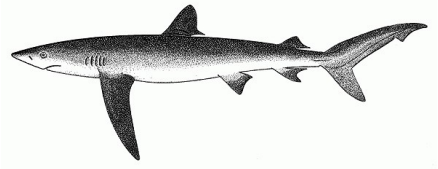
Food and Agriculture Organization of the United Nations

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

APPENDIX 23
EXECUTIVE SUMMARY: BLUE SHARK (2025)



CITES APPENDIX II species

Table 1. Status of blue shark (*Prionace glauca*) in the Indian Ocean

Area	Indicators		2025 stock status determination
Indian Ocean	Catch (2024) (t)	9,562[2]	100%
	Catch of NEI sharks (2024) (t)	15,742[3]	
	Mean annual catch (2020-2024) (t)	9,463	
	Mean annual catch of NEI sharks (2020-2024) (t)	24,929[3]	
	MSY (1,000 MT) (95% CI)[4]	30.81 (21.79 - 39.84)	
	F_{MSY} (95% CI)[4]	0.18 (0.18 - 0.18)	
	SB_{MSY} (1,000 MT) (95% CI)[4,5]	52.87 (37.38 - 68.37)	
	F_{2023}/F_{MSY} (95% CI)[4]	0.39 (0.21 - 0.57)	
	SB_{2023}/SB_{MSY} (95% CI)[4]	2.22 (1.76 - 2.68)	
	SB_{2023}/SB_0 (95% CI)[4]	0.73 (0.34 - 1.13)	

[1]Stock boundaries defined as the IOTC area of competence; [2]Proportion of catch fully or partially estimated for 2024: 0%; [3]NEI includes all other shark catches reported to the IOTC Secretariat, which may contain this species, i.e., AG38: Blue shark, shortfin mako, oceanic whitetip shark; RSK: Requiem sharks nei; SKH: Various sharks nei

[4]Estimates refer to the base case model using estimated catches

[5]Refers to fecund stock biomass

Colour key	Stock overfished (SB_{2023}/SB_{MSY}< 1)	Stock not overfished (SB_{2023}/SB_{MSY}≥ 1)
Stock subject to overfishing(F_{2023}/F_{MSY}> 1)	0%	0.0%
Stock not subject to overfishing (F_{2023}/F_{MSY}≤ 1)	0%	100%
Not assessed/Uncertain		

Table 2. Blue shark: IUCN threat status of blue shark (*Prionace glauca*) in the Indian Ocean (Sources: Stevens 2009, Rigby et al., 2019).

Common name	Scientific name	IUCN threat status[6]		
		Global status	WIO	EIO
Blue shark	*Prionace glauca*	Near Threatened	–	–

IUCN = International Union for Conservation of Nature; WIO = Western Indian Ocean; EIO = Eastern Indian Ocean

[6]The process of the threat assessment from IUCN is independent from the IOTC and is presented for information purposes only

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status.

Two stock assessments were carried out for blue shark (BSH) in 2025: one using a Bayesian state-space surplus production model (JABBA) and another using an integrated age-structured model (SS3). Both assessments used data (catch and indices of abundance) from 1950 to 2023, although the model structure was inherently different. The SS3 model included annual length composition data where available. Uncertainty in data inputs and model configuration were explored through sensitivity analyses. All models produced similar results, suggesting the stock is currently **not overfished** and **not subject to overfishing** (**Figure 3**) with respect to MSY related reference points (although the IOTC has not adopted reference points for this species).

A base case model, using SS3, was selected to provide management advice based on the best available Indian Ocean biological data, parameter estimates, consistency of standardised CPUE relative abundance series, model fits/diagnostics and the spatial extent of the data (**Fig. A** 1, **Table A 1**).

The major sources of uncertainty identified in the current model are based on the estimated and reported catches. Nominal reported catches were considered unrealistic, and several alternative catch series were developed for this assessment. Recent revisions of reported catch related to large portions of the historical catch have resulted in a wide range of estimates, it is expected that these revisions will continue soon. The WP suggests further research regarding the estimation of non-reported and under reported catch.

All of the CPUE indices of abundance accepted for consideration in the assessment are largely consistent except for the CPUEs from South Africa and Portugal which show a declining trend in recent years, compared to more stable trends from the other CPCs.

The base case models used the GAM-based catch history estimates (lower estimates for catch – "D1 GAM LOW") and CPUE series from EU-Spain, Taiwan,China and Japan, and a starting year of 1950. Model assumptions regarding the parameterization of steepness, natural mortality and the estimated selectivity were considered with respect to their sensitivity to the major axes of uncertainty identified.

The ecological risk assessment (ERA) conducted for the Indian Ocean by the WPEB and SC in 2018 consisted of a semi-quantitative risk assessment analysis to evaluate the resilience of shark species to the impact of a given fishery by combining the biological productivity of the species and its susceptibility to each fishing gear type. Blue sharks received a medium vulnerability ranking (No. 10) in the ERA rank for longline gear because it was estimated as the most productive shark species, but was also characterized by the second highest susceptibility to longline gear. Blue shark was estimated as not being susceptible thus not vulnerable to purse seine gear.

The current IUCN threat status of 'Near Threatened' applies to blue sharks globally (**Table 2**). Information available on this species has been improving in recent years. Blue sharks are commonly taken by a range of fisheries in the Indian Ocean and in some areas they are fished in their nursery grounds. Due to their life history characteristics – they live until at least 25 years, mature at 4–6 years, and have 25–50 pups every year – they are considered to be the most productive of the pelagic sharks. On the weight-of-evidence available in 2025, the stock status is determined to be **not overfished** and **not subject to overfishing** (**Table 1**).

Outlook. Increasing effort could result in declines in biomass. The Kobe II Strategy Matrix (Table 3) provides the probability of exceeding reference levels in the short (3 years) and long term (10 years) given a range of percentage changes in catch.

Management advice. The SS3 assessment indicates current catches are near MSY, and significant increases could result in decreasing biomass and the stock becoming subject to overfishing in the future (Table 3). The stock should be closely monitored, especially with respect to overall catch and discard reporting. While mechanisms exist for encouraging CPCs to comply with their recording and reporting requirements (Resolution 16/06), these need to be further implemented by the Commission, so as to better inform scientific advice in the future.

The following key points should also be noted:

- **Maximum Sustainable Yield (MSY)**: The MSY estimate for the Indian Ocean blue shark stock is approximately, 31,000t (95% CI is 21.79 - 39.84 thousand tonnes).
    - The current stock assessment suggests that catch amounts near the estimated MSY values are likely supportable in the near future. However, noting that firstly, the current MSY catch estimates from the assessment model are based on nominal reported catch (which are currently under revision and likely under-reported based on sharks not reported to species) and secondly, key uncertainties in other model inputs and parameters, it is recommended that there is no increase in fishing pressure until such uncertainties are resolved.
    - ~~o~~ It is expected that as the nominal reported catch is revised, estimates of MSY and other parameters will change.
    - The upcoming blue shark MSE process will address the uncertainties in the stock assessment.

- **Reference points**: The Commission has not adopted reference points or harvest control rules for any shark species.
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- **Main fisheries (mean annual retained catch 2020-2024)**: blue shark are caught using longline (81.4%), followed by line (13.9%) and purse seine (3.5%). The remaining catches taken with other gears contributed to 1.2% of the total catches in recent years (**Fig. 1**).
- **Main fleets (mean annual retained catch 2020-2024)**: the majority of blue shark catches are attributed to vessels flagged to Taiwan,China (29.8%) followed by EU (Spain) (29.5%) and Indonesia (17.8%). The 15 other fleets catching blue shark contributed to 22.9% of the total catch in recent years (**Fig 2**).

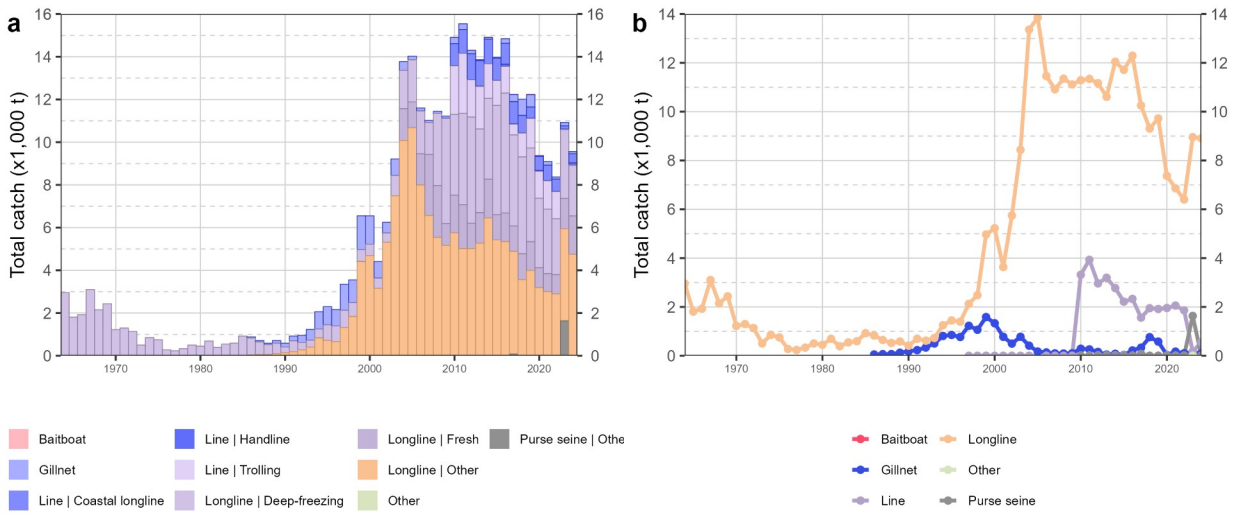

Figure 1 Annual time series of (a) cumulative retained catches (metric tonnes; t) by fishery and (b) individual retained catches (metric tonnes; t) by fishery group for blue shark during 1950-2024. FS = free-swimming school; LS = school associated with drifting floating objects. Purse seine | Other: coastal purse seine, purse seine of unknown association type, ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

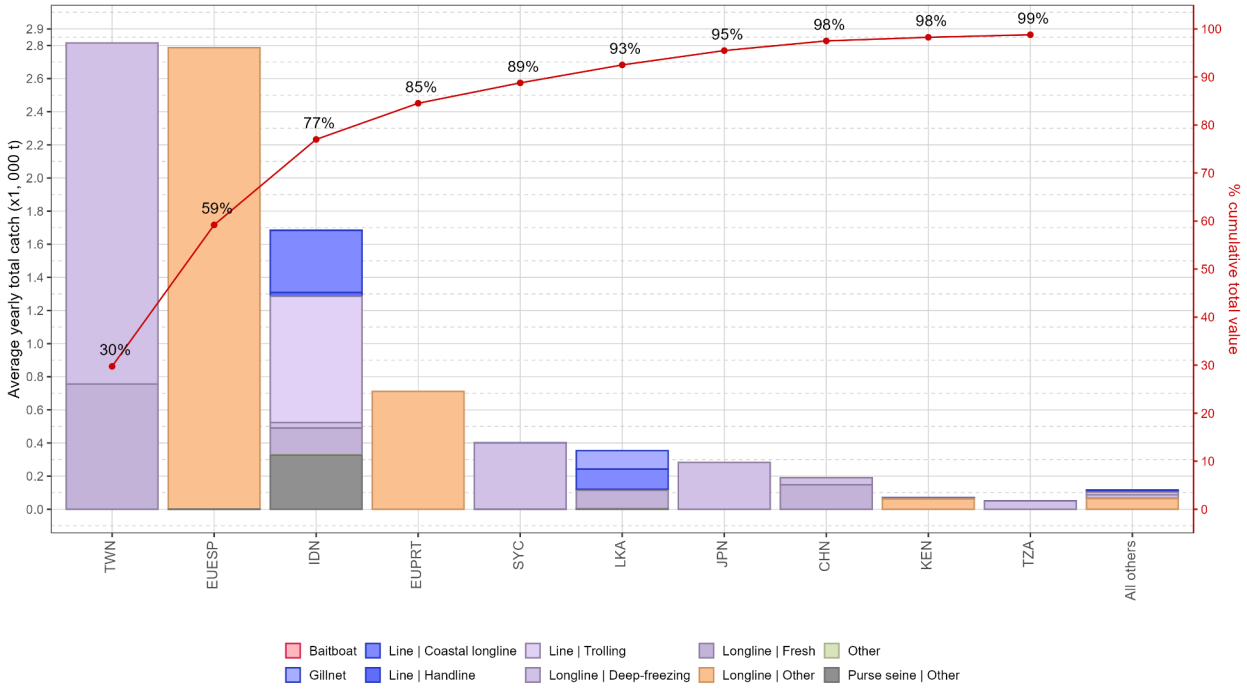

Figure 2: Mean annual retained catches (metric tonnes; t) of blue shark by fleet and fishery between 2020 and 2024, with indication of cumulative catches by fleet. FS = free-swimming school; LS = school associated with drifting floating objects. Purse seine | Other: coastal purse seine, purse seine of unknown association type, ring net; Longline | Other: swordfish and sharks-

targeted longlines; Other: all remaining fishing gears

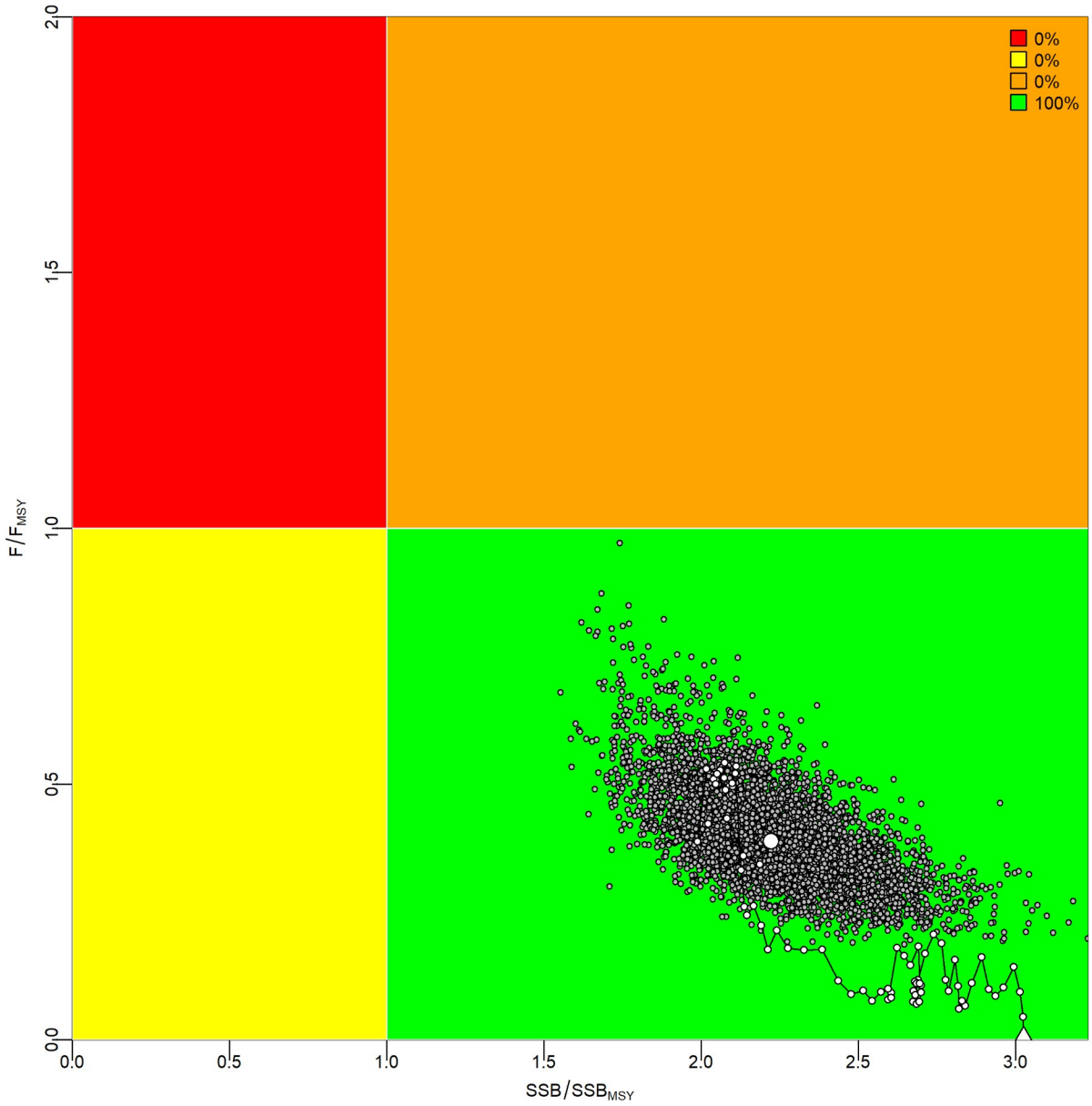

Fig. 3. Blue shark: Aggregated Indian Ocean stock assessment Kobe plot (based on SS3) for the estimate based on 2025 assessment base case model. (base case model with trajectory and uncertainty in the terminal year).

Table 3. Blue shark: Aggregated Indian Ocean assessment Kobe II Strategy Matrix. Probability (percentage) of violating the MSY-based reference points for nine constant catch projections using the base case model (average catch level from 2021-2023)* (25,877MT), ± 10%, ± 20%, ± 30% and ± 40%) projected for 3 and 10 years

Kobe II Strategy Matrix: Probability (%) of violating MSY-based reference points

	Alternative TAC projections								
Reference point and projection timeframe	**60% (15,526 t)**	**70% (18,113 t)**	**80% (20,701 t)**	**90% (23289 t)**	**100% (25877 t)**	**110% (28464 t)**	**120% (31052 t)**	**130% (33640 t)**	**140% (36227 t)**
B2028<BMSY	0	0	0	0	0	0	0	0	0
F2028>FMSY	0	0	0	0	0	0	0	0	1
B2035<BMSY	0	0	0	0	0	0	0	0	1
F2035>FMSY	0	0	0	0	0	0	2	5	12

*Average catch level and respective % changes refer to the estimated catch series used in the final base case model (IOTC-2025-WPEB21(AS)-30)

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