Food and Agriculture Organization of the United Nations

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

EXECUTIVE SUMMARY: KAWAKAWA (2021)

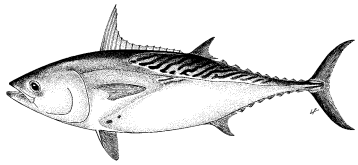

Table 1. Status of kawakawa (*Euthynnus affinis*) in the Indian Ocean

Area[1]	Indicators		2021 stock status determination
Indian Ocean	Catch 2020[2] (t) Average catch 2016-2020 (t)	143,211 151,150	50%
	MSY (t) (80% CI) F_{MSY} (80% CI) B_{MSY} (t) (80% CI) $F_{current}/F_{MSY}$ (80% CI) $B_{current}/B_{MSY}$ (80% CI)	148,825 (124,114 – 222,505) 0.44 (0.21–0.82) 355,670 (192,080 – 764,530) 0.98 (0.85–1.11) 1.13 (0.75–1.58)	

[1] Boundaries for the Indian Ocean stock assessment are defined as the IOTC area of competence
[2] Proportion of 2020 catch fully or partially estimated by IOTC Secretariat: 49.7%

Colour key	Stock overfished (B_{year}/B_{MSY}< 1)	Stock not overfished (B_{year}/B_{MSY}≥ 1)
Stock subject to overfishing (F_{year}/F_{MSY}> 1)	35%	15%
Stock not subject to overfishing (F_{year}/F_{MSY}≤ 1)	0%	50%
Not assessed/Uncertain		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was conducted for kawakawa in 2021 and so the results are based on the assessment carried out in 2020 using data-limited assessment techniques. The OCOM model indicated that the fishing mortality F was very close to F_{MSY} (F/F_{MSY}=0.98) and the B above B_{MSY} (B/B_{MSY}=1.13). The estimated probability of the stock currently being in green quadrant of the Kobe plot is about 50%. Due to the quality of the data being used, the simple modelling approach employed in 2020, and the large increase in kawakawa catches over the last decade (**Fig. 1**), measures need to be taken in order to reduce the level of catches which have surpassed the estimated MSY levels for all years since 2011. Based on the weight-of-evidence available, the kawakawa stock for the Indian Ocean is classified as **not overfished** and **not subject to overfishing** (**Table 1**, **Fig. 2**).

Outlook. There is considerable uncertainty about stock structure and the estimate of total catches. Due to the uncertainty associated with catch data (e.g., 53% of catches partially or fully estimated by the IOTC Secretariat in 2019) and the limited number of CPUE series available for fleets representing a small proportion of total catches, only data poor assessment approaches can currently be used. Aspects of the fisheries for this species, combined with the lack of data on which to base a more complex assessment (e.g., integrated models) are a cause for considerable concern. In the interim, until more traditional approaches are developed, data-poor approaches will be used to assess stock status. Continued increase in the annual catches for kawakawa is also likely to further increase the pressure on the Indian Ocean stock. 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 assessment models rely on catch data, which are considered to be highly uncertain. The catch in 2019 was equal to the estimated MSY. The available gillnet CPUE of kawakawa showed a somewhat increasing trend although the reliability of the index as abundance indices remains unknown. Despite the substantial uncertainties, the

stock is probably very close to being fished at MSY levels and that higher catches may not be sustained in the longer term. A precautionary approach to management is recommended.

The following should be also noted:

- The Maximum Sustainable Yield estimate for the Indian Ocean is estimated to be 148,825 t with a range between 124,114 and 222,505 t and so catch levels should be reduced in future to prevent the stock becoming overfished.
- 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.
- **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.).
- Given the limited information submitted by CPCs on total catches, catch and effort and size data for neritic tunas, despite their mandatory reporting status, the IOTC Secretariat was required to estimate 53% of the catches (in 2020, with reference year 2019), 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.
- **Main fisheries (mean annual catch 2016-2020)**: kawakawa are caught mainly by gillnets (~50%), followed by purse seines (including coastal ones, ~30%) and lines (~16%) (**Fig. 1**).
- **Main fleets (mean annual catch 2016-2020)**: catches of kawakawa are highly concentrated, with most catches attributed to vessels flagged to Indonesia (28.3%) followed by I. R. Iran (23.6%) and India (21.4%). The 32 other fleets catching kawakawa contributed to 26.3% of the total catch in recent years.

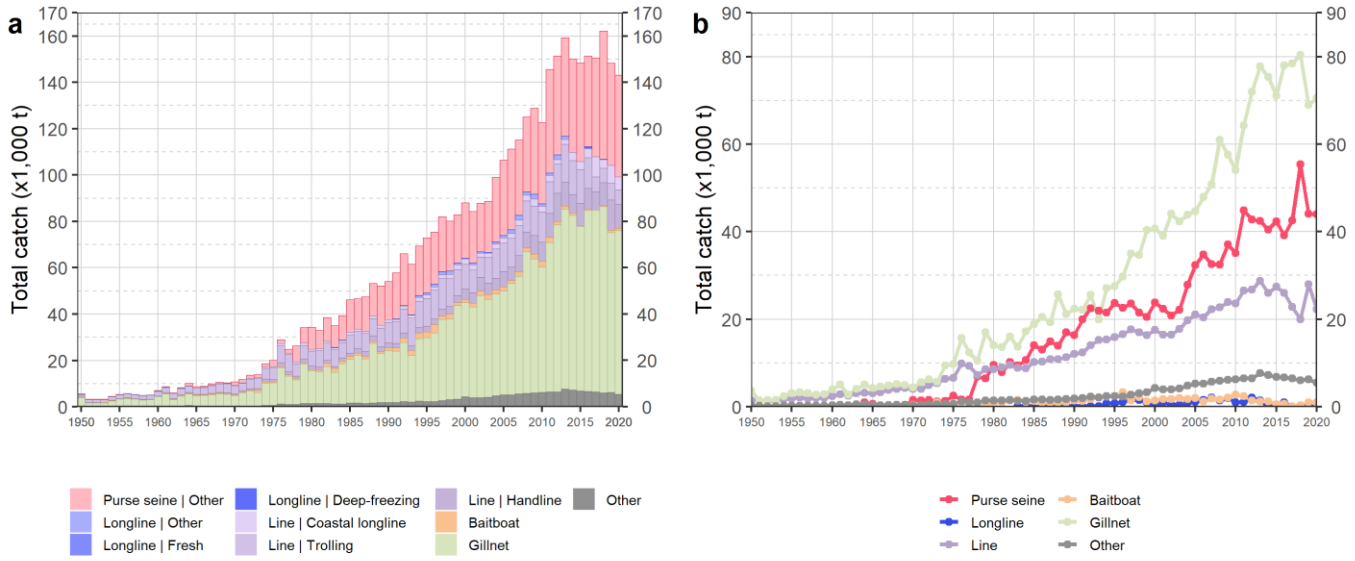

Fig. 1. Annual time series of (a) cumulative nominal catch (t) by fishery and (b) individual nominal catches (t) by fishery group for kawakawa during 1950-2020. Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

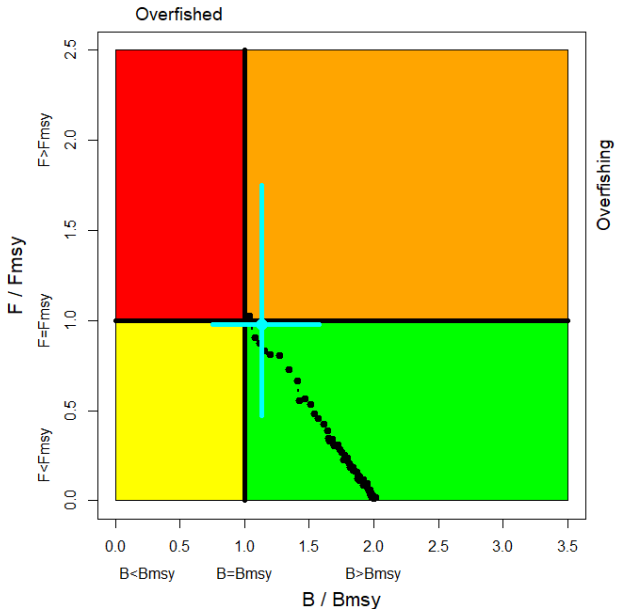

Fig. 2. OCOM Indian Ocean assessment Kobe plot for kawakawa. The Kobe plot presents the trajectories (geometric mean) for the range of plausible model options included in the formulation of the final management advice. The blue cross represents the estimate of stock status in 2018 (median and 80% confidence interval)