APPENDIX 9
EXECUTIVE SUMMARY: LONGTAIL TUNA (2022)

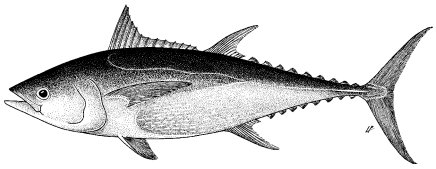

TABLE 1. Status of longtail tuna (*Thunnus tonggol*) in the Indian Ocean

Area[1]	Indicators		2020 stock status determination[3]
Indian Ocean	Catch 2021[2] (t)	135,962	76%
	Mean annual catch (2017-2021) (t)	133,499	
	MSY (t) (80% CI)	128,750 (99,902 – 151,357)	
	F_{MSY} (80% CI)	0.32 (0.15 – 0.66)	
	B_{MSY} (t) (80% CI)	395,460 (129,240 – 751,316)	
	$F_{current}/F_{MSY}$ (80% CI)	1.52 (0.751 – 2.87)	
	$B_{current}/B_{MSY}$ (80% CI)	0.69 (0.45 – 1.21)	

[1]Stock boundaries defined as the IOTC area of competence; [2]Proportion of catch fully or partially estimated for 2021: 30.6%;
[3]Status relates to the final year data are available for assessment.

Colour key	Stock overfished ($SB_{year}/SB_{MSY}< 1$)	Stock not overfished ($SB_{year}/SB_{MSY}\geq 1$)
Stock subject to overfishing ($F_{year}/F_{MSY}> 1$)	76%	2%
Stock not subject to overfishing ($F_{year}/F_{MSY}\leq 1$)	2%	20%
Not assessed/Uncertain		

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Stock status. No new assessment was conducted for longtail tuna in 2022 and so the results are based on the assessment carried out in 2020 using the Optimised Catch-Only Method (OCOM) (based on data up to 2018). Analysis using the OCOM 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} (76% of plausible models runs) (**Fig. 2**). Catches were above MSY between 2010 and 2018 but steadily declined from 2012 to less than 113,000 t in 2019, below the estimated MSY (**Fig. 1**). The F_{2018}/F_{MSY} ratio is slightly higher than previous estimates. The estimate of the B_{2018}/B_{MSY} ratio (0.69) was lower than in previous years, reflecting declining abundance. An assessment using a biomass dynamic model incorporating gillnet CPUE indices was also undertaken in 2020 and results were consistent with OCOM in terms of status. While the precise stock structure of longtail tuna remains unclear, recent research (IOTC-2020-SC23-11_Rev1) provides strong evidence of population structure of longtail tuna within the IOTC area of competence, with at least 3 genetic populations identified. This increases the uncertainty in the

assessment, which currently assumes a single stock of longtail tuna. Based on the weight-of-evidence currently available, the stock is considered to be both **overfished** and **subject to overfishing** (**Table 1**; **Fig. 1**).

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

Management advice. The catch in 2021 was above the estimated MSY and the exploitation rate has been increasing over the last few years, as a result of the declining abundance. Despite the substantial uncertainties, this suggests that the stock is being fished above MSY levels and that higher catches may not be sustained. A precautionary approach to management is recommended.

The following should be also noted:

- The Maximum Sustainable Yield estimate of around 128,750 t was exceeded between 2011 and 2018. Limits to catches are warranted to recover the stock to the B_{MSY} level;
- Limit reference points: the Commission has not adopted limit reference points for any of the neritic tunas under its mandate;
- Further work is needed to improve the reliability of the catch series. Reported catches should be verified or estimated, based on expert knowledge of the history of the various fisheries or through statistical extrapolation methods;
- Improvements in data collection and reporting are required if the stock is to be assessed using integrated stock assessment models;
- Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets (I.R. Iran, Indonesia, Pakistan, Sultanate of Oman and India), size compositions and life trait history parameters (e.g. estimates of growth, natural mortality, maturity, etc.);
- There is limited information submitted by CPCs on total catches, catch and effort and size data for neritic tunas, despite their mandatory reporting status. In the case of 2022 catches (reference year 2021) 31% 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.

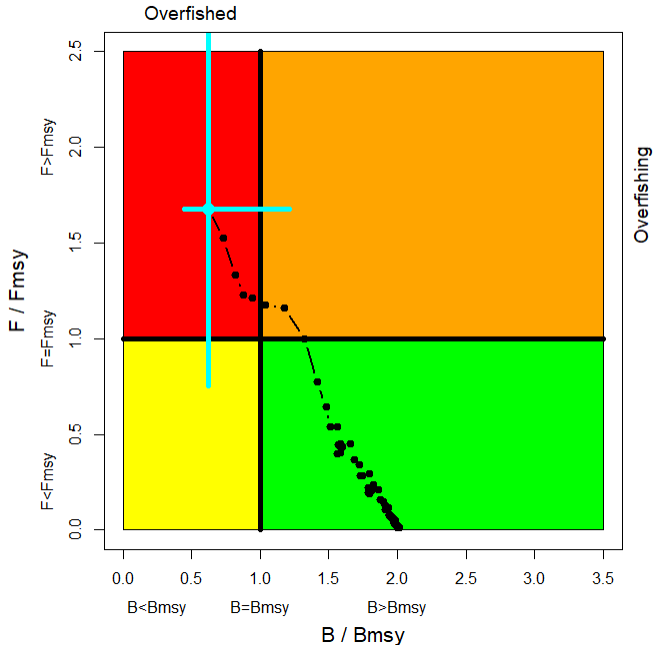

Fig. 1. Longtail tuna OCOM Indian Ocean assessment Kobe plot. The Kobe plot presents the trajectories (geometric mean) for the range of plausible model options included in the formulation of the final management advice. The blue cross represents the estimate of stock status in 2018 (median and 80% confidence interval)

Fisheries overview.

- **Main fisheries (mean annual catch 2017-2021)**: longtail tuna are caught using gillnet (68.4%), followed by line (15%) and purse seine (7.6%). The remaining catches taken with other gears contributed to 9% of the total catches in recent years (**Fig. 2**).

- **Main fleets (mean annual catch 2017-2021)**: the majority of longtail tuna catches are attributed to vessels flagged to I. R. Iran (41.7%) followed by Indonesia (20.2%) and Sultanate of Oman (16.5%). The 23 other fleets catching longtail tuna contributed to 21.6% of the total catch in recent years (**Fig. 3**).

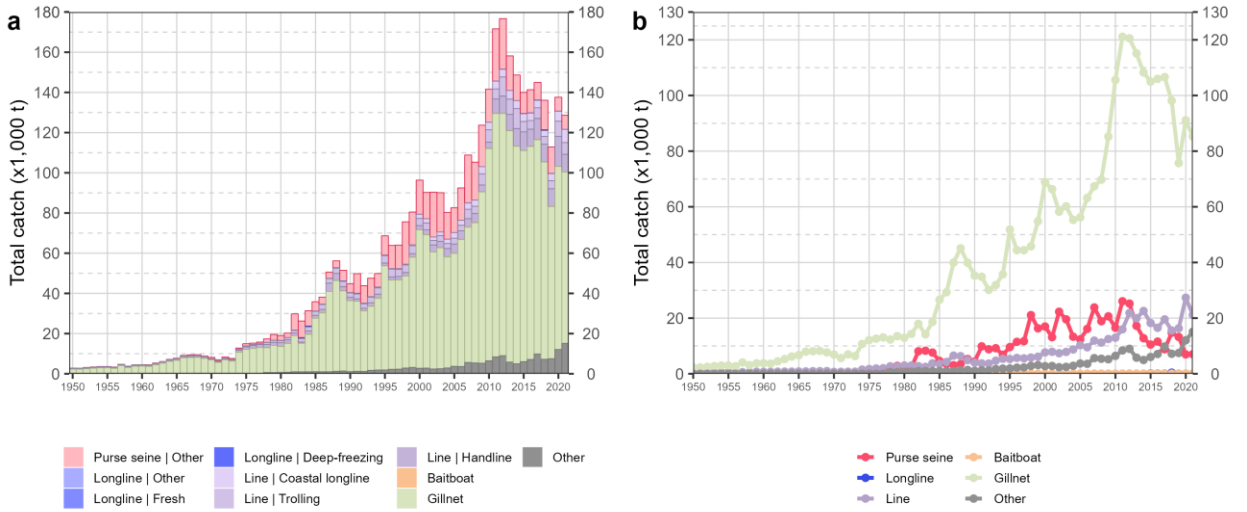

Fig. 2. Annual time series of (a) cumulative nominal catches (t) by fishery and (b) individual nominal catches (t) by fishery group for longtail tuna during 1950-2021

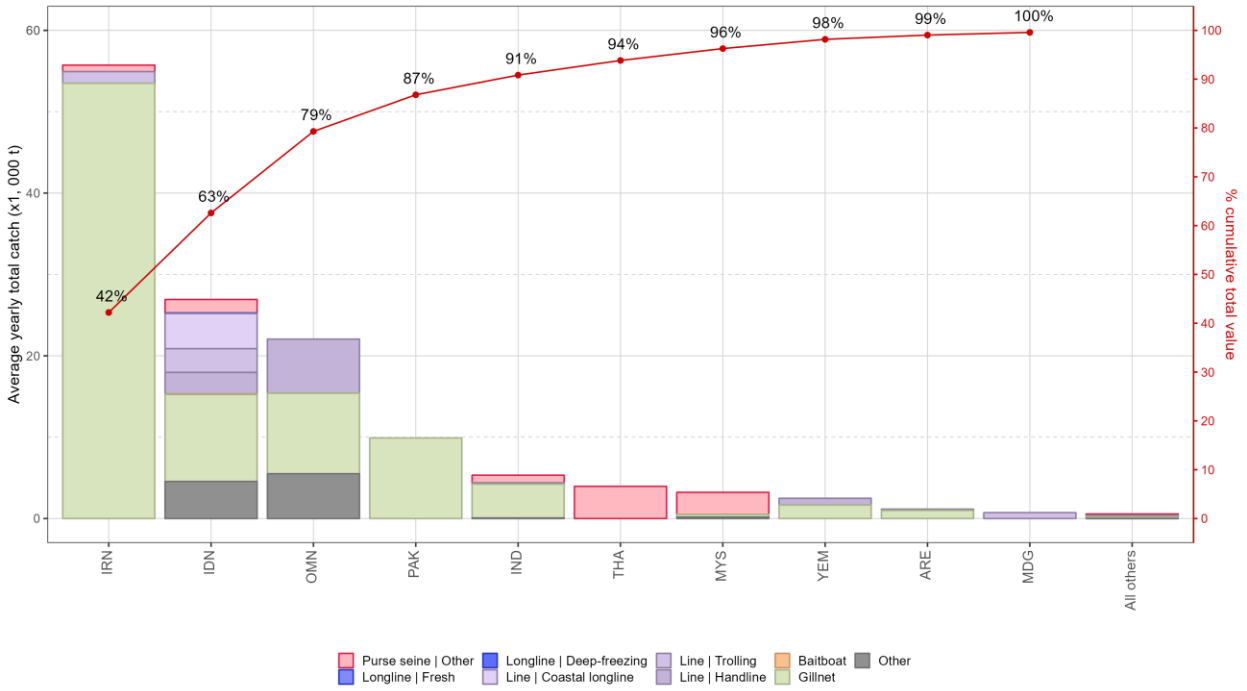

Fig. 3. Mean annual catches (t) of longtail tuna by fleet and fishery between 2017 and 2021, with indication of cumulative catches by fleet