APPENDIX 2
EXECUTIVE SUMMARY: BIGEYE TUNA (2023)

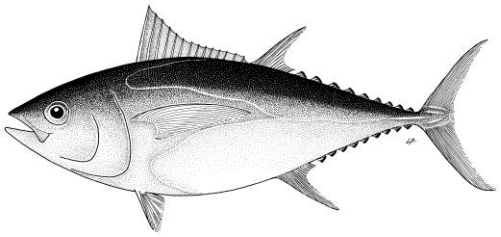

Table 1. Status of bigeye tuna (*Thunnus obesus*) in the Indian Ocean

Area[1]	Indicators		2022 stock status determination[4]
Indian Ocean	Catch 2023[2] (t)	105,369	79%
	Mean annual catch 2019-2023 (t)[3]	94,691	
	MSY (1,000 t) (80% CI)	96 (83 – 108)	
	F_{MSY} (80% CI)	0.26 (0.18 – 0.34)	
	SB_{MSY} (1,000 t) (80% CI)	513 (332 – 694)	
	F_{2021}/F_{MSY} (80% CI)	1.43 (1.10–1.77)	
	SB_{2021}/SB_{MSY} (80% CI)	0.25 (0.23 – 0.27)	

[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: 18.9%
[3]Including re-estimations of EU PS species composition for 2018 (only requested for stock assessment purposes)
[4]2021 is the final year that data were available for this assessment
*Estimated probability that the stock is in the respective quadrant of the Kobe Plot (**Table 2**), 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

	Stock overfished (SB_{2021} / SB_{MSY}<1)	Stock not overfished (SB_{2021} / SB_{MSY}≥ 1)
Stock subject to overfishing (F_{2021} / F_{MSY}≥ 1)	79%	17%
Stock not subject to overfishing (F_{2021} / F_{MSY}≤ 1)	2%	2%
Not assessed / Uncertain / Unknown		

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Stock status. No new stock assessment was carried out for bigeye tuna in 2024 and so the advice is based on the 2022 assessment. In the 2022 assessment, two models were applied to the bigeye stock (Statistical Catch at Size (SCAS) and Stock Synthesis (SS3)), with the SS3 stock assessment selected to provide scientific advice. The reported stock status is based on a grid of 24 model configurations designed to capture the uncertainty on stock recruitment relationship, longline selectivity, growth and natural mortality. Spawning

biomass in 2021 was estimated to be 25% (80% CI: 23-27%) of the unfished levels (**Table 1**) and 90% (75-105%) of the level that can support MSY. Fishing mortality was estimated at 1.43 (1.1-1.77) times the F_{MSY} level. Considering the characterized uncertainty, the assessment indicates that SB2021 is below SBMSY and that F_{2021} is above FMSY (79%). On the weight-of-evidence available in 2022, the bigeye tuna stock is determined to be **overfished** and **subject to overfishing** (**Table 2**).
As IOTC agreed on a bigeye Management Procedure (Res. 22/03) it should be noted that the stock assessment is not used to provide a recommendation on the TAC.

Management Procedure. A management procedure for Indian Ocean Bigeye tuna was adopted under Resolution 22/03 by the IOTC Commission in May 2022 and was applied to determine a recommended TAC for Bigeye tuna for 2024 and 2025. A review of evidence for exceptional circumstances, was also conducted following the adopted guideline (ref SC 2021 report appendix 6A) as per the requirements of Resolution 22/03. The review covered information pertaining to i) new knowledge about the stock, population dynamics or biology, ii) changes in fisheries or fisheries operations, iii) changes to input data or missing data, and iv) inconsistent implementation of the MP advice. The evaluation concluded that there were no exceptional circumstances requiring either further research or management action on the TAC calculated by the MP. Application of the MP in 2022 results in a recommended TAC of 80,583t per year for the period 2024-2025. The recommended TAC is 15% below the 2021 catch The MP was scheduled to be run in time for the 2024 SC, however, exceptional circumstances in relation to the CPUE series has delayed the TAC advice. The revised plan is to run the MP in early 2025 following new standardisation of the CPUE as specified for the adopted MP (see section 5.2). A special session of the SC is proposed for late February 2025 to update the TAC advice for 2026-2028 prior to the TCMP..

Outlook. Catch in 2021 (94,803 t) and 2022 (102,266 t), and 2023 (105,369 t) of bigeye tuna were above the recommended TAC for 2024 and 2025 from the application of the bigeye tuna MP. Achieving the objectives of the Commission for this stock will require effective implementation of the MP TAC advice by the Commission going forward, a requirement further emphasised by the current status of the stock estimated from the stock assessment to be overfished and subject to overfishing.

Management advice. The TAC recommended from the application of the MP specified in Resolution 22/03 and Resolution 23/04 is 80,583t / year for the period 2024-2025. The recommended TAC is 15% below the 2021 catch (this is constrained by the maximum TAC change).

The following key points should also be noted:

- **Main fisheries (mean annual catch 2019-2023)**: bigeye tuna are caught using purse seine (44.9%), followed by longline (35.1%) and line (13.3%). The remaining catches taken with other gears contributed to 6.8% of the total catches in recent years (**Fig. 1**).

- **Main fleets (mean annual catch 2019-2023)**: the majority of bigeye tuna catches are attributed to vessels flagged to Indonesia (26.7%) followed by EU (Spain) (15.1%) and Seychelles (15%). The 29 other fleets catching bigeye tuna contributed to 43.4% of the total catch in recent years (Fig. 2).

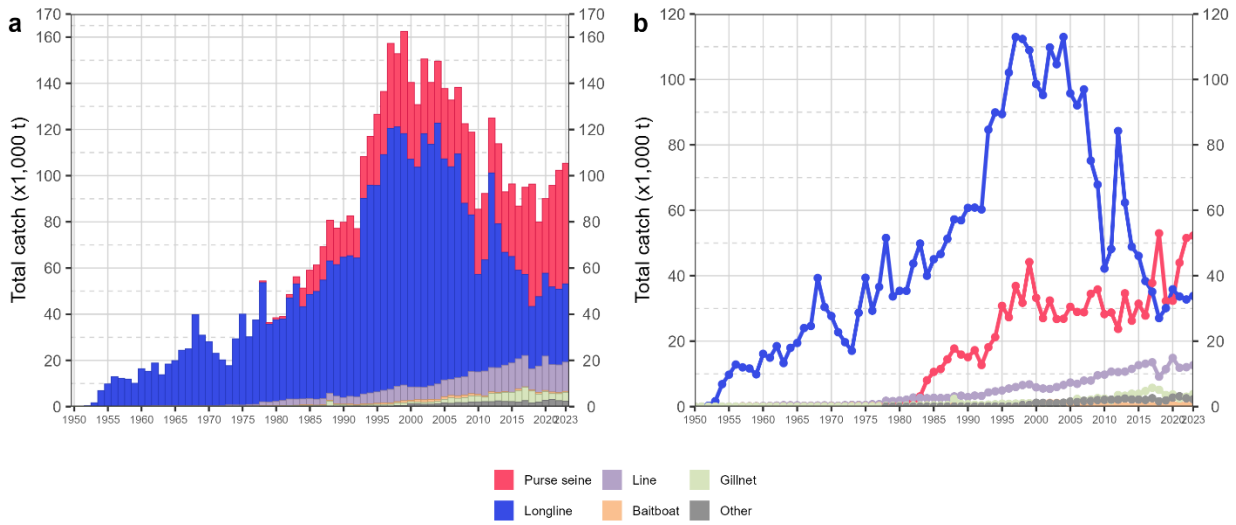


Fig. 1. Annual time series of (a) cumulative nominal catches (metric tonnes; t) by fishery group and (b) individual nominal catches (metric tonnes; t) by fishery group for bigeye tuna during 1950-2023.

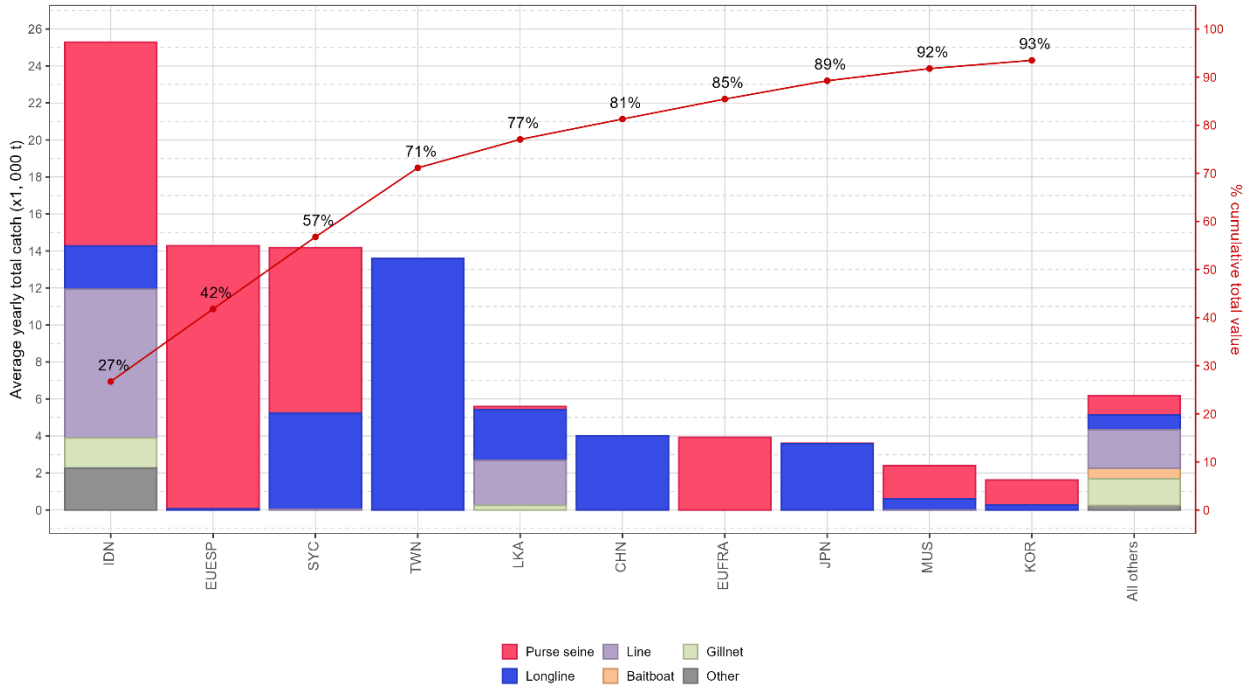
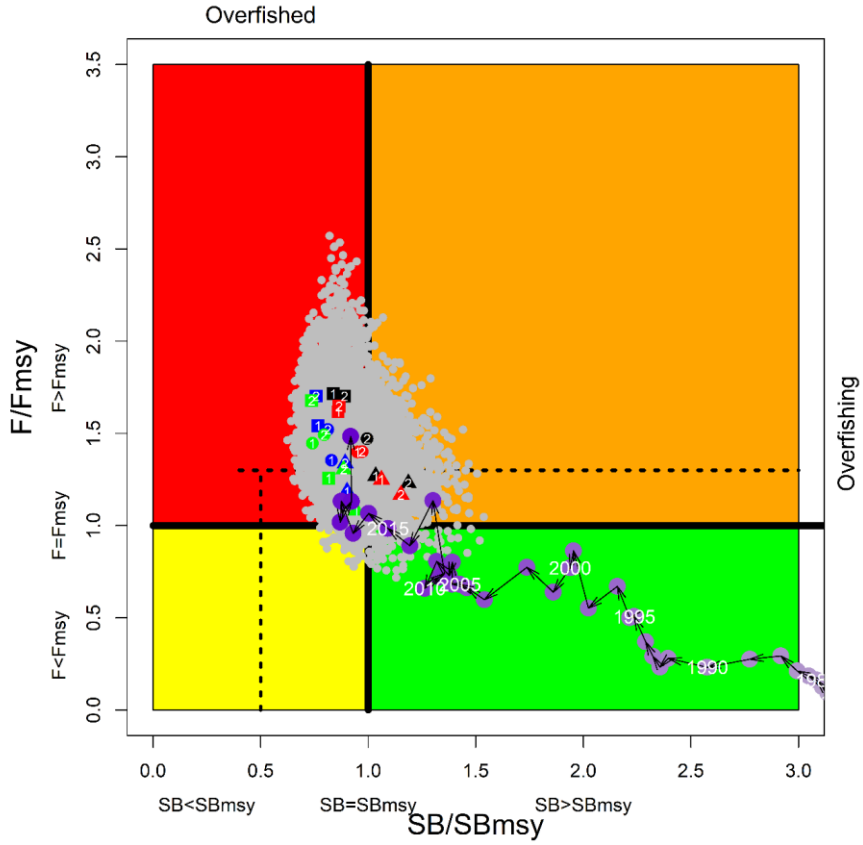


Fig. 2. Mean annual catches (metric tonnes; t) of bigeye tuna by fleet and fishery group between 2019 and 2023, with indication



of cumulative catches by fleet.

Fig. 3. Bigeye tuna: SS3 Aggregated Indian Ocean assessment Kobe plot. The coloured points represent stock status estimates from the 24 model options. Coloured symbols represent Maximum posterior density (MPD) estimates from individual models: square, circle, and Triangles represents alternative steepness options; black, red, blue, and green represents alternative growth and natural mortality option combination; 1,2, represents alternative selectivity options. The purple dot and arrowed line represent estimates of the reference model (the last purple dot represents the terminal year of 2021). Grey dots represent uncertainty from individual models. The dashed lines represent limit reference points for IO bigeye tuna (SBlim = 0.5 SBMSY and Flim = 1.4 FMSY)