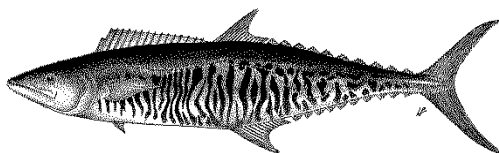


## APPENDIX 11

### EXECUTIVE SUMMARY: NARROW-BARRED SPANISH MACKEREL (2022)



**TABLE 1.** Status of narrow-barred Spanish mackerel (*Scomberomorus commerson*) in the Indian Ocean

Area <sup>1</sup>	Indicators		2021 stock status determination <sup>3</sup>
Indian Ocean	Catch (2021) <sup>2</sup> (t)	172,887	<b>73%</b>
	Mean annual catch (2017-2021) (t)	160,966	
	MSY (t) (80% CI)	157,760 (132,140–187,190)	
	F <sub>MSY</sub> (80% CI)	0.49 (0.25–0.87)	
	B <sub>MSY</sub> (t) (80% CI)	323,500 (196,260–592,530)	
	F <sub>current</sub> /F <sub>MSY</sub> (80% CI)	1.24 (0.65–2.13)	
	B <sub>current</sub> /B <sub>MSY</sub> (80% CI)	0.80 (0.54–1.27)	

<sup>1</sup>Stock boundaries defined as the IOTC area of competence; <sup>2</sup>Proportion of catch fully or partially estimated for 2021: 79%;

<sup>3</sup>Status relates to the final year data are available for 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)	<b>73%</b>	3%
Stock not subject to overfishing (F <sub>year</sub> /F <sub>MSY</sub> ≤ 1)	3%	22%
Not assessed/Uncertain		

#### INDIAN OCEAN STOCK – MANAGEMENT ADVICE

**Stock status.** No new assessment was conducted for narrow-barred Spanish mackerel 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). The OCOM model indicates that the stock is being exploited at a rate exceeding F<sub>MSY</sub> in recent years, and the stock appears to be below B<sub>MSY</sub>. An analysis undertaken in 2013 in the Northwest Indian Ocean (Gulf of Oman) indicated that overfishing is occurring in this area and that localised depletion may also be occurring<sup>1</sup>. While the precise stock structure of Spanish mackerel remains unclear, recent research (IOTC-2020-SC23-11\_Rev1) provides strong evidence of population structure of Spanish mackerel within the IOTC area of competence, with at least 4 genetic populations identified. This increases the uncertainty in the assessment, which currently assumes a single stock of Spanish mackerel.

Based on the weight-of-evidence available, the stock appears to be **overfished** and **subject to overfishing** (Table 1, Fig. 1). Catches since 2012 and also recent average catches for 2015-2019 have been above or close to the current MSY estimate of 157,760 t in recent years (Fig. 1).

<sup>1</sup> IOTC-2013-WPNT03-27

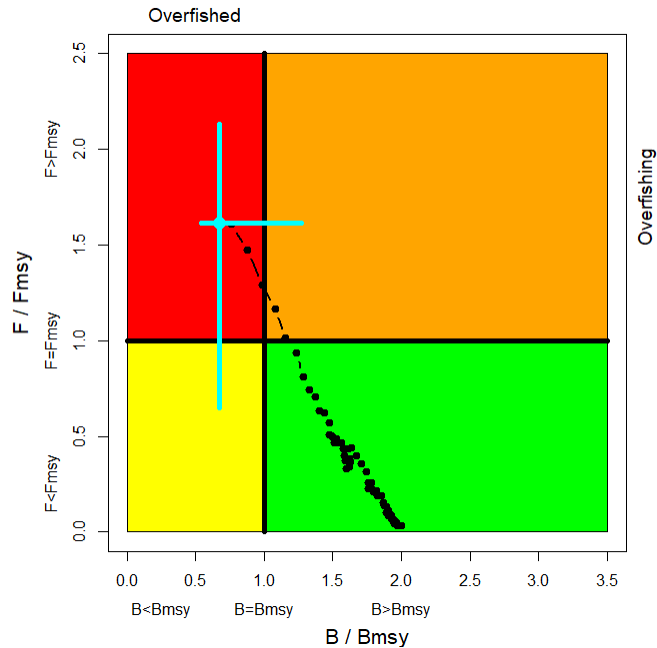
**Outlook.** There is considerable uncertainty about the estimate of total catches. The continued increase in annual catches in recent years has further increased the pressure on the Indian Ocean narrow-barred Spanish mackerel stock. The apparent fidelity of narrow-barred Spanish mackerel to particular 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 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 available gillnet CPUE shows a somewhat increasing trend in recent years although the reliability of the index as an abundance index remains unknown. Despite the substantial uncertainties, the stock is being fished above MSY levels and higher catches may not be sustained.

The following should also be noted:

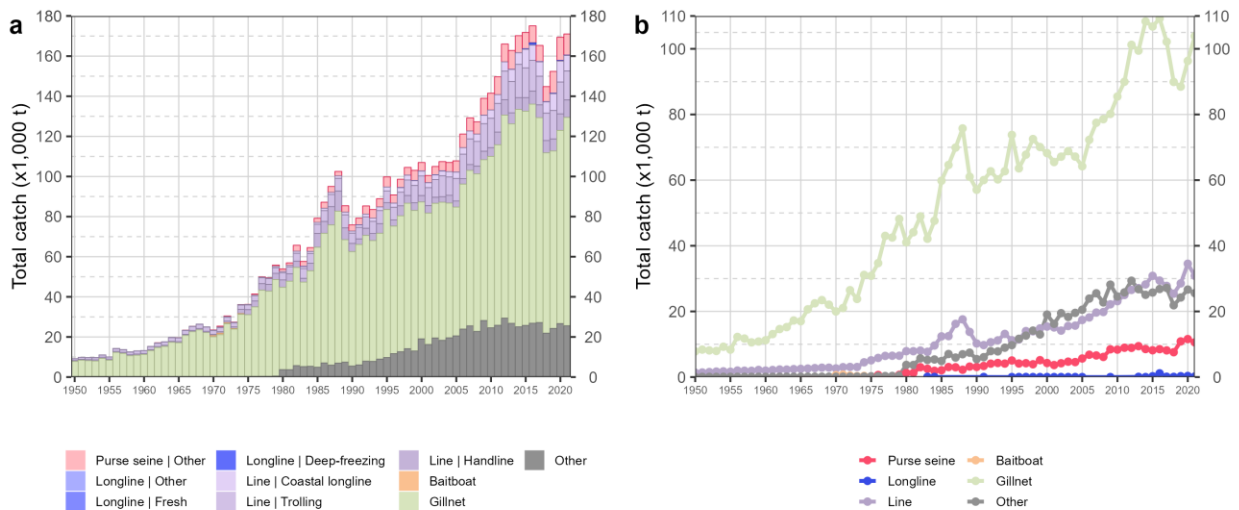
- Maximum Sustainable Yield for the Indian Ocean stock was estimated at 157,760 t, with catches for 2019 (159,457 t) exceeding this level;
- Limit reference points: the Commission has not adopted limit reference points for any of the neritic species under its mandate;
- Further work is needed to improve 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;
- Improvement in data collection and reporting is required if the stock is to be assessed using integrated stock assessment models;
- Given the increase in narrow-barred Spanish mackerel catch in the last decade, measures need to be taken to reduce catches in the Indian Ocean;
- 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.);
- 
- There is a lack of 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) 79% 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](#).



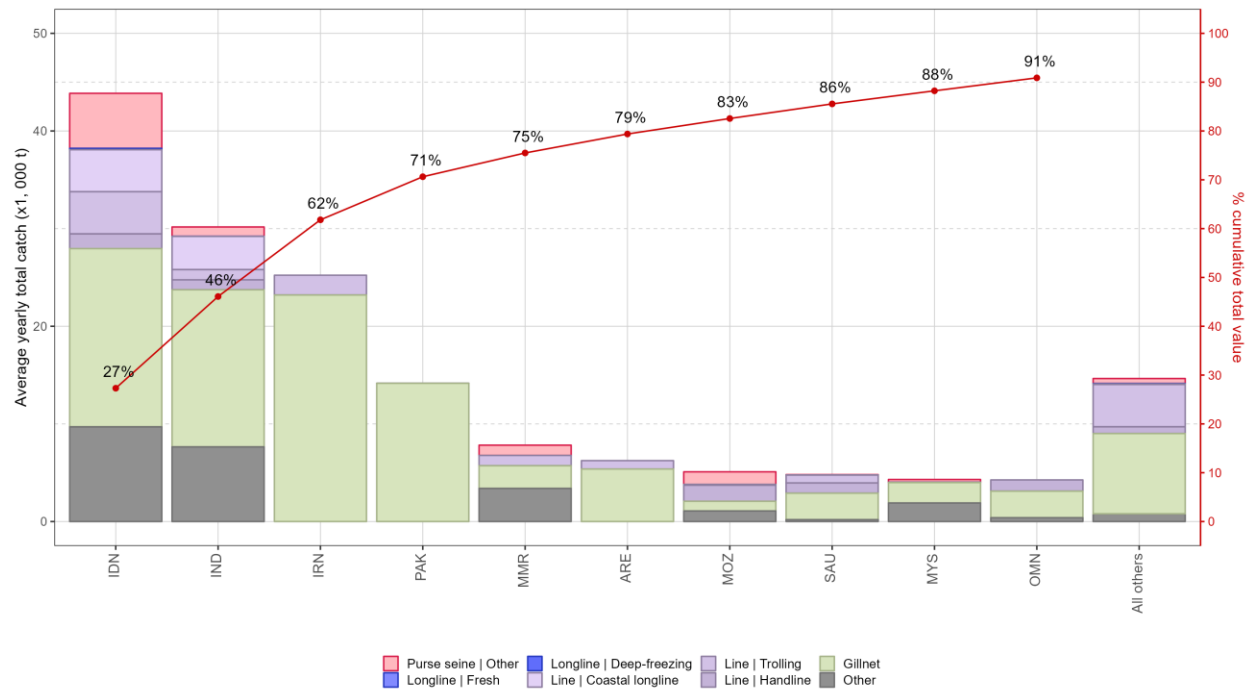
**Fig. 1.** Narrow-barred Spanish Mackerel OCOM Indian Ocean assessment Kobe plot. The Kobe plot presents the trajectories (geometric mean) for the range of plausible model options included in the formulation of the final management advice. The blue cross represents the estimate of stock status in 2018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

#### Fisheries overview.

- **Main fisheries (mean annual catch 2017-2021):** narrow-barred Spanish mackerel are caught using gillnet (59.7%), followed by line (18.3%) and other (15.8%). The remaining catches taken with other gears contributed to 6.2% of the total catches in recent years (**Fig. 2**).
- **Main fleets (mean annual catch 2017-2021):** the majority of narrow-barred Spanish mackerel catches are attributed to vessels flagged to Indonesia (27.3%) followed by India (18.7%) and I. R. Iran (15.7%). The 28 other fleets catching narrow-barred Spanish mackerel contributed to 38.3% 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 narrow-barred Spanish mackerel during 1950-2021



**Fig. 3.** Mean annual catches (t) of narrow-barred Spanish mackerel by fleet and fishery between 2017 and 2021, with indication of cumulative catches by fleet