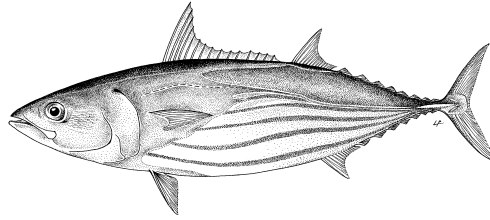# APPENDIX 3
EXECUTIVE SUMMARY: SKIPJACK TUNA (2024)

Table 1. Status of skipjack tuna (*Katsuwonus pelamis*) in the Indian Ocean

Area[1]	Indicators		2023 stock status determination[3]
Indian Ocean	Catch 2023[2] (t)	688,680	**70%***
	Mean annual catch 2019-2023 (t)	630,120	
	$E_{40\%SB0}$ [4] (80% CI)	0.55 (0.48–0.65)	
	SB_0 (t) (80% CI)	2 177 144 (1 869 035–2 465 671)	
	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)	
	$SB_{2022} / SB_{40\%SB0}$ (80% CI)	1.33 (1.04–1.71)	
	$SB_{2022} / SB_{20\%SB0}$ (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)	
	$F_{2022} / F_{40\%SSB0}$ (80% CI)	0.90 (0.68–1.22)	
	MSY (t) (80% CI)	584 774 (512 228–686 071)	

[1]Boundaries for the Indian Ocean stock assessment are defined as the IOTC area of competence
[2] Proportion of 2023 catch fully or partially estimated by IOTC Secretariat: 17.5%
[3]2022 is the final year that data were available for this assessment.
[4] $E_{40\%SB0}$ is the equilibrium annual exploitation rate (Etarg) associated with the stock at Btarg, and is a key control parameter in the skipjack harvest control rule as stipulated in Resolution 21/03. Note that Resolution 23/03 did not specify the exploitation rate associated with the stock at Blim
*Estimated probability that the stock is in the respective quadrant of the Kobe plot (defined in resolution 21/03 and shown below), derived from the confidence intervals associated with the current stock status

Table 2. Probability of stock status with respect to each of four quadrants of the Kobe plot. Percentages are calculated as the proportion of model terminal values that fall within each quadrant with model weights taken into account, as defined in resolution 21/03

	Stock overfished ($SB_{2022} / SB_{40\%SB0}<1$)	Stock not overfished ($SB_{2022} / SB_{40\%SB0}\geq 1$)
Stock subject to overfishing ($F_{2022} / F_{40\%SB0}\geq 1$)	8%	21%
Stock not subject to overfishing ($F_{2022} / F_{40\%SB0}\leq 1$)	1%	70%
Not assessed / Uncertain / Unknown		

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Stock status. No new stock assessment was carried out for skipjack tuna in 2024 and so the advice is based on the 2023 assessment using Stock Synthesis with data up to 2022. The outcome of the 2023 stock assessment model is more optimistic than the previous assessment (2020) despite the high catches recorded in the period 2021-2022, which exceeded the catch limits established in 2020 for this period.

The final assessment indicates that:

i) The stock is above the adopted target for this stock ($40\%SB_0$) and the current exploitation rate is below the target exploitation rate with the probability of 70%. Current spawning biomass relative to unexploited levels is estimated at 53%.

ii) The spawning biomass remains above SB_{MSY} and the fishing mortality remains below F_{MSY} with a probability of 98.4 %

iii) Over the history of the 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**.


Outlook.

There has been a substantial increase of fishery dependent abundance index in recent years: the CPUE from the Pole and line fishery increased by 75% from 2019 to 2022, and the PSLS also increased by over 30% between 2019 and 2021. Total catches in 2022 were 30% larger than the resulting catch limit from the skipjack HCR for the period 2021-2023 (513,572 t). The increase in abundance despite catches exceeding the recommended limits was primarily driven by an increase in recent recruitment which was estimated to be well above the long-term average. Environmental conditions (such as sea surface productivity (chlorophyll)) are believed to significantly influence recruitment of skipjack tuna and can produce high variability in recruitment levels between years. The high recruitment anomaly estimated in 2022 appears to be supported by the strong increasingly positive phase of sea surface productivity which began from a below average level in 2015. Climate model predictions suggest that the positive productivity phase will end by the start of 2024 resulting in a period of lower productivity. There is also considerable uncertainty in the stock assessment models due to the potential caveats of using PL and PSLS CPUE as index of basin-level abundance and uncertainty in stock productivity parameters of skipjack tuna (e.g., steepness and growth, natural mortality). The model runs analyzed illustrate a wide range of stock status (SB_{2022} / SB_0) to be between 35% and 78%.


Management advice. The catch limit calculated by applying the HCR specified in Resolution 21/03 is [628, 606t] for the period 2024-2026. The SC noted that this catch limit is higher than for the previous period. This is attributed to the new stock assessment which estimates a higher productivity of the stock in recent years and a higher stock level relative to the target reference point, possibly due to skipjack life history characteristics and favorable environmental conditions. 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. In addition, the SC recognizes the potential impact on other associated stocks (bigeye and yellowfin) of exceeding the catch limits of skipjack. In 2024, the Commission adopted Resolution 24/07 on a management procedure for skipjack. The MP is scheduled to be implemented in 2025 to provide TAC advice for 2027-2029.

The following key points should also be noted:

- **Reference points**: Commission in 2016 agreed to [Resolution 16/02 on *harvest control rules for skipjack tuna in the IOTC area of competence (superseded by Resolution 21/03)*](#).

- **Biomass**: Current spawning biomass was considered to be above the target reference point of 40% of SB_0, and above the limit reference point of $0.2*SB_0$ as per Resolution 16/02 (**Fig. 2**).

- **Main fisheries (mean annual catch 2019-2023):** skipjack tuna are caught using purse seine (53.9%), followed by baitboat (19.5%) and gillnet (17.5%). The remaining catches taken with other gears contributed to 9.2% of the total catches in recent years (Fig. 1).
- **Main fleets (mean annual catch 2019-2023):** the majority of skipjack tuna catches are attributed to vessels flagged to Indonesia (21.8%) followed by Maldives (18%) and EU (Spain) (14.8%). The 32 other fleets catching skipjack tuna contributed to 45.3% of the total catch in recent years (Fig. 2).

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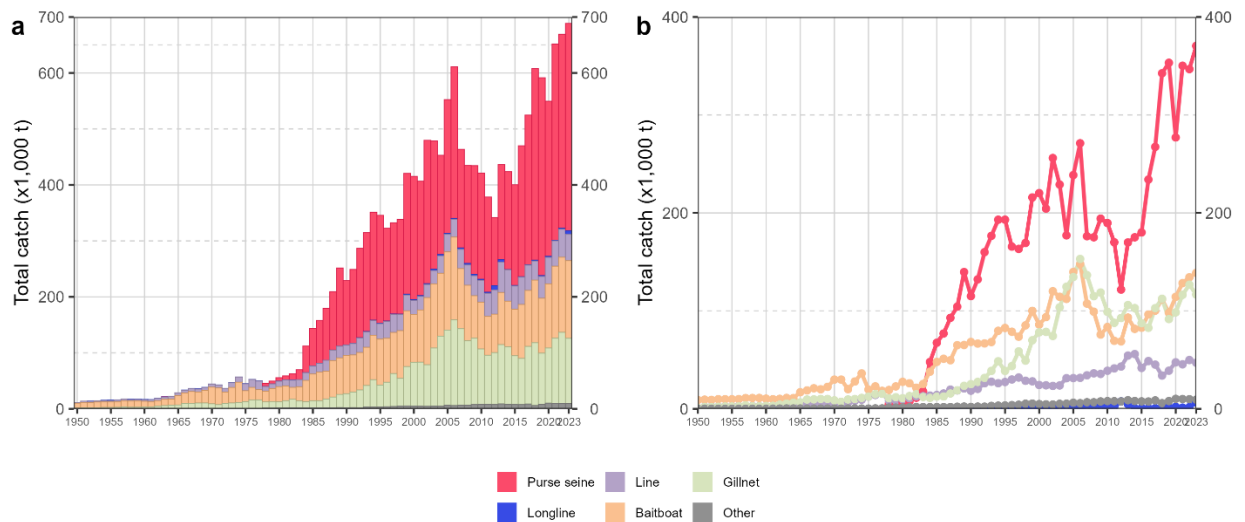
Fig. 1. Annual time series of (a) cumulative nominal catches (metric tonnes; t) by fishery group and (b) individual nominal catches (metric tonnes; t) by fishery group for skipjack tuna during 1950-2023.
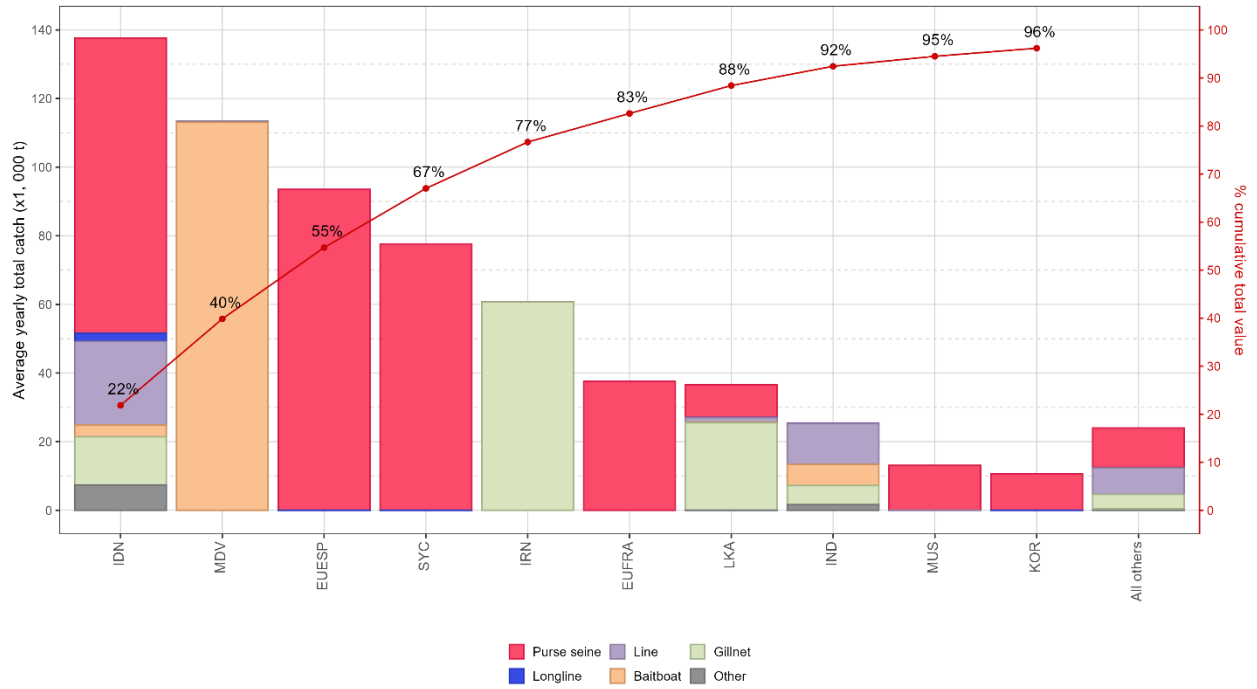
Fig. 2. Mean annual catches (metric tonnes; t) of skipjack tuna by fleet and fishery group between 2019 and 2023, with indication of cumulative catches by fleet.
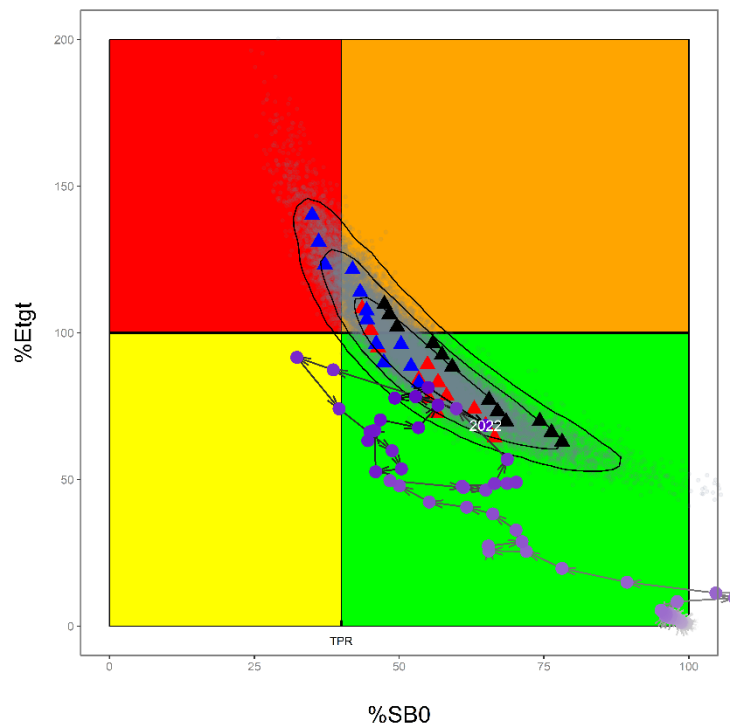
Fig. 3. Skipjack tuna: SS3 Aggregated Indian Ocean assessment Kobe plot of the 2023 uncertainty grid. Left - current stock status, relative to SB0 and F (x-axis) and $F_{40\%B0}$ (y-axis) reference points for the final model grid.. TPR indicates 40% B0; Triangles represent MPD estimates from individual models (black, models based on PL index; red, models based on PSLS index; blue, models based

on and both PSLS and ABBI index). Grey dots represent uncertainty from individual models. The arrowed line represents time series of historical stock trajectory for model PSLS. Contours represents 50, 80, and 90% confidence region.