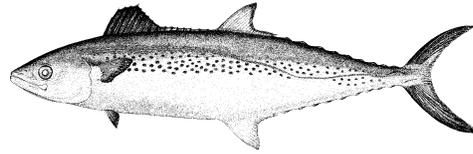


## APPENDIX 10

### EXECUTIVE SUMMARY: INDO-PACIFIC KING MACKEREL (2023)



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

Area <sup>1</sup>	Indicators		2021 stock status determination <sup>3</sup>
Indian Ocean	Catch (2022) (t) <sup>2</sup>	45,594	<b>35%</b>
	Mean annual catch (2018-2022) (t)	43,224	
	MSY (1,000 t)	46.9 (37.7–58.4)	
	F <sub>MSY</sub>	0.74 (0.56–0.99)	
	B <sub>MSY</sub> (1,000 t)	63.2 (42–94)	
	F <sub>current</sub> /F <sub>MSY</sub>	0.90 (0.78–2.01)	
	B <sub>current</sub> /B <sub>MSY</sub>	1.03 (0.46–1.19)	
	B <sub>current</sub> /B <sub>0</sub>	0.51 (0.23–0.60)	

<sup>1</sup>Stock boundaries defined as the IOTC area of competence;

<sup>2</sup>Proportion of catch fully or partially estimated for 2022: 76.1%;

<sup>3</sup>2019 is the final year that data were available for this assessment

Colour key	Stock overfished (SB <sub>year</sub> /SB <sub>MSY</sub> < 1)	Stock not overfished (SB <sub>year</sub> /SB <sub>MSY</sub> ≥ 1)
Stock subject to overfishing (F <sub>year</sub> /F <sub>MSY</sub> > 1)	16%	19%
Stock not subject to overfishing (F <sub>year</sub> /F <sub>MSY</sub> ≤ 1)	30%	35%
Not assessed/Uncertain/Unknown		

#### INDIAN OCEAN STOCK – MANAGEMENT ADVICE

**Stock status.** No new assessment was conducted in 2023 so results are based on the assessment conducted in 2021 using the data-limited techniques (CMSY and LB-SPR) (using data up to 2019). Analysis using the catch only method CMSY indicates the stock is being exploited at a rate that is below F<sub>MSY</sub> in recent years and that the stock appears to be above B<sub>MSY</sub>, although the estimates would be more pessimistic if the stock productivity is assumed to be less resilient. The analysis using the length-based approach (LB-SPR) was also undertaken in 2021 and the results are not conflicting with CMSY in terms of status. 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 51,600 t in 2009 and have since fluctuated between around 40,000 t and 48,000 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 has increased considerably since the late 2000s with recent catches fluctuating around estimated MSY, although the catch in 2021 was below the estimated MSY. This suggests that the stock is close to being fished at MSY levels and that higher catches may not be sustained despite the substantial uncertainty associated with the assessment, a precautionary approach to management is recommended.

The following should be also noted:

- The Maximum Sustainable Yield for the Indian Ocean is estimated to be 46,900 t with a range between 37,700–58,400 t
- 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.).
- 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;
- 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 2022 catches 76.1% 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](#).

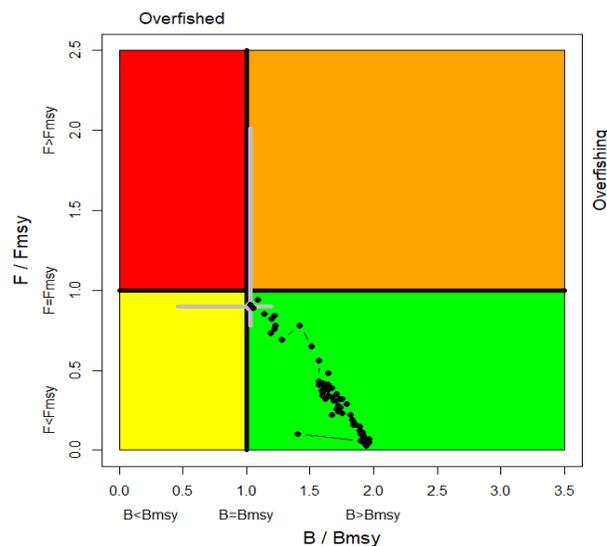
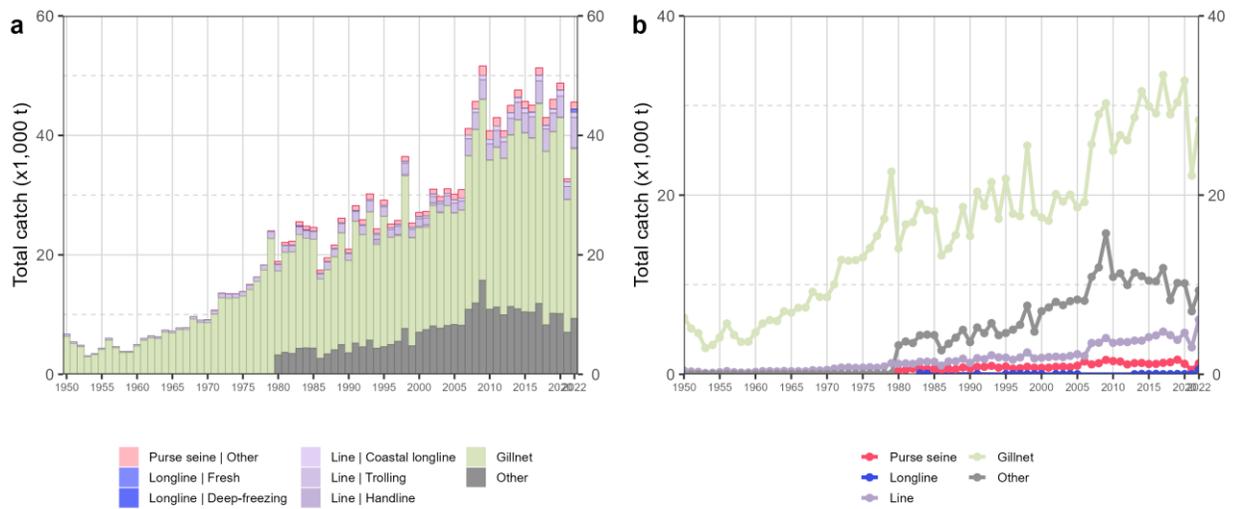


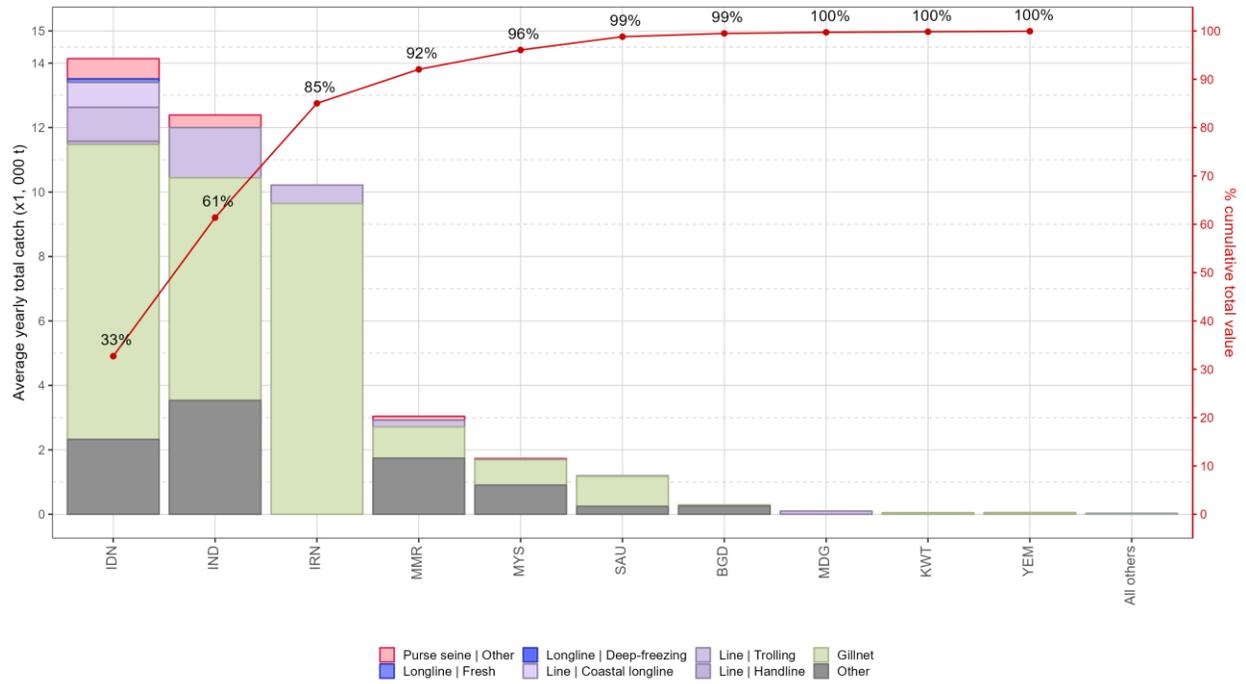
Fig. 1 Kobe plot of the CMSY assessment for the Indian Ocean spotted kingfish. The Kobe plot shows the trajectories (geometric mean) of the range of plausible model options included in the formulation of the final management advice. The grey cross represents the estimated stock status in 2021 (median and 80% confidence interval).

**Fisheries overview.**

- **Main fisheries (mean annual catch 2018-2022):** Indo-Pacific king mackerel are caught using gillnet (66%), followed by other (20.8%) and line (10.2%). The remaining catches taken with other gears contributed to 3% of the total catches in recent years (**Fig. 2**).
- **Main fleets (mean annual catch 2018-2022):** the majority of Indo-Pacific king mackerel catches are attributed to vessels flagged to Indonesia (32.7%) followed by India (28.7%) and I. R. Iran (23.6%). The 12 other fleets catching Indo-Pacific king mackerel contributed to 14.9% 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 Indo-Pacific king mackerel during 1950-2022



**Fig. 3.** Mean annual catches (t) of Indo-Pacific king mackerel by fleet and fishery between 2018 and 2022, with indication of cumulative catches by fleet.