment	**1950 - 2024**
F_{MSY} (95% CI)	0.49 (0.32 – 0.60)
B_{MSY} (95% CI)	318 000 (248 000 – 457 000)
$F_{current}/F_{MSY}$ (95% CI)	0.79 (0.51 – 1.29)
$B_{current}/B_{MSY}$ (95% CI)	1.25 (0.91 – 1.52)
$B_{current}/B_0$ (95% CI)	0.97 (0.64 – 1.20)

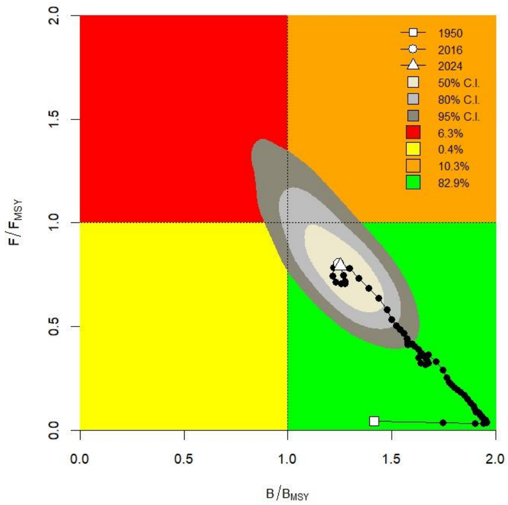

Fig. 3. Narrow-barred Spanish mackerel C-MSY++ Indian Ocean assessment Kobe plot.

121. The WPNT **NOTED** that CMSY++ estimates indicate the Indian Ocean narrow-barred Spanish mackerel stock is currently **not overfished** (B2024 > BMSY) and **not subject to overfishing** (F2024 < FMSY). The JABBA method yields a similar conclusion.

122. The WPNT **NOTED** that 2024 catches were very high, exceeding estimated MSY and were therefore considered unsustainable. The Secretariat has been working with the main harvesting CPCs to verify the accuracy of reported 2024 catches.

123. The WPNT **NOTED** that while JABBA estimated a stock status similar to CMSY++, it produced a notably different biomass trajectory from 2006 to 2018, showing an increasing trend driven by the Iranian gillnet CPUE index. The model was configured to fit the CPUE closely; however, this increasing CPUE trend is inconsistent with the high catches observed during the same period. The WPNT **SUGGESTED** examining estimated process error for evidence of overfitting. The WPNT further **NOTED** that the absence of abundance indices in the early and later years introduces substantial uncertainty into the biomass estimates.

124. The WPNT **NOTED** that revisions to Indonesia's historical catches have introduced significant differences relative to the last assessment. For Spanish mackerel, annual discrepancies range from 20,000 to 36,000 tonnes over 2017–2022 (kawakawa shows similar differences; longtail tuna differences are considerably smaller). Consequently, the current assessment results are not directly comparable to 2023. The revised catch series, endorsed by the SC, is based on logbook and landing-site data and is considered more reliable. However, the WPNT **AGREED** that it remains difficult to explain why the revision disproportionately affects some species (e.g., COM and KAW) over others (e.g., LOT) given they are caught in the same fisheries. The WPNT **REQUESTED** the WPDCS to investigate this discrepancy further.

125. The WPNT **NOTED** that LB-SPR was applied separately to gillnet and line fishery length-frequency data, with most samples in both cases originating from Iran. There is concern that data dominated by a single CPC or region may not be representative of the whole stock.

126. The WPNT **NOTED** that SPR was estimated below 40% (the risk-averse overfishing threshold) for the gillnet fishery and above 40% for the line fishery, reflecting a greater proportion of large fish in line fishery samples. These results are also consistent with the fishblicc analysis (see IOTC-2026-WPNT16-17).

127. The WPNT **NOTED** paper IOTC-2026-WPNT16-12 on Ensemble modeling for catch prediction and data-limited stock assessment of Narrow-barred Spanish mackerel (Scomberomorus commerson, Lacepède, 1800) in the Persian Gulf and Oman Sea, including the following summary provided by the authors:

"This study presents a data-limited stock assessment and catch forecasting analysis of Narrow-barred Spanish mackerel (Scomberomorus commerson) in the Persian Gulf and Oman Sea, focusing on southern Iranian waters over the period 1997–2024. A 28-year catch time series was analyzed using the CMSY (Catch-MSY) Monte Carlo simulation method. Four forecasting models—Generalized Additive Model (GAM), Random Forest (RF), Neural Network (NN), and ARIMA—were evaluated, and an inverse RMSE-weighted ensemble model was developed to improve predictive reliability. The CMSY model estimated the Maximum Sustainable Yield (MSY) at approximately 21.2 thousand tonnes (range 17–25 thousand tonnes). The current biomass relative to biomass at MSY (B/BMSY) was 0.93 (range 0.8–1.15), indicating that stock biomass is close to the level capable of producing MSY. However, the ratio of current fishing mortality to fishing mortality at MSY (F/FMSY) was 1.48 (range 1.21–1.75), reflecting fishing pressure exceeding sustainable levels. The saturation index ($S = B/K = B/B_o$) was estimated at 0.45 (range 0.42–0.48), suggesting that current biomass is below the unfished carrying capacity. Catch increased seven-fold from 3,939 tonnes in 1997 to 29,095 tonnes in 2023, with a mean annual catch of 15,337 ± 8,736 tonnes. Catch growth accelerated notably after 2010. Among individual models, GAM achieved the lowest prediction error (RMSE ≈ 3300 tonnes), while the ensemble model provided the most robust and stable forecasts. Ensemble projections for 2024–2028 indicate a continued increasing trend, with catches reaching approximately 32,000–34,000 tonnes by 2028. Overall, the stock of Narrow-barred Spanish mackerel in southern Iranian waters is approaching full exploitation, with current fishing pressure exceeding sustainable limits. Precautionary management measures—including science-based catch limits, enhanced monitoring, and effort reductions—are urgently recommended to prevent overfishing and ensure long-term sustainability."

128. The WPNT **NOTED** that based on the CMSY model the stock has decreased to the red exploitation status, indicating an unfavourable condition in terms of harvest pressure. The WPNT also **NOTED** that there is considerable variability in both catch and biomass, reflecting substantial fluctuations in the fishery.

129. The WPNT **DISCUSSED** the assumptions regarding the initial stock status. There were questions around the assumption that the stock was at a very low level in 1997 and whether alternative priors for initial exploitation levels had been considered. The WPNT **NOTED** that, given the absence of data prior to 1997, the assumed starting condition may have a strong influence on the assessment results. The WPNT **NOTED** that no information prior to 1997 was available and that alternative starting stock levels had not been evaluated.

130. The WPNT **DISCUSSED** whether projected catches from the ensemble model had been incorporated back into the CMSY model to evaluate the consequences of future catches on stock status. The presenter confirmed that this had not been undertaken.

131. The WPNT **DISCUSSED** the rationale for applying an ensemble modelling approach rather than relying on individual model diagnostics. The WPNT **DISCUSSED** whether the model projections from 2019 onwards had been evaluated through forward-testing approaches to assess model performance through time. The presenter clarified that the ensemble approach was selected because it provided the best overall model performance compared with individual models.

132. The WPNT **DISCUSSED** the use of splines and knots within the GAM component of the assessment. The presenter confirmed that models using one and two splines had been evaluated, with approximately three to four knots applied.

133. The WPNT **NOTED** paper IOTC-2026-WPNT16-17 on An application of the Bayesian Length Interval Catch Curve Analysis (fishblicc) to Indian Ocean longtail tuna and (*Thunnus tonggol*) and narrow-barred Spanish mackerel (*Scomberomorus commerson*), including the following summary provided by the authors:

"In recent years, the assessment of stock depletion using Spawning Potential Ratio (SPR)-based proxies has been advanced by the development of length-based methods such as the Length-Based Spawning Potential Ratio (LBSPR) model. The LBSPR approach has been applied to stock assessments of neritic tuna species by the Indian Ocean Tuna Commission (IOTC), including the current assessment in 2026. However, a key limitation of the LBSPR model is its assumption of asymptotic selectivity, which may not be appropriate for IOTC neritic fisheries that employ selective fishing gears. The recently developed R package fishblicc (Bayesian Length Interval Catch Curve Analysis) offers greater flexibility in modeling fishing selectivity. In this study, we applied fishblicc to length frequency data for Indian Ocean longtail tuna (Thunnus tonggol) and narrow-barred Spanish mackerel (Scomberomorus commerson). The exercise demonstrates that incorporating more realistic selectivity patterns (e.g., dome-shaped double normal selectivity) is important for capturing the factors influencing observed length frequencies, and the robustness of the assessment can be enhanced when length data are available from multiple fisheries with contrasting selectivity patterns. Further, while fishblicc and similar packages are not specifically designed to model temporal dynamics, further development to enable key estimates to be compared across time would be valuable. Such advancements would allow these assessment models to serve as powerful tools for monitoring the performance of fisheries and stocks over time."

134. The WPNT **NOTED** the presentation, and **DISCUSSED** the uses, flexibility, and ability of the model to be customised to a specific stock. Overall, the WPNT **NOTED** that this modelling framework could replace the traditional LB-SPR analyses for data-poor stocks, particularly due to the inclusion of Bayesian uncertainty, mixed gear types, and flexibility around selectivity.

135. The WPNT **NOTED** that model diagnostics may not always identify incorrect selectivity assumptions, as models can achieve good fits despite potentially unrealistic selectivity patterns. The WPNT **NOTED** that logistic selectivity assumptions may result in lower estimates of stock status by assuming that larger individuals have largely disappeared from the population, whereas dome-shaped selectivity allows for the presence of cryptic biomass.

136. The WPNT **NOTED** that selectivity assumptions had a strong influence on estimates of relative fishing mortality and spawning potential ratio (SPR). Under logistic selectivity assumptions, relative fishing mortality declined through time and SPR increased, whereas under double-normal selectivity assumptions SPR remained above 50% for much of the assessment period.

137. The WPNT **DISCUSSED** the confounding relationship between selectivity and fishing mortality estimates and **NOTED** that additional data is required to improve estimates of stock status for the entire Indian Ocean, as the length data are currently very limited both spatially, and temporally for all neritic species.

6.2 Development of management advice for neritic tuna species

138. The WPNT **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.

139. The WPNT **NOTED** that the models used for the three assessed species produced broadly consistent stock estimates. While JABBA generally represents a better modelling option as it incorporates an abundance index, the current CPUE indices originate from a single region and have not been updated since 2020. Furthermore, JABBA is unable to estimate carrying capacity with a reasonable degree of certainty without additional prior constraints, indicating that the CPUE is either uninformative or conflicting with catch data. The CMSY++ model has been explored more thoroughly and is therefore used to obtain estimates of stock status.

140. The WPNT **NOTED**, however, that catch-only methods are subject to high uncertainty and heavily influenced by prior assumptions. These methods are well suited for identifying plausible stock trajectory scenarios supported by data, but point estimates of reference points risk conveying a false impression of accuracy and understating uncertainty. The WPNT **DISCUSSED** whether only range estimates should be provided for management advice, similar to a risk assessment approach. The WPNT **NOTED** that current practice is to provide point estimates in the Executive Summary for agreed and accepted assessments while highlighting the limitations. The WPNT **AGREED** that further discussion is required on the best way to present stock estimates derived from data-limited methods, **NOTING** the need to harmonise practices across IOTC species.

141. With regard to complementing the assessment with length-based methods, the WPNT **SUGGESTED** using fishblicc as the future modelling platform, as it produces essentially the same stock estimate outputs as LB-SPR but offers greater flexibility. Moreover, it is based on a Bayesian approach, better characterises parameter uncertainty, and is naturally suited for simulation testing of management options. The WPNT **AGREED** that it is important to validate that the two models produce consistent results under the same assumptions.

142. The WPNT **NOTED** an increasing use of data-limited methods in IOTC stock assessments and that recent advances in length-based models, e.g., fishblicc, have expanded options for conducting cost-effective assessments. The WPNT **ENCOURAGED** CPC scientists to apply these tools to available data for neritic tuna stocks. Recognising the need for technical capacity building, the WPNT **RECOMMENDED** that the SC mobilise resources to conduct training workshops on data-limited stock assessment methods.

143. The WPNT also **RECOGNISED** that length-based methods require representative length samples with sufficient spatial coverage and from a wider range of gear groups, whereas currently the data are dominated by a single CPC and one gear group. The WPNT **RECOMMENDED** that the SC **ENCOURAGE** CPCs to implement sampling programmes to collect length data that improve spatial coverage, and to share data collected through their research projects with the IOTC Secretariat for use in assessments.

144. The WPNT **NOTED** that the length-weight relationships currently used by the Secretariat are not thought to be very robust and so **ENCOURAGED** CPCs to submit their length-weight data to the Secretariat. The WPNT further **NOTED** the development of a new form 5MB[2] which is a voluntary form that can be used by CPCs to submit raw length weight data.

145. The WPNT **DISCUSSED** the best way to synthesise different modelling tools that operate on different data sources (e.g., fishblicc, CMSY, JABBA) and **SUGGESTED** research to explore ways of building links between them, allowing these methods to collaborate and jointly explain information from various data sources in a consistent manner. Examples include using catch curve analysis to derive depletion estimates as input priors for CMSY, or estimating SPR time series as proxy abundance indices for input to JABBA. Such approaches would allow assessments to better integrate different data sources within a unified modelling framework.

146. The WPNT also **DISCUSSED** whether it would be useful to conduct assessments at regional levels, taking into consideration the potential population structure of neritic tunas and the localised nature of fisheries. The WPNT **NOTED**, however, that regional-level assessments may be constrained by the availability and granularity of data (i.e., whether data can be allocated spatially) as well as missing information for many regions and fisheries. The WPNT **SUGGESTED** intersessional workshops to bring CPCs together to identify data gaps and discuss data collection needs.

[2] https://data.iotc.org/reference/latest/forms/Form-5MB.html

147. The WPNT **SUGGESTED** exploring a wider range of data-limited approaches for neritic tunas beyond those already in use, such as data-limited SS3 and JABBA-Select. The WPNT **NOTED** that while these new methods can be explored in the future, improving the quality of available data may ultimately matter more than the choice of method.

148. Full management advice for each species is provided in the Executive Summaries in the Appendices.

7. Programme of Work (Research and Priorities)

7.1 Revision of the WPNT Program of Work 2027–2031

149. The WPNT **NOTED** paper IOTC–2026–WPNT16–08 on Revision of the WPNT Program of Work (2027-2031).

150. The WPNT **SUGGESTED** that the collection and analysis of length-frequency data and data-poor methods should again be priority topics for the coming year and for inclusion on next year's agenda.

151. The WPNT **NOTED** discussions around CPCs where missions by the Secretariat would be most beneficial for improving the data held by the Secretariat for neritic species.

152. The WPNT **NOTED** that the development of robust CPUE indices requires the use of all available fisheries data and that efforts should initially focus on CPCs where collaborative relationships and data-sharing arrangements are already established.

153. The WPNT **NOTED** that intersessional collaboration between the Secretariat and CPCs is essential to provide the data and information required to support stock assessments in advance of future Working Party meetings.

154. The WPNT **NOTED** that a pilot project with Pakistan could be undertaken to examine fisheries data available nationally that have not yet been submitted to the IOTC. It was suggested that WWF Pakistan could provide supporting metadata, including information on sampling effort, spatial coverage, and fishing gears, and that collaboration between the relevant organisations should be encouraged.

155. The WPNT **NOTED** that Thailand expressed its willingness to collaborate with the Secretariat to further analyse available fisheries data with the aim of improving CPUE analyses and supporting future fisheries management. The Secretariat confirmed that such collaborative work is being planned.

156. The WPNT **NOTED** a suggestion to develop a research plan to support improvements in future stock assessments to be considered at the next meeting. Such a plan could strengthen the link between research undertaken by CPCs and the scientific priorities of the Working Party.

157. The WPNT **NOTED** that incorporating the research plan into the Working Party's Programme of Work would help identify and prioritise key activities, including capacity-building workshops and other technical support required to improve assessments.

158. The WPNT **NOTED** that a consolidated research plan could summarise ongoing research activities across CPCs, identify remaining information gaps, and outline the data and analyses needed to improve stock assessments, particularly for data-poor species and assessments using alternative methodologies. The plan could also identify priority workshops and collaborative activities needed to achieve these objectives.

159. The WPNT **NOTED** that, under an EU-funded project, a series of capacity-building workshops are being developed, including training on data-poor assessment methods and CPUE standardisation, with delivery planned over the next several years.

160. The WPNT **NOTED** potential training workshops that would be useful to the group such as training on the use of fishblicc and other length-based assessment methods.

161. 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.

162. The WPNT **RECOMMENDED** that the SC consider and endorse the WPNT Program of Work (2027–2031), as provided in Appendix VI.

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

163. The WPNT **NOTED** that the invited expert for the 2026 meeting had experience with data poor assessment approaches.

164. Given that in 2027, the WPNT will be running assessments for three further data-poor stocks, 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 2027, by an Invited Expert:

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

8. OTHER BUSINESS

8.1 Date and place of the 17th and 18th Working Party on Neritic Tunas

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

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

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

167. The WPNT **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPNT16, 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 2026:
   - 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

168. The report of the 16th Session of the Working Party on Neritic Tunas (IOTC–2026–WPNT16–R) was **ADOPTED** by correspondence.

APPENDIX I
LIST OF PARTICIPANTS

CHAIRPERSONS					
Title	**First name**	**Last name**	**Affiliation**	**CPC**	**E-mail**
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APPENDIX II
AGENDA FOR THE 16TH WORKING PARTY ON NERITIC TUNAS

Date: 6–9 July 2026
Location: Seychelles
Venue: UNDP
Time: 09:00 – 17:00 daily (Seychelles time)
Chair: Dr Farhad Kaymaram; **Vice-Chair**: Dr 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 28th Session of the Scientific Committee (IOTC Secretariat)
   - **3.2.** Outcomes of the 30th 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 WPNT15 and SC28 (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.** Review new information on fisheries and associated environmental data (general CPC papers)
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.** Data for input into stock assessments (all)
6. **STOCK ASSESSMENT UPDATES**
   - **6.1.** Stock assessment updates (all)
     - Longtail tuna
     - Kawakawa
     - Narrow-barred Spanish mackerel
   - **6.2.** Stock status indicators for other neritic tuna species (all)
   - **6.3.** Development of management advice for neritic tuna species (all)
7. **PROGRAM OF WORK (RESEARCH AND PRIORITES)**
   - **7.1.** Revision of the WPNT Program of Work 2027–2031 (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 17th and 18th Working Party on Neritic Tunas (Chair)
   - **8.2.** Review of the draft, and adoption of the Report of the 16th Working Party on Neritic Tunas (Chair)

APPENDIX III
LIST OF DOCUMENTS

Document	Title
IOTC-2026-WPNT16-01a	Draft: Agenda of the 16th Working Party on Neritic Tunas
IOTC-2026-WPNT16-01b	Annotated agenda of the 16th Working Party on Neritic Tunas
IOTC-2026-WPNT16-02	List of documents of the 16th Working Party on Neritic Tunas
IOTC-2026-WPNT16-03	Outcomes of the 28th Session of the Scientific Committee (IOTC Secretariat)
IOTC-2026-WPNT16-04	Outcomes of the 30th Session of the Commission (IOTC Secretariat)
IOTC-2026-WPNT16-05	Review of current Conservation and Management Measures relating to neritic tuna species (IOTC Secretariat)
IOTC-2026-WPNT16-06	Progress made on the recommendations and requests of WPNT15 and SC28 (IOTC Secretariat)
IOTC-2026-WPNT16-07	Review of the statistical data available for the neritic tuna species (IOTC Secretariat)
IOTC-2026-WPNT16-08	Revision of the WPNT Program of Work (2027-2031) (IOTC Secretariat)
IOTC-2026-WPNT16-09	Analysis of Neritic Tuna in Malagasy Small-Scale Fisheries of the Mozambique Channel (A. M. Rasolomampionona)
IOTC-2026-WPNT16-10	Spatial and temporal variability of longtail tuna from Thai purse seine fishery in the Andaman Sea of Thailand (Kulanujaree N, Pheaphabrattana S, Maeroh K, Noranarttragoon P)
IOTC-2026-WPNT16-11	Analysis of artisanal fishing gears impact on King Mackerel (*Scomberomorus Commerson*) along the Kenya Coast line (Barasa I)
IOTC-2026-WPNT16-12	Ensemble modeling for catch prediction and data-limited stock assessment of Narrow-barred Spanish mackerel (*Scomberomorus commerson*, Lacepède, 1800) in the Persian Gulf and Oman Sea (southern Iranian waters) (S. A. Hashemi, F. Kaymaram and M. Doustdar)
IOTC-2026-WPNT16-13	Trophic Dynamics and Reproductive Resilience: Implications for the Management of Kawakawa (*Euthynnus affinis*) in Western Sri Lankan Waters (S. Athukoorala)
IOTC-2026-WPNT16-14	Stock Assessment of Indian Ocean longtail tuna (*Thunnus tonggol*) using data-limited methods (Phillip G)
IOTC-2026-WPNT16-15	Stock Assessment of Indian Ocean kawakawa (*Euthynnus affinis*) using data-limited methods (Phillip G)
IOTC-2026-WPNT16-16	Stock Assessment of Indian Ocean narrow-barred Spanish mackerel (*Scomberomorus commerson*) using data-limited methods (Phillip G)
IOTC-2026-WPNT16-17	An application of the Bayesian Length Interval Catch Curve Analysis (fishblicc) to Indian Ocean longtail tuna and (*Thunnus tonggol*) and narrow-barred Spanish mackerel (*Scomberomorus commerson*) (Fu D)

Document	Title
IOTC-2026-WPNT16-19	Towards new data for neritic tuna management in the Indian Ocean: a toolbox of genetic and epigenetic approaches (Chevrier T., Nieblas, A.E, Cowart D., Chanut J., Imbert Nguyen J., Bernard S. and Bonhommeau S.)
IOTC-2026-WPNT16-20	Updates and Simplified Access to the IOTC Species Identification Website: iotcspecies.com (Fujino T)
IOTC-2026-WPNT16-21	A systematic approach to estimating life-history parameters under data-limited scenarios for kawakawa (*Euthynnus affinis*) in the western and southern part of Indonesian waters (B. Setyadji, M. Spencer, L. Kell, S. Wright and S. Ferson)
IOTC-2026-WPNT16-22	Stock structure of kawakawa (*Euthynnus affinis*) in Indonesian waters inferred from parasite communities (P. Lestari, T. S. Syamsudin, E. Nurdin, A. S. Panggabean, C. P. Rura, F. Satria and L. Sadiyah)
Information papers	
IOTC-2026-WPNT16-INF01	Preliminary guide to measurements and sampling (IOTC Secretariat)
IOTC-2026-WPNT16-INF02	Review of fisheries statistical data available for Indian Ocean narrow-barred Spanish mackerel
IOTC-2026-WPNT16-INF03	Review of fisheries statistical data available for Indian Ocean kawakawa
IOTC-2026-WPNT16-INF04	Review of fisheries statistical data available for Indian Ocean longtail tuna

APPENDIX IV
STATISTICS FOR NERITIC TUNAS AND SEERFISH

Extract from IOTC–2026–WPNT16–07

Historical trends (1950-2024)

Over the past two decades, the contribution of neritic tuna and seerfish species to the total catch has increased markedly, rising from approximately 25% in the 1990s to 33% by 2010s and continuing to increase thereafter. This shift in catch composition can be attributed to several factors:

1. **Changes in Fisheries Operations**: Beginning in the late 2010s, significant changes occurred in fishing operations across the region. Semi-industrial fisheries, particularly those operating in waters adjacent to Somalia, substantially reduced their activities. As a result, many vessels shifted their operations towards waters within national jurisdictions, potentially increasing fishing effort on neritic tuna and seerfish species in coastal areas.
2. **Changes in Large Pelagic Fisheries**: During the same period, industrial fleets from Distant Water Fishing Nations (DWFNs), which traditionally targeted large pelagic tunas in the western Indian Ocean, also reduced their fishing activities in the late 2010s. This reduction may have contributed to an increase in the relative proportion of neritic tuna and seerfish catches.
3. **Increased Fishing Activity in Coastal Areas**. In recent years, there has been a substantial increase in the number of vessels operating in coastal waters, including both small and medium scale fleets. These vessels often employ multiple fishing gears, allowing them to maximize catches and adapt their fishing strategies to seasonal changes in resource availability (Herrón et al. 2019, Martin 2025).

Fig. A 1 illustrates changes in catch composition among major species groups between 1950 and 2024. The figure shows a pronounced decline in tropical tuna catches between 2009 and 2011, in contrast to the continued growth in catches of neritic tuna species during the same period. This divergence highlights the increasing contribution of neritic tunas to total catches in the Indian Ocean over recent decades.

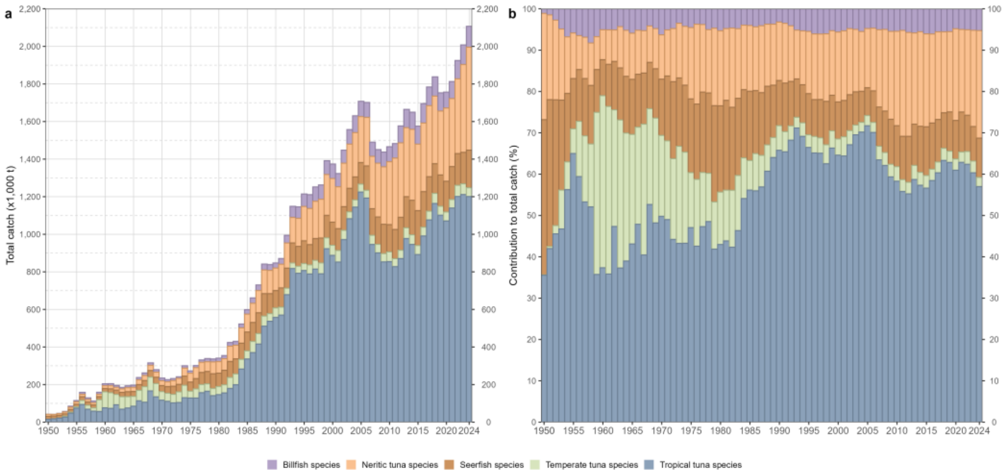

Fig. A 1: Annual time series of (a) cumulative retained catches (metric tonnes; t) and (b) contribution to the total retained catches (percentage; %) of IOTC tuna and tuna-like species by species category for the period 1950-2024

Since 1950, neritic tuna and seerfish species have been predominantly harvested by coastal fisheries, with drifting gillnets accounting for more than 61% of total catches. Drifting gillnets have remained the principal fishing gear targeting these species since the 1950s, particularly for mackerel species across both small and medium scale gillnet fisheries (Nguyen et al. 2023). In addition to drifting gillnets, several other fishing gears contribute substantially to catches in the coastal waters of the Indian Ocean (Fig. A 2):

1. **Surrounding Nets**: This category includes purse seines and ring nets, which together accounted for approximately 15% of total catches between 2010 and 2024 (Fig. A 3). These gears are effective in targeting schooling fish near the surface, including neritic tunas. Although primarily associated with coastal fisheries, surrounding nets operating in offshore waters have also been reported to catch neritic tuna species, albeit at lower levels.

2. **Line Fisheries**: Line fisheries, including handlines and coastal longlines, contributed approximately 14% of total catches during the same period. These gears are generally more selective and are commonly used to target specific species, including neritic tunas and seerfishes.

3. **Smaller Coastal Fisheries**: Fishing gears such as beach seines, Danish seines, and trawls have also contributed increasing catches of neritic tuna and seerfish species in recent years. While these fisheries vary considerably in terms of scale, operation, and target species, they remain important components of coastal fishing activities throughout the Indian Ocean.

In contrast, catches of neritic tunas reported by longline and baitboat fisheries have continued to decline relative to those reported by other fishing gears. This trend likely reflects the primary focus of these fisheries on other target species and their operation in areas where neritic tuna species occur at relatively low abundance.

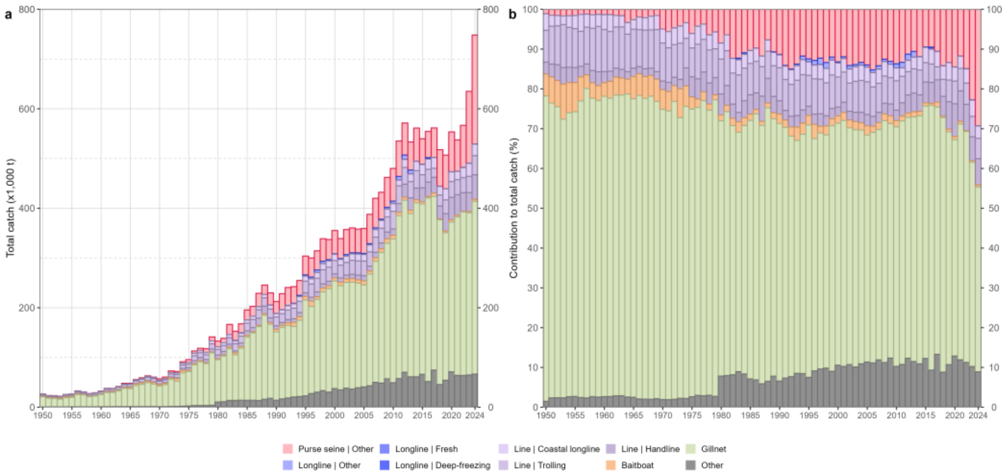

Fig. A 2: Annual time series of (a) cumulative retained catches (metric tonnes; t) and (b) contribution to the total retained catches (percentage; %) of IOTC neritic tunas and seerfish by fishery for the period 1950-2024

Recent fishery features (2020-2024)

Recent catch trends indicate that Indonesia, India, and the Islamic Republic of Iran collectively accounted for approximately 68% of total neritic tuna and seerfish catches in the Indian Ocean during 2020 and 2024. These catches were derived from a diverse range of fisheries. Indonesian and Indian fisheries are characterized by multi-purpose, small-scale fleets employing a variety of fishing gears, whereas Iranian fisheries are predominantly gillnet-based, although some vessels switch gears seasonally in response to changing fishing opportunities (Fig. A 3).

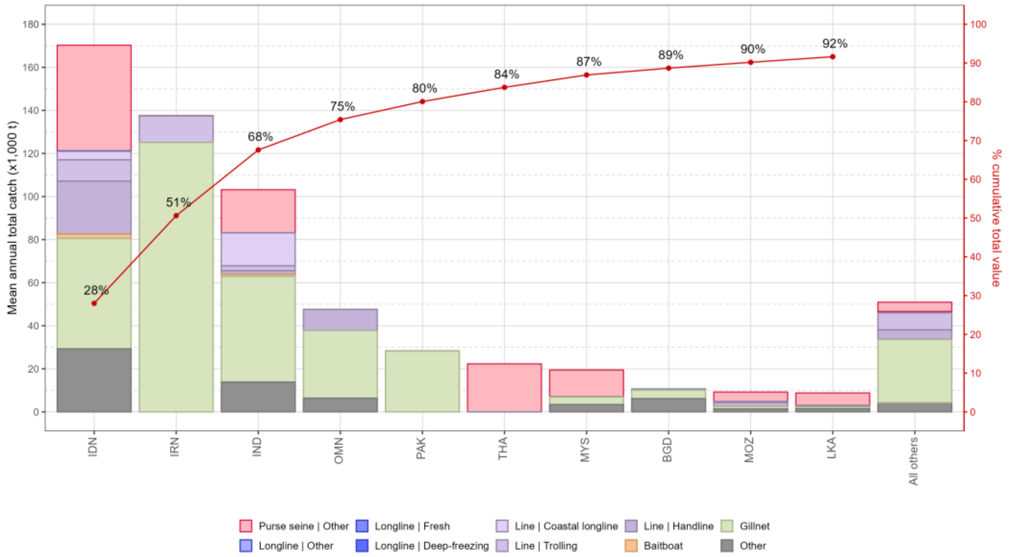

Fig. A 3: Mean annual retained catches (metric tonnes; t) of IOTC neritic tunas and seerfish by fleet and fishery between 2020 and 2024, with indication of cumulative contribution (percentage; %) of catches by fleet

Catch trends by fishery group indicate an overall increase in catches from both gillnet and purse-seine fisheries (Fig. A 4). At the fleet level, Iranian gillnet fisheries have shown increasing catches in recent years, although the magnitude of the increase has been lower than that observed in Indonesian gillnet fisheries. In contrast, catches from Indian gillnet fisheries declined in 2024 after reaching peak levels in 2022 and 2023.

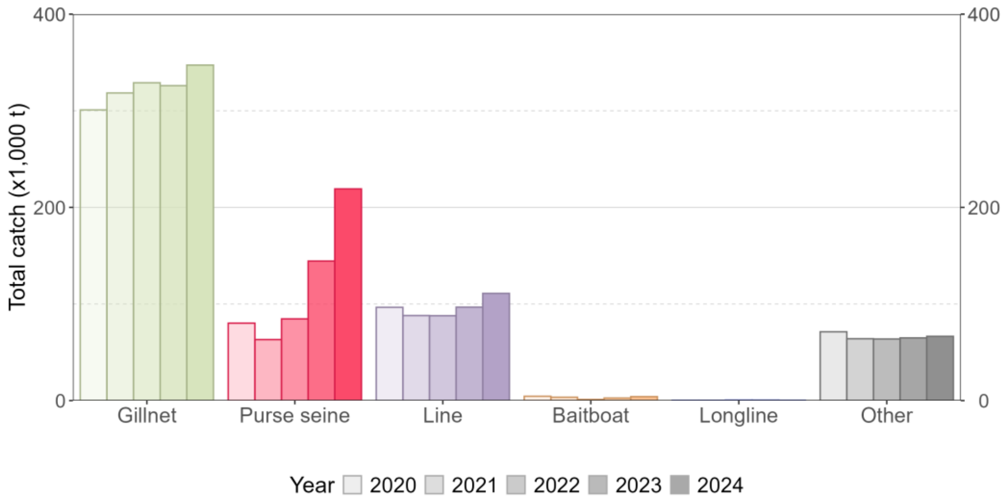

Fig. A 4: Annual trends in retained catch (metric tonnes; t) of IOTC neritic tunas and seerfish by fishery group between 2018 and 2023

A particularly notable increase was observed in Indonesian purse-seine fisheries, with catches rising from approximately 24,000t to an average of 93,000 t during 2023-2024. Increases in purse-seine catches were also recorded for Thailand and India in 2024. Similar upward trends were observed in Indonesian line, baitboat, and other fisheries.

Conversely, catches from Indian line and baitboat fisheries declined in 2024. Line fishery catches decreased from 24,000 t in 2023 to 12,000 t in 2024, while baitboat fishery catches have shown a continuous decline since 2020. In contrast, catches of neritic tuna and seerfish species from other Indian fisheries increased in 2024 (Fig. A 5).

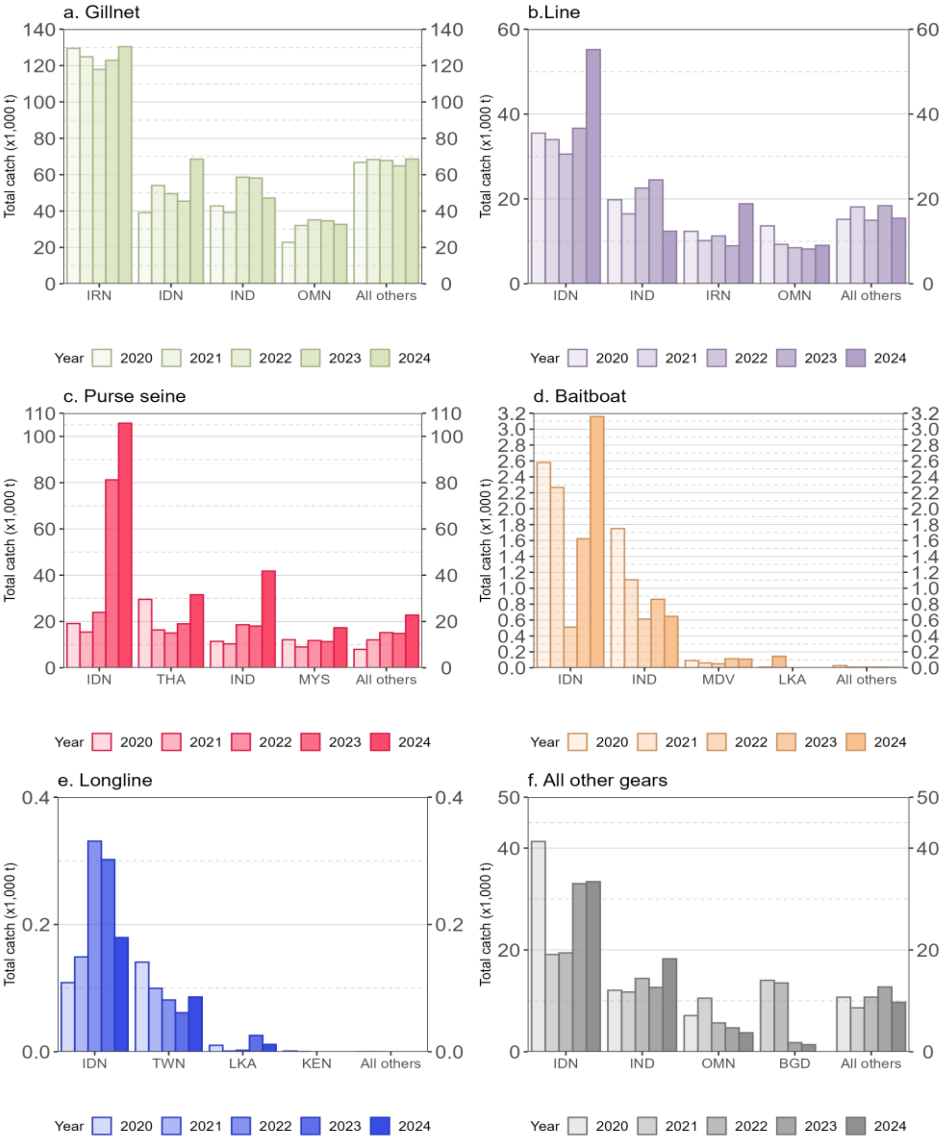

Fig. A 5: Annual trends **in retained** catch **(metric tonnes; t) of** IOTC **neritic** tunas **and seerfish** by fishery group and fleet **between** 2020 and 2024

Uncertainties in nominal catch data

Uncertainty associated with catch data available in the IOTC databases has become an increasing concern for scientists (Cappa et al. 2024). To address these challenges, the Secretariat, with supplementary funding provided by CPCs, has intensified its support to members with limited reporting capacities (Capacity Development in Support of IOTC Developing Coastal States). These include in-country missions, regional workshops, and other technical assistance modes, as well as the development of a range of reporting and validation tools designed to improve data quality and facilitate compliance with IOTC reporting requirements.

These efforts have resulted in gradual improvements in the reporting of retained-catch data, as reflected by increasing levels of data submission over time. However, similar progress has not been consistently observed across other datasets.

Several CPCs continue to face challenges in meeting reporting obligations due to constraints within their national fisheries data collection systems, including:

- Limited emphasis on recording catches of tuna and tuna-like species, particularly where these species represent a relatively small component of total catches;
- Insufficient numbers of trained personnel and frequent turnover of key technical staff within fisheries administrations;
- Inadequate or non-existent fisheries data collection and management frameworks;
- Limited financial resources available for fisheries monitoring and management activities.

Recent reviews and revisions of catch data have improved the availability of retained catch data for neritic tuna and seerfish species, which are predominantly harvested by coastal fisheries. However, improved availability does not necessarily imply improved data quality. The analyses presented here primarily evaluate the level of catch disaggregation by species and fishery, as well as the overall availability of species-specific catch information. Accurate identification of neritic tuna and seerfish species can be challenging due to similarities among species, particularly at juvenile stages. In addition, the multi-species and multi-gear nature of many coastal fisheries complicates the collection of species and gear specific catch data in the absence of well-designed sampling programmes.

The proportion of nominal catches reported to the Secretariat at either a fully or partially disaggregated level (quality scores 0–2) has varied between 44.7% and 97.8% of total catches over time. Nevertheless, reporting completeness has shown a clear and encouraging upward trend since the mid-1990s, reaching its highest level in 2024 (Fig. 4.9).

Spatial distribution of catch and effort

Revisions to geo-referenced data submitted in 2025 indicate notable improvements in fisheries data reporting by several CPCs. Iran, in particular, has enhanced its reporting by providing data aggregated by spatial grid squares rather than irregular grids. These revisions have increased spatial coverage and improved the alignment of catch data with retained catches. In addition, Indonesia has expanded the coverage of geo-referenced data for fisheries targeting neritic species. These improvements have helped refine effort distributions and enable more accurate allocation of fishing effort within the respective fishing grounds.

Following the introduction of recommended effort units for coastal fisheries, CPCs have been encouraged to report effort using measurements that are less dependent on trips and instead reflect actual fishing activity, such as fishing days or other fishery-specific effort units. Consequently, several CPCs revised the effort units used in their geo-referenced datasets.

For example, Sri Lanka changed its effort reporting from trips, which had been the standard unit throughout its historical time series, to fishing days, while Indonesia changed from sets to fishing days for certain fisheries.

Although the availability of geo-referenced data has continued to improve, uncertainties remain. It should be noted that the Secretariat does not undertake a systematic evaluation of the sampling methodologies applied by CPCs, and inconsistencies in reported catch and effort data are still evident for some CPCs. The principal factors constraining the collection and reporting of geo-referenced fisheries data include:

- Extensive and geographically dispersed landing sites, where fisheries data are collected from only a subset of locations;
- Limited information on the capacity and characteristics of fishing vessels;
- Challenges in maintaining consistent and reliable effort data over time; and
- Insufficient funding to support comprehensive sampling programmes, as well as the training and retention of fisheries enumerators.

The positive impact of Secretariat workshops and awareness-raising activities is reflected in the increasing availability of geo-referenced data from coastal fisheries in recent years. In 2024, the proportion of geo-referenced data assessed as being of good quality (quality scores 0–2) reached 66.1%, compared to 56.4% in 2023.

Size composition of the catch

Depending on the catch levels of neritic tuna and seerfish species, CPCs undertaking biological sampling aim to meet the IOTC reporting requirement of at least one fish sampled per metric tonne of catch. Achieving this target has proven challenging for many coastal fisheries due to: (i) limited sampling coverage and resources; and (ii) difficulties in raising sampled data to represent total catches. Nevertheless, several CPCs have increased their sampling coverage in recent years, contributing to improvements in the quantity of size-frequency data available for assessment purposes.

The level of standardized sampling varies considerably among CPCs. The Islamic Republic of Iran consistently provides more than 5,000 samples annually, while Indonesia has substantially increased its sampling of neritic tuna and seerfish species in recent years in response to rising catch levels. Sri Lanka, the Maldives, and Thailand have maintained regular sampling programmes over several years, although at lower levels of coverage Fig. A 6.

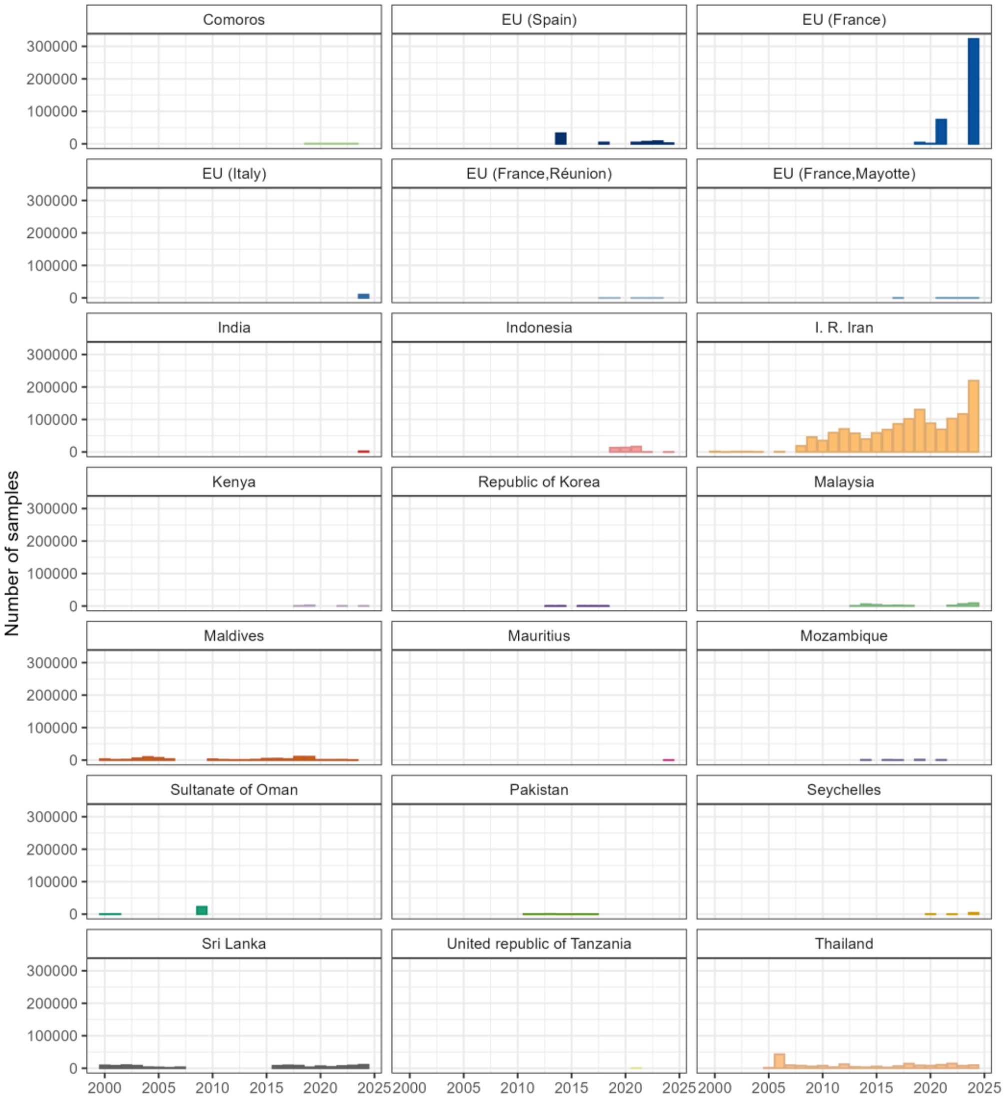

Fig. A 6: Annual number of standard size samples available at the IOTC Secretariat by fleet.

The availability of size-frequency samples varies considerably among fisheries, with the dominant fishing gears contributing the majority of the data. Gillnet fisheries account for the largest share of size samples for neritic tunas and seerfishes, representing 69.9% of all size data available in the IOTC database. Additional size-frequency data have been collected from purse seine (1985-2024), baitboat (1983-2024), and trolling line (1983-2024) fisheries, although in substantially lower quantities than those obtained from gillnet fisheries. Only limited numbers of samples are available from other fishery types.

Frigate tuna and kawakawa together account for more than 60% of all size samples available in the IOTC database, representing 34.41% and 29.37% of the total samples, respectively. In contrast, narrow-barred Spanish mackerel accounts for only 15.59% of the available samples despite its substantial contribution to total catches. Sampling coverage is particularly limited for bullet tuna and Indo-Pacific king mackerel, which together represent less than 5% of the total size-frequency samples available.

In recent years, relatively few projects have specifically targeted the collection of biological samples for neritic tuna and seerfish species, particularly when compared with the level of sampling undertaken during the IPTP period. Biological sampling in coastal fisheries remains constrained by limited funding and logistical challenges, resulting in lower sampling coverage across many fisheries.

To address these gaps, the IOTC Secretariat is exploring initiatives aimed at improving the visibility of small-scale coastal fisheries through dedicated sampling programmes. These efforts are expected to strengthen the collection, management, and accessibility of biological data, thereby enhancing the scientific information available for stock assessment of small species.

Uncertainties in size-frequency data

Challenges in collecting size-frequency data remain for many coastal CPCs. As illustrated in the previous section, size-composition data are available from only a limited number of CPCs and, in most cases, sample coverage remains relatively low. The availability of size-frequency data, measured as the proportion of retained catches associated with adequate sampling coverage (quality scores 0-2), averaged only 7.2% over the last decade. Although the number of samples collected has increased in recent years, sampling coverage remains below 50% of retained catches, with only 26.1% in 2024.

The coverage is based on size frequency data that could be successfully processed and standardized within the IOTC databases. However, there are instances in which CPCs have submitted size-frequency datasets that could not be incorporated into the database due to data quality issues. The most common deficiencies include:

- Size classes that are excessively broad and not biologically meaningful for the species concerned;
- Use of inappropriate or non-standard length measurements;
- Absence of geo-referenced spatial information, with samples often reported only at the level of IOTC major areas;
- Aggregation of data across multiple fisheries, preventing fishery-specific analyses.

The Secretariat provides technical assistance to the affected CPCs to support improvements in data collection, reporting, and submission procedures. However, given the nature of some data collection systems and historical datasets, it is not always possible to fully resolve these issues. Consequently, some submitted size-frequency data remain unsuitable for standardization and inclusion in the IOTC databases.

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 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	• 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, Madagascar, 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 ● Temporal inconsistencies in reported catch trends	• India: catch-and-effort and size data for coastal fisheries are not reported according to standards • Indonesia: In 2024, re-estimation of the historical retained catch data for all fisheries, and the revised estimates were subsequently adopted as the official national catch series. However, temporal inconsistencies remain evident in the reported catch trends for neritic species In the past, catch-and-effort and size-frequency data for coastal fisheries were collected through the IOTC–OFCF pilot sampling project, although coverage was limited to a very small number of landing sites (fewer than 10). More recently, Indonesia has provided these data for a range of fisheries. However, coverage remains limited, particularly for small-scale fisheries. • Kenya: Kenya is developing a new fisheries management platform aimed at consolidating all fisheries data into a single repository. This integrated system is expected to support more consistent data estimation, validation, and management within a unified database, thereby reducing discrepancies between datasets. The platform was first presented to the Secretariat during a capacity-building mission to Kenya in June 2025. Subsequently, in May 2026, the Secretariat provided additional technical support, focusing on persistent gaps in fisheries data reporting. During the latter mission, however, only limited progress was observed in the development and implementation of the fisheries management platform. The absence of a fully operational and comprehensive data management system may be a key factor contributing to the incompleteness and inconsistency of the fisheries data reported by Kenya. • Madagascar: The World Bank-funded sampling programme that supported fisheries data collection in Madagascar ended in 2021. Data collected under this programme were not adequately raised to estimate total catches for the entire fishery.

			Furthermore, the quality of data received from this period was inconsistent, reflecting variations in data collection practices over time. Madagascar has participated in several training workshops organized by the Secretariat, and a technical assistance mission was also conducted in the country. These capacity-building activities have contributed to improvements in the quality of data reported since 2023, although some data gaps and uncertainties remain. • Mozambique: Mozambique received technical assistance in 2024 to review its fisheries data collection and reporting systems. The country is currently transitioning from manual to electronic data collection and management systems; however, gaps in data reporting remain. In addition, turnover among key technical staff within the fisheries administration has affected data management and reporting processes, including a lack of follow-up and resolving identified data gaps and reporting issues. • Oman: Several virtual meetings have recently been held between Oman and the Secretariat to review the catch estimation methodologies being applied by Oman and to provide guidance on data reporting. With the support of a consultant, Oman is currently reviewing its methodology for estimating catches from small-scale fisheries and, at the same time, developing a data management platform to integrate fisheries data from multiple sources into a single system. Oman has also requested a Secretariat mission to conduct an on-site review of the new system and to provide further technical assistance on data management, catch estimation, and reporting procedures. To date, no size frequency data reported from Omani fisheries • Tanzania: Tanzania has received several technical assistance missions from the Secretariat, most recently in May 2026. Despite these efforts, significant gaps remain in the fisheries datasets. These shortcomings are largely attributed to limited integration among the various fisheries institutions and departments responsible for data collection and management. To address these challenges, Tanzania has established a task force to harmonize data from different departments, including the standardization of data collection methodologies. At the same time, the country is developing a fisheries management platform designed to consolidate all fisheries data into a single repository. Tanzania also plans to review its historical coastal fisheries catch data, as current estimates are believed to underrepresent the actual catches of tuna and tuna-like species. Furthermore, data reported in recent years exhibit temporal inconsistencies across species and fisheries
	Coastal fisheries of Indonesia, Malaysia	Reliability of catch estimates	• Indonesia (nominal catch): Catch estimates for neritic tunas are considered highly uncertain due to species misidentification and the aggregation of juvenile neritic and tropical tuna species under the commercial category tongkol. To address these issues,

		Several issues have been identified for the following fisheries, which compromise the quality of the data in the IOTC database	the IOTC Secretariat supported a pilot artisanal fisheries sampling project in North and West Sumatra between 2014 and 2017, with the specific objective of improving estimates for neritic tunas and juvenile tuna species. Although Indonesia subsequently re-estimated its historical catch series, the marked fluctuations observed in the reported catches of neritic tuna and seerfish species suggest that species misidentification may still persist. These inconsistencies may reflect uncertainties in the species composition data used to derive catch estimation ratios, thereby contributing to ongoing uncertainty in the resulting catch estimates. • Malaysia (catch-and-effort): Historical geo-referenced data require revision to improve both spatial allocation and effort reporting. Prior to 2023, data were reported using limited spatial grids that did not adequately represent fishing grounds, and CPUE trends showed substantial variability and inconsistencies associated with different effort units. These issues introduce uncertainty into the spatial distribution of catch and effort data and affect the reliability of historical CPUE series. Malaysia needs to revise and re-submit historical geo-referenced catch and effort.
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): The Islamic Republic of Iran improved the geo-referenced catch and effort data for its offshore fisheries in 2024. However, the size-frequency data reported for neritic tuna and seerfish species from these fisheries do not yet fully comply with IOTC reporting standards. • 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. No data on size frequency from Pakistan in 2025

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 amounts of neritic tunas discarded. The same applies to catch-and-effort data.	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 industrial purse seine vessels from coastal countries, namely Oman, Kenya, and Tanzania are not reporting catches of neritic tunas accordingly. Update: The level of ROS coverage in industrial fisheries is increasing, leading to improved reporting of bycatch data of neritic species. However, newer purse seine operators, particularly those from coastal CPCs, still lack the information and experience required to adequately monitor and report discarded catches Although a comprehensive revision of catch data has been undertaken for all fisheries, including industrial purse seine fisheries, uncertainties remain in the estimation of bullet tuna catches. These uncertainties persist in both historical and recent data
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, although there are increase coverage of ROS. Limited information reported by some 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 length-weight-age keys, non-standard measurements-fork length keys and processed weight-live weight keys.	Collection of biological information, including size data, remains very low for most neritic species. 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. The IOTC Secretariat, under the SWIOFC project, plans to undertake biological sampling of small-scale fisheries in the region, which is expected to improve the availability of biological information for neritic tuna and seerfish species.

APPENDIX VI
WORKING PARTY ON NERITIC TUNAS PROGRAM OF WORK (2027–2031)

The following is the Draft WPNT Program of Work (2027 to 2031) and is based on the specific requests of the Commission and Scientific Committee as well as topics identified during the WPNT16. 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**				
		2027	**2028**	**2029**	**2030**	**2031**
	Consultancy to review existing systems for qualifying datasets — including those used in fisheries data, to identify best practices and propose improvements to the current data quality scoring system used by the Secretariat. (Common across all Working Parties)					
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 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 to understand their phylogenetic relationships.					

2. Stock assessment / Stock indicators	Explore alternative assessment approaches and develop improvements where necessary based on the data available to determine stock status for neritic and seerfish species.					
	1. Review and improve the current data limited methods for determining stock status and provide management advice. 2. Review size data and their suitability for monitoring stock status 3. Explore inclusion of research and alternative data sources from CPCs in assessments (in particular length-frequency data). 4. 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: ➢ Collaborate with CPCs to analyse their catch and effort and length frequency data and develop CPUE indices (Iran, Sri Lanka, India, Pakistan, Thailand) ➢ Re-estimation of historic catches by CPCs using recovered or captured information (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		**2027**	**2028**	**2029**	**2030**	**2031**
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 length-weight relationships, age-at-maturity, and fecundity-at-age/length relationships, age-length keys, age and growth, longevity which will be input into future stock assessments. 3. Increase ecological traditional knowledge of all neritic tunas throughout their range including information on their feeding habits. 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 2027-2031

Working Party on Neritic Tunas					
Species	**2027***	**2028****	**2029***	**2030***	**2031****
Bullet tuna	**Assessment**	Data preparation	Data preparation	**Assessment**	Data preparation
Frigate tuna	**Assessment**	Data preparation	Data preparation	**Assessment**	Data preparation
Indo-Pacific king mackerel	**Assessment**	Data preparation	Data preparation	**Assessment**	Data preparation
Kawakawa	Data preparation	Data preparation	**Assessment**	Data preparation	Data preparation
Longtail tuna	Data preparation	Data preparation	**Assessment**	Data preparation	Data preparation
Narrow-barred Spanish mackerel	Data preparation	Data preparation	**Assessment**	Data preparation	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

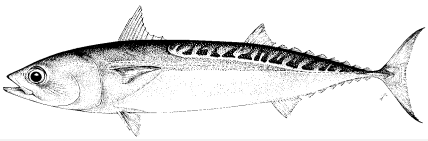

TABLE 1. Status of bullet tuna (*Auxis rochei*) in the Indian Ocean

Area[1]	Indicators		2024 stock status determination[3]
Indian Ocean	Catch 2024 (t) Mean annual catch (2020-2024) (t)	94,374[2] 54,787	**Unknown**
	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 2024: 7.2%;
[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 /Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was conducted in 2026 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 increased steadily, reaching a peak of over 40,000 t in 2020. Although catches in 2020 and 2021 remained close to 30,000 t, a sharp increase has taken place again in recent years, exceeding 90,000 t in 2023-2024 (**Fig. 1**). The increased catches are thought to be due to issues with the revision of catch data from Indonesia. 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 2024 was estimated to be 94,273 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 (19,580 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;
- Accurate and consistent catch series data constitute a critical prerequisite for the robust execution of stock assessments. Additional efforts may be beneficial to enhance the reliability of the catch series data being submitted to IOTC;
- Further work is needed to improve the reliability of the catch series from some fisheries wherever necessary. Reported catches should be verified or estimated where needed, 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 2024 catches, 7.2% 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 2020-2024)**: bullet tuna are caught using purse seine (65.2%), followed by line (13.1%) and gillnet (11.6%). The remaining catches taken with other gears contributed to 10.1% of the total catches in recent years (**Fig. 1**);
- **Main fleets (mean annual catch 2020-2024)**: the majority of bullet tuna catches are attributed to vessels flagged to Indonesia (63.2%) followed by India (15.2%) and Thailand (12.4%). The 17 other fleets catching bullet tuna contributed to 9.1% of the total catch in recent years (**Fig. 2**).

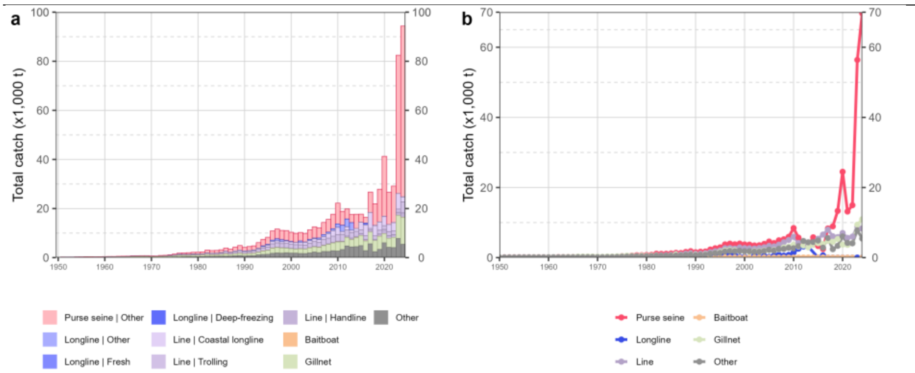

Fig. 1. Annual time series of (a) cumulative retained catches (t) by fishery and (b) individual retained catches (t) by fishery group for bullet tuna during 1950-2024. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

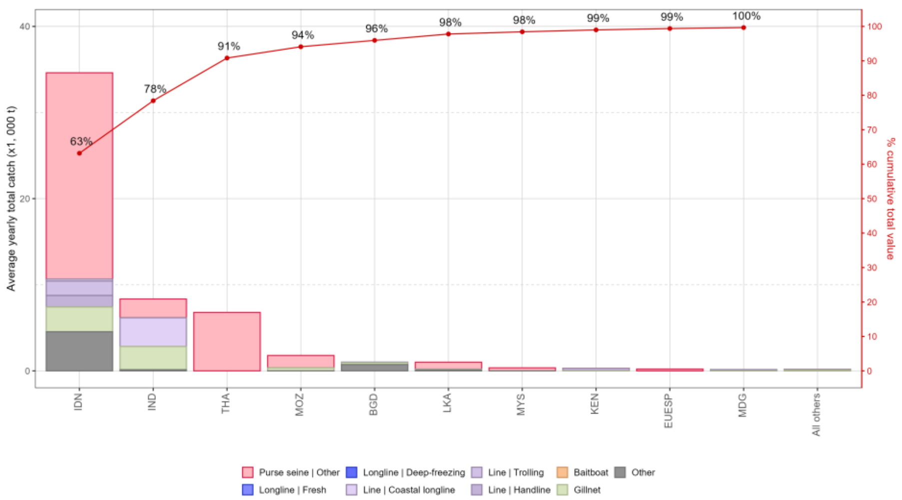

Fig. 2. Mean annual retained catches (t) of bullet tuna by fleet and fishery between 2020 and 2024, with indication of cumulative catches by fleet. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

APPENDIX VIII
EXECUTIVE SUMMARY: FRIGATE TUNA

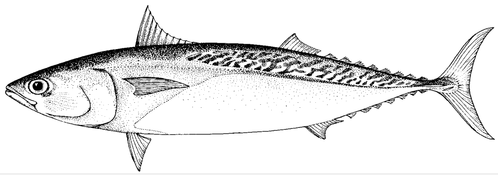

TABLE 1. Status of frigate tuna (*Auxis thazard*) in the Indian Ocean

Area[1]	**Indicators**		**2024 stock status determination**[3]
Indian Ocean	Catch (2024) (t)	144,447[2]	Unknown
	Mean annual catch (2020-2024) (t)	108,493	
	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 2024: 2.4%;
[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 / Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was conducted in 2026 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 mid-1990s, and steadily increasing to over 90,000 t in the following ten years. In recent years catches have increased to over 140,000 t, rising to the highest levels recorded 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 2024 was estimated to be 144,447t 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 (75,830 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;
- Accurate and consistent catch series data constitute a critical prerequisite for the robust execution of stock assessments. Additional efforts may be beneficial to enhance the reliability of the catch series data being submitted to IOTC;
- Further work is needed to improve the reliability of the catch series from some fisheries wherever necessary. Reported catches should be verified or estimated where needed, 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 2024 catches, 2.4% 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 2020-2024)**: frigate tuna are caught using gillnet (46.3%), followed by purse seine (24.9%) and line (14.9%). The remaining catches taken with other gears contributed to 13.9% of the total catches in recent years (**Fig. 1**);
- **Main fleets (mean annual catch 2020-2024)**: the majority of frigate tuna catches are attributed to vessels flagged to Indonesia (49.1%) followed by India (11.8%) and Pakistan (9%). The 24 other fleets catching frigate tuna contributed to 30.3% of the total catch in recent years (**Fig. 2**).

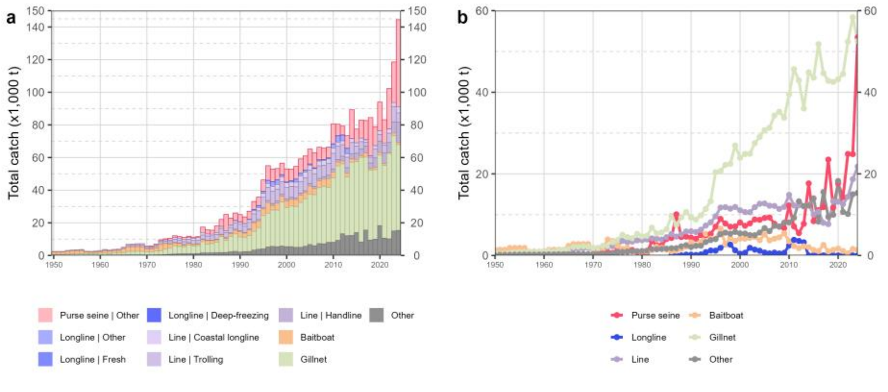

Fig. 1. Annual time series of (a) cumulative retained catches (t) by fishery and (b) individual retained catches (t) by fishery group for frigate tuna during 1950-2024. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

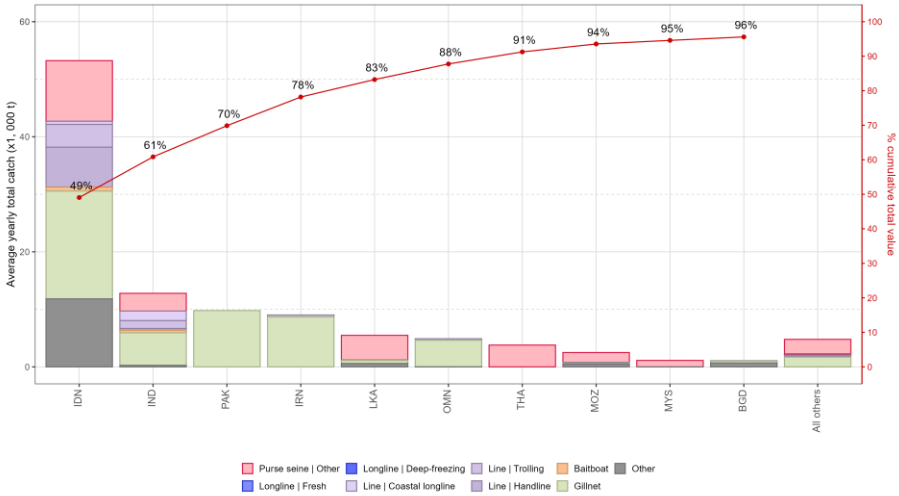

Fig. 2. Mean annual catches (t) of frigate tuna by fleet and fishery between 2020 and 2024, with indication of cumulative catches by fleet. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

APPENDIX IX
EXECUTIVE SUMMARY: KAWAKAWA

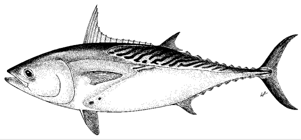

TABLE 1. Status of kawakawa (*Euthynnus affinis*) in the Indian Ocean

Area[1]	Indicators		2026 stock status determination[3]
Indian Ocean	Catch 2024 (t) Mean annual catch 2020-2024 (t)	160,841[2] 132,910	**88%**
	MSY (t) (95% CI) F_{MSY} (95% CI) B_{MSY} (t) (95% CI) $F_{current}/F_{MSY}$ (95% CI) $B_{current}/B_{MSY}$ (95% CI)	155,000 (120,000 – 203,000) 0.45 (0.29 – 0.56) 346,000 (266,000 – 518,000) 0.74 (0.44–1.22) 1.31 (0.98 – 1.56)	

[1]Stock boundaries defined as the IOTC area of competence;
[2]Proportion of catch fully or partially estimated for 2024: 2.8%;
[3]2024 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)	2.8%	9.3%
Stock not subject to overfishing (F_{year}/F_{MSY}≤ 1)	0.2%	87.8%
Not assessed/Uncertain / Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. A new stock assessment was conducted in 2026 for kawakawa which examined a number of data-limited methods include C-MSY++, LB-SPR and JABBA models (based on data up to 2024). The C-MSY++ and JABBA models produced stock estimates that are not drastically divergent because they shared similar dynamics and assumptions. The length based methods show promising signs, however, we require more data to get an accurate picture of the stock status for the entire Indian Ocean. 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 below F_{MSY} and the current biomass B was above $B_{MSY.}$. The estimated probability of the stock currently being in green quadrant of the Kobe plot is 87.8 %. %. The analysis using JABBA incorporating gillnet CPUE indices is more pessimistic. There has been a plateau in kawakawa catches over the last decade (**Fig. 1**), however the final year of catch data represents the largest ever reported nominal catches of kawakawa. It is worth noting, that this final year of data is within the range of previously reported total nominal catches, prior to data revisions. While the precise stock structure of kawakawa remains unclear, recent research provides strong evidence of population structure of kawakawa within the IOTC area of competence, with at least 2 genetic populations identified (Feutry et al., 2025[3]). 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 **not overfished** and **<u>not</u> subject to overfishing** (**Table 1**, **Fig. 1**). However, the assessment is subjected to high uncertainty and are 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., 28.4% of catches partially or fully estimated by the IOTC Secretariat for

[3] Feutry et al., 2025. Genome scans reveal extensive population structure in three neritic tuna and tuna-like species in the Indian Ocean, *ICES Journal of Marine Science*, Volume 82, Issue 2, February 2025, fsae162, https://doi.org/10.1093/icesjms/fsae162

2024) 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 available gillnet CPUE of kawakawa (running from 2008-2017) showed a somewhat increasing trend although the reliability of the index as abundance indices remains unknown. Indonesia has recently revised its catch estimates for neritic tuna species. The updated catch for kawakawa differs substantially from those previously reported. These changes have had a significant impact on estimates of stock status (i.e. moving from red to green). A precautionary approach to management is recommended.

The following should be also noted:

- Accurate and consistent catch series data constitute a critical prerequisite for the robust execution of stock assessments. Additional efforts may be beneficial to enhance the reliability of the catch series data being submitted to IOTC;
- Further work is needed to improve the reliability of the catch series for some fisheries wherever necessary. Reported catches should be verified or estimated where needed, 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 2.8% of the catches of kawakawa (for 2024), 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.

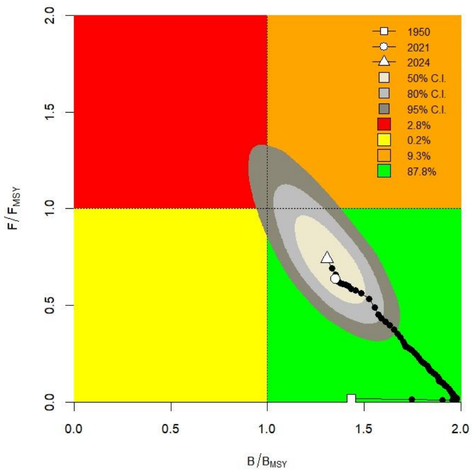

Fig. 1. C-MSY++ Indian Ocean assessment Kobe plot for kawakawa. The Kobe plot presents the trajectories (median) for the range of plausible model trajectories included in the formulation of the final management advice. The shaded contour lines represent 50%, 80%, and 95% confidence intervals of estimated stock status in 2024

Fisheries overview.

- **Main fisheries (mean annual catch 2020-2024):** kawakawa are caught using gillnet (56.4%), followed by purse seine (24.9%) and line (14%). The remaining catches taken with other gears contributed to 4.7% of the total catches in recent years (**Fig. 2**).

- **Main fleets (mean annual catch 2020-2024)**: the majority of kawakawa catches are attributed to vessels flagged to India (28.8%) followed by I. R. Iran (26.9%) and Indonesia (16.8%). The 35 other fleets catching kawakawa contributed to 27.5% of the total catch in recent years (**Fig. 3**).

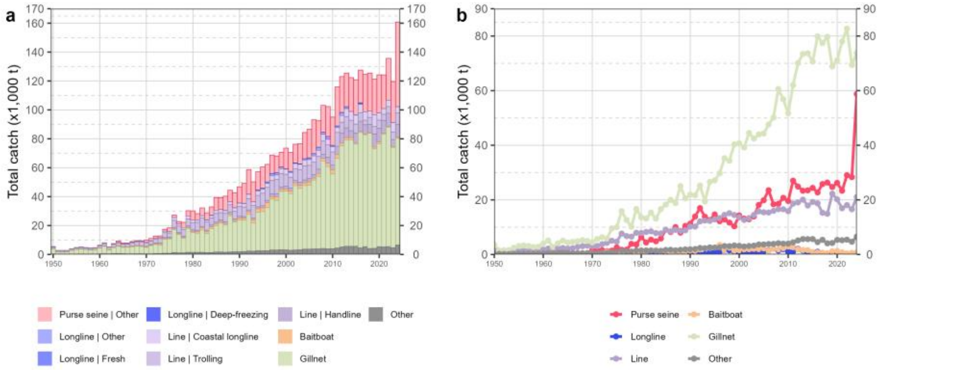

Fig. 2. Annual time series of (a) cumulative retained catches (t) by fishery and (b) individual retained catches (t) by fishery group for kawakawa during 1950-2024. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

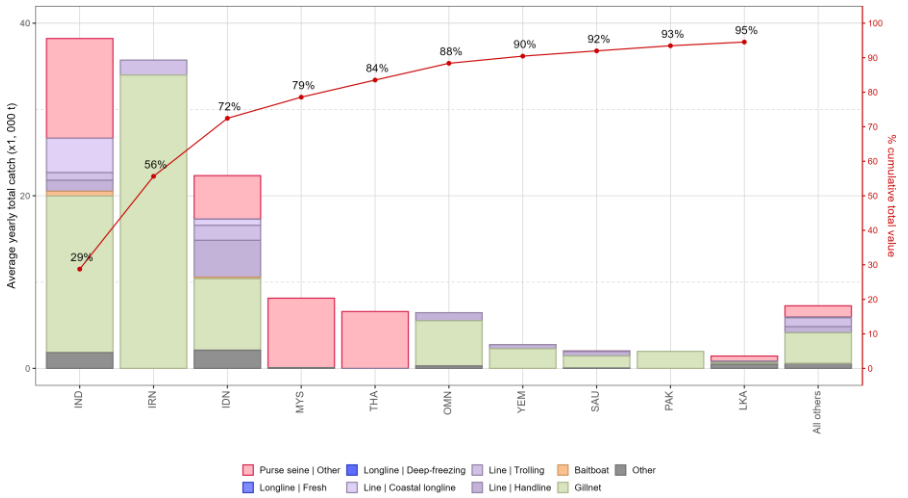

Fig 3. Mean annual retained catches (t) of kawakawa by fleet and fishery between 2020 and 2024, with indication of cumulative catches by fleet. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

APPENDIX X
EXECUTIVE SUMMARY: LONGTAIL TUNA

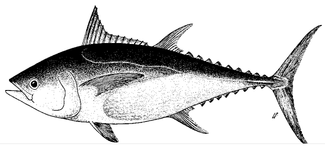

TABLE 1. Status of longtail tuna (*Thunnus tonggol*) in the Indian Ocean

Area[1]	**Indicators**		**2026 stock status determination**[3]
Indian Ocean	Catch 2024 (t)	148,572[2]	**72%**
	Mean annual catch (2020-2024) (t)	136,835	
	MSY (t) (95% CI)	123,000 (94000 –152000)	
	F_{MSY} (95% CI)	0.16 (0.10 – 0.22)	
	B_{MSY} (t) 95% CI)	375,000 (266,000 – 518,000)	
	$F_{current}/F_{MSY}$ (95% CI)	1.43 (0.77 – 3.41)	
	$B_{current}/B_{MSY}$ (95% CI)	0.88 (0.47 – 1.27)	

[1]Stock boundaries defined as the IOTC area of competence;
[2]Proportion of catch fully or partially estimated for 2024: 2.3%;
[3]2024 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)	72.3%	14.8%
Stock not subject to overfishing (F_{year}/F_{MSY}≤ 1)	0.5%	12.4%
Not assessed/Uncertain/Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. A new stock assessment was conducted for longtail tuna in 2026 which examined a number of data-limited methods including C-MSY++, LB-SPR and JABBA models (based on data up to 2024). The C-MSY++ and JABBA 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} (**Fig. 2**). Catches steadily declined from 2012 to less than 113,000 t in 2019 but have been increasing since 2022 (**Fig. 1**). The F_{2024}/F_{MSY} ratio is higher than previous estimates and the B_{2024}/B_{MSY} ratio is lower than in previous years. 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 (Feutry et al., 2025[4]) 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

[4] Feutry et al., 2025. Genome scans reveal extensive population structure in three neritic tuna and tuna-like species in the Indian Ocean, *ICES Journal of Marine Science*, Volume 82, Issue 2, February 2025, fsae162, https://doi.org/10.1093/icesjms/fsae162

be both **overfished** and **subject to overfishing** (**Table 1**; **Fig. 1**). However, the assessment 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. After 2012 there was a major declining trend for several years but since 2019, catches have been increasing. 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 improving our understanding of life trait history parameters (e.g. estimates of growth, natural mortality, maturity, etc.) and stock structure to complement the information recently published by Feutry et al. (2025).

Management advice.

The following should be noted:

- Limit reference points: the Commission has not adopted limit reference points for any of the neritic tunas under its mandate;
- Accurate and consistent catch series data constitute a critical prerequisite for the robust execution of stock assessments. Additional efforts may be beneficial to enhance the reliability of the catch series data being submitted to IOTC;
- Further work is needed to improve the reliability of the catch series from some fisheries wherever necessary. Reported catches should be verified or estimated where needed, 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 2024 catches 2.3% of the total catches of longtail tuna 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.
- A precautionary approach to management is recommended.

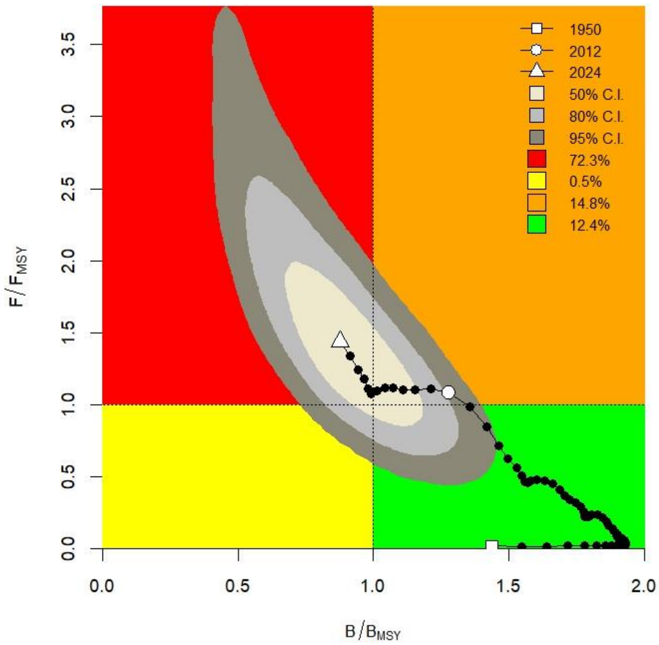

Fig. 1. Longtail tuna C-MSY++ Indian Ocean assessment Kobe plot. The Kobe plot presents the trajectories (median) for the range of plausible model trajectories included in the formulation of the final management advice. The shaded contour lines represent 50%, 80%, and 95% confidence intervals of estimated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

Fisheries overview.

- **Main fisheries (mean annual catch 2020-2024)**: longtail tuna are caught using gillnet (62.7%), followed by line (15.8%) and purse seine (12.3%). The remaining catches taken with other gears contributed to 9.1% of the total catches in recent years(**Fig. 2**).
- **Main fleets (mean annual catch 2020-2024)**: the majority of longtail tuna catches are attributed to vessels flagged to I. R. Iran (39.1%) followed by Indonesia (23.2%) and Sultanate of Oman (20.6%). The 21 other fleets catching longtail tuna contributed to 17% of the total catch in recent years (**Fig. 3**).

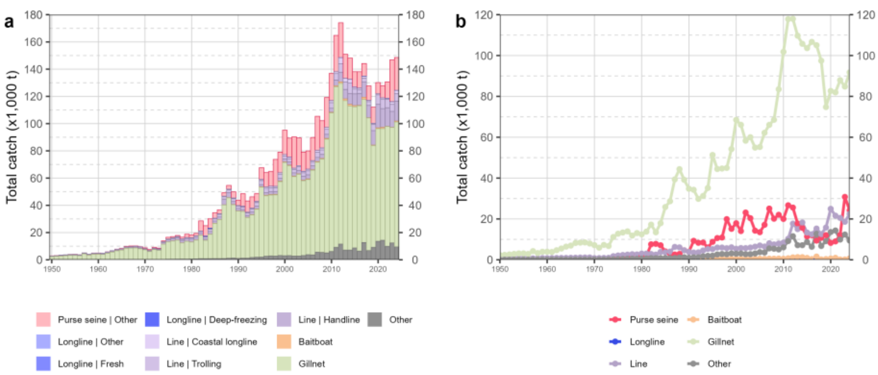

Fig. 2. Annual time series of (a) cumulative retained catches (t) by fishery and (b) individual retained catches (t) by fishery group for longtail tuna during 1950-2024. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

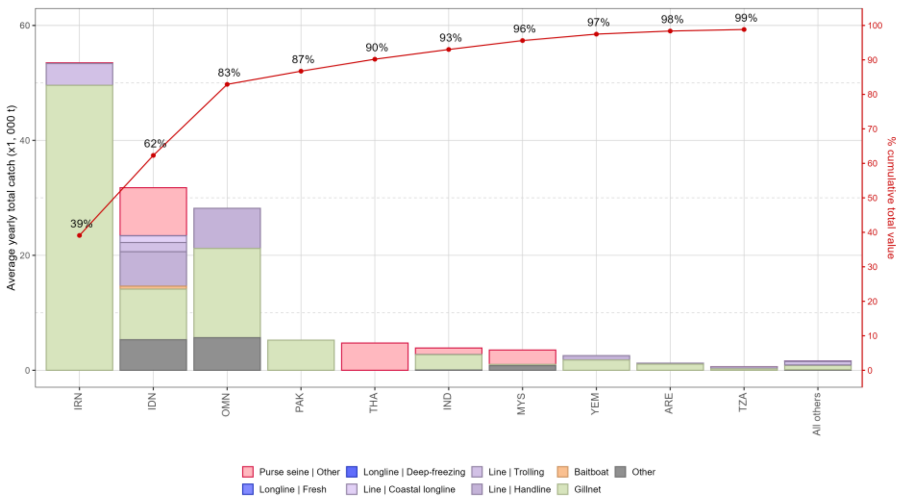

Fig. 3. Mean annual catches (t) of longtail tuna by fleet and fishery between 2020 and 2024, with indication of cumulative catches by fleet. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Other: all remaining fishing gears

APPENDIX XI
EXECUTIVE SUMMARY: INDO-PACIFIC KING MACKEREL

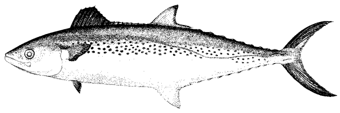

TABLE 1. Status of Indo-Pacific king mackerel (*Scomberomorus guttatus*) in the Indian Ocean

Area[1]	Indicators		2024 stock status determination[3]
Indian Ocean	Catch (2024) (t)	42,289[2]	**27%**
	Mean annual catch (2020-2024) (t)	38,817	
	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 2024: 8.1%;
[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/Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was conducted for Indo-Pacific king mackerel in 2026 and so the results are based on the results of the assessment carried out in 2024 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 approximatively 43,000 t in 2009 and have since fluctuated between around 30,000 t and 42,289 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 have increased considerably since the late 2000s.

Indonesia has recently revised its catch estimates for neritic tuna and seerfish species. The updated catch for Indo-Pacific king mackerel differs substantially from those previously reported and used in the stock assessment. These changes are expected to have a significant impact on estimates of stock status and associated MSY-based reference quantities, which were primarily based on the earlier catch data. An updated assessment is therefore urgently required to revise stock estimates and management advice that incorporate and reflect the most recent catch information. A precautionary approach to management is recommended.

The following should be also noted:

- Limit reference points: the Commission has not adopted limit reference points for any of the neritic tunas or seerfish 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.).
- Accurate and consistent catch series data constitute a critical prerequisite for the robust execution of stock assessments. Additional efforts may be beneficial to enhance the reliability of the catch series data being submitted to IOTC;
- Further work is needed to improve the reliability of the catch series from some fisheries wherever necessary. Reported catches should be verified or estimated where needed, 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 2024, 8.1% 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.

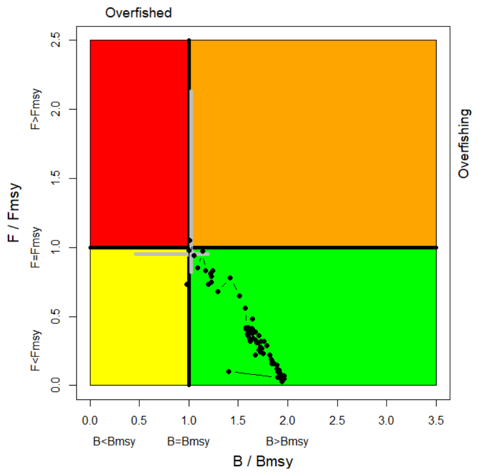

Fig. 1 Kobe plot of the CMSY assessment for the Indo-Pacific king mackerel. The Kobe plot shows the trajectories (geometric mean) of the range of plausible model options included in the formulation of the final management advice. The grey cross represents the estimated stock status in 2022 (median and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

Fisheries overview.

- **Main fisheries (mean annual catch 2020-2024)**: Indo-Pacific king mackerel are caught using gillnet (63.7%), followed by other (21.9%) and line (11.2%). The remaining catches taken with other gears contributed to 3.2% of the total catches in recent years (**Fig. 2**).

- **Main fleets (mean annual catch 2020-2024:** the majority of Indo-Pacific king mackerel catches are attributed to vessels flagged to India (37.3%) followed by I. R. Iran (27.6%) and Indonesia (13.2%). The 15 other fleets catching Indo-Pacific king mackerel contributed to 21.9% of the total catch in recent years (**Fig. 3**).

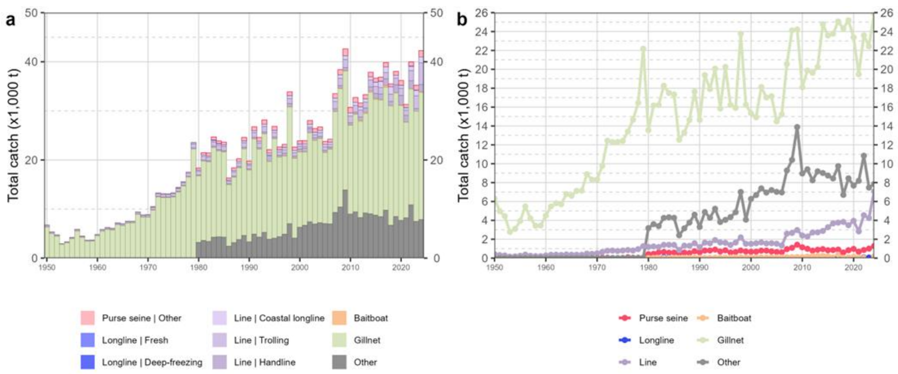

Fig. 2. Annual time series of (a) cumulative retained catches (t) by fishery and (b) individual retained catches (t) by fishery group for Indo-Pacific king mackerel during 1950-2024. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

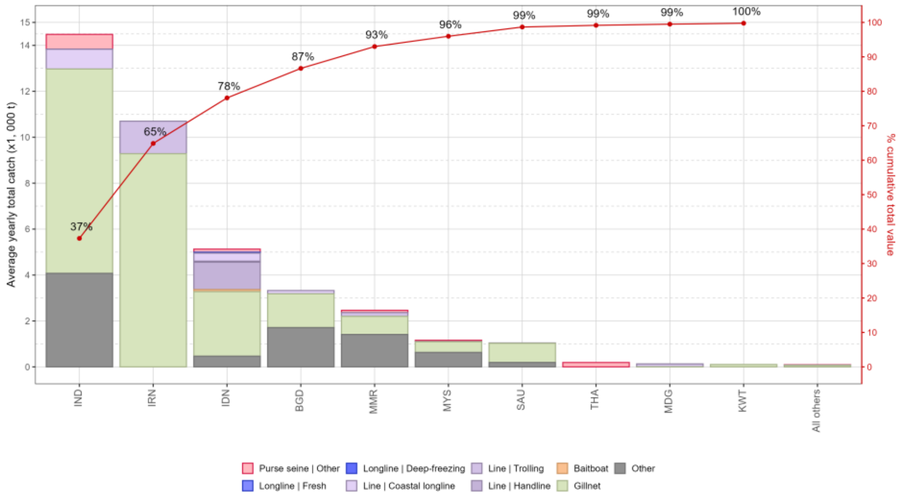

Fig. 3. Mean annual retained catches (t) of Indo-Pacific king mackerel by fleet and fishery between 2020 and 2024, with indication of cumulative catches by fleet. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

APPENDIX XII
EXECUTIVE SUMMARY: NARROW-BARRED SPANISH MACKEREL

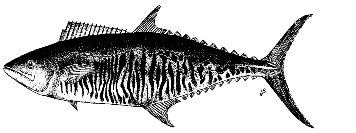

TABLE 1. Status of narrow-barred Spanish mackerel (*Scomberomorus commerson*) in the Indian Ocean

Area[1]	Indicators		2026 stock status determination[3]
Indian Ocean	Catch (2024) (t) Mean annual catch (2020-2024) (t)	157,775[2] 136,353	83%
	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)	155,000 (127,000 – 186,000) 0.49 (0.32–0.60) 318,000 (248,000 – 457,000) 0.79 (0.51 – 1.29) 1.25 (0.91 – 1.52)	

[1]Stock boundaries defined as the IOTC area of competence;
[2]Proportion of catch fully or partially estimated for 2024: 11.8%;
[3]2024 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)	6.3%	10.3%
Stock not subject to overfishing (F_{year}/F_{MSY}≤ 1)	0.4%	82.9%
Not assessed/Uncertain/Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. A new stock assessment was conducted in 2026 for narrow-barred Spanish mackerel. The assessment examined a number of data-limited methods including C-MSY++, LB-SPR and JABBA (based on data up to 2024). The C-MSY++ and JABBA 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 is below F_{MSY} and the stock biomass is estimated to be above B_{MSY}. The analysis using JABBA incorporating the gillnet CPUE indices is more pessimistic. 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 2026 in the Northwest Indian Ocean (Persian Gulf and Oman Sea) indicated that overfishing is occurring in this area and that localised depletion may also be occurring[5]. While the precise stock structure of Spanish mackerel remains unclear, recent research provides strong evidence of population structure of Spanish mackerel within the IOTC area of competence, with at least 4 genetic populations identified (Feutry et al., 2025[6]). 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 **not overfished** and **not subject to overfishing** (**Table 1**, **Fig. 1**). However, the assessment is subjected to high uncertainty and is highly influenced by several prior assumptions.

Outlook. There is 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, however the

[5] Hashemi et al 2026. Ensemble modeling for catch prediction and data-limited stock assessment of Narrow-barred Spanish mackerel (Scomberomorus commerson, Lacepède, 1800) in the Persian Gulf and Oman Sea. IOTC-2016-WPNT16-12

[6] Feutry et al., 2025. Genome scans reveal extensive population structure in three neritic tuna and tuna-like species in the Indian Ocean, *ICES Journal of Marine Science*, Volume 82, Issue 2, February 2025, fsae162, https://doi.org/10.1093/icesjms/fsae162

overall reduction in catch over time due to revised catches has reduced the relative exploitation of the stock over time. 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.

Management advice. The available gillnet CPUE (from 2008-2017) shows a somewhat increasing trend in the final years of the index although the reliability and representativeness of the index as an abundance index for the entire Indian Ocean remains unknown.
Indonesia has recently revised its catch estimates for neritic tuna and seerfish species. The updated catch for narrow-barred Spanish mackerel differs substantially from those previously reported. These changes had a significant impact on estimates of stock status (i.e. moving from red to green). This updated assessment incorporates and reflects the most recent catch information. A precautionary approach to management is recommended.

The following should also be noted:

- Limit reference points: the Commission has not adopted limit reference points for any of the neritic tuna or seerfish species under its mandate;
- Accurate and consistent catch series data constitute a critical prerequisite for the robust execution of stock assessments. Additional efforts may be beneficial to enhance the reliability of the catch series data being submitted to IOTC;
- Further work is needed to improve the reliability of the catch series from some fisheries wherever necessary. Reported catches should be verified or estimated where needed, 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 data submitted by CPCs on total catches, catch and effort, biological data, and length frequency data for neritic tunas, despite their mandatory reporting status. In the case of 2024 catches, 11.8% 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.

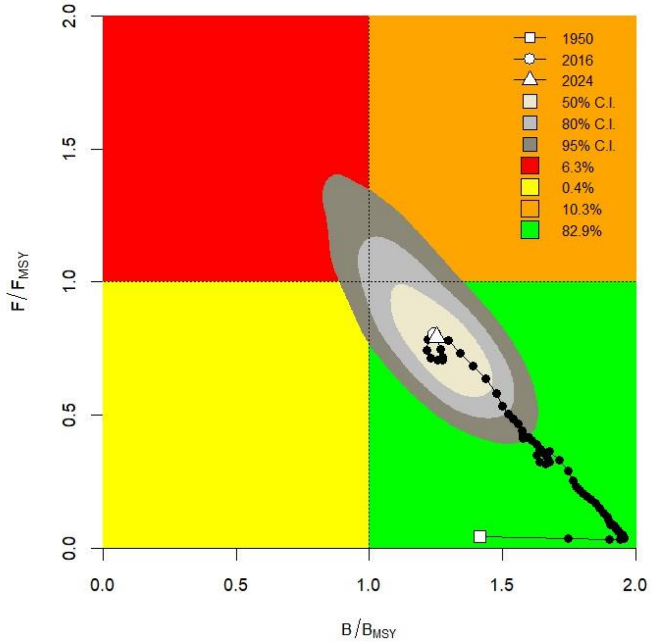

Fig. 1. Narrow-barred Spanish Mackerel C-MSY++ Indian Ocean assessment Kobe plot. The Kobe plot presents the trajectories (median) for the range of plausible model trajectories included in the formulation of the final management advice. The shaded contour lines represent 50%, 80%, and 95% confidence intervals of estimated stock status in 2024

Fisheries overview.

- **Main fisheries (mean annual catch 2020-2024)**: narrow-barred Spanish mackerel are caught using gillnet (60.3%), followed by line (20.7%) and other (15.3%). The remaining catches taken with other gears contributed to 3.7% of the total catches in recent years(**Fig. 2**).
- **Main fleets (mean annual catch 2020-2024)**: the majority of narrow-barred Spanish mackerel catches are attributed to vessels flagged to I. R. Iran (21%) followed by India (18.7%) and Indonesia (17%). The 29 other fleets catching narrow-barred Spanish mackerel contributed to 43.3% of the total catch in recent years (**Fig. 3**).

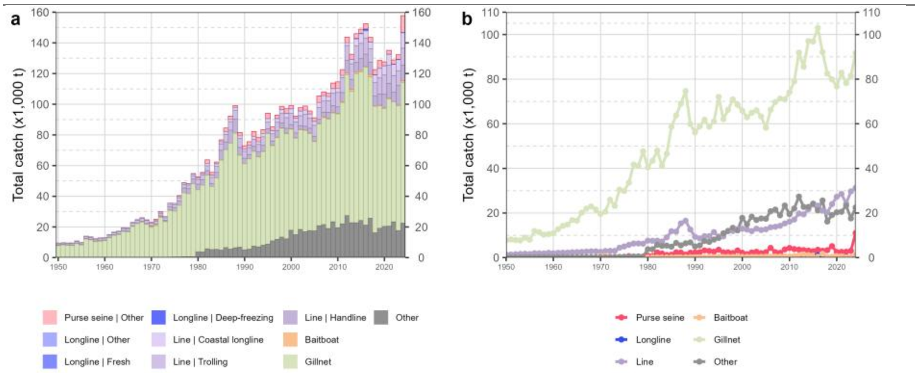

Fig. 2. Annual time series of (a) cumulative retained catches (t) by fishery and (b) individual retained catches (t) by fishery group for narrow-barred Spanish mackerel during 1950-2024. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

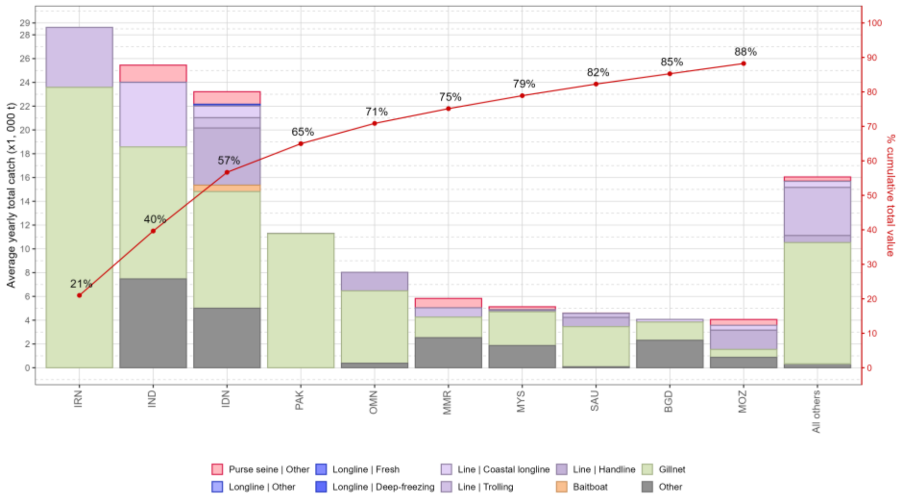

Fig. 3. Mean annual retained catches (t) of narrow-barred Spanish mackerel by fleet and fishery between 2020 and 2024, with indication of cumulative catches by fleet. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

APPENDIX XIII
CONSOLIDATED RECOMMENDATIONS OF THE 16TH SESSION OF THE WORKING PARTY ON NERITIC TUNAS

Note: Appendix references refer to the Report of the 16th Session of the Working Party on Neritic Tunas (IOTC–2026–WPNT16–R)

6.2 Stock assessment updates

WPNT16.01 (para. 142) The WPNT **NOTED** an increasing use of data-limited methods in IOTC stock assessments and that recent advances in length-based models, e.g., fishblicc, have expanded options for conducting cost-effective assessments. The WPNT **ENCOURAGED** CPC scientists to apply these tools to available data for neritic tuna stocks. Recognising the need for technical capacity building, the WPNT **RECOMMENDED** that the SC mobilise resources to conduct training workshops on data-limited stock assessment methods.

WPNT16.02 (para. 143) The WPNT also **RECOGNISED** that length-based methods require representative length samples with sufficient spatial coverage and from a wider range of gear groups, whereas currently the data are dominated by a single CPC and one gear group. The WPNT **RECOMMENDED** that the SC **ENCOURAGE** CPCs to implement sampling programmes to collect length data that improve spatial coverage, and to share data collected through their research projects with the IOTC Secretariat for use in assessments.

7.2 Revision of the WPNT Program of Work 2027–2031

WPNT16.03 (para. 162) The WPNT **RECOMMENDED** that the SC consider and endorse the WPNT Program of Work (2027–2031), as provided in Appendix VI.

8.2 Review of the draft, and adoption of the Report of the 16th Working Party on Neritic Tunas

WPNT16.04 (para. 167) The WPNT **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPNT16, 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 2026:

- 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