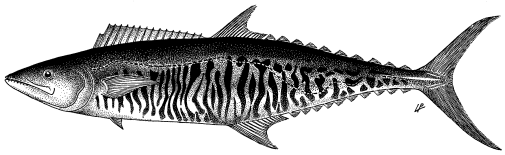
EXECUTIVE SUMMARY: NARROW-BARRED SPANISH MACKEREL

Indian Ocean Tuna Commission
Commission des Thons de l'Océan Indien
iotc ctoi



Status of the Indian Ocean narrow-barred Spanish mackerel (COM: *Scomberomorus commerson*) resource

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

Area[1]	Indicators		2016 stock status determination
Indian Ocean	Catch 2015[2]: Average catch 2011–2015:	152,798 t 151,227 t	**72%**
	MSY (1,000 t) [*]: F_{MSY} [*]: B_{MSY} (1,000 t) [*]: F_{2014}/F_{MSY} [*]: B_{2014} B_{MSY} [*]: B_{2014}/B_0 [*]:	131.1 [98.7–178.8] 0.34 [0.21–0.56] 326 [178–702] 1.21 [0.95–1.48] 0.95 [0.74–1.27] 0.47 [0.37–0.63]	

[1]Boundaries for the Indian Ocean stock assessment are defined as the IOTC area of competence.
[2] Proportion of catch estimated or partially estimated by IOTC Secretariat in 2015: 54%
Nominal catches represent those estimated by the IOTC Secretariat. If these data are not reported by CPCs, the IOTC Secretariat estimates total catch from a range of sources including: partial catch and effort data; data in the FAO FishStat database; catches estimated by the IOTC from data collected through port sampling; data published through web pages or other means; data reported by other parties on the activity of vessels; and data collected through sampling at the landing place or at sea by scientific observers.

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

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. OCOM techniques indicate that the stock is being exploited at a rate exceeding F_{MSY} in recent years, and the stock appears to be below B_{MSY} (72% of plausible model runs). Northwest Indian Ocean (Gulf of Oman Sea countries) indicate that localised depletion may be occurring from an analysis done in 2013, and overfishing is occurring in this area, though the degree of connectivity with other stocks remains unknown. Stock structure issues remain to be clarified for this stock. Based on the weight-of-evidence available, including the two different SRA approaches pursued in 2016, the stock appears to be **overfished** and **subject to overfishing** (Table 1, Fig. 2). Catches in 2015 and recent average catches are above the current MSY median estimates (131,000 t) (Fig. 1).

Outlook. There remains considerable uncertainty about stock structure and the total catches. The continued increase of annual catches for narrow-barred Spanish mackerel in recent years has further increased the pressure on the Indian Ocean stock as a whole, and the stock is overfished and subject to overfishing. 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, as was presented at a previous meeting (IOTC-2015-WPNT03-27). Research emphasis on improving indicators and exploration of stock structure and stock assessment approaches for data poor fisheries are warranted. There is a high to very high risk of exceeding MSY-based reference points by 2017 and 2024 if catches are maintained at current (2014) levels (100% risk that $B_{2017}<B_{MSY}$, and 100% risk that $F_{2017}>F_{MSY}$) (Table 2).

Management advice. There is a continued high risk of exceeding MSY-based reference points by 2024, even if catches are reduced to 80% of the 2014 levels (53% risk that $B_{2024}<B_{MSY}$, and 97% risk that $F_{2024}>F_{MSY}$). The modelled probabilities of the stock achieving levels consistent with the MSY reference levels (e.g. $B > B_{MSY}$ and $F<F_{MSY}$) in 2024 are 1 and 10%, respectively, for a future constant catch at 70% of current catch level. If the Commission wishes to recover the stock to levels above the MSY reference points, the Scientific Committee

recommends that catches should be reduced by at least 30% of current levels which corresponds to catches below MSY in order to recover the status of the stock.

The following should be noted:

- Maximum Sustainable Yield estimate for the whole Indian Ocean was estimated at 131,000, while 2015 catches (152,798 t) are exceeding this level.
- The change in advice from 2015 is due to the fact that the stock biomass has continued to decline, and that catches have continued to increase in 2013 and 2014, resulting in a lower probability of recovering the stock with last year's recommended reduction in catches.
- Reconstruction of the catch history needs to occur, as do improvements to annual catches submitted to the Secretariat.
- Improvement in data collection and reporting is required to assess the stock using more traditional stock assessment techniques.
- 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 (Table 2).
- Limit reference points: The Commission has not adopted limit reference points for any of the neritic tunas under its mandate.

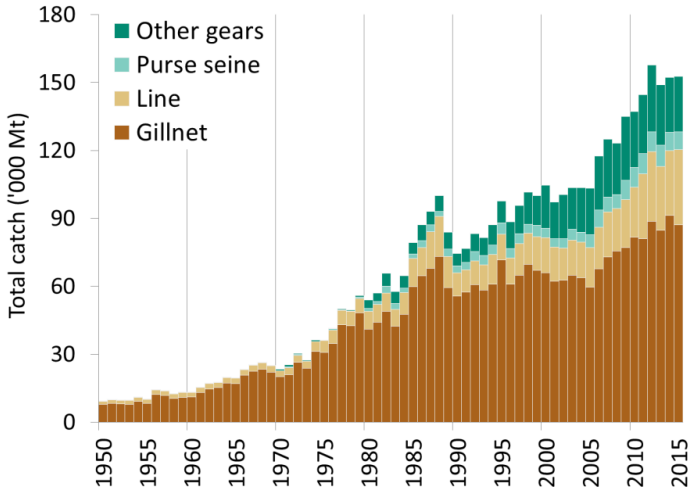


Fig. 1. Narrow-barred Spanish mackerel: Annual catches of narrow-barred Spanish mackerel by gear recorded in the IOTC database (1950–2015) (data as of October 2016).

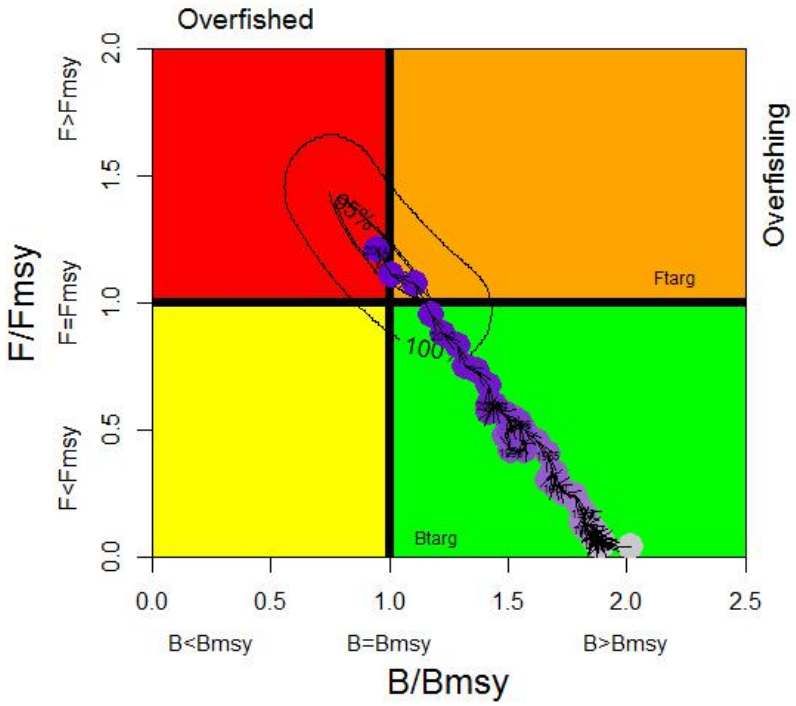


Fig. 2. Narrow-barred Spanish mackerel. OCOM Indian Ocean assessment Kobe plot. The Kobe plot presents the trajectories for the range of plausible model options included in the formulation of the final management advice. The trajectory of the geometric mean of the plausible model options is also presented.

Table 2. Narrow-barred Spanish mackerel: 2016 OCOM Indian Ocean assessment Kobe II Strategy Matrix. Probability (percentage) of plausible models violating the MSY-based reference points for five constant catch projections (2014 catch level, -10%, -20%, -30%, +10% and + 20%) projected for 3 and 10 years. Note: from the 2016 stock assessment using catch estimates at that time.

Reference point and projection timeframe	**Alternative catch projections (relative to 2014) and weighted probability (%) scenarios that violate reference point**					
	70% (108,306 t)	**80%** (123,778 t)	**90%** (139,251 t)	**100%** (154,723 t)	**110%** (170,195t)	**120%** (185,668 t)
$B_{2017} < B_{MSY}$	53	86	98	100	100	100
$F_{2017} > F_{MSY}$	97	100	100	100	100	100
$B_{2024} < B_{MSY}$	1	53	100	100	100	100
$F_{2024} > F_{MSY}$	10	97	100	100	100	100