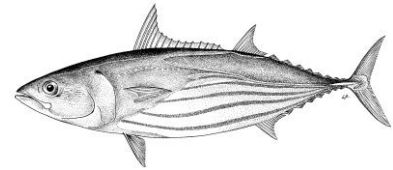DRAFT RESOURCE STOCK STATUS SUMMARY – SKIPJACK TUNA

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

Status of the Indian Ocean skipjack tuna (SKJ: *Katsuwonus pelamis*) resource

TABLE 1. Skipjack tuna: Status of skipjack tuna (*Katsuwonus pelamis*) in the Indian Ocean.

Area[1]	Indicators		2017 stock status[4] determination
Indian Ocean	Catch 2018[2]: Average catch 2014–2018:	607,701 t (606,197 t)[5] 484,993 t (484,692 t)[5]	**47%***
	Yield$_{40\%SSB}$ (1000 t) (80% CI): $C_{2016}/C_{40\%SSB}$ (80% CI): SB_{2016} (1000 t) (80% CI): Total Biomass B_{2016} (1000 t) (80% CI): $SB_{2016}/SB_{40\%SSB}$ (80% CI): SB_{2016}/SB_0 (80% CI): $E^3_{40\%SSB}$ (80% CI): SB_0 (80% CI):	510.1 (455.9–618.8) 0.88 (0.72-0.98) 796.66 (582.65-1,059.29) 910.4 (873.6-1195) 1.00 (0.88–1.17) 0.40 (0.35–0.47) 0.59 (0.53-0.65) 2,015,220 (1,651,230–2,296,135)	

[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 2018: 12%

[3] E is the annual harvest rate.

[4] The stock status refers to the most recent years' data used in the last assessment conducted in 2017.

[5] Considering the alternative purse seine log-associated catches composition for the EU fleet in 2018 as per IOTC-2019-WPTT21-R[E].

* Estimated probability that the stock is in the respective quadrant of the Kobe plot (shown below), derived from the confidence intervals associated with the current stock status.

Colour key	Stock overfished ($SB_{year}/SB_{40\%}< 1$)	Stock not overfished ($SB_{year}/SB_{40\%}\geq 1$)
Stock subject to overfishing($F_{year}/F_{40\%}> 1$)	**38%**	2%
Stock not subject to overfishing ($F_{year}/F_{40\%}\leq 1$)	13%	47%
Not assessed/Uncertain		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was carried out for skipjack tuna in 2019, thus, stock status is determined on the basis of the 2017 assessment and other indicators presented in 2019. The 2017 stock assessment model results differ substantively from the previous (2014 and 2011) assessments. The main reasons for this are: (i) the correction of an error in specifying selectivity for small fish in the previous assessments, (ii) the addition of tag-release mortality in the model and (iii) assuming effort creep of 1% per year since 1995 for the standardized European purse seine CPUE. The final overall estimate of stock status indicates that the stock is at the target biomass reference point and that the current and historical fishing mortality rates are estimated to be below the target. Over the history of the fishery, biomass has been well

above and the fishing mortality has been well below the established limit reference points. The median value of Catch at the target fishing mortality ($C_{SB40\%}$) from the model runs investigated is 510,090 t with a range between 455,920 and 618,760t. Current spawning stock biomass relative to unexploited levels is estimated at 40% (**Table 1**). Catch in 2018 (≈607,401 t) is in the upper range of the estimated range of $C_{SB40\%}$ (**Table 1**). The average catch over the previous five years (2014–18; ≈ 484,993 t) is at the lower range of the estimated range of $C_{SB40\%}$. Thus, on the weight-of-evidence available in 2017, the skipjack tuna stock is determined to be **not overfished** and is **not subject to overfishing** (**Table 1**).

Outlook. Total catches in 2018 were 29% larger than the resulting catch limit from the skipjack HCR for the period 2018-2020. It should be noted that skipjack catches for most gears have increased from 2017 to 2018 (+43% for purse seine (log-associated), +13% for gillnet and +13% for baitboats). In particular, due to Resolution 19/01, an increase in fishing operations on FADs by purse seine fleets has been increased, with the associated increase in skipjack catch. CPUE fluctuations coincide with environmental signals at inter-annual timescale (e.g., Indian Ocean Dipole). Due to its specific life history attributes, skipjack can respond quickly to ambient foraging conditions driven by ocean productivity. Environmental indicators should be closely monitored to inform on the potential increase/decrease of stock productivity.

Management advice. Based on the results of the stock assessment of skipjack tuna in 2017, the Commission, following Resolution 16/02, adopted an annual catch limit of 470,029 tonnes for the years 2018 to 2020. Total catches in 2018 (607,701 t) were 29% larger than the catch limit generated by the Harvest Control Rule (470,029 t) which applies to the years 2018–2020, and there has been an increasing trend in catches over the past 3 years. The Commission needs to ensure that catches of skipjack in the 2018–2020 period do not exceed the agreed limit.

Following Resolution 16/02, the annual catch limit for the period 2018-2020 was established at 470,029 t.

The SC has included in its programme of work further development of Management Strategy Evaluation (MSE) for the IOTC Skipjack tuna fishery including, but not limited to: refinement of operating model(s) used, specifications for the assessment and data to be used, and alternative management procedures. The aim of this programme of work is to develop the fully specified management procedure (harvest strategy) for Skipjack including the revision of the HCR as may be required.

It should also be noted that:

- **Reference points:** Commission in 2016 agreed to Resolution 16/02 on *harvest control rules for skipjack tuna in the IOTC area of competence;*
- **Fishing mortality**: Current fishing mortality was considered to be below the target reference point, and also below the limit reference point (**Fig. 2**) as per Resolution 15/10;
- **Biomass**: Current spawning biomass was considered to be at the target reference point of 40% of SB_0, and above the limit reference point of $0.2*SB_0$ (**Fig. 2**) as per Resolution 15/10;
- **Main fishing gear** (average catches 2014-18): Purse seine ≈40% (FAD associated school ≈39% and free swimming school ≈1%); Gillnet ≈21%; Pole-and-line ≈19%; Other ≈20% (**Fig. 1(a-c)**);

Main fleets (average catches 2014-18): Indonesia ≈17%; European Union ≈24% (EU-Spain: ≈17%; EU-France: ≈6%); ≈Maldives 16%; Seychelles ≈12%; Sri Lanka ≈10%; ≈I.R. Iran 9%.
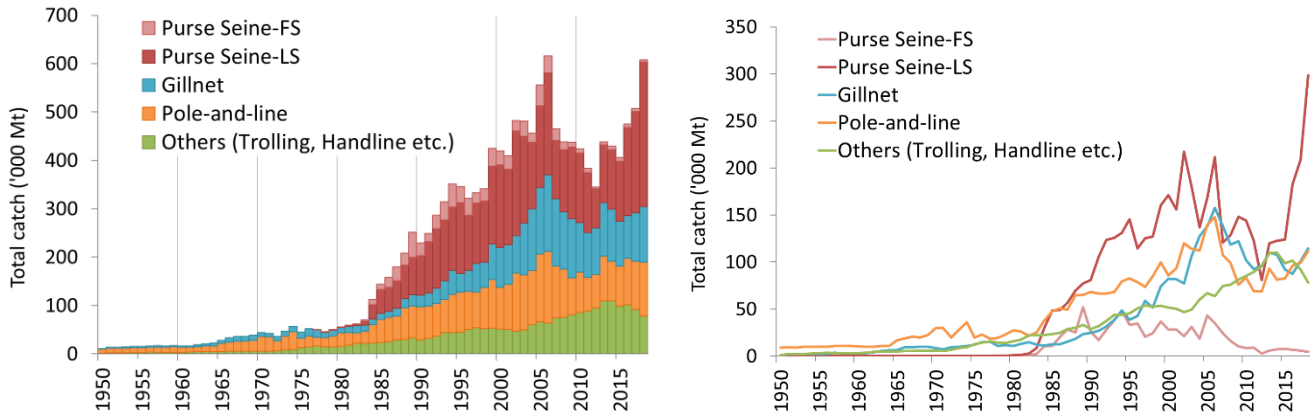
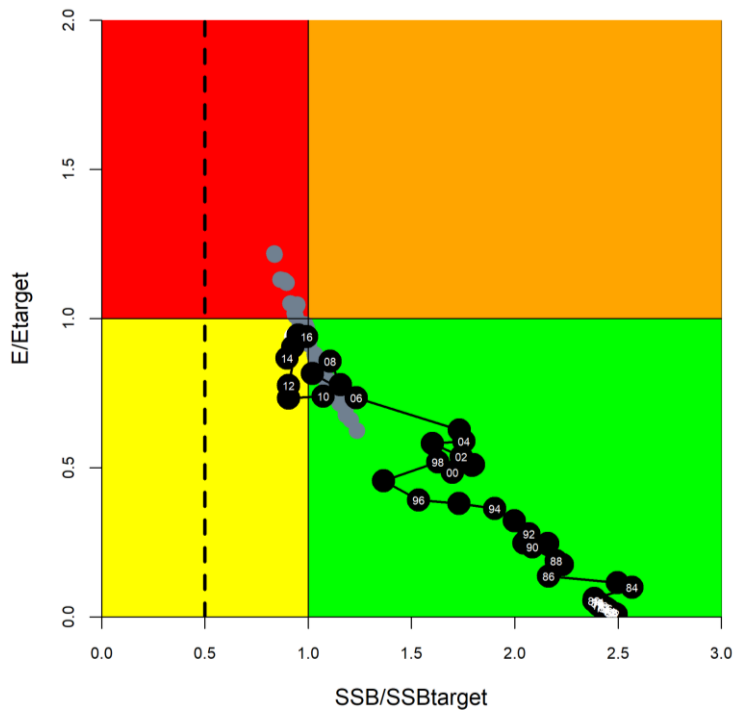**Fig. 1(a-b).** Annual catches of skipjack tuna by gear (1950–2018). Data as of October 2019.

Fig. 2. Skipjack tuna: SS3 Aggregated Indian Ocean assessment Kobe plot of the 2017 uncertainty grid. Black circles indicate the trajectory of the median estimates for the SB/SB_{target} ratio and E/E_{target} ratio across all models of the 2017 uncertainty grid for each year 1950–2016; grey dots are the estimates for year 2016 from individual models. The dashed line indicates SB_{limit} (20% SB_0)