DRAFT RESOURCE STOCK STATUS SUMMARY

SKIPJACK TUNA (SKJ: *Katsuwonus pelamis*)

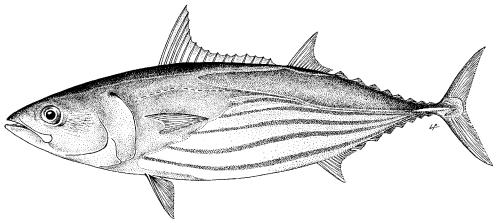

Table 1. Status of skipjack tuna (*Katsuwonus pelamis*) in the Indian Ocean

Area[1]	Indicator	Value	Status[2]
Indian Ocean	Catch in 2019 (MT)	547,248	60.4%*
	Average catch 2015-2019 (MT)	506,555	
	$C_{40\%SSB0}$ (MT)	535,964 (461,995–674,536)	
	C_{2019} / $C_{40\%SSB0}$ (MT)	1.02 (0.81–1.18)	
	$E_{40\%SSB0}$ (MT)[3]	0.59 (0.53–0.66)	
	E_{2019} / $E_{40\%SSB0}$	0.92 (0.67-1.21)	
	SSB_0 (MT)	1,992,089 (1,691,710–2,547,087)	
	SSB_{2019} (MT)	870,461 (660,411–1,253,181)	
	$SSB_{40\%SSB0}$ (MT)	794,310 (672,825–1,019,056)	
	$SSB_{20\%SSB0}$ (MT)	397,155 (336,412–509,528)	
	SSB_{2019} / SSB_0	0.45 (0.38-0.5)	
	SSB_{2019} / $SSB_{40\%SSB0}$	1.11 (0.95-1.29)	
	SSB_{2019} / SSB_{MSY}	1.99 (1.47-2.63)	
	MSY (MT)	601,088 (500,131–767,012)	
	E_{2019} / E_{MSY}	0.48 (0.35-0.81)	

[1]Boundaries for the Indian Ocean stock assessment are defined as the IOTC area of competence
[2]The stock status refers to the most recent years' data used in the assessment conducted in 2020, i.e. 2019
[3]E is the annual harvest rate
*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 (SSB_{2019} / $SSB_{40\%SSB0}$<1)	Stock not overfished (SSB_{2019} / $SSB_{40\%SSB0}$≥ 1)
Stock subject to overfishing (E_{2019} / $E_{40\%SSB0}$≥ 1)	19.5%	19.5%
Stock not subject to overfishing (E_{2019} / $E_{40\%SSB0}$≤ 1)	0.6%	60.4%
Not assessed / Uncertain		

The percentages are calculated as the proportion of model terminal values that fall within each quadrant with model weights taken into account

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. A new stock assessment was carried out for skipjack tuna in 2020 using Stock Synthesis with data up to 2019. The outcome of the 2020 stock assessment model does not differ substantially from the previous assessment (2017) despite the large catches recorded in the period 2018-2019, which exceeded the catch limits established in 2017 for this period.

The final overall estimate of stock status indicates that the stock is above the adopted target for this stock and that the current exploitation rate is just below the target. Also, the models estimate that the spawning biomass remains above its SSB_{MSY} and the fishing mortality remains below E_{MSY} with very high probability. Over the history of the fishery, biomass has been well above the adopted limit reference point ($0.2*SSB_0$). The recent catches have been within the range of estimated target yield (see $C_{40\%SSB0}$). Current spawning stock biomass relative to unexploited levels is estimated at 45% (**Table 1**). Thus, on the weight-of-evidence available in 2020, the skipjack tuna stock is determined to be: (i) above the adopted biomass target reference point; (ii) **not overfished** ($SSB_{2019}>SSB_{40\%SSB0}$); (iii) with fishing mortality below the adopted target fishing mortality, and; (iv) **not subject to overfishing** ($E_{2019}<E_{40\%SSB0}$).

Outlook. Total catches in 2018 were 30% larger than the resulting catch limit from the skipjack HCR for the period 2018-2020, which raises concern in the WPTT. It is important to note that reaching the management objectives defined in Resolution 16/02 requires that the catch limits adopted by the skipjack HCR are implemented effectively. It should be noted that skipjack catches for most gears have increased from 2017 to 2018 (+44% for purse seine (log/FAD-associated), +12% for gillnet and +13% for pole-and-line). In 2019, catch was reduced considerably compared to 2018. Due to its specific life history attributes, skipjack can respond quickly to ambient foraging conditions driven by ocean productivity, which seem to have been favourable in recent years. Environmental indicators should be closely monitored to inform on the potential increase/decrease of stock productivity. There remains considerable uncertainty in the assessment: The assumption of two hypotheses for the effort creep since 1995 for the standardized European purse seine CPUE was included in the model grid. The range of runs analysed illustrate a range of stock status to be between 36% and 51% of SSB_{2019} / SSB_0 based on all runs examined. It is important to note the differences between the runs that apply an additional effort creep parameter to the standardized series of CPUE (median $SSB_{2019}/SSB_0=0.44$) and those that do not (median SSB_{2019} / $SSB_0=0.45$). Also, there was contrast between runs that fully weighted tagging information (median SSB_{2019} / $SSB_0=0.42$) and those that reduced their influence (median $SSB_{2019}/SSB_0=0.48$).

Management advice. The catch limit will be calculated applying the HCR specified in Resolution 16/02. The Commission needs to ensure that catches of skipjack tuna in the 2021–2023 period do not exceed the agreed limit.

The following key points should also be noted:

- **Reference points**: Commission in 2016 agreed to Resolution 16/02 on *harvest control rules for skipjack tuna in the IOTC area of competence*;
- **Exploitation rate**: Current exploitation rate 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 above the target reference point of 40% of SSB_0, and above the limit reference point of $0.2*SSB_0$ (**Fig. 2**) as per Resolution 15/10;
- **Main fishing gears** (average catches 2015-19): Purse seine ~53% (FAD/log associated school ~42%; free-swimming school ~2.4%; other ~8.3%); Pole-and-line ~19%; Gillnet ~19%; Other gears ~9% (**Fig. 1**);

- **Main fleets** (average catches 2015-19): European Union ~26% (EU-Spain: ~18.6%; EU-France: ~6.7%; EU-Italy: 0.4%); Maldives ~16%; Indonesia ~16%; Seychelles ~13%; I.R. Iran ~9%; Sri Lanka ~9%.

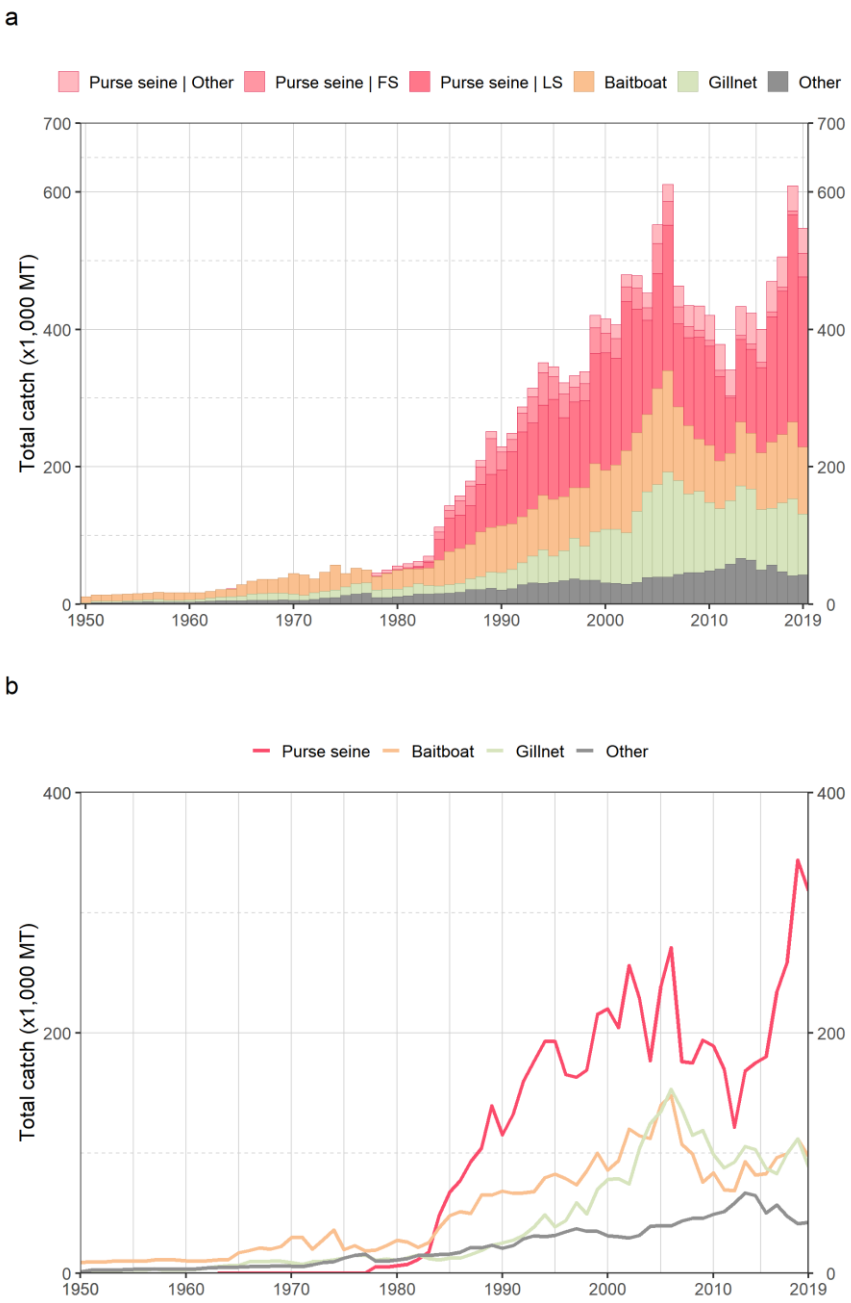

Fig. 1. Annual time series of (a) cumulative nominal catches (MT) by gear and (b) individual nominal catches (MT) by gear group for skipjack tuna during 1950–2019. LS = drifting log or FAD-associated school and FS = free-swimming school. Purse seine: coastal purse seine, purse seine, ring net; Baitboat: coastal and offshore baitboats; Gillnet: coastal and offshore gillnets, driftnet; Other: all remaining fishing gears

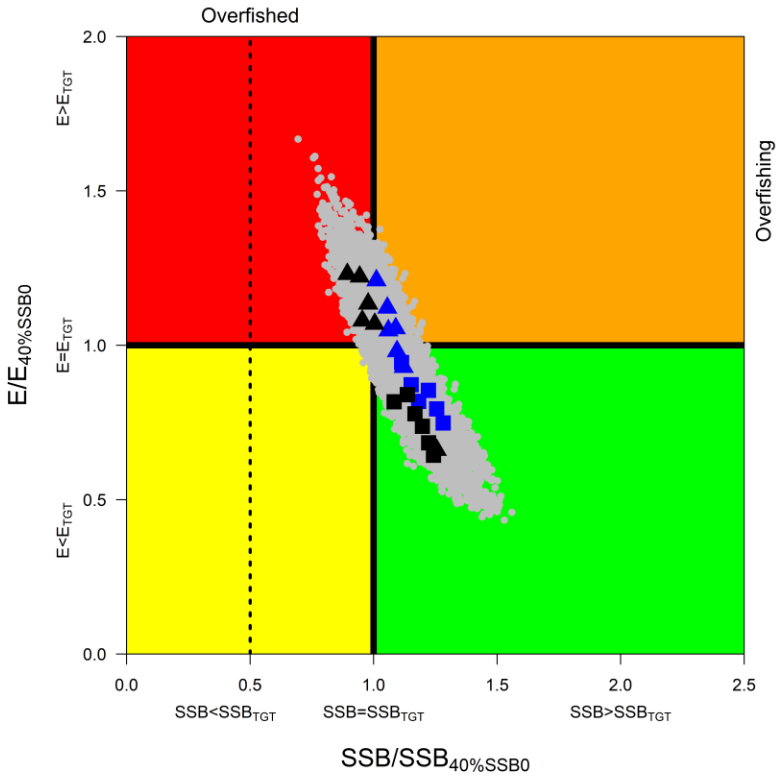

Fig. 2. Skipjack tuna: SS3 Aggregated Indian Ocean assessment Kobe plot of the 2020 uncertainty grid. Symbols represent MPD estimates of current stock status relative to $SSB_{40\%SSB0}$ (x-axis) and $E_{40\%SSB0}$ (y-axis) for the individual models (blue, no effort creep; black, additional effort creep; triangle, full weighting of tagging data; square, tagging data downweighted). Grey dots represent uncertainty from individual models. The vertical dashed line represents the limit reference point for Indian Ocean skipjack tuna (SSB_{lim} = 20%SSB_0)