



Food and Agriculture Organization
of the United Nations



REPORT OF THE 26TH SESSION OF IOTC SCIENTIFIC COMMITTEE DECEMBER 4-8, 2023, MUMBAI (INDIA)

TOSHIHIDE KITAKADO & GORKA MERINO

28TH IOTC COMMISSION MEETING, MAY 13-17, 2024@BANGKOK (THAILAND)

- The SC26 was held from 4-8 December 2023 in Mumbai (India)
- 92 delegates from 21 Contracting Parties;
- 14 participants from 11 observer organisations (including the invited experts)



CONTENTS

- Stock status and management advice for the following species for which a new stock assessment was carried out in 2023
 - Skipjack tuna (WPTT)
 - Swordfish (WPB)
 - Kawakawa, Longtail tuna and Narrow-based Spanish mackerel (WPN)
- Working Party and Working Group discussions other than stock assessment
- General recommendations from SC 2023
- Workplan and draft meeting schedule in 2024-2025





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STOCK STATUS AND MANAGEMENT ADVICE



STOCK ASSESSMENT MODELS



	Data-rich	Data-moderate	Data-poor
	Integrated assessment with age- (and gender-) structured models (SS3, SCAA, ASPM,...)	Age-aggregated models (JABBA, BSPM, ASPIC,..)	Data-limited methods (C-MSY, OCOM)
Catch series	✓	✓	✓
STD-CPUE	✓	✓	
Catch-at-size (or Catch-at-age)	✓		
Biological parameters	✓		
Tag-data	(✓)		

yellowfin, bigeye, skipjack, albacore, swordfish

billfish, marlins, shark

neritic species

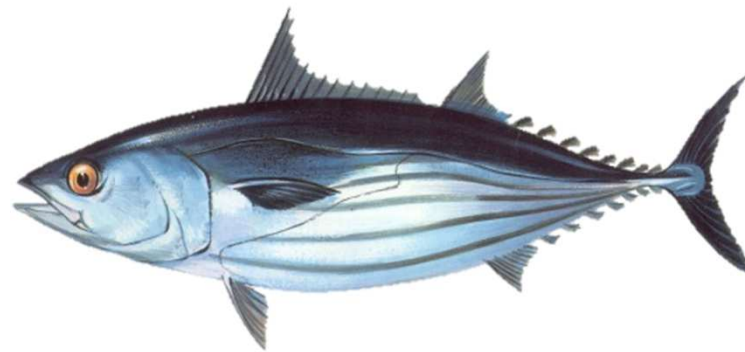


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STOCK STATUS AND MANAGEMENT ADVICE (1)

SKIPJACK TUNA





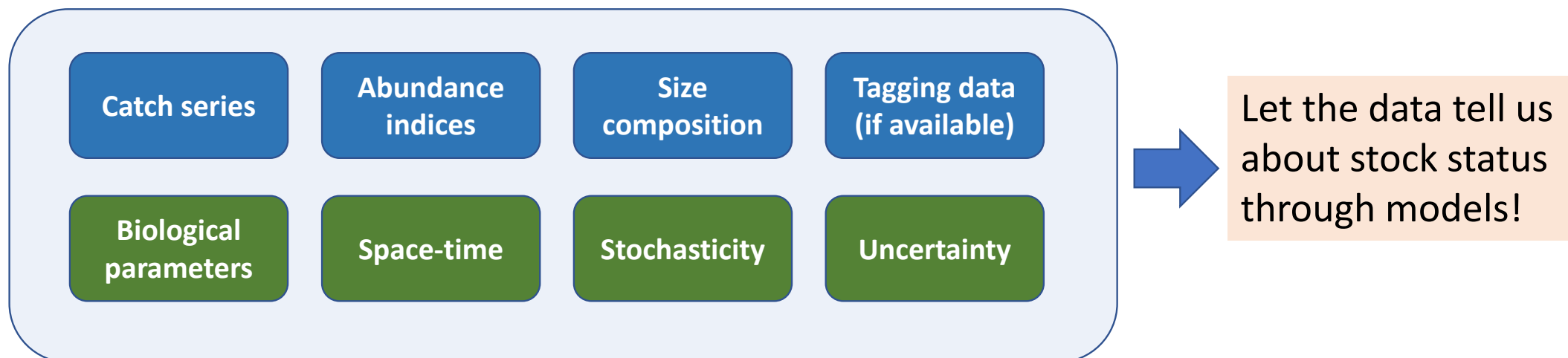
SKIPJACK STOCK ASSESSMENT IN 2023



- WPTT Chair: Gorka Merino (EU, Spain); Vice-chair: Shiham Adam (IPNLF)
- WPTT25 (DP): May 31st – June 2nd, 2023 (virtual)
 - ✓ Data preparation
 - ✓ Model specification
- WPTT25 : October 30th – November 4th, 2023 (Donostia, Spain, EU)
 - ✓ Stock assessment and model diagnostics
- SC 26: Dec 4-8, 2023 (Mumbai, India)
 - ✓ Endorsement of assessment results
 - ✓ Application of HCR (Res 21/03) for setting a TAC.
 - ✓ Finalization of management advice.

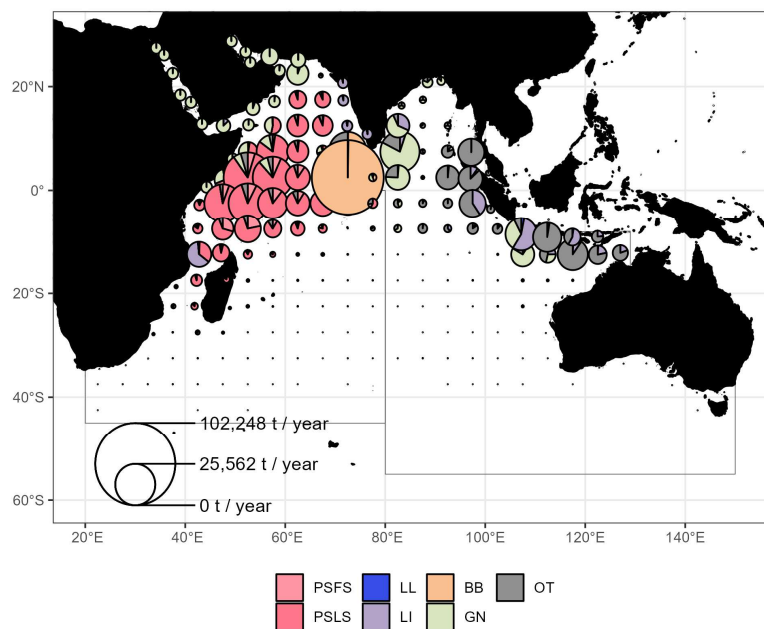
Stock assessment model

- “Stock Synthesis 3” (SS3), an **integrated** stock assessment model
- Simultaneous use of different sources of data on catch, abundance indices, size and tagging
- **Age-structured** model with spatial and seasonal components
- High flexibility to account for different fisheries, biological assumptions and stochasticity

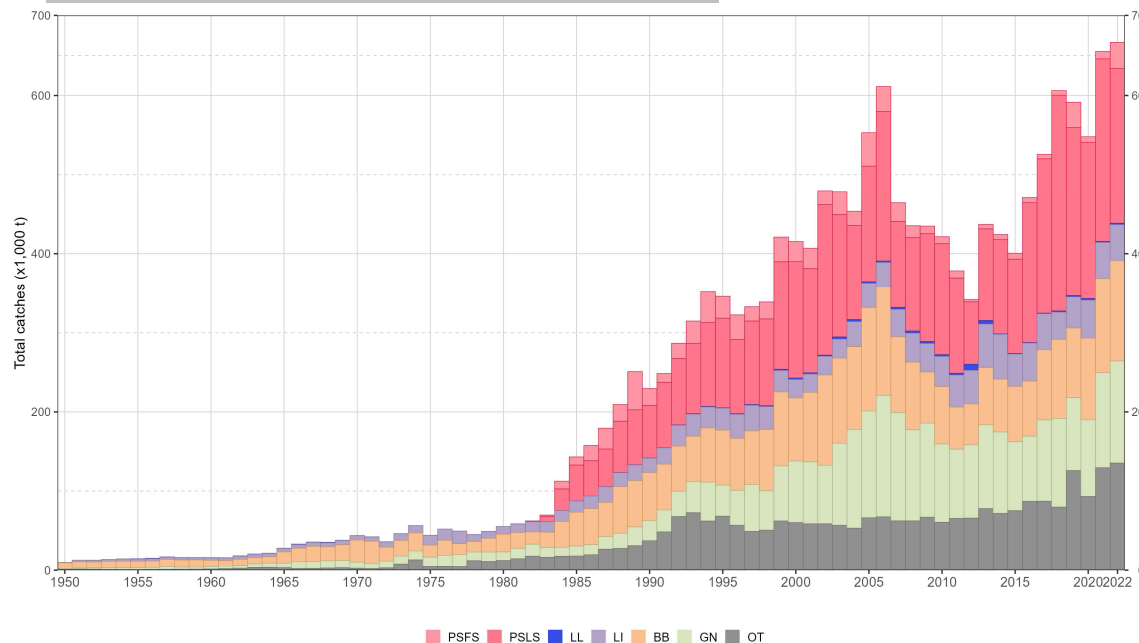


DATA (1) CATCH SERIES

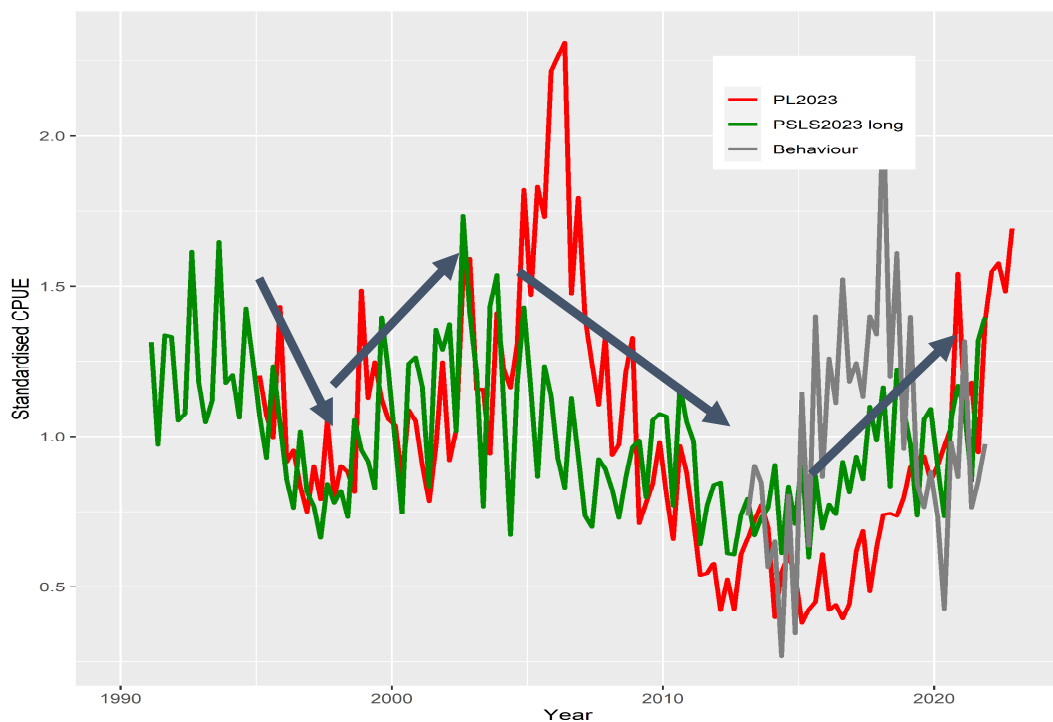
Catch (spatial)



Catch (time series by fishery)



- Record catch in 2022 (671,317 tons), 2021 (also a record, 655,115 tons).
- Excess of recommended catch limits (513,572 tons) by +30%!
- 7 Fisheries considered: LS, BB, GN, Li, LL, FS, OT.
- Main gears: PSLs (44%), BB (19%) and GN (18%).



PL: Pole and line (Maldives)

PSLS: Purse seine log-school (EU)

ABBI: Associative Behaviour-Based Index

[associative dynamics around floating objects (FOBs)]

Abundance Indices

Fishery-dependent CPUE

- PL and PSLS CPUE indices.
- ~300% increase for PL and 200% increase for PSLS in 2015-22.

Echosounder buoys

- ABBI increasing (2015-2018), drop (2018-2020), increase again (2020-2022).

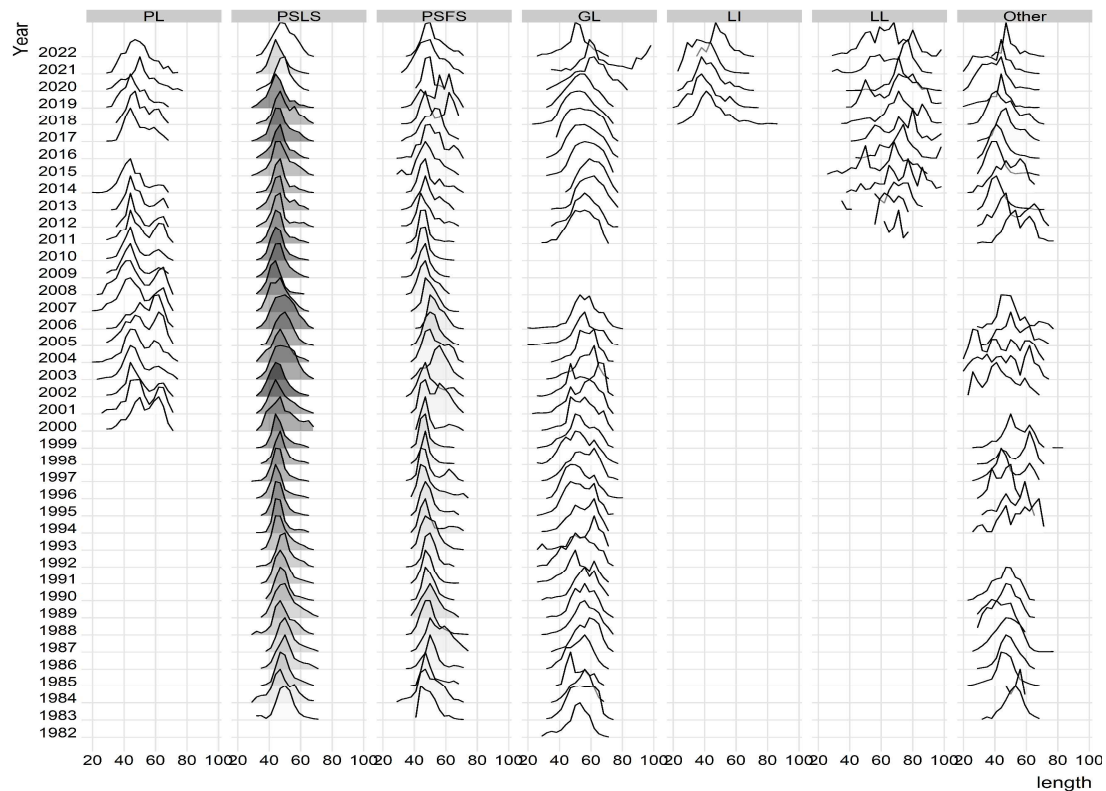
In general

- Relatively well correlated except ABBI, period 2018-2020

DATA (3) SIZE FREQUENCY AND TAG DATA

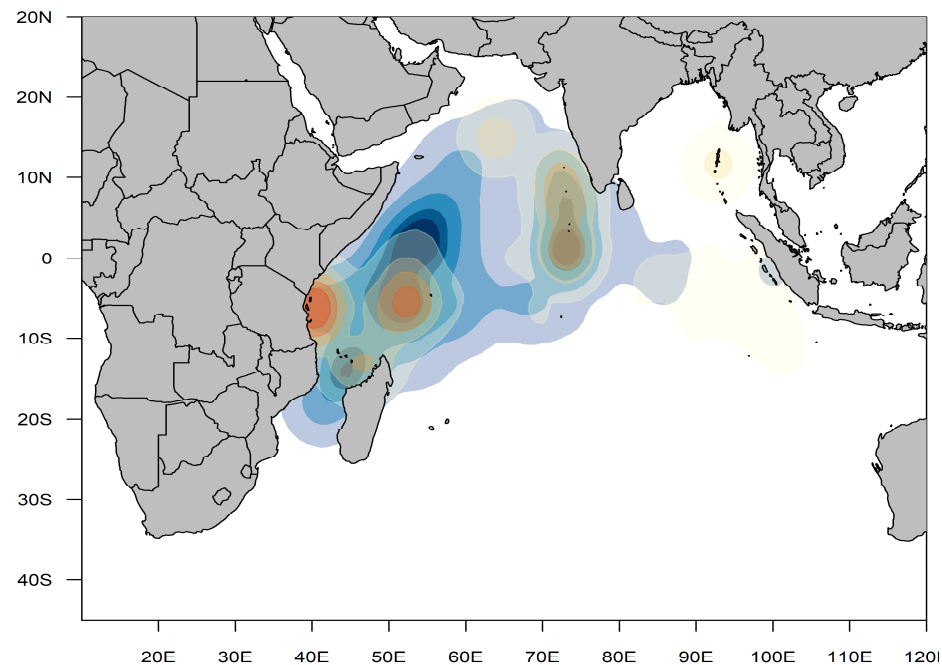
LENGTH COMPOSITION

- From 1980
- More consistent for PL, FS, LS and GI
- Large variability for LI, LL and OT



TAG DATA (RTTP-IO)

- Releases 2005-2007 (NWIO)
- Recoveries from PS (15%)
- Informs model of abundance and fishing mortality



“Ensemble” of 36(=3*2*3*2) model runs
(Characterization of uncertainty)

CPUE OPTIONS (3)

- U1, PL (1995-2022) included
- Ua, PSLs (1991-2021) only
- Ub, PSLs (1991-2021) + ABBI

STEEPNESS in Stock-Recruitment (3)

- 0.70
- 0.80
- 0.90

CATCHABILITY Trend (2)

- Q0, no annual increase
- Q1, 1.25% increase per year

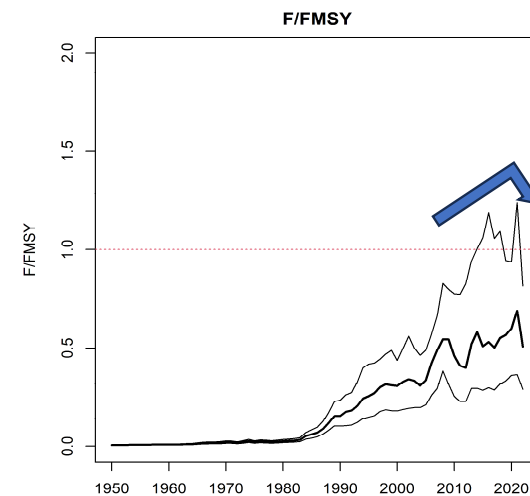
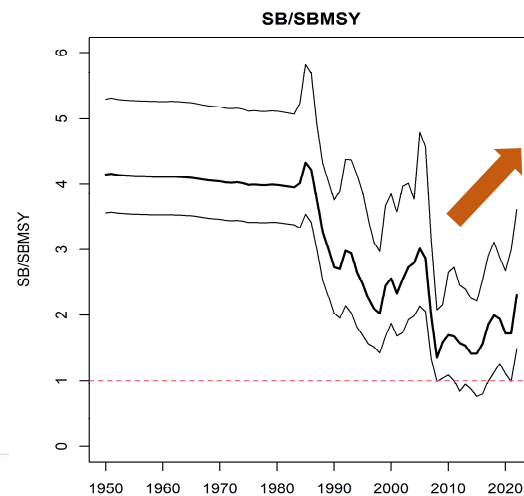
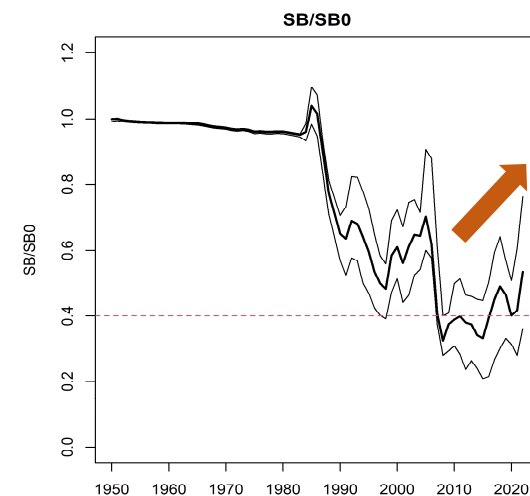
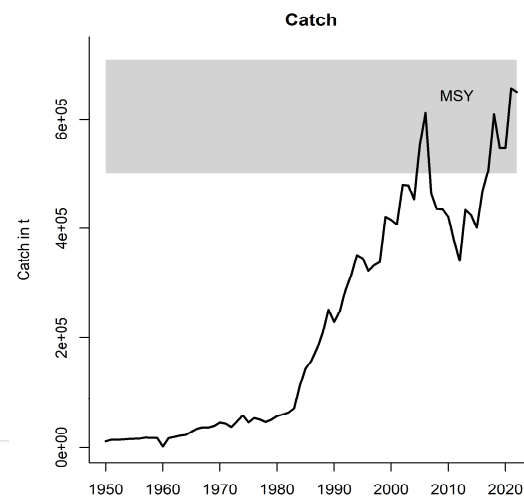
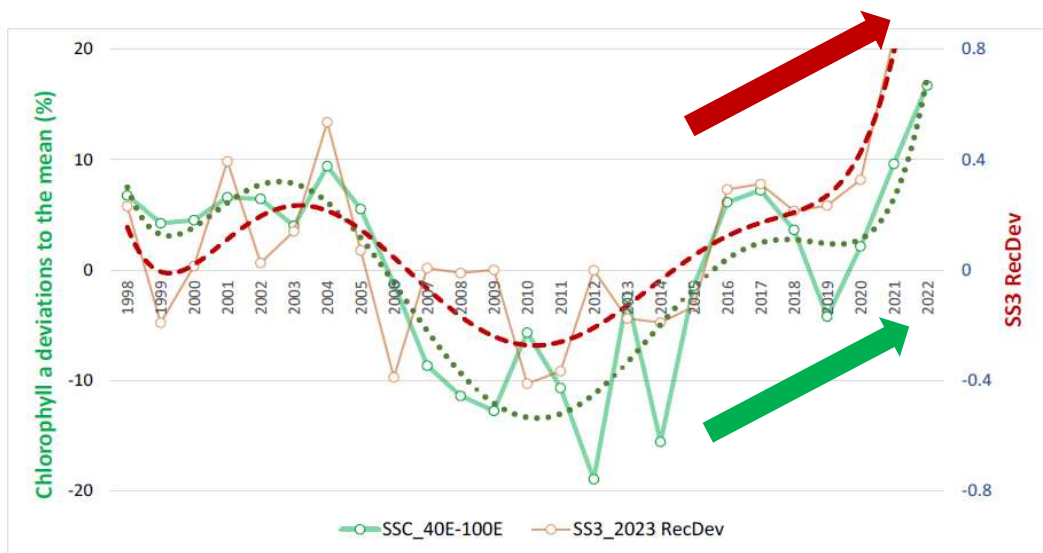
GROWTH function (2)

- L_{∞} : estimated by model
- L_{∞} : fixed at 70 cm (Eveson et al 2012)

Assessment was skillfully and successfully conducted by Dan Fu.

STOCK ASSESSMENT RESULTS

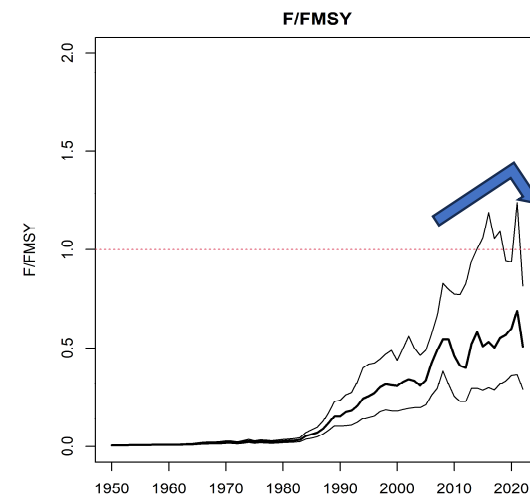
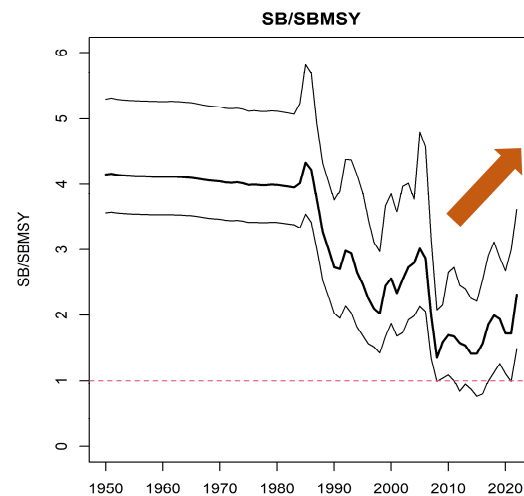
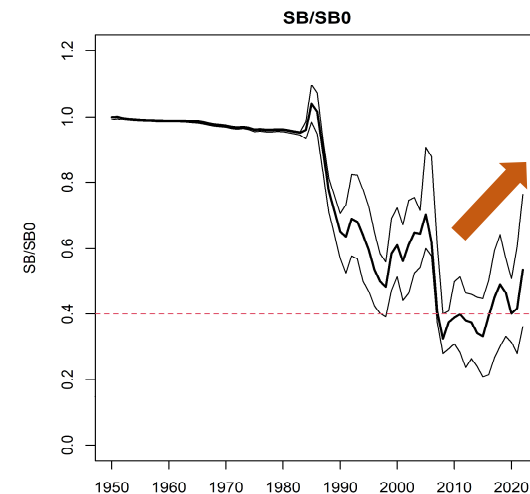
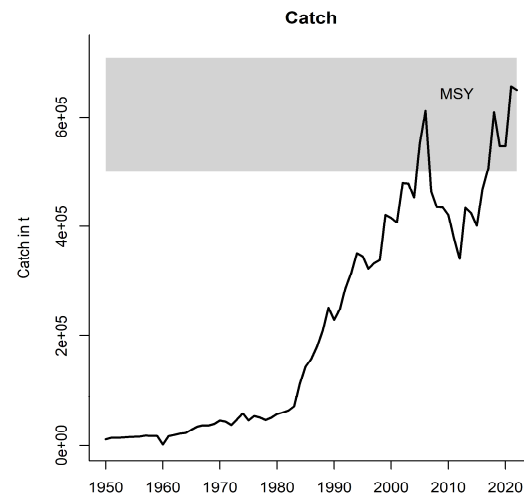
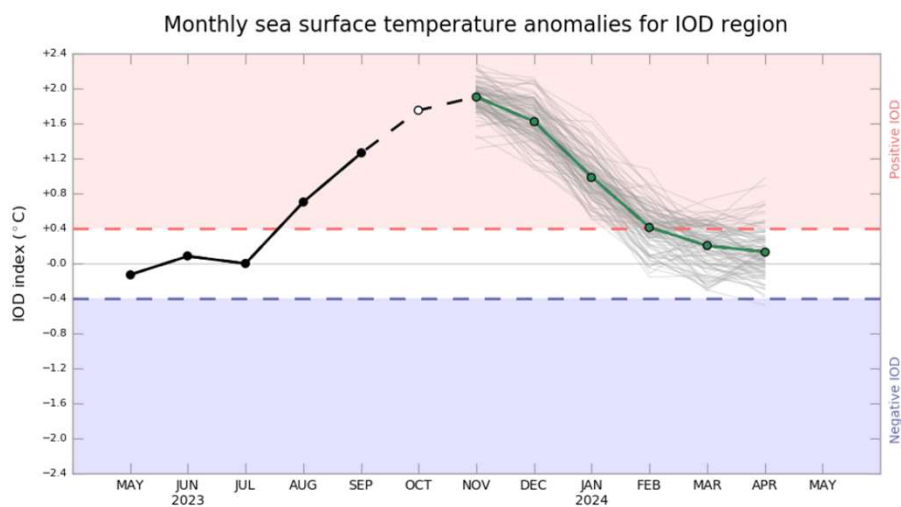
- **Biomass increasing despite large catch**
- **Fishing mortality increasing but drop in 2022**
- Possibly related to:
 - **Increased surface chlorophyll productivity**
 - **Positive recruitment deviations**
 - Positive Indian Dipole Index
 - Enhanced recruitment



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!!! Expect lower ocean productivity (Chlorophyll) by 2023-2024

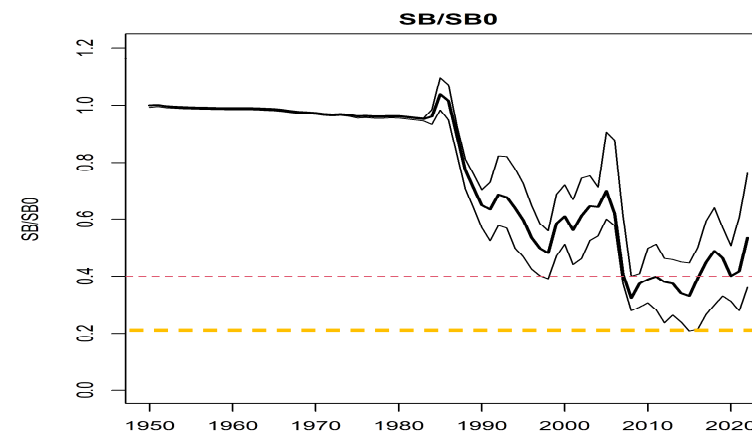


SUMMARY OF SKIPJACK STOCK STATUS IN 2023

Indicator	Value	Status ³
Catch in 2022 (t) ²	666 408	70%*
Average catch 2018-2022 (t)	613 061	
$E_{40\%SB_0}$ ⁴ (80% CI)	0.55 (0.48–0.65)	
SB_0 (t) (80% CI)	1 992 089 (1 691 710–2 547 087)	
SB_{2022} (t) (80% CI)	1 142 919 (842 723–1 461 772)	
SB_{2022} / SB_0 (80% CI)	0.53 (0.42–0.68)	
$SB_{2022} / SB_{40\%SB_0}$ (80% CI)	1.33 (1.04–1.71)	
$SB_{2022} / SB_{20\%SB_0}$ (80% CI)	2.67 (2.08–3.42)	
SB_{2022} / SB_{MSY} (80% CI)	2.30 (1.57–3.40)	
F_{2022} / F_{MSY} (80% CI)	0.49 (0.32–0.75)	
$F_{2022} / F_{40\%SSB_0}$ (80% CI)	0.90 (0.68–1.22)	
MSY (t) (80% CI)	584 774 (512 228–686 071)	

	Stock overfished ($SB_{2022} / SB_{40\%SB_0} < 1$)	Stock not overfished ($SB_{2022} / SB_{40\%SB_0} \geq 1$)
Stock subject to overfishing ($F_{2022} / F_{40\%SB_0} \geq 1$)	8%	21%
Stock not subject to overfishing ($F_{2022} / F_{40\%SB_0} \leq 1$)	1%	70%
Not assessed / Uncertain / Unknown		

- The stock is above the adopted target for this stock ($40\%SB_0$) and the current exploitation rate is below the target exploitation rate (in median)
- Current spawning biomass relative to unexploited levels is estimated at 53% (median)
- The spawning biomass remains above SB_{MSY} and the fishing mortality remains below F_{MSY} with a probability of 98.4 %
- Over the history of fishery, biomass has been well above the adopted limit reference point ($20\%SB_0$)



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- Over the history of fishery, biomass has been well above the adopted limit reference point ($20\%SB_0$)



Subsequently, based on the weight-of-evidence available in 2023, the skipjack tuna stock is determined to be not overfished and not subject to overfishing.

	Stock overfished ($SB_{2022} / SB_{40\%SB_0} < 1$)	Stock not overfished ($SB_{2022} / SB_{40\%SB_0} \geq 1$)
Stock subject to overfishing ($F_{2022} / F_{40\%SB_0} \geq 1$)	8%	21%
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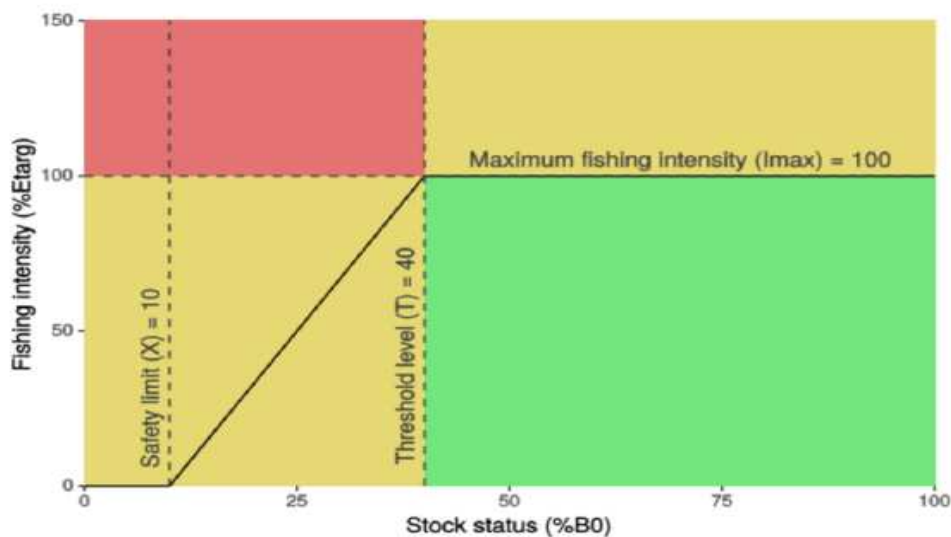


- (Para 92) The SC **NOTED** that studying environmental factors, such as sea surface chlorophyll and the Indian Ocean Dipole Index, and how they interact with stock dynamics, is beneficial. The SC **AGREED** that it is important to include environmental considerations when developing management recommendations and to make sure that these recommendations are resilient to changes in the environment (such as climate change) through tools like management strategy evaluations.
- (Para 94) The SC **NOTED** that the assessment is now able to provide an estimate of **MSY-based reference point estimates** since it has fixed an error that previously caused a flat-top production curve. As such, the SC **AGREED** that the use of the depletion based TRP for Skipjack tuna to define stock status should be reviewed before the next assessment, as part of a broader review of the application of Resolution 15/10, which lacks clarity regarding when MSY or depletion-based reference points should be applied, and the role of the interim LRPs within the management framework.

Resolution 16/02 On Harvest Control Rules for skipjack tuna in the IOTC area of competence (Superseded by 21/03)

- a) The estimate of current spawning stock biomass (B_{curr});
- b) The estimate of the unfished spawning stock biomass (B_0);
- c) The estimate of the equilibrium exploitation rate (E_{targ}) associated with sustaining the stock at B_{targ} .

From stock assessment
(external to HCR)



$$SB_{2022} = 1,143 \text{ (1000t)}$$

$$SB_0 = 2,177 \text{ (1000t)}$$

$$SB_{2022}/SB_0 = 0.53 > 0.40$$

$$E_{targ} \text{ (Exploitation rate for 40\%SB}_0\text{)} = 0.55$$

HCR

$$\begin{aligned} \text{Catch limit} &= E_{targ} * SB_{2022} \\ &= 0.55 * 1,143 = 629 \text{ (1000t)} \end{aligned}$$



COMPARISON OF 2020 AND 2023 HCR APPLICATION



HCR application in 2020

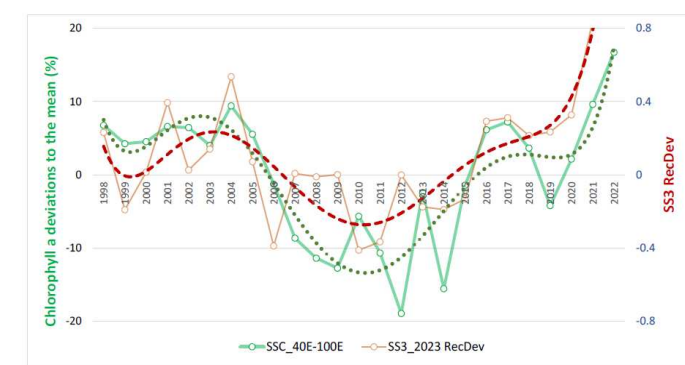
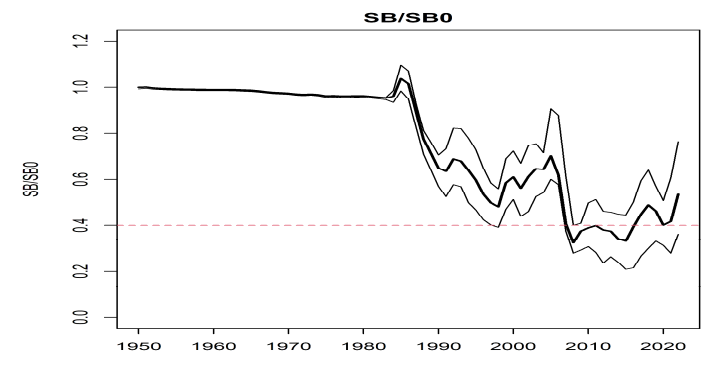
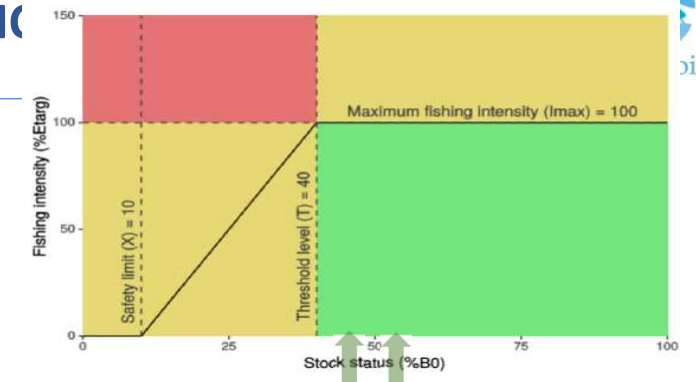
$SB_{2019} = 870$ (1000t)
 $SB_0 = 1992$ (1000t)
 $SB_{2019}/SB_0 = 0.45 > 0.40$
 E_{targ} (Exploitation rate for 40%SB0) = 0.59

HCR application in 2023

$SB_{2022} = 1,143$ (1000t)
 $SB_0 = 2,177$ (1000t)
 $SB_{2022}/SB_0 = 0.53 > 0.40$
 E_{targ} (Exploitation rate for 40%SB0) = 0.55

Annual catch limit
 = $I_{max} \times E_{targ} \times B_{2019}$
 = $1 \times 0.59 \times 870,461$
 = **513,572**

Annual catch limit
 = $I_{max} \times E_{targ} \times B_{2022}$
 = $1 \times 0.55 \times 1,142,919$
 = **628,606**





SKIPJACK MANAGEMENT ADVICE IN 2023



- (Para 95) The SC RECALLED that IOTC Resolution 21/03, which superseded Resolution 16/02 requires the skipjack tuna stock assessment estimates to be used as inputs for the Harvest Control Rule (HCR) to calculate the TAC. The SC therefore **ENDORSED** the stock assessment and that the median estimates from the model ensemble are used to calculate the TAC for skipjack tuna. The SC **RECOMMENDED** that the Commission endorse the **calculated annual TAC of 628 606 t for 2024-2026.**
- Noting that the environmental conditions are predicted to enter a less favorable period, it is important that the Commission ensures that catches of skipjack tuna during this period do not exceed the agreed limit, as occurred in recent years. e and yellowfin) of exceeding the catch limits of skipjack.

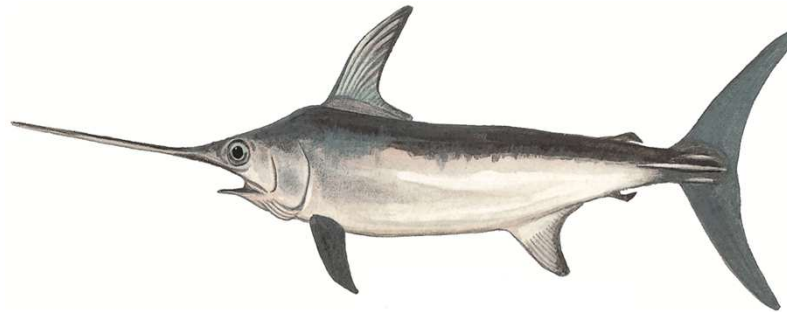


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STOCK STATUS AND MANAGEMENT ADVICE (2)

SWORDFISH





SWORDFISH STOCK ASSESSMENT IN 2023



- WPB Chair: Denham Parker (South Africa); Vice-chair: Jie Cao (China)
- WPB21: 6-9 September (La Reunion, France, EU)
 - ✓ Data preparation
 - ✓ Model specification
- SC 26: Dec 4-8, 2023 (Mumbai, India)
 - ✓ Endorsement of assessment results
 - ✓ Finalization of management advice

Stoch assessment based on SS3

- Age-structured, sex explicit, and spatially disaggregated into 4 regions
- 15 fleets were defined based on spatial disaggregation of the fisheries
- 13 standardized CPUEs

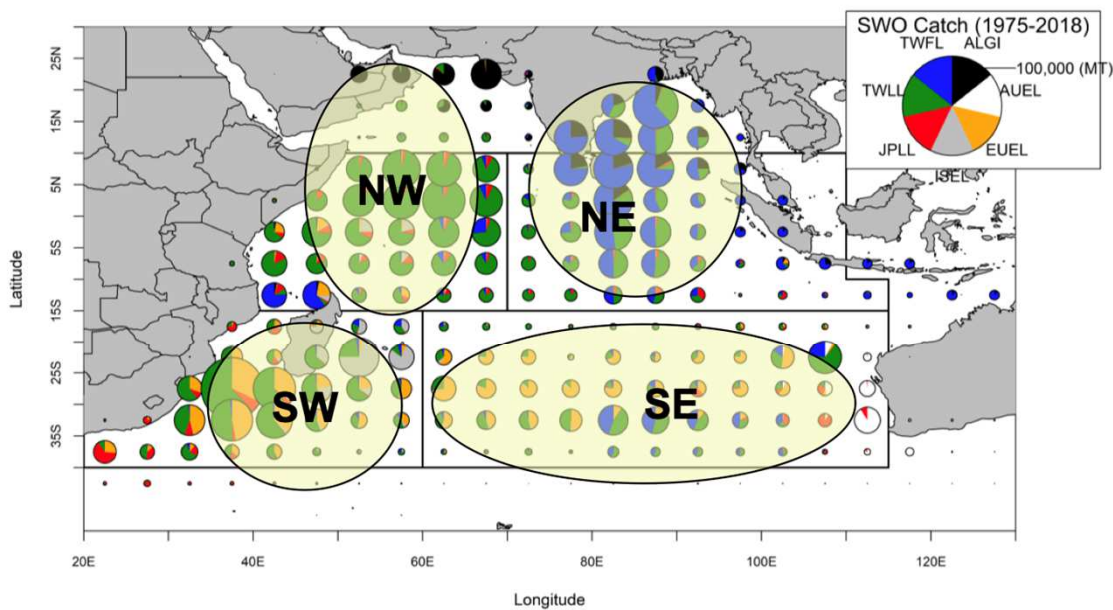
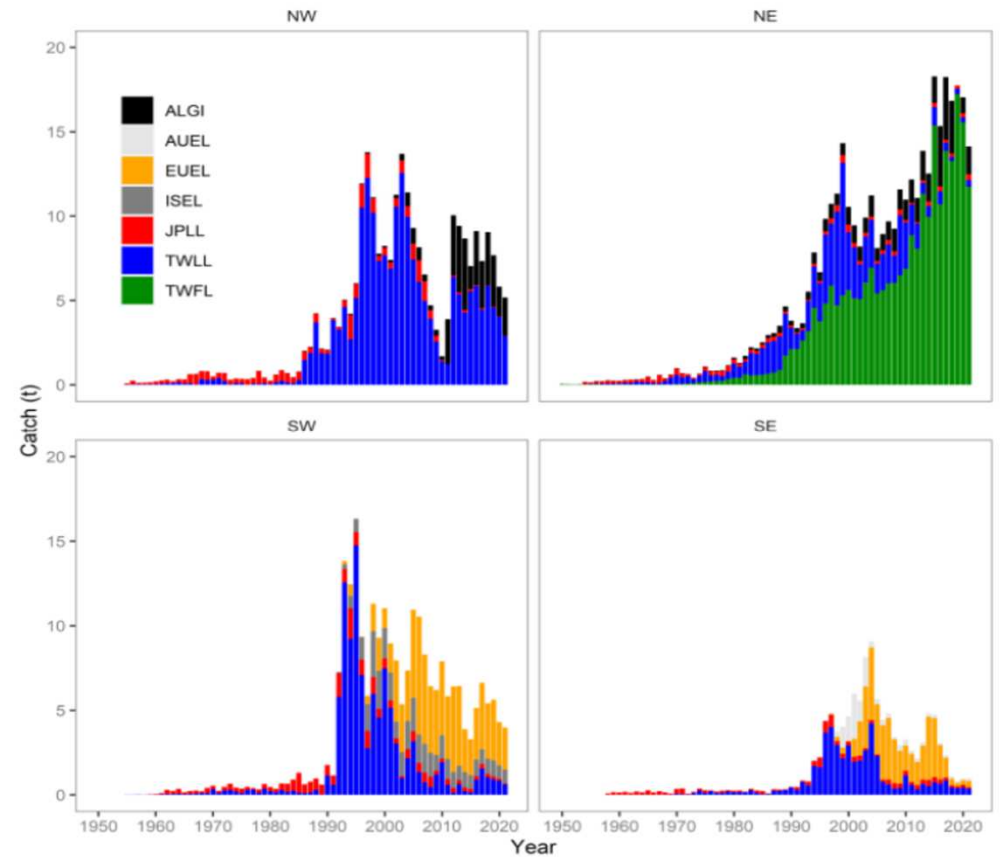


Figure 1: Spatial structure showing the 4 areas used in the assessment model, and distribution of catches in the Indian Ocean by fleet aggregated for 1990-2018.



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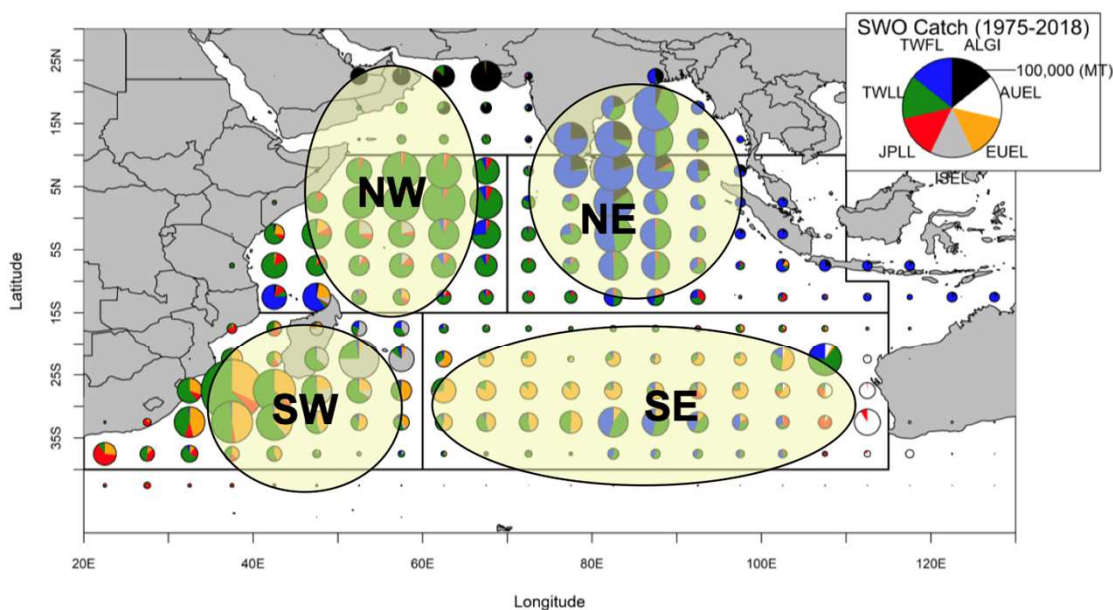
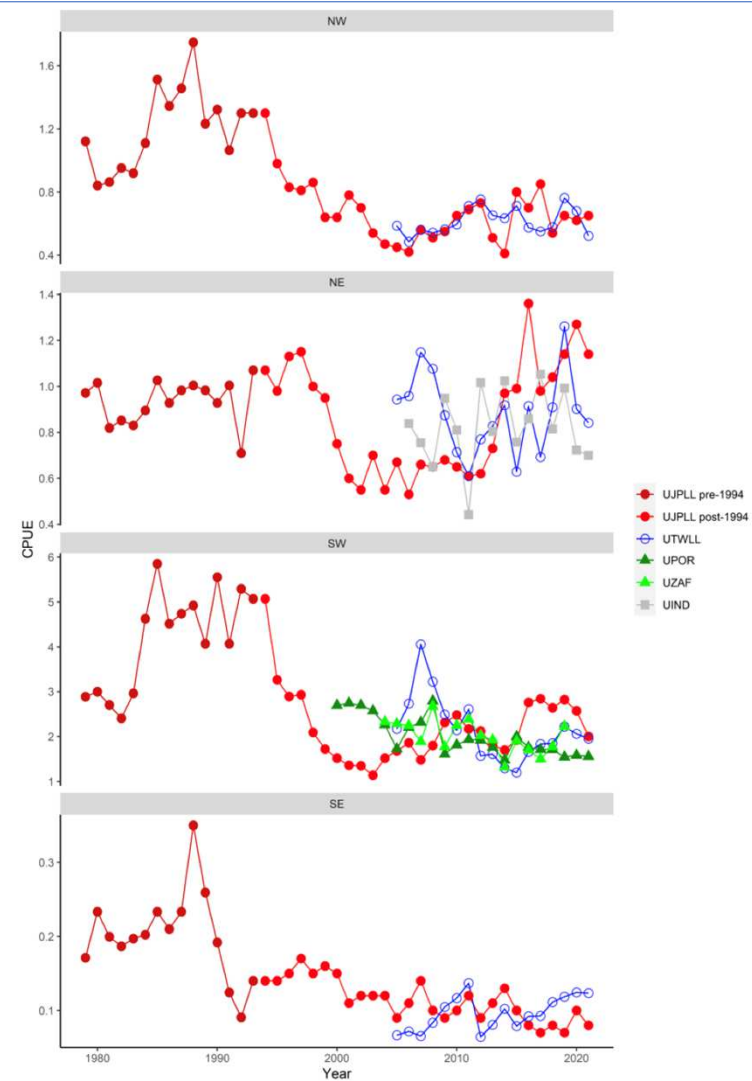
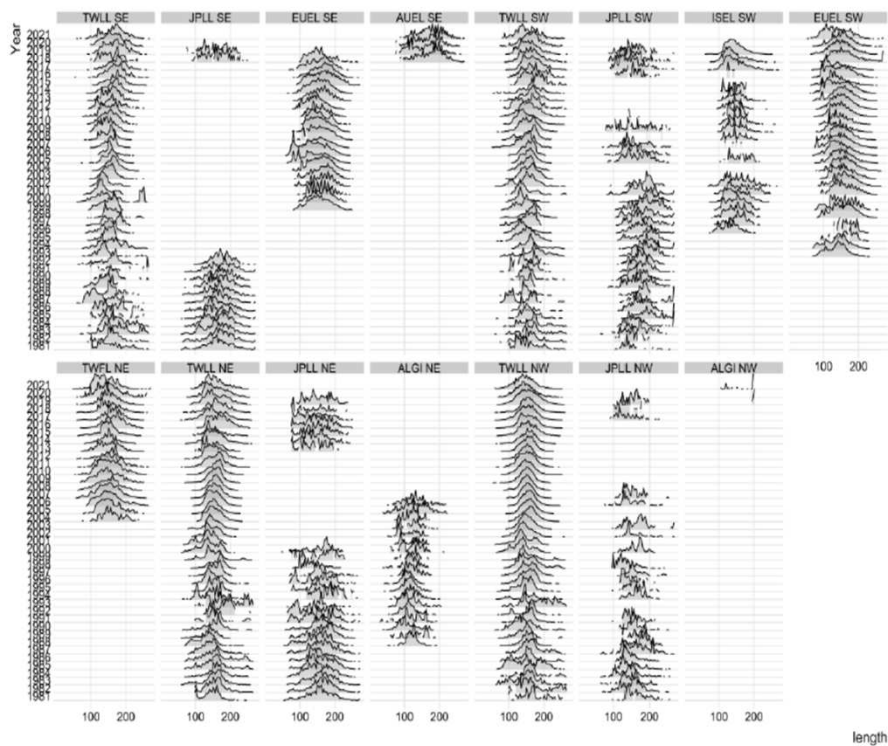


Figure 1: Spatial structure showing the 4 areas used in the assessment model, and distribution of SWO catches in the Indian Ocean by fleet aggregated for 1990-2018.



Stoch assessment based on SS3

- Catch series
- CPUE
- Length composition



“Ensemble” of 48(=2*3*2*2*2) model runs

CPUE (2)

- JPLL + two different configurations

Sample size for length composition (2)

- Smaller effective sample size = 5, 20

GROWTH function (2)

- Farley et al. 2016
- Wang et al. 2010

STEEPNESS in Stock-Recruitment (3)

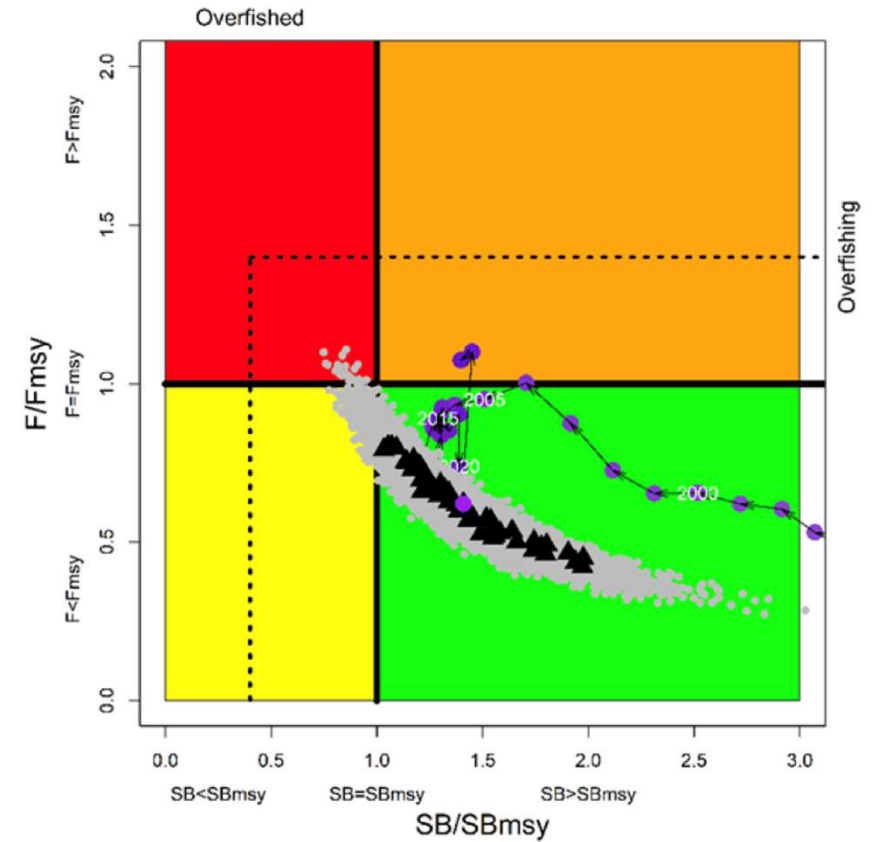
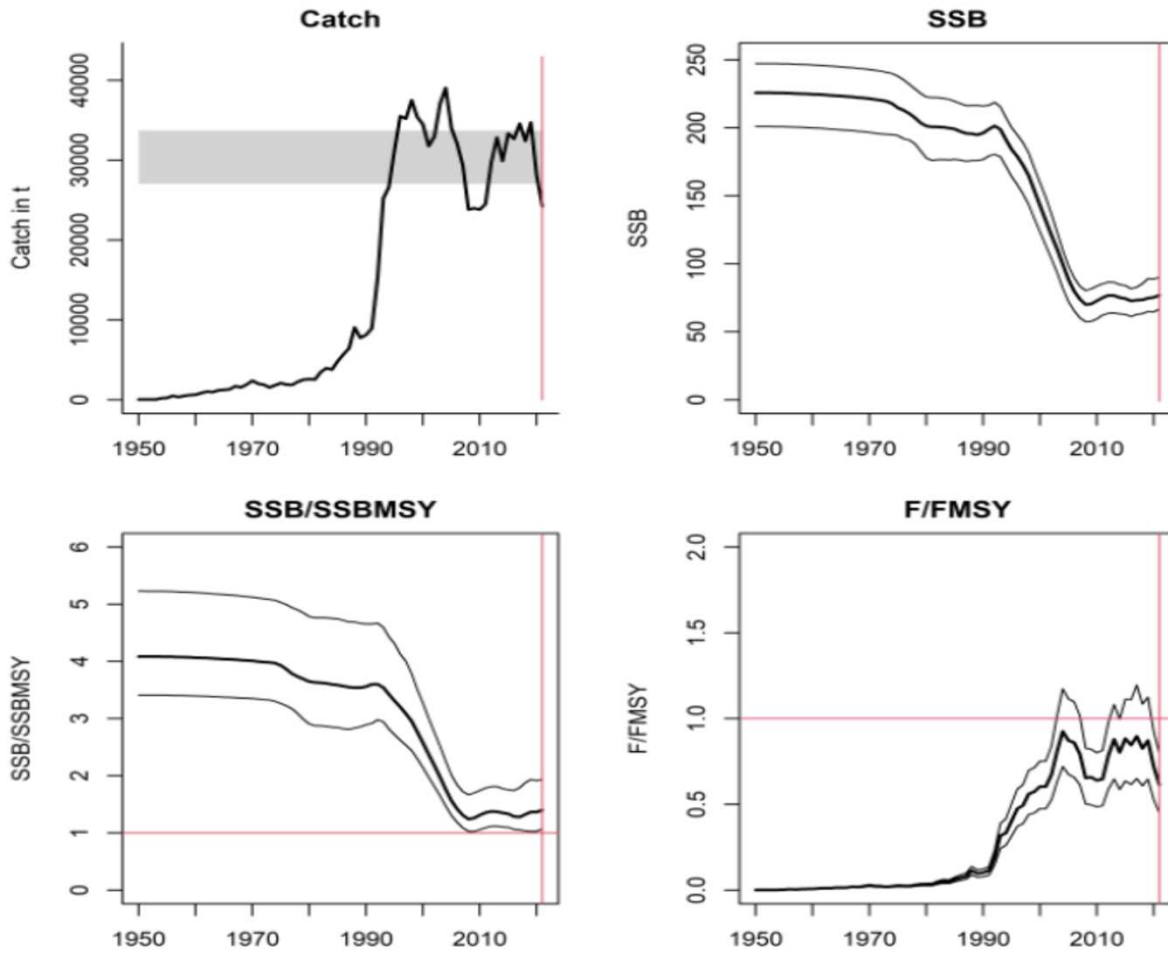
- 0.70, 0.80, 0.90

Recruitment variability (2)

- $\sigma_R = 0.2, 0.4$

Assessment was skillfully and successfully carried out by Dan Fu.

SWORDFISH STOCK ASSESSMENT IN 2023



SWORDFISH STOCK STATUS AND MANAGEMENT ADVICE

Area ¹	Indicators		2023 stock status determination
Indian Ocean	Catch 2021 ² (t)	24,527	97%
	Average catch 2017-2021 (t)	31,226	
	MSY (1,000 t) (80% CI)	30 (26–33)	
	F _{MSY} (80% CI)	0.16 (0.12–0.20)	
	SB _{MSY} (1,000 t) (80% CI)	55 (40–70)	
	F ₂₀₂₁ /F _{MSY} (80% CI)	0.60 (0.43–0.77)	
	SB ₂₀₂₁ /SB _{MSY} (80% CI)	1.39 (1.01–1.77)	
SB ₂₀₂₁ /SB ₁₉₅₀ (80% CI)	0.35 (0.32–0.37)		

¹ Boundaries for the Indian Ocean stock assessment are defined as the IOTC area of competence

² Proportion of 2021 catch estimated or partially estimated by IOTC Secretariat: 22.7%

- SC **ENDORSED** the results of the assessment model which indicated that the stock is **not overfished and not subject to overfishing with a high probability (97%)**.
- Very low risk of exceeding MSY-based RPs if catches are maintained at 2021 levels (<1%).

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)	0.002	0.000
Stock not subject to overfishing (F _{year} /F _{MSY} ≤ 1)	0.03	0.97
Not assessed/Uncertain		

- The Commission should consider monitoring the catches to ensure that the probability of exceeding the SB_{MSY} target reference points in the long term remains minimal.

Reference point and projection timeframe	Alternative catch projections (relative to the 2019 catch of 3,001 t) and probability (%) of violating MSY-based target reference points (B _{target} = B _{MSY} ; F _{target} = F _{MSY})				
	60% (13 942 t)	80% (18 590 t)	100% (23 237 t)	120% (27 884 t)	140% (32 532 t)
B ₂₀₂₄ < B _{MSY}	0	0	1	1	2
F ₂₀₂₄ > F _{MSY}	0	0	0	5	24
B ₂₀₃₁ < B _{MSY}	0	0	0	3	15
F ₂₀₃₁ > F _{MSY}	0	0	0	8	30



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STOCK STATUS AND MANAGEMENT ADVICE (3)

NERITIC TUNAS

KAWAKAWA, LONGTAIL TUNA AND NARROW-BASED SPANISH MACKEREL



Meeting

- Ririk K Sulistyaningsih (Indonesia), Vice chair : Dr. Farhad Kaymaram (I.R. Iran)
- WPNT: 3-7th July 2023 (Seychelles)
 - CPUE standardization workshop (facilitated by Dan Fu and SC chair)
 - New assessments were conducted for three species

The methods used were the catch based (C-MSY), O-COM and a biomass dynamic model (JABBA)

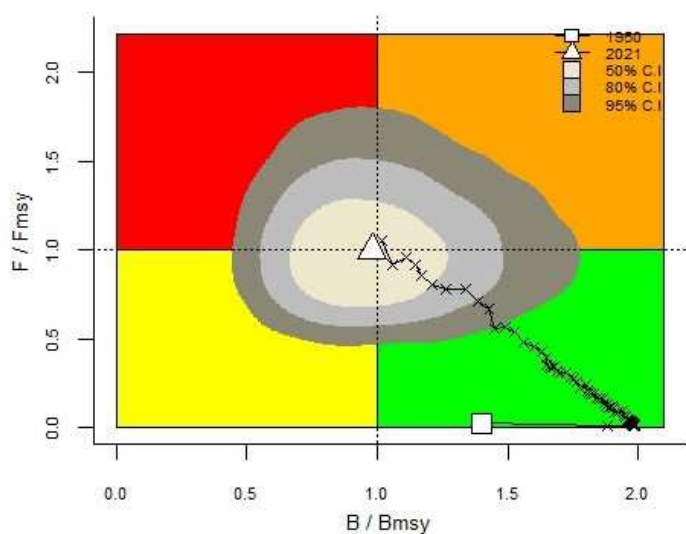
The models used for the three assessed species produced stock estimates that are not drastically divergent because they shared similar dynamics and assumptions.

The C-MSY model has been explored more fully and therefore is used to obtain estimates of stock status.

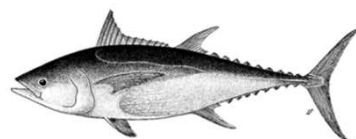
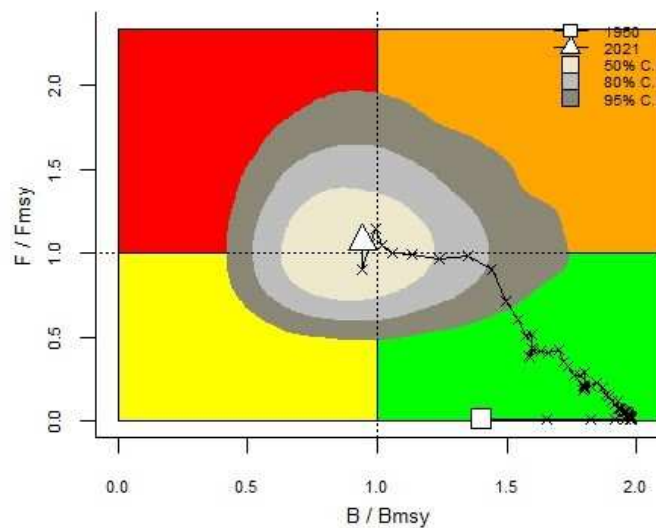
High uncertainty

STOCK ASSESSMENTS AND ADVICE (3)

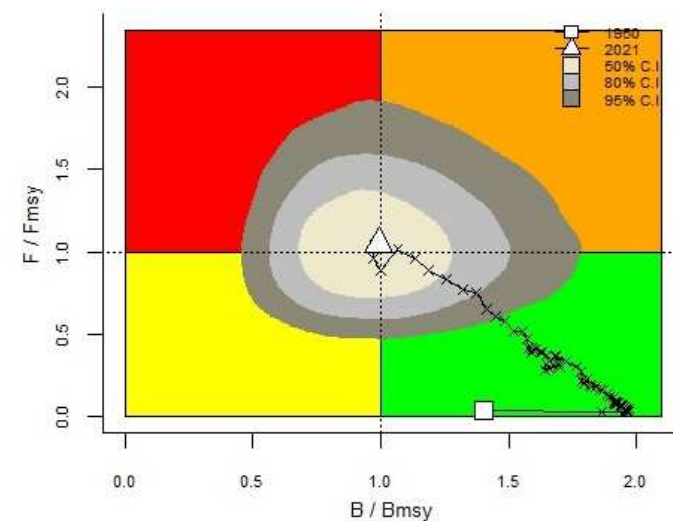
Kawakawa



Longtail tuna



Narrow-barred Spanish mackerel





STOCK ASSESSMENTS AND ADVICE (3)



	Kawakawa	Longtail tuna	Narrow-barred Spanish mackerel
Catch 2022	157 423 t	136 271 t	178 403 t
MSY	154 000 t	133 000 t	161 000 t
% of catches estimated by the Secretariat	65%	35%	70%
Management advice	Reduction of catches to MSY levels (Catch 2022 > MSY)		
Predominant gear	Gillnet		
Stock status and probability	Overfished but not subject to overfishing (27%)	Overfished and subject to overfishing (35%)	Overfished and subject to overfishing (31%)
Notes	Previous assessments placed this stock in the green quadrant of the Kobe plot	Longtail tuna stock has been in the red since 2017	Narrow-barred Spanish mackerel stock of has been in the red since 2016



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OTHER ISSUES

Meetings

- Chair: Hilario Murua (ISSF)
- WPM(MSE): 28th March – 31st April 2023 (Wageningen, The Netherlands)
 - ✓ Technical discussion on MSE (priority skipjack and swordfish)
- WPM14: 26-28 October 2023 (Donostia, Spain)
 - ✓ MSE, joint CPUE, etc.
 - The WPM and WPM MSE taskforce took into consideration the recommendations and discussions in TCMP06
 - Progress was made for each species (SKJ, ALB, SWO), with priority on SWO and SKJ, plus examination of “Exceptional Circumstances” for BET.

(Details were discussed in TCMP08 last week, and some more information will be reported in [Commission Agenda Item 11](#))



WGEMS 03: March 15-16th, 2023 (Virtual)

- Chair: Hilario **Murua** (ISSF)
- Vice-chair: Don **Bromhead** (Australia)
- Requirements on IOTC Resolutions in relation to the WGEMS02 (2022)
- Collection of ROS data through EMS
- Set an intersessional WG to discuss:
 - ROS data fields, status of ROS fields, EMS specifics to mandatory ROS data and other aspects of the implementation of EMS



- Chair: Julien **Barde** (EU, France)
- Vice-Chair: Nuwan Gunawardane (Sri Lanka)
- WPDCS18: Nov 28 – Dec 2nd, 2023 (Mumbai, India)
 - ✓ Data overview and quality by species groups
 - ✓ Data reporting:
 - new fisheries codes and forms
 - Indonesia's re-estimation methodology for Tuna Catch
 - ✓ Data
 - ✓ Estimated yellowfin catch limits for 2024
 - ✓ Outcomes of the 3rd ad-hoc WGEMS



STATUS OF YELLOWFIN TUNA CATCH LIMITS FOR 2023 AND 2024 PURSUANT TO RESOLUTIONS 19/01 AND 21/01



APPENDIX 33

STATUS OF YELLOWFIN TUNA CATCH LIMITS FOR 2023 AND 2024 PURSUANT TO RESOLUTIONS 19/01 AND 21/01

The SC **ENDORSED** the annual catch limits for 2023 (calculated) and 2024 (estimated) as deriving from Res. 19/01 and 21/01

Table 1: calculated / estimated total catch limits for 2023 and 2024 for all CPCs bound to Resolution 21/01

YFT annual catch limits (t) for 2023 (calculated) and 2024 (estimated) as per Res. 21/01			
CPC	Base annual limit	Catch limits	
		2023	2024
AUS – Australia	2,000	2,000	2,000
BGD – Bangladesh	2,000	2,000	2,000
CHN – China	10,557	7,658	7,642
COM – Comoros	5,279	5,279	5,279
ERI – Eritrea	2,000	2,000	2,000
EU – European Union	73,078	72,091	73,078
FRA – France (territories)	500	500	500
GBR – United Kingdom	500	500	500
JPN – Japan	4,003	4,003	4,003
KEN – Kenya	3,654	3,654	3,654
KOR – Republic of Korea	9,056	9,056	9,056
LKA – Sri Lanka	33,245	33,245	33,245
MDV – Maldives	47,195	47,195	47,195
MOZ – Mozambique	2,000	2,000	2,000
MUS – Mauritius	10,490	10,490	10,490
MYS – Malaysia	2,000	2,000	2,000
PAK – Pakistan	14,468	14,468	14,468
PHL – Philippines	700	700	700
SDN – Sudan	2,000	2,000	2,000
SYC – Seychelles	39,577	36,587	39,577
THA – Thailand	2,000	2,000	2,000
TZA – Tanzania	3,905	3,905	3,905
YEM – Yemen	26,262	26,262	26,262
ZAF – South Africa	2,000	2,000	2,000
Totals	298,469	291,593	295,024



STATUS OF YELLOWFIN TUNA CATCH LIMITS FOR 2023 AND 2024 PURSUANT TO RESOLUTIONS 19/01 AND 21/01



The SC **ENDORSED** the annual catch limits for 2023 (calculated) and 2024 (estimated) as deriving from Res. 19/01 and 21/01

Table 2: Calculated / estimated catch limits for 2020-2023 and 2024 for industrial fisheries of all CPCs bound to Resolution 19/01

YFT annual catch limits (t) for 2020-2023 (calculated) and 2024 (estimated) as per Res. 19/01							
CPC	Fishery	Base annual limit	Catch limits				
			2020	2021	2022	2023	2024
IDN – Indonesia	LL	-	-	-	-	-	-
	PS	4,833	4,833	4,095	3,961	4,136	4,833
IND - India	LL	-	-	-	-	-	-
IRN – I.R. Iran	GN	16,948	16,948	-12,490	-398	-16,798	-7,087
	PS	-	-	-	-	-	-
MDG – Madagascar	LL	-	-	-	-	-	-
OMN – Oman	LL	-	-	-	-	-	-
SOM – Somalia	IND	-	-	-	-	-	-



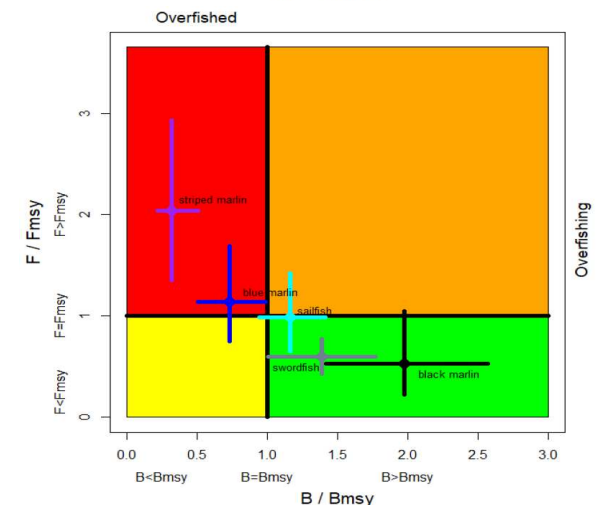
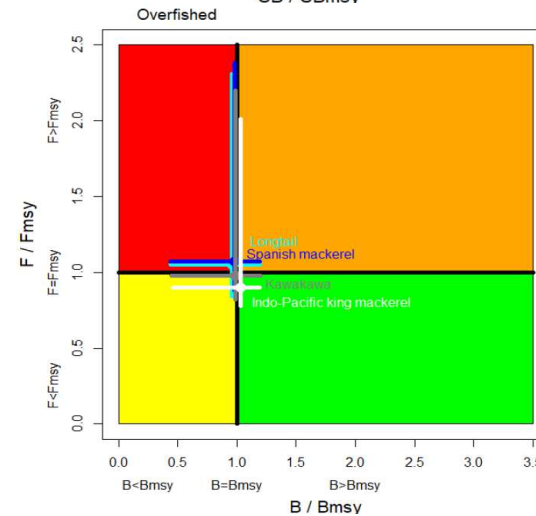
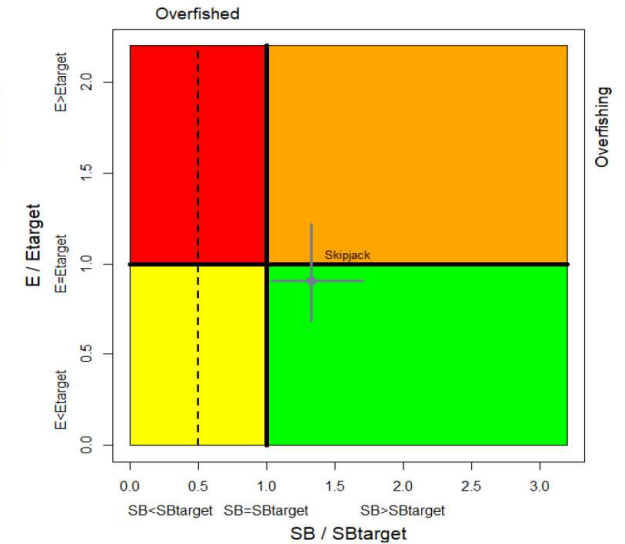
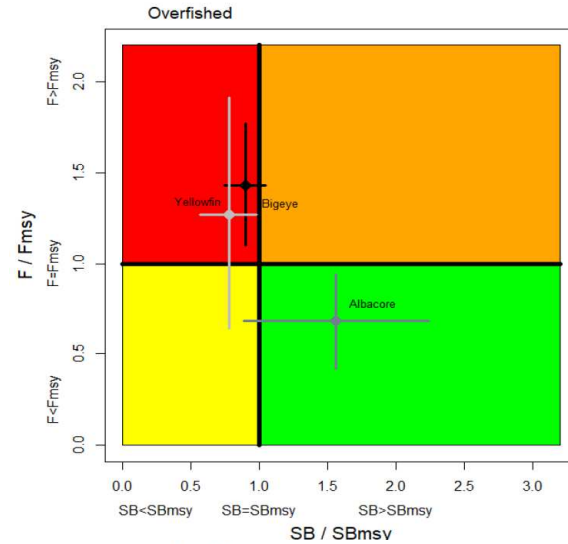
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RECOMMENDATIONS TO THE COMMISSION

SC26.01 – SC26.03

The SC **RECOMMENDED** that the Commission note the management advice developed for each species under the IOTC mandate (tropical, temperate, billfish, neritic tuna and mackerel), as provided in the Executive Summary for each species, and combined Kobe plots.





Sharks

SC25.04 (para. 163) The SC **RECOMMENDED** that the Commission note the management advice developed for a subset of shark species commonly caught in IOTC fisheries for tuna and tuna-like species:

Blue shark (*Prionace glauca*) – [Appendix 23](#)

Oceanic whitetip shark (*Carcharhinus longimanus*) – [Appendix 24](#)

Scalloped hammerhead shark (*Sphyrna lewini*) – [Appendix 25](#)

Shortfin mako shark (*Isurus oxyrinchus*) – [Appendix 26](#)

Silky shark (*Carcharhinus falciformis*) – [Appendix 27](#)

Bigeye thresher shark (*Alopias superciliosus*) – [Appendix 28](#)

Pelagic thresher shark (*Alopias pelagicus*) – [Appendix 29](#)

Marine turtles

SC25.05 (para. 164) The SC **RECOMMENDED** that the Commission note the management advice developed for marine turtles, as provided in the Executive Summary encompassing all six species found in the Indian Ocean:

Marine turtles – [Appendix 30](#)

Seabirds

SC25.06 (para. 165) The SC **RECOMMENDED** that the Commission note the management advice developed for seabirds, as provided in the Executive Summary encompassing all species commonly interacting with IOTC fisheries for tuna and tuna-like species:

Seabirds – [Appendix 31](#)

Marine Mammals

SC25.07 (para. 166) The SC **RECOMMENDED** that the Commission note the management advice developed for cetaceans, as provided in the newly developed Executive Summary encompassing all species commonly interacting with IOTC fisheries for tuna and tuna-like species:

Cetaceans – [Appendix 32](#)



RECOMMENDATIONS TO THE COMMISSION (8): NATIONAL REPORT



The SC **RECOMMENDED** that the Compliance Committee and Commission note the lack of compliance by 5 Contracting Parties (Members) that did not submit a National Report to the Scientific Committee in 2023, NOTING that the Commission agreed that the submission of the annual reports to the Scientific Committee is mandatory.

Table 2. CPC submission of National Reports to the SC from 2013 to 2023.

CPC	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Contracting Parties (Members)											
Australia											
Bangladesh	n.a.	n.a.									
China											
Comoros											
Eritrea											
European Union											
France (OT)											
India											2 Dec
Indonesia											
Iran, Islamic Rep. of											
Japan											
Kenya											
Korea, Republic of											
Madagascar											
Malaysia											
Maldives, Rep. of											
Mauritius											
Mozambique											
Oman, Sultanate of											
Pakistan											2 Dec
Philippines											
Seychelles, Rep. of											
Somalia	n.a.										
Sri Lanka											
South Africa, Rep. of											
Sudan											
Tanzania, United Republic of											
Thailand											
United Kingdom											
Yemen											
Cooperating Non-Contracting Parties											
Liberia	n.a.	n.a.									

Green = submitted. Red = not submitted. Orange = Submitted using an outdated template or late n.a. = not applicable (not a CPC in that year). For 2023, the date of submission of the report is included in the table if the report was submitted after the deadline (**Note:** the deadline for submission was 19 November 2023).



REPORT OF THE 21ST SESSION OF THE WORKING PARTY ON BILLFISH (WPB21)

SC26.09 (para. 49) The SC **NOTED** that the WPB had reviewed evidence that **shortbill spearfish** (*Tetrapturus angustirostris*) is being caught in IOTC fisheries and that the species population size may be declining. The SC **ACKNOWLEDGED** that the addition of shortbill spearfish in the official list of IOTC species may require a review of the IOTC Agreement, which would be a complex administrative process and unlikely to occur in the near future. The SC **AGREED** that a way to move forward may be for the Commission to adopt the same approach as for the main pelagic sharks caught in tuna and tuna-like fisheries (e.g., blue shark) **and mandate the SC with collating information on this species and providing scientific advice for its management**. As such the SC **RECOMMENDED** that the Commission endorse the SCs approach to address the captures of shortbill spearfish in IOTC fisheries.

Revision of catch levels of marlins under Resolution 18/05

SC26.10 (para. 57) Subsequently, the SC **RECOMMENDED** that **Resolution 18/05 be urgently revised and updated so as to reflect MSY based catch limits for each species based on the most recent stock assessment and projections information available, and to contain provisions to ensure that catches do not exceed such limits**. The SC **REQUESTED** that for Indo-Pacific sailfish, K2SM projections be provided based on the most recent assessment so as to inform revised limits for that stock, and that further work is undertaken to improve the black marlin assessment to generate status and catch limit information.



- Chair: Mariana Tolotti (EU, France)
- Vice-chair: Mohammed Koya (India), Charlene de Silva (South Africa)
- WPEB 19: 11-15 September 2023 (La Reunion, France, EU)
 - ✓ Development of research work plan for scalloped hammerhead shark;
 - ✓ Assessment / indicators for silky shark and porbeagle shark;
 - ✓ Review the status of Mobulids and provide management advice (Res. 19/03);
 - ✓ Indicators for marine turtles.



REPORT OF THE 19TH SESSION OF THE WORKING PARTY ON ECOSYSTEMS AND BYCATCH (WPEB19)

SC26.11 (para. 64) The SC **NOTED** that several longline fleets targeting swordfish in the IOTC area of competence are using submerged artificial lights (chemical light sticks or electrically powered lights) attached to the terminal gear for the purpose of attracting the target species and further **NOTED** that Resolution 16/07 prohibits all vessels from using artificial lights to attract fish, without specifying the type of fleet or gear subjected to the Resolution. The SC therefore **RECOMMENDED** that the Commission provides clarity on whether Resolution 16/07 applies to longline fisheries as the current wording is somewhat ambiguous. The SC also **SUGGESTED** that Resolution 16/07 could be amended to clearly state which fleets and/or gears are bound by the Resolution to avoid future doubts.

SC26.12 (para. 66) The SC **RECOMMENDED** that the Commission consider extending measures to prevent finning of sharks such as fins naturally attached including partially attached and tethered for all fisheries or similar, alternative measures (for example, fins artificially attached), providing they had been assessed and endorsed by the SC and Compliance Committee as being equally or more likely to meet the conservation benefit (of a fins naturally attached measure) and are logistically feasible from a compliance monitoring perspective. The SC **NOTED** that while such other measures may be logistically more difficult to implement and monitor for governments, they may be more practical (and beneficial to crew safety) for the fishing industry when conducting their fishing operations and storing shark catches on board.



RECOMMENDATIONS TO THE COMMISSION (13): WPEB



SC26.13 (para. 71) The SC **RECOMMENDED** that the Commission note the current status of development and implementation of National Plans of Action (NPOAs) for sharks and seabirds, and the implementation of the FAO guidelines to reduce marine turtle mortality in fishing operations, by each CPC as provided in Appendix 6, recalling that the IPOA-Seabirds and IPOA-Sharks were adopted by the FAO in 1999 and 2000, respectively, and recommended the development of NPOAs.



REPORT OF THE 25TH SESSION OF THE WORKING PARTY ON TROPICAL TUNAS (WPTT25)

SC26.14 (para. 88) The SC **NOTED** that when looking into the effectiveness of measures within Resolutions which CPCs have objected to such as those contained within Resolution 23/02, the consequences of not having full implementation of measures should be considered in relation to future catch trends and **RECOMMENDED** that the Commission provide clarification on this situation.

Skipjack tuna stock assessment

SC26.15 (para. 96) The SC **RECALLED** that IOTC Resolution 21/03, which superseded Resolution 16/02 requires the skipjack tuna stock assessment estimates to be used as inputs for the Harvest Control Rule (HCR) to calculate the TAC. The SC therefore **ENDORSED** the stock assessment and that the median estimates from the model ensemble are used to calculate the TAC for skipjack tuna. The SC **RECOMMENDED** that the Commission endorse the calculated annual TAC of 628 606 t for 2024-2026.

Co-chairs: Gorka **Merino** (EU,Spain) and Avelino **Munwane** (Mozambique)

WGFAD04: 29-30th May (virtual)

- Developed a workplan to evaluate closures (Res 23-02 and Res 23-04) to reduce mortality on juveniles, mitigate by-catch and habitat impact.

WGFAD05: 4-6th October (virtual)

- To evaluate modalities of closures.
- Specific documents and discussions on data collection forms, biodegradable dFADs, quantitative analyses on the impact of closures with Recommendations.

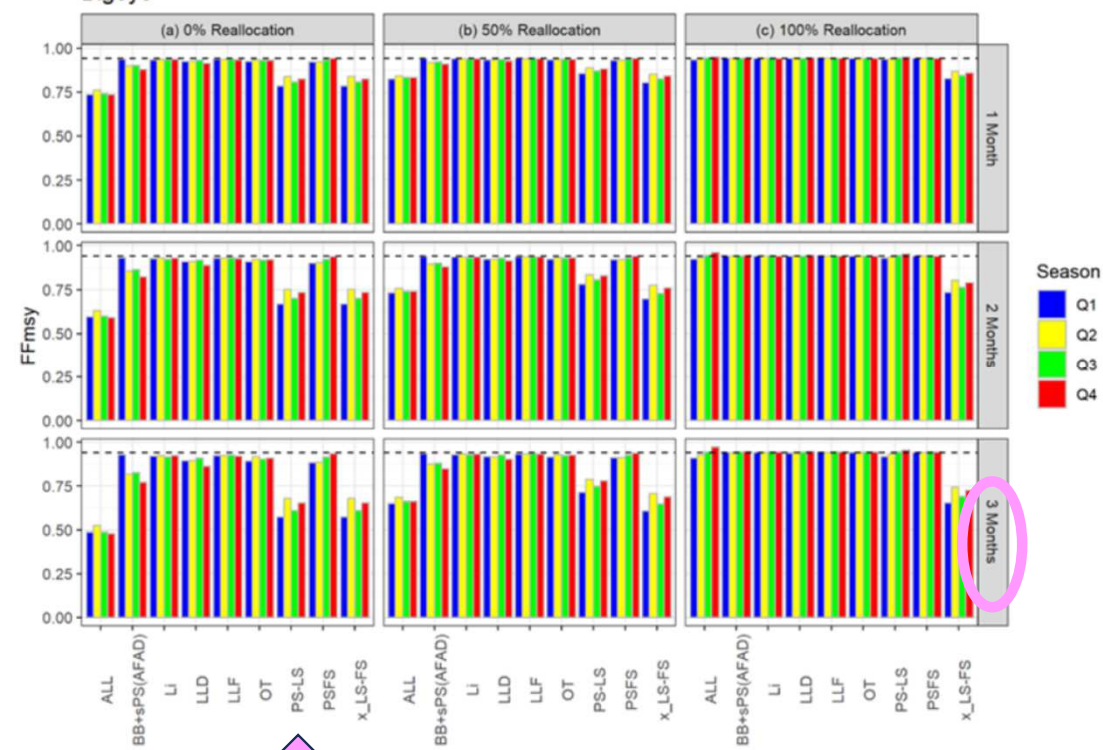
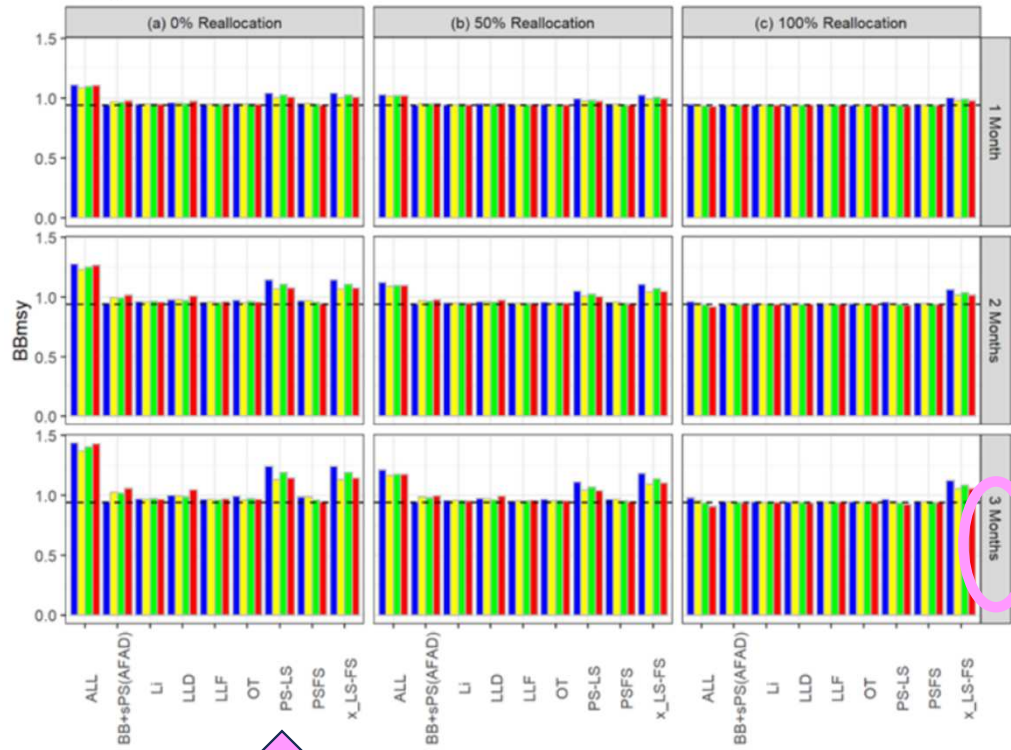
FOR BIGEYE

B/B_{msy}

F/F_{msy}

Bigeye

Bigeye



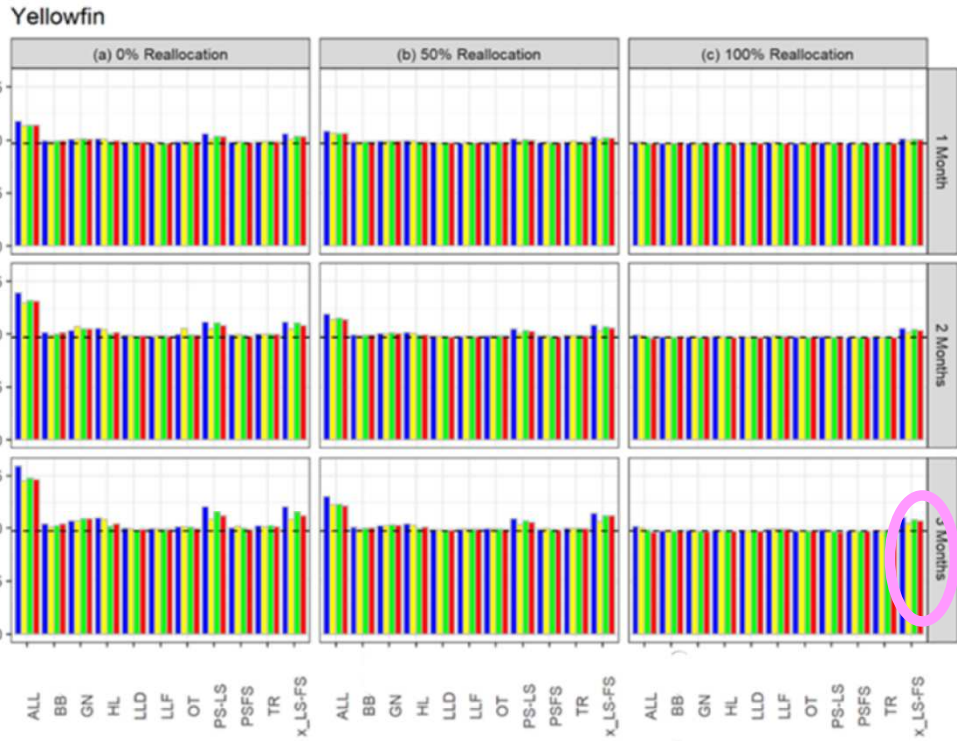
Q1, Q3, Q4

Q1, Q3, Q4

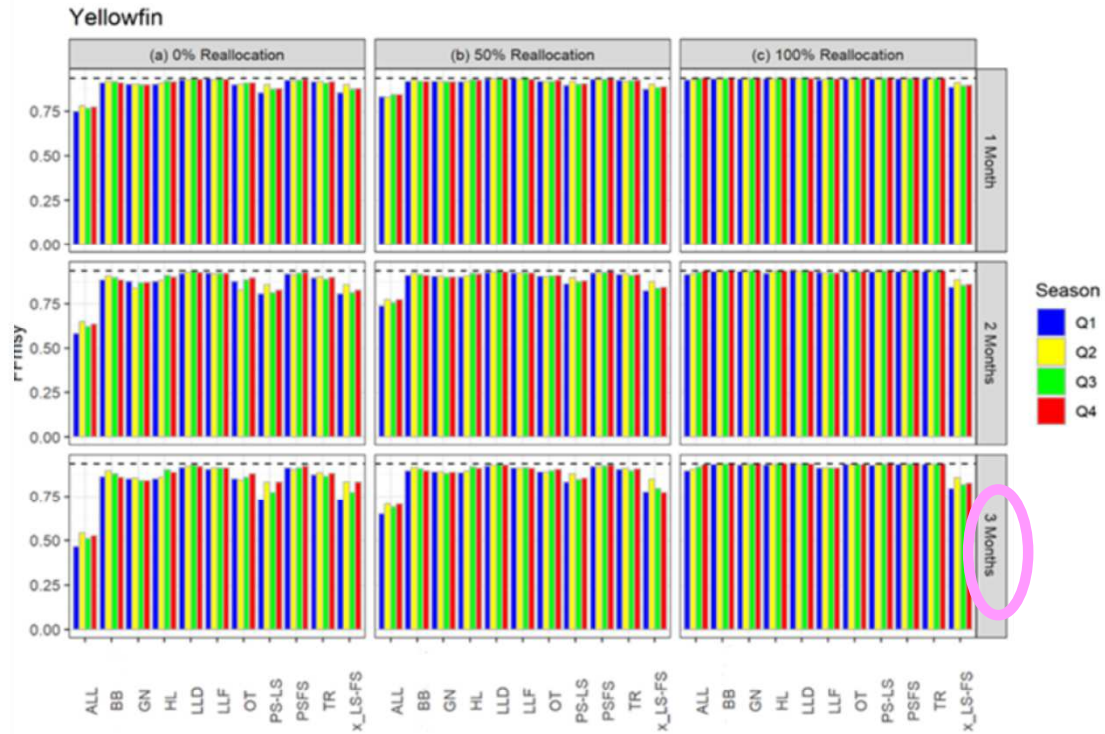
FOR YELLOWFIN

B/B_{msy}

F/F_{msy}



↑
Q1, Q3, Q4



↑
Q1, Q3, Q4

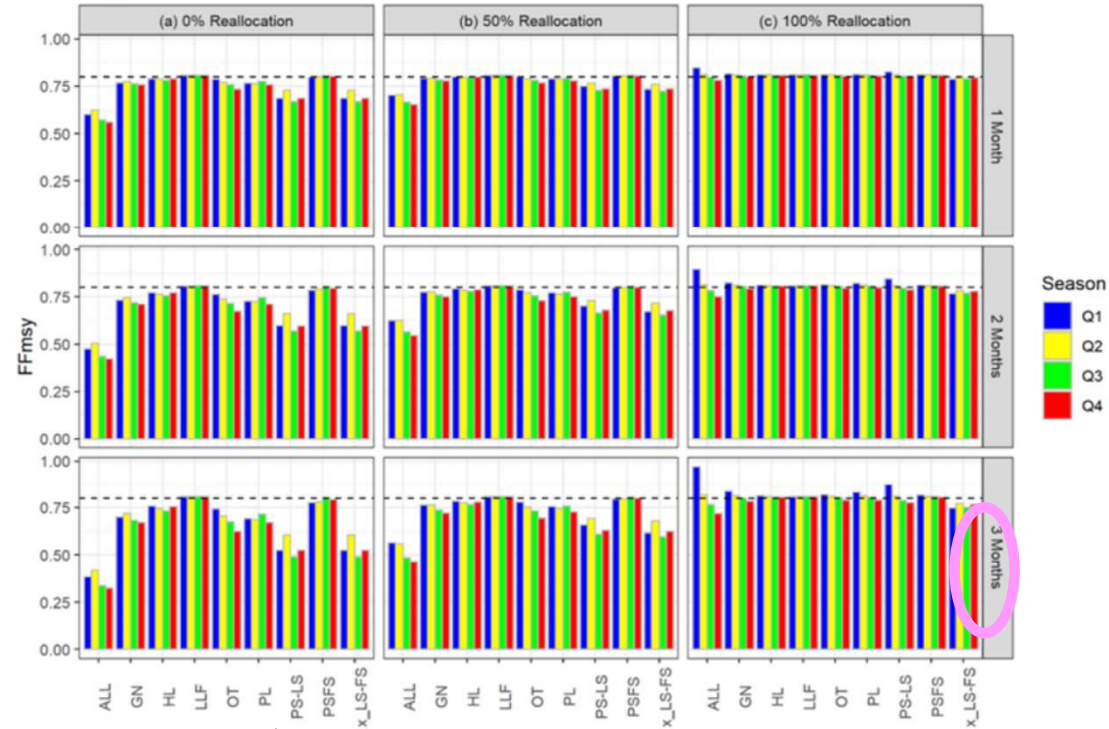
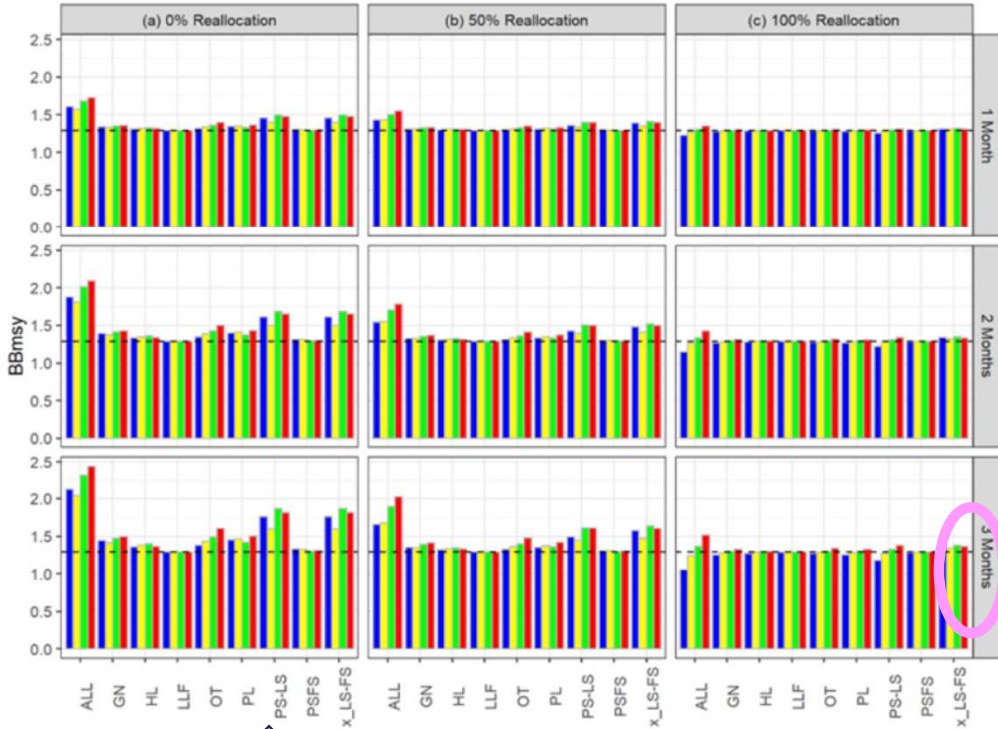
FOR SKIPJACK

B/B_{msy}

F/F_{msy}

Skipjack

Skipjack



Q3, Q4

Q3, Q4



RECOMMENDATIONS TO THE COMMISSION (16): WGFADs



SC26.16 (para. 100) The SC **NOTED** the quantitative analyses presented during the meeting (IOTC-2023-WGFAD05-13 and IOTC-2023-WPTT25-INF08). The analyses which were all conducted with a 10 year time frame indicated that the most positive impact on the stocks for the three tuna species, in order of the largest to smallest benefits, would be (i) a three-month complete closure for all gears, (ii) a two-month complete closure for all gears, and (iii) a three-month oceanwide PS log school closure. In addition, several scenarios with closures applied to other gears also achieve the objective of recovering bigeye and yellowfin to the green quadrant of the Kobe plot in 10 years. However, the SC **NOTED** that these benefits were estimated under the assumption that there would not be an increase in catches from other gears during this time and further **NOTED** that the full benefits of these closures would only be seen if there is no reallocation of catches to other gears or time periods. The analyses further indicated that the period that would result in the best outcomes from the closure would be during Q1, Q3 and Q4 for BET and YFT and Q3 and Q4 for SKJ. In addition, the SC **RECALLED** that Resolution 23/03 (para. 3) states that “The IOTC Scientific Committee shall provide advice and recommendations no later than 31st December 2023 on appropriate fishing closures applicable to all fishing gears.” As such the SC **RECOMMENDED** the Commission take these analyses into account, with results shown in Annex IX of the WPTT report (IOTC-2023-WPTT25-R) and Figures a-c (below), and **REQUESTED** the WPTT to consider conducting further analysis intersessionally to assess the impacts of all gears on stock status so that this issue can be comprehensively addressed. The SC **NOTED** that some artisanal fleets may struggle to implement closures due to socio-economic dependence on the resources and so **REQUESTED** that the WGFAD look into excluding artisanal fleets from future analyses.



RECOMMENDATIONS TO THE COMMISSION (17): WGFADs



SC26.17 (para. 101) The SC **NOTED** that the Jelly-FAD is an example of how the implementation of biodegradable DFADs can be achieved, further **NOTING** that other actions have been also carried out in the Indian Ocean for BIOFAD testing using alternative designs and materials and this work has been presented to the WGFAD and WPEB for many years. The SC further **NOTED** that the IATTC has recently adopted a step-wise approach to the full adoption of biodegradable DFADs (IATTC C-23-04). **The SC therefore RECOMMENDED that the Commission initiate an ambitious step-wise approach for the implementation of biodegradable DFADs as soon as possible.**



REPORT OF THE 25TH SESSION OF THE WORKING PARTY ON TROPICAL TUNAS (WPTT25)

Bigeye Tuna MP

SC26.18 (para. 106) The SC agreed with the review findings that there was no evidence for exceptional circumstances and **RECOMMENDED** that the agreed TAC for 2024 and 2025 should remain unchanged.

Other Matters

SC26.19 (para. 114) Following the presentation of document IOTC-2023-SC26-11 the SC **RECOMMENDED** that pursuing the development of the Close-Kin Mark Recapture project for yellowfin tuna should be a high priority for the Commission.



REPORT OF THE 14TH SESSION OF THE WORKING PARTY ON METHODS (WPM14)

General MSE issues

SC26.20 (para. 129) The SC **NOTED** that there is a need to ensure that any code and input files used for developing MPs is housed internally on an accessible platform, so it is available to other users and not lost when developers move on to other tasks. The SC **NOTED** that ICES uses a Transparency and Assessment Framework (TAF) which is a useful frontend to direct users to the locations of relevant documents and code (e.g. Github repositories) that enable users to re-run assessments and other analyses, but that a much smaller system would be needed for the IOTC. The SC **NOTED** that most important information to be curated would be the input files, executables, and control files (not the large volume of output files), and **RECOMMENDED** that the Commission ensure that the IOTC Secretariat is provided with the necessary resources to manage the curation of this information.



REPORT OF THE 19TH SESSION OF THE WORKING PARTY ON DATA COLLECTION AND STATISTICS (WPDCS19)

SC26.21 (para. 138) The SC **ACKNOWLEDGED** the request to clarify the issues with data reporting requirements identified with Res. 12/02 and 19/07, as well as the request to change the status of reporting of fishing craft statistics from voluntary to mandatory in Res. 15/02 and **RECOMMENDED** that the Commission **takes these requests in due consideration at the next revision of all concerned resolutions.**



SC26.22 – SC25.27

- **SUMMARY DISCUSSION OF MATTERS COMMON TO WORKING PARTIES**
 - *Invited Expert(s) at the WP meetings*
 - *Meeting participation fund*
 - *IOTC species identification guides: Tuna and tuna-like species*
 - *Chairpersons and Vice-Chairpersons of the SC and its subsidiary bodies*
- **IMPLEMENTATION OF THE REGIONAL OBSERVER SCHEME**
- **PROGRAM OF WORK AND SCHEDULE OF WORKING PARTY AND SCIENTIFIC COMMITTEE MEETINGS**
 - *Consultants*
 - *Data preparatory meetings and Hybrid meetings*



ASSESSMENT SCHEDULE IN 2024-2028: TROPICAL TUNAS



<i>Working Party on Tropical Tunas</i>					
Species	2024	2025	2026	2027	2028
Bigeye tuna	Indicators MP to be run	Data preparatory meeting Full assessment	Indicators	Indicators MP to be run	Data preparatory meeting Full assessment
Skipjack tuna	Indicators	Indicators	Data preparatory meeting Full assessment	Indicators	Indicators
Yellowfin tuna	Data preparatory meeting Full assessment	Indicators	Indicators	Data preparatory meeting Full assessment	Indicators



ASSESSMENT SCHEDULE IN 2024-2028: WPB AND WPTMT



<i>Working Party on Billfish</i>					
Species	2024	2025	2026	2027	2028
Black marlin	Full assessment			Full assessment	
Blue marlin		Full assessment			Full assessment
Striped marlin	Full assessment			Full assessment	
Swordfish		Indicators**	Full assessment		Indicators**
Indo-Pacific sailfish		Full assessment*			Full assessment*

* Including data poor stock assessment methods; Note: the assessment schedule may be changed depending on the annual review of fishery indicators, or SC and Commission requests.

** Including biological parameters, standardized CPUE, and other fishery trend.

<i>Working Party on Temperate Tunas</i>					
Species	2024	2025	2026	2027	2028
Albacore		Data preparatory Meeting (4 days) (April/May/June) Stock assessment meeting (5 days) (July/August)	–	–	TBC



ASSESSMENT SCHEDULE IN 2024-2028: NERITIC TUNAS



<i>Working Party on Neritic Tunas</i>					
Species	2024*	2025**	2026*	2027*	2028*
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	Assessment
Longtail tuna	Data preparation	Data preparation	Assessment	Data preparation	Assessment
Narrow-barred Spanish mackerel	Data preparation	Data preparation	Assessment	Data preparation	Assessment

* 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.



ASSESSMENT SCHEDULE IN 2024-2028: WPEB



Working Party on Ecosystems and Bycatch					
Species	2024	2025	2026	2027	2028
Blue shark	-	Data preparatory meeting Full	-	-	-
Oceanic whitetip shark	Data preparation	Indicator analysis	-	Data preparation	-
Scalloped hammerhead shark	-	-	Data preparatory meeting Full assessment	-	-
Shortfin mako shark	Data preparatory meeting Full assessment	-	-	Data preparatory meeting Full assessment	-
Silky shark	-	-	Assessment*	-	Assessment*
Bigeye thresher shark	-	-	Assessment*	-	-
Pelagic thresher shark	-	-	Assessment*	-	-
Porbeagle shark	-	-	-	-	Assessment*
Mobulid Rays	Interactions/ Indicators	-	-	Interactions/ Indicators	-
Marine turtles	-	Indicators	-	-	Indicators
Seabirds	Development of draft workplan	-	Review of mitigation measures in Res. 23/06	-	-

Working Party on Ecosystems and Bycatch					
Species	2024	2025	2026	2027	2028
Marine Mammals	<ul style="list-style-type: none"> Review of mitigation measures Review of handling guidelines 		-	-	-
Data preparatory meeting	<ul style="list-style-type: none"> Methods for using available data for assessments Considering the shark research plan Consider effectiveness of mitigation measures for a range of taxa 				
Ecosystem Based Fisheries Management (EBFM) approaches	Ecoregions pilot study	ongoing			

*Including data poor stock assessment methods; Note: the assessment schedule may be changed dependent on the annual review of fishery indicators, or SC and Commission requests.



LIST OF CHAIRS AND VICE-CHAIRS



Group	Chair/Vice-Chair	Chair	CPC/Affiliation	1 st Term commencement date	Term expiration date (End date is until replacement is elected)	Comments
SC	Chair	Dr Toshihide Kitakado	Japan	10-Dec-19	End of SC in 2025	3 rd term (interim)
	Vice-Chair	Dr Gorka Merino	EU	08-Dec-23	End of SC in 2025	1 st term
WPB	Chair	Dr Jie Cao	China	08-Sep-23	End of WPB in 2025	1 st term
	Vice-Chair	Dr Sylvain Bonhommeau	EU,France	08-Sep-23	End of WPB in 2025	1 st term
WPTmT	Chair	Dr Toshihide Kitakado	Japan	29-July-22	End of WPTmT in 2028	1 st term
	Vice-Chair	Dr Jiangfeng Zhu	China	29-July-22	End of WPTmT in 2028	1 st term
WPTT	Chair	Dr Gorka Merino	EU,Spain	03-Nov-23	End of WPTT in 2025	Ext 2 nd term
	Vice-Chair	Dr Shiham Adam	IPNLF	03-Nov-23	End of WPTT in 2025	Ext 2 nd term
WPEB	Chair	Dr Mariana Tolotti	EU,France	15-Sept-21	End of WPEB in 2025	2 nd term
	1 st Vice-Chair	Dr Mohamed Koya	India	15-Sept-21	End of WPEB in 2025	2 nd term
	2 nd Vice-Chair	Dr Charlene da Silva	South Africa	15-Sept-21	End of WPEB in 2025	2 nd term
WPNT	Chair	Dr Farhad Kaymaram	I.R. Iran	7-July-23	End of WPNT in 2025	1 st term
	Vice-Chair	Mr Bram Setyadji	Indonesia	7-July-23	End of WPNT in 2025	1 st term
WPDCS	Chair	Dr Julien Barde	EU,France	3-Dec-21	End of WPDCS in 2025	2 nd term
	Vice-Chair	Mr Nuwan Gunawardane	Sri Lanka	3-Dec-21	End of WPDCS in 2025	2 nd term
WPM	Chair	Dr Hilario Murua	ISSF	28-Oct-23	End of WPM in 2025	Ext 2 nd term
	Vice-Chair	Dr Ann Preece	Australia	28-Oct-23	End of WPM in 2025	1 st term
WGFAD	Co-Chair	Dr Gorka Merino	EU,Spain	06-Oct-21	End of WGFAD in 2024	1 st term
	Co-Chair	Mr Avelino Munwane	Mozambique	03-Oct-22	End of WGFAD in 2024	1 st term
WGEMS	Chair	Dr Hilario Murua	ISSF	17-Nov-21	End of WGEMS in 2024	1 st term
	Vice-Chair	Dr Don Bromhead	Australia	17-Nov-21	End of WGEMS in 2024	1 st term



SCHEDULE OF MEETINGS IN 2024 AND 2025



Meeting	2024			2025		
	No.	Date	*Location	No.	Date	*Location
Management Strategy Evaluation Task Force of the Working Party on Methods (WPM)	15 th	10 – 13 April (4d)	Virtual	16 th	February/March	Virtual
Working Party on Ecosystems and Bycatch (Data Preparatory meeting) (WPEB)	20 th	22-26 April (5d)	Virtual	21 st	TBC	Virtual
Ad hoc Working Group on Electronic Monitoring Systems (WGEMS)	4 th	5-7 June (3d)	Virtual	5 th	TBC	Virtual
Ad hoc Working Group on FADs (WGFAD)	6 th	10 -11 June (2d) (Maybe extend meeting hours – hour earlier)	Virtual	7 th	May/June	Virtual
Working Party on Tropical Tunas (Data Preparatory meeting) (WPTT)	26 th	12-14 June (3d) (Maybe extend meeting hours)	Virtual	27 th	May/June	Virtual
Working Party on Neritic Tunas (WPNT)	14 th	8-12 July (5d)	TBC	15 th	July	TBC
Working Party on Billfish (WPB)	22 nd	4-7 September (4d) (with WPEB)	TBC	23 rd	September (with WPEB)	TBC
Working Party on Ecosystems and Bycatch (WPEB)	20 th	9-13 September (5d) (with WPB)	TBC	21 st	September (with WPB)	TBC
Ad hoc Working Group on FADs (WGFAD)	7 th	1-4 October (4d)	Virtual	8 th	Virtual	TBC
Working Party on Methods	15 th	24-26 October (3d) (with WPTT)	TBC	16 th	October (3d) (with WPTT)	TBC
Working Party on Tropical Tunas (Assessment meeting)	26 th	28 October – 2 November (6d) (with WPM)	TBC	27 th	October (6d) (with WPM)	TBC
Working Party on Data Collection and Statistics	20 th	26 – 30 November (5d)	TBC	21 st	November (5d)	TBC
Scientific Committee	27 th	2 - 6 December (5d)	TBC	28 th	December (5d)	TBC



MSE Task Force; 10-13th April



WPEB Data Prep; 22-26th April



WGEMS: 5-7 June



- **WGFAD: 10 - 11 June**
- **WPTT(Data Prep): 12 – 14 June**



WGFAD: 1-4 October

At this moment, **virtual** format meetings are planned for

- Data preparatory meetings
- Working Group meetings

* In accordance with the SC Recommendations, Data Preparatory and Working Group meetings will remain virtual. The Secretariat will endeavour to ensure all remaining meetings are held in a hybrid format.



RECOMMENDATIONS TO THE COMMISSION (30)



REVIEW OF THE DRAFT, AND ADOPTION OF THE REPORT OF THE 25TH SESSION OF THE SCIENTIFIC COMMITTEE

SC26.30 (para. 196) The SC **RECOMMENDED** that the Commission consider the consolidated set of recommendations arising from SC25, provided at [Appendix 38](#).

ACKNOWLEDGEMENTS

- All the participants of WPs and SC for dedicated and productive discussion
- CPCs that hosted the WPs and SC
- Chairs, Vice-chairs of WPs and WGs
- IOTC secretariat team



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THANK YOU SO MUCH FOR KIND ATTENTION