Food and Agriculture Organization of the United Nations

Indian Ocean Tuna Commission
Commission des Thons de l'Océan Indien
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28TH SESSION OF THE IOTC WORKING PARTY ON TROPICAL TUNAS (DATA PREP)

ONLINE: 2-5 JUNE 2026

STOCK ASSESSMENT OF SKIPJACK TUNA (*KATSUWONUS PELAMIS*)

GENEVIEVE PHILLIPS

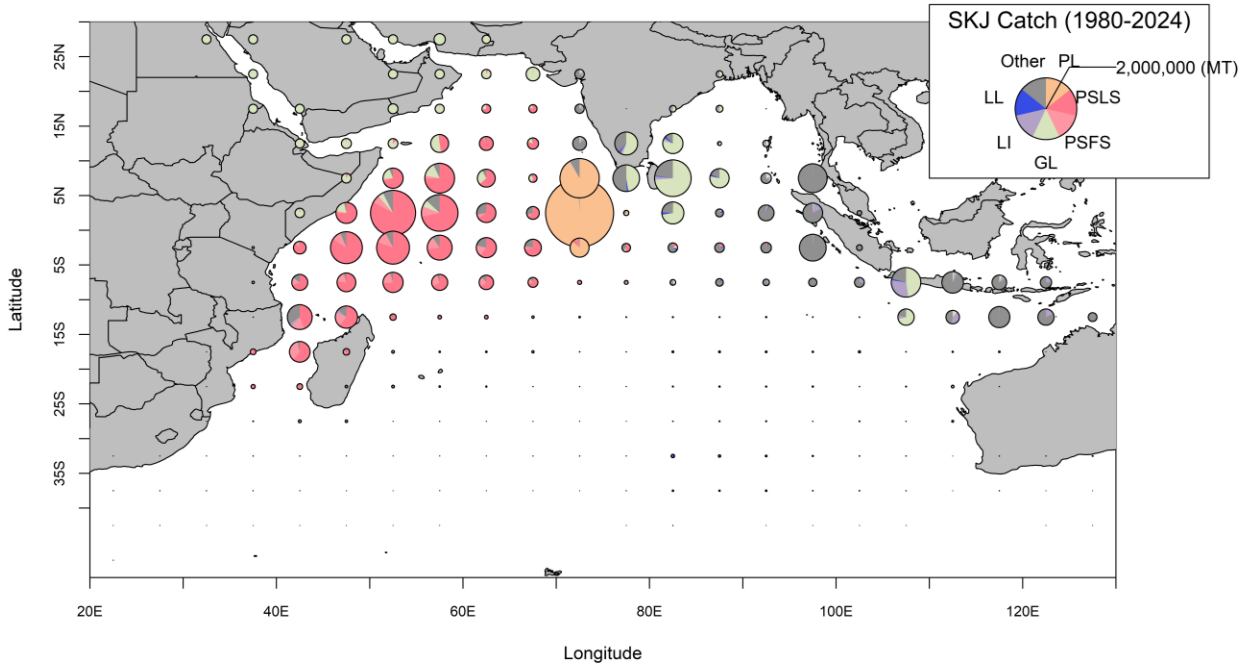
Genevieve.Phillips@fao.org

MODEL – SS3.30.24.2 (MARCH 2026)

- Integrated SS3 model developed in 2011
  - Age-based, spatially aggregated, seasonally structured
- 2023 Assessment
  - An ensemble of 36 models with variation in CPUE indices, catchability (through CPUE indices), steepness (*h*), and growth (L_{inf})
  - $\boldsymbol{SSB_{2022}}$ (80% CI) estimated at **0.53** $\boldsymbol{SSB_{MSY}}$ (0.42-0.68)
  - $\boldsymbol{F_{2022}}$ (80% CI) estimated at **0.49** $\boldsymbol{F_{MSY}}$ (0.32-0.75)
  - The stock was considered **not overfished**, and **not subject to overfishing** in 2022.
- SKJ Management Procedure adopted in 2024 (Res. 24/07) and run in October 2025 for TAC setting.
- 2026 assessment will use data up to 2025, including new CPUE indices – stock status only.

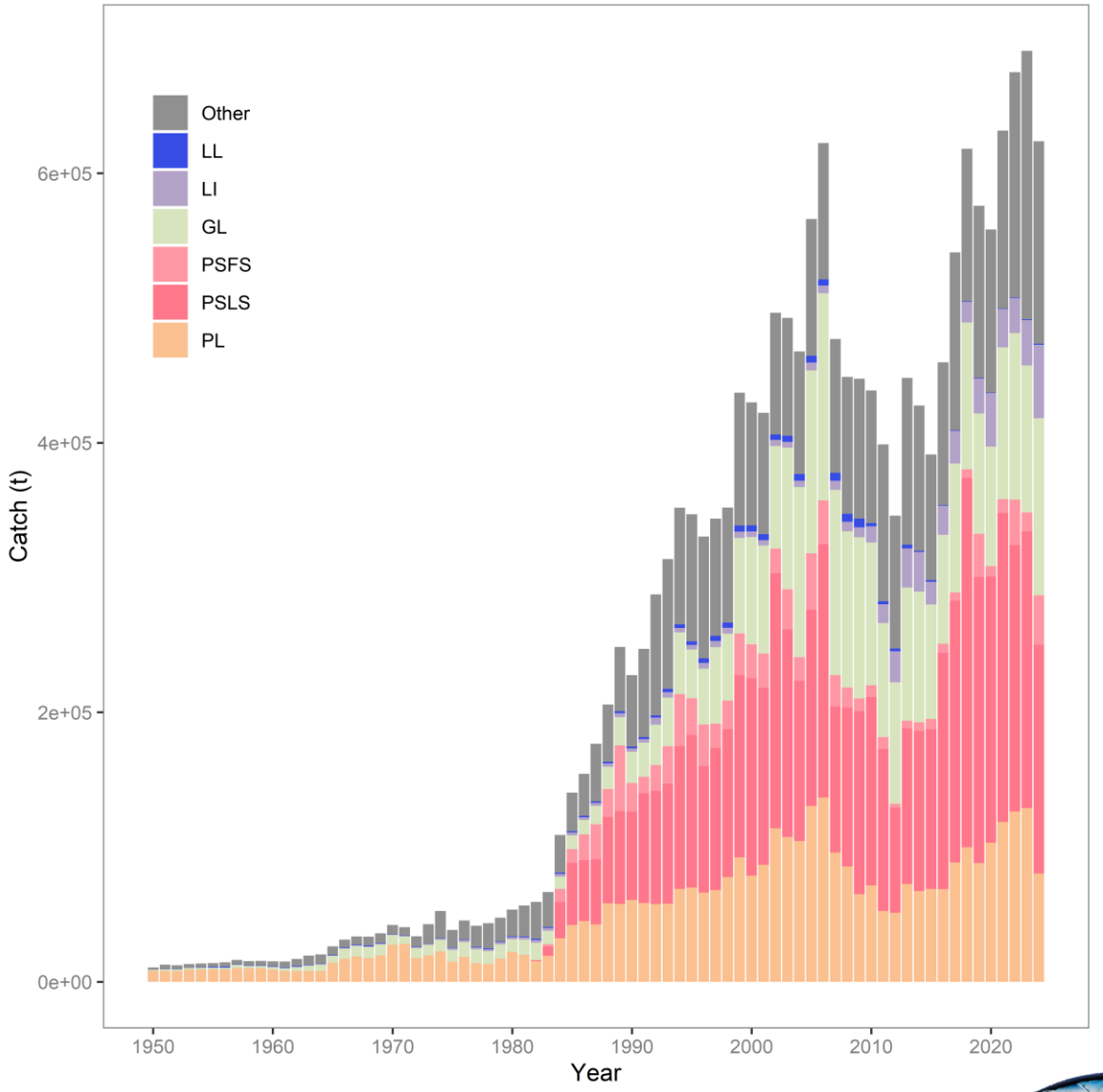
Model Structure

- Model years: 1950-2025
- Annual time step with four seasons
- 8 age classes (0-7)
- One area (fleets-as-areas)
- 7 fleets
  - Fisheries combined based on similarities in fishing gear type (selectivity) and regional stratification (fishing behaviour) - métiers



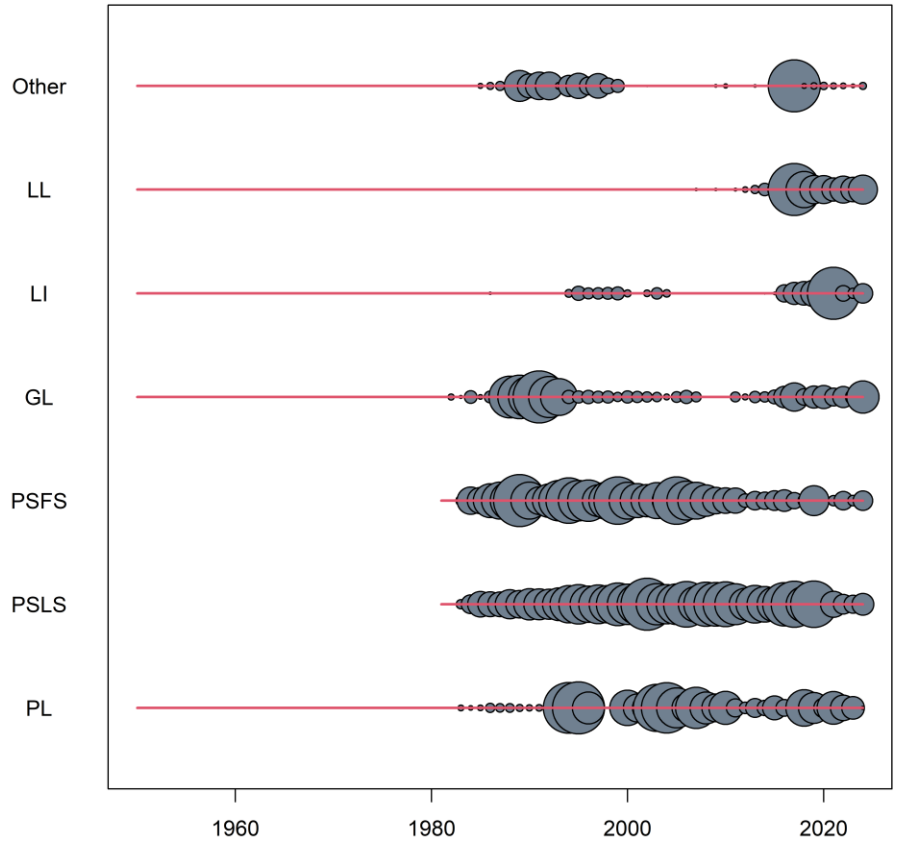
DATA

- Catch: total annual catch by fishing gear from 1950-2025.
- CPUE
  - Maldives PL 1995-2025
  - PSLS 1991-2025 (Kaplan et al., 2026)
  - Index based on associative dynamics and acoustic data 2013-2025 (ABBI)
  - Index of juvenile SKJ from echo-sounder buoy data
- RTTP-IO Tagging Data
- Size: Length composition data
  - Length-frequency year/season for each fishery



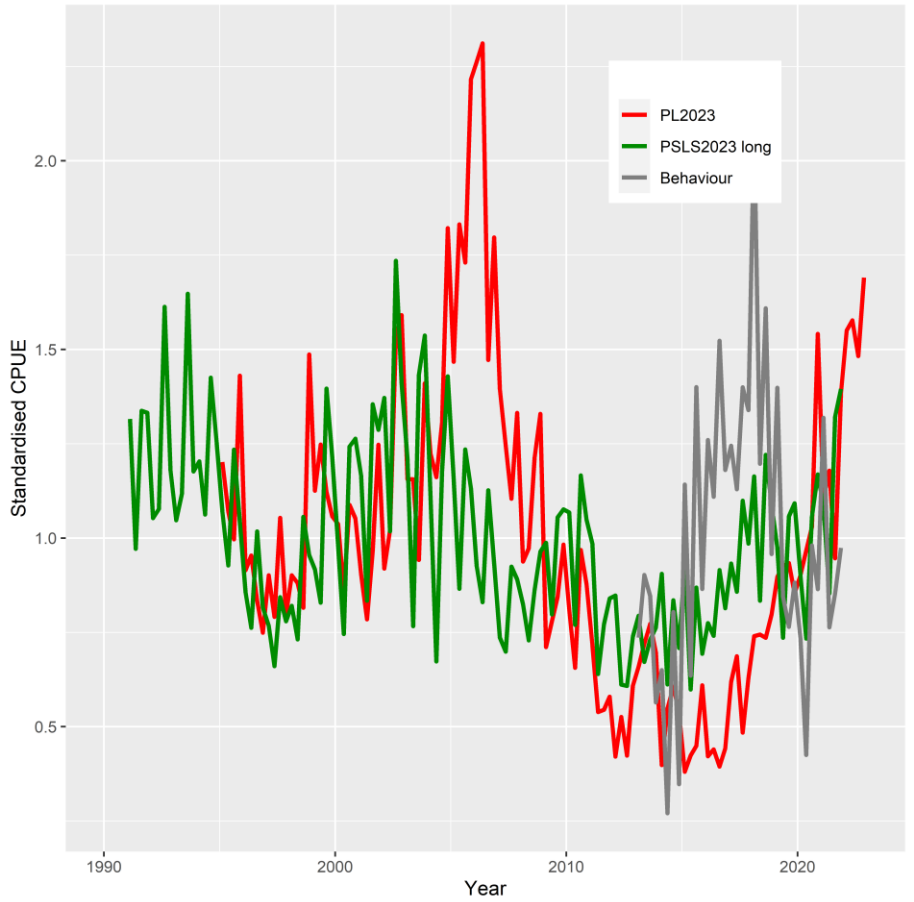
SIZE DATA

- Each fleet-season. Variable sampling quality, and temporal coverage from 1980s. Compiled into 4 cm size classes.
- Long time series for PSFS + PSLS + PL
- Poor sampling for LI + LL + Other
- Problematic strata identified and removed
- Sample size proportional to number of fish, capped at 10 (or 1)
    - $ESS_{PSLS, PSFS, PL}$ = <=10
    - ESS_{LL} = 1



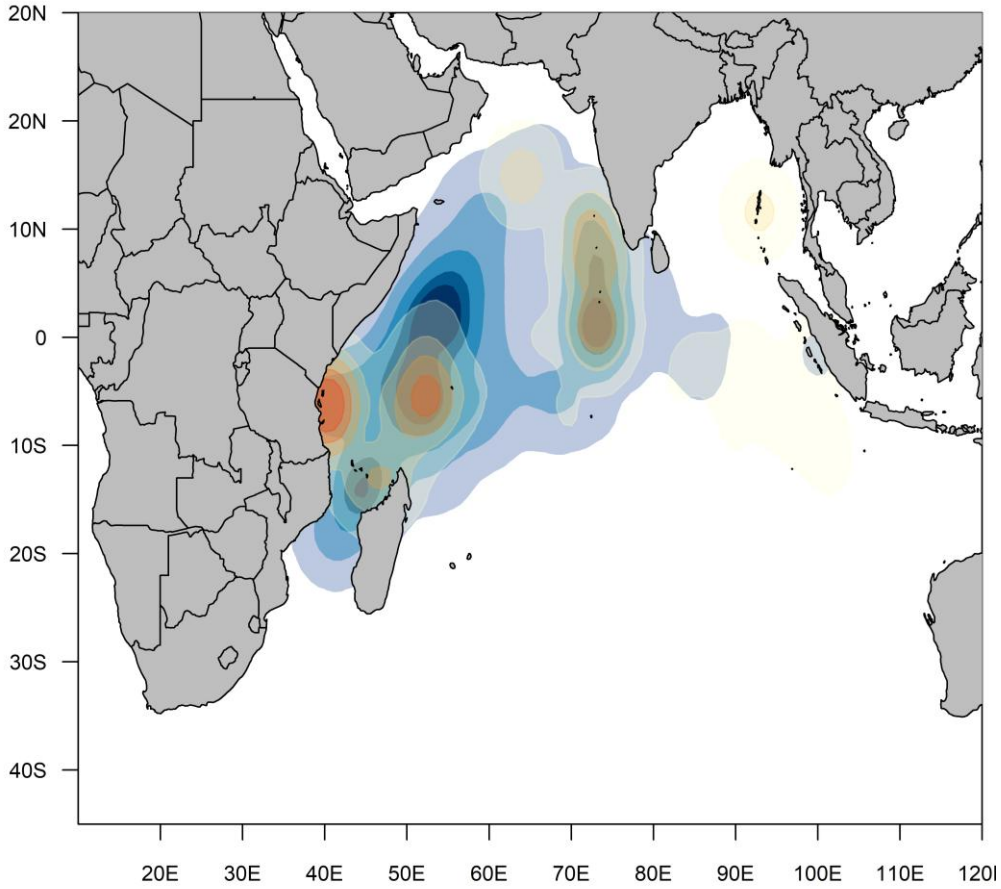
CPUE

- Broadly consistent between PL and PSLS index
- ~300% increase for PL index 2015 – 2022
- ~200% increase for PS index since 2015 – 2021
- a somewhat decline for the ABBI index 2018 – 2021



TAGGING DATA

- Releases 2005–2007 (WIO)
- Recoveries primarily from PS (15%)
- Data processing
- Reporting, tag mortality & loss
- Included in the model to inform abundance and fishing mortality



MODEL ASSUMPTIONS + STARTING PARAMETERS

MODEL STRUCTURE

Recruitment	B-H stock-recruitment relationship (h=0.8). Recruitment deviates, 1983–2018 (σ_R = 0.3) Seasonal apportionment of recruitment Temporal deviates in the seasonal proportion 1983–2018
Initial population	An equilibrium, unexploited state in 1950.
Age and growth	8 age-classes, with a plus group. Richard growth model (Eveson et al., 2012) CV decreasing from 20% at age 0 to 10% at maximum age
Natural mortality	Constant (0.8)
Maturity	Proportion mature at length from Grande et al. 2010: 50% maturity at 38 cm.
CPUE indices	PL index 1995 – 2025; PSLS index 1990 – 2025. CV =0.2
Tagging data	RTTP tag release, and EU PS tag recoveries ;
Length data	Length samples assigned maximum ESS of 10.

Model options	Description
Steepness	*h70* – Stock-recruitment steepness parameter 0.7
	h80 – Stock-recruitment steepness parameter 0.8
	h90 – Stock-recruitment steepness parameter 0.9
Growth	*L70 – L inf parameter fixed at 70 cm as Eveson et al., 2012*
	Linf – L inf parameter estimated
	CAAL – growth estimated internally using CAAL based on otolith data
Natural Mortality	*Mfixed – M fixed at 0.80*
	MLorHam6 – Lorenzen-based M: estimated using Hamel & Cope (2022), assuming A_{max} = 8. With minimum (1 yr) and maximum (4 yr) reference ages for average M calculation]
CPUE?	*Inclusion of all indices, or just PL+PSLS, and short/long PSLS indices +/- associative behaviour index*

2026 ASSESSMENT – PLAN

- Base 2023 model updated with catches (when available – currently up to 2024), length frequency sequentially
- Run CPUE comparison analyses, and update with non-conflicting CPUE indices
- Sensitivity analysis to explore uncertainty – e.g. CPUE indices / M / growth
- Update model
- Revisions of model grid ready for the assessment meeting
- Quantify stock status using MSY-based reference points and uncertainty generated from model ensembled
- Run the GRID during the assessment meeting after discussions
- **DATA CUT-OFF ("guillotine") DATE: 1st August 2026**