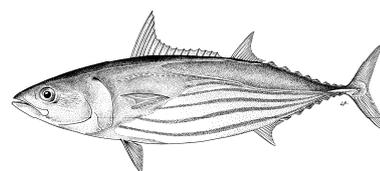


EXECUTIVE SUMMARY – SKIPJACK TUNA

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

Area ¹	Indicators		2017 stock status determination
Indian Ocean	Catch 2016 ² :	446,723 t	47%
	Average catch 2012–2016:	407,456 t	
	Yield _{40%SSB} (1000 t) (80% CI):	510.1 (455.9–618.8)	
	C ₂₀₁₆ /C _{40%SSB} (80% CI):	0.88 (0.72–0.98)	
	SB ₂₀₁₆ (1000 t) (80% CI):	796.66 (582.65–1,059.29)	
	Total biomass B ₂₀₁₆ (1000 t) (80% CI):	910.4 (873.6–1195)	
	SB ₂₀₁₆ /SB _{40%SSB} (80% CI):	1.00 (0.88–1.17)	
	SB ₂₀₁₆ /SB ₀ (80% CI):	0.40 (0.35–0.47)	
E ³ _{40%SSB} (80% CI):	0.59 (0.53–0.65)	2,015,220 (1,651,230–2,296,135)	
SB ₀ (80% CI):			

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 2016: 22%

³ E is the annual harvest rate

Colour key	Stock overfished (SB _{year} /SB _{40%} < 1)	Stock not overfished (SB _{year} /SB _{40%} ≥ 1)
Stock subject to overfishing (F _{year} /F _{40%} > 1)	38%	2%
Stock not subject to overfishing (F _{year} /F _{40%} ≤ 1)	13%	47%
Not assessed/Uncertain		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. A new assessment was carried out for skipjack tuna in 2017. 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 2016 (≈446,723 t) remain lower than the estimated range of C_{SB40%} (Table 1). The average catch over the previous five years (2012–16; ≈ 407,450 t) also remains below 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. Given the current status of the fishery and assuming that catch does not exceed prescription from Resolution 16-02, it would be expected that the stock would fluctuate around the target level. CPUE fluctuations, mainly for the purse seine, coincide with environmental signals at inter-annual timescale (e.g. Indian Ocean Dipole). Due to its specific life traits, 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. There remains considerable uncertainty in the assessment, and the range of runs analysed illustrate a range of stock status to be between 0.35 and 0.47 of SB₂₀₁₆/SB₀ based on all runs examined.

Management advice. The catch limit will be calculated applying the Harvest Control Rule specified in Resolution 16-02.

The following key points should also be noted:

- There is no evidence of any exceptional circumstance that may impede the application of the *harvest control rule* specified in Resolution 16-02. The spawning biomass is above the limit reference point.
- As agreed by the Commission, the application of the HCR provides a total annual catch limit for 2018-2020 using the following values estimated from the 2017 skipjack stock assessment. For each value, the reported median from the reference grid adopted by the Scientific Committee for advising the Commission is used:
 - The median of $SB_{2016}/SB_0 = 0.40$;
 - The estimate median of current spawning stock biomass (SB_{curr}) is 796,660 tons;
 - The estimate of the equilibrium exploitation rate associated with sustaining the stock at SB_{targ} is $E_{targ} = 0.59$;
 - As current spawning biomass (SB_{curr}) is estimated to be at or above the threshold spawning biomass i.e., $SB_{curr} \geq 0.4B_0$, then the fishing intensity parameter (I) corresponds to I_{max} (1);

Following Resolution 16/02, the catch limit is calculated as $[I_{max} \times E_{targ} \times B_{curr}] = 1 * 0.59 * 796,660$ t. which results in an annual overall catch limit of 470,029 t. for the period 2018-2020.

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.

- **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 is 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 is 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 2012–16): Purse seine $\approx 33\%$ (FAD associated school $\approx 31\%$ and free swimming school $\approx 2\%$); Gillnet $\approx 24\%$; Pole-and-line $\approx 20\%$; Other $\approx 24\%$ (**Fig 1**).
- **Main fleets** (average catches 2012–16): Indonesia $\approx 20\%$; European Union $\approx 20\%$ (EU-Spain: $\approx 15\%$; EU-France: $\approx 5\%$); \approx Maldives 16%; Sri Lanka $\approx 14\%$; \approx I.R. Iran 9%; Seychelles $\approx 9\%$; India $\approx 6\%$; All other fleets $\approx 6\%$).

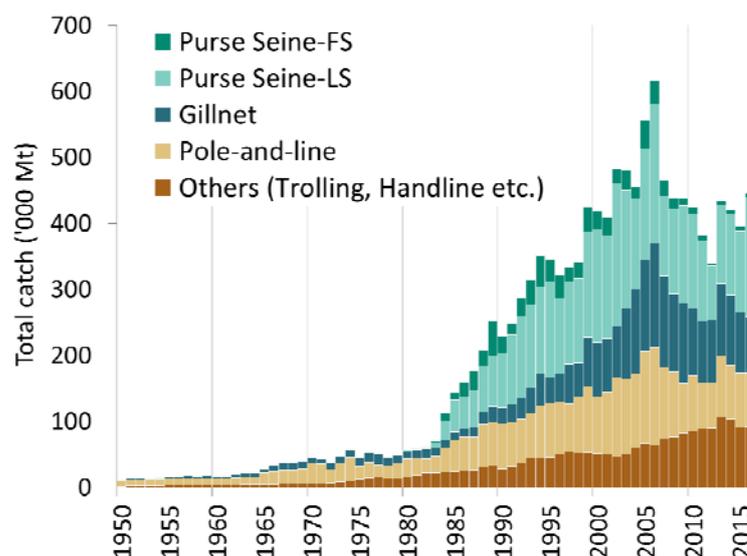


Fig. 1. Annual catches of skipjack tuna by gear (1950–2016)¹.

¹ **Definition of fisheries:** Gillnet, including offshore gillnet; Pole-and-Line; Purse seine free-school (FS); Purse seine associated school (LS); Other gears (e.g., troll line, handline, beach seine, Danish seine, liftnet).

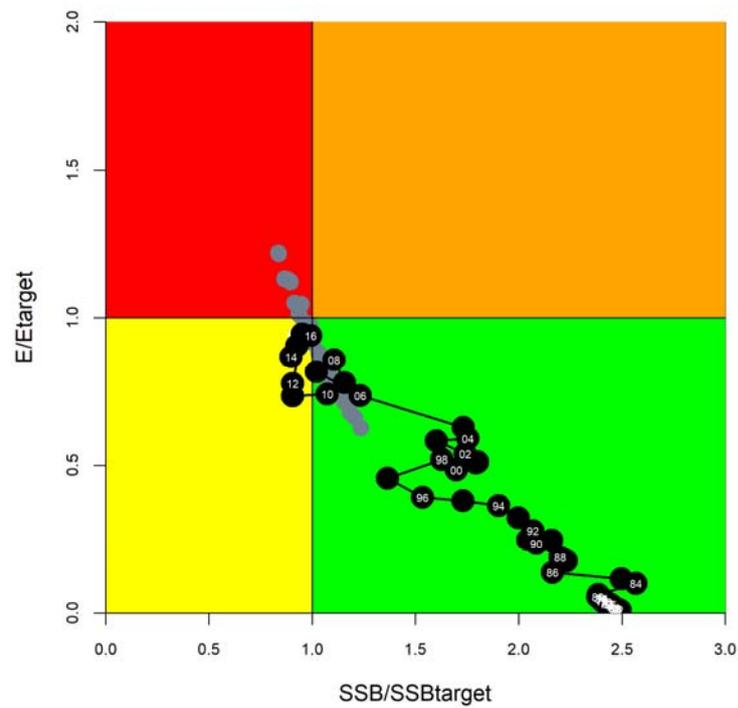


Fig. 2. Skipjack tuna: SS3 Aggregated Indian Ocean assessment Kobe plot of the 2017 uncertainty grid. Black circles indicate the trajectory of the median estimates for the SB/SSB_{target} ratio and E/E_{target} ratio across all models of the 2017 uncertainty grid for each year 1950–2016; grey dots are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