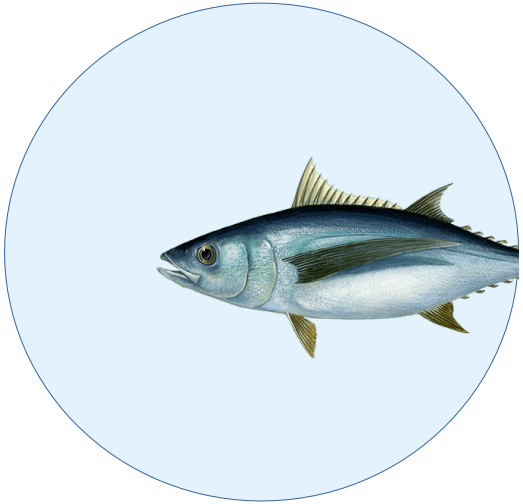
Indian ocean albacore Management procedures evaluation : status report

IOTC TCMP05 – 13-14th May 2022

Iago Mosqueira, Thomas Brunel



WAGENINGEN
UNIVERSITY & RESEARCH

Status of the ALB MSE work

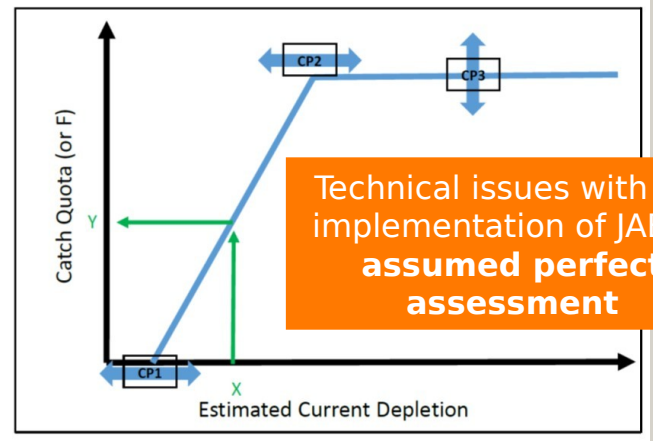
- OM based on 2019 WPTmT SS3 assessment and covered the dynamics of the stock until the year 2017.
  - updated to 2021 by projecting the stock forward for reported catches for 2018-2020 and constant fishing mortality in 2021 at the 2020 level.
- Candidate MPs explored
  - Model-based (surplus production, JABBA)
  - Data-based (Joint LL CPUE)
  - Model-trend based (surplus production, JABBA)
- Tunning objectives as in TCMP-04 (2021)
- Work conducted at WMR (funding contract FAO, 03/2022-12/2023) with support of WMP MSE and WPTmT.

WAGENINGEN
UNIVERSITY & RESEARCH

Candidate MPs

MODEL BASED MP

INPUT : Total annual catches
CPUE (LL_NW, LL_SW)
Model (JABBA) Current depletion SB/SB0
HCR TAC

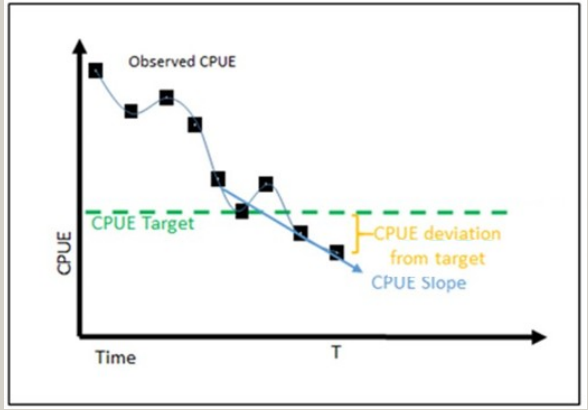


Technical issues with the implementation of JABBA **assumed perfect assessment**

CP1 : Set at SB/SB0 = 0.1
CP2 : Set at SB/SB0 = 0.4
CP3 : Estimated by tuning

DATA BASED MP

INPUT : CPUE (LL_NW)
MP % change in the TAC

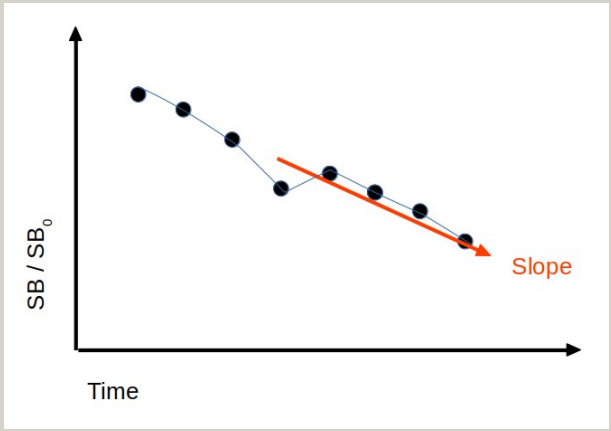


Responsiveness to CPUE slope and deviation from target : set
CPUE targe : Estimated by tuning

Candidate MPs

MODEL TREND BASED MP

INPUT : Total annual catches
CPUE (LL_SW, LL_SW)
Model (JABBA) Current depletion SB/SB0
HCR Trend (CCSBT)



k_1 : Gain parameter, ranges explored
k_2 : Gain parameter, tuned
g: Assymetry of response, set to 1

- Trend in depletion, slope (*l*) in SB/SB0 over 5 years.

- If slope < 0 (downward)

$$TAC_y = TAC_{y-1} \cdot 1 - \left|k_1\right|^g \cdot l$$

- If slope >= 0 (stable or upwards)

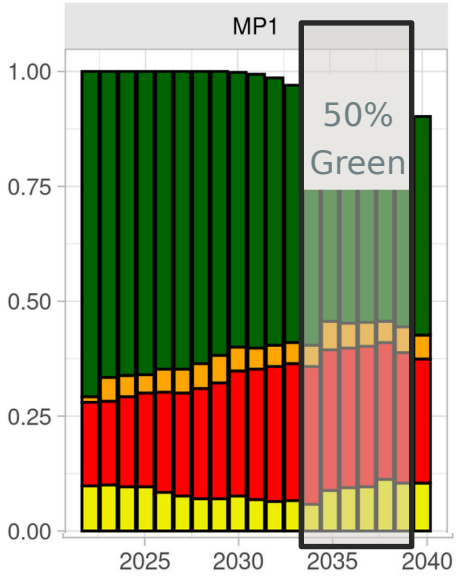
$$TAC_y = TAC_{y-1} \cdot 1 + k_2 \cdot l$$

Technical issues with the implementation of JABBA **assumed perfect assessment**

Candidate MPs

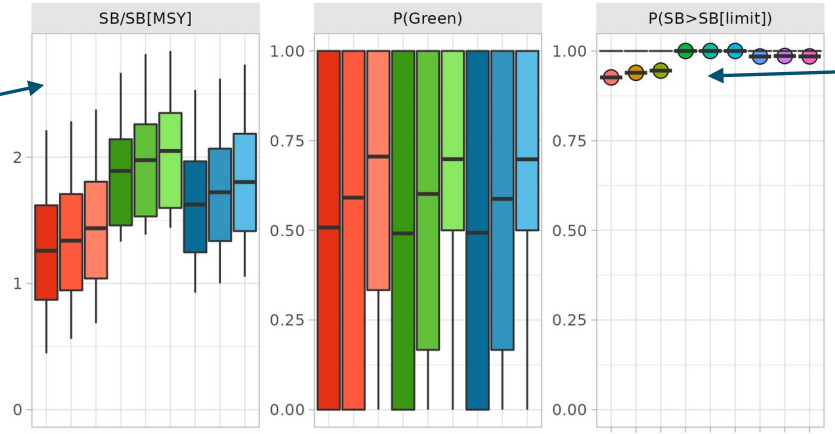
- MP constraints and implementation
  - Maximum 15% year-to-year change in the TAC (up- or downwards)
  - 3 year advice (first TAC set for 2022)
  - 3 year lag (2 data, 1 advice) : 2020 data used in 2022 assessment to set TAC for 2023-2025
- Tuning
  - For Max catch (model-based MP), target CPUE (data-based MP) and k2 (trend-based MP).
  - Tuning separately for 3 management objectives

P(Kobe Green) $_{2034\text{-}2039}$ = 50%, 60% or 70%



MP performance (2034-2039)

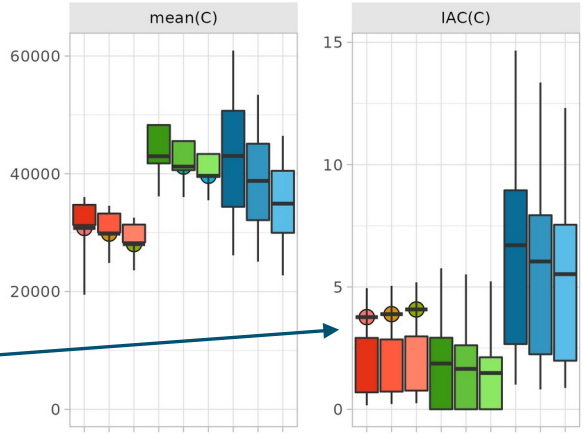
dataMP lower average SB and wider distribution

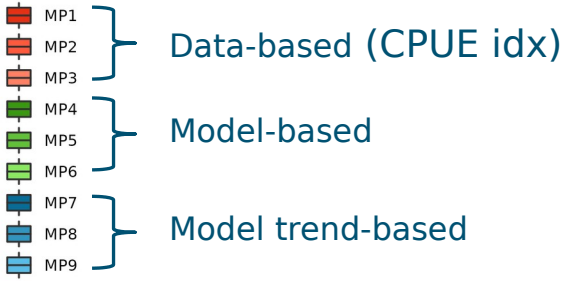


dataMP higher biological risk

dataMP lower Catch, with narrower distribution

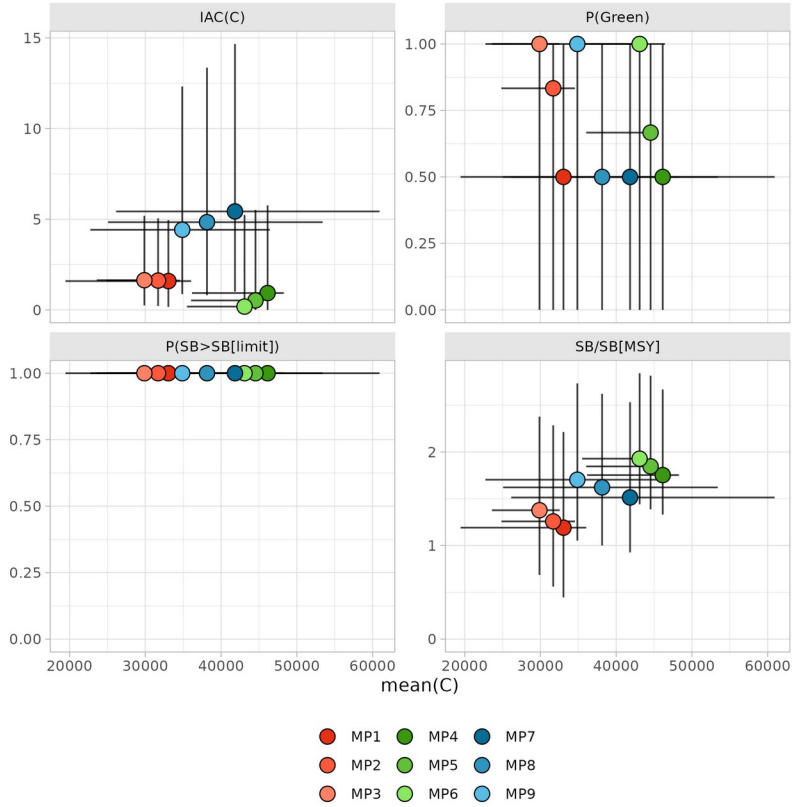
trendMP higher variation, needs improving





WAGENINGEN UNIVERSITY & RESEARCH

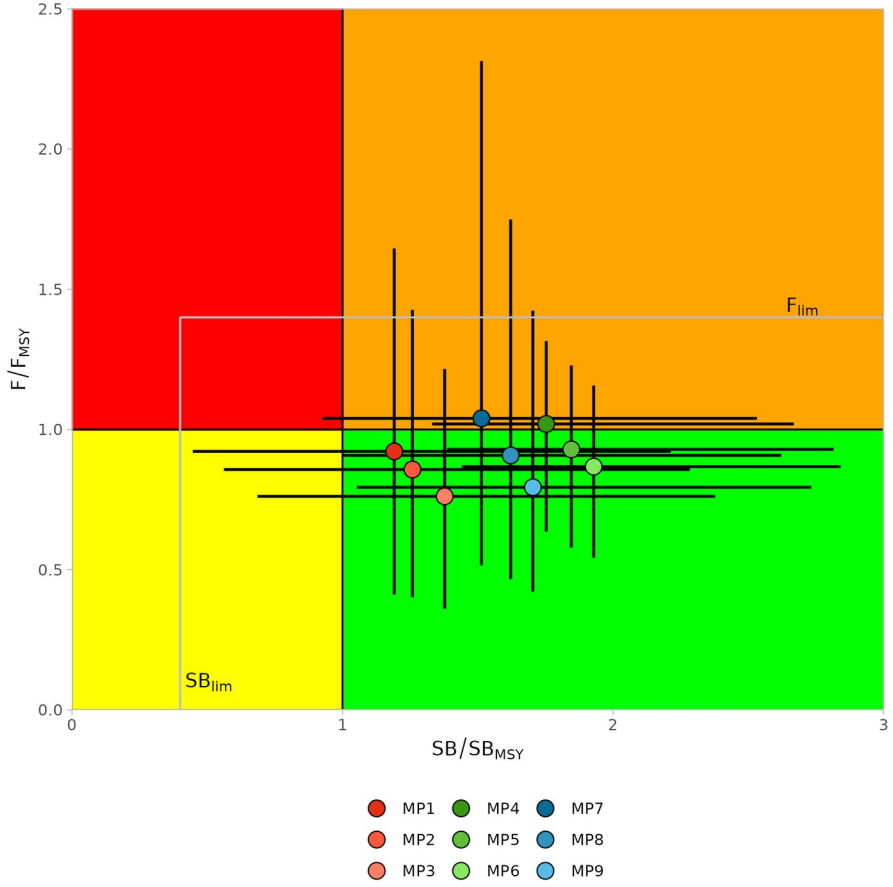
Trade-offs (2034-2039)



Mean and medians divergence, as OM is really a composite

Biomass level linked to both model and risk

Kobe performance 2034-2039



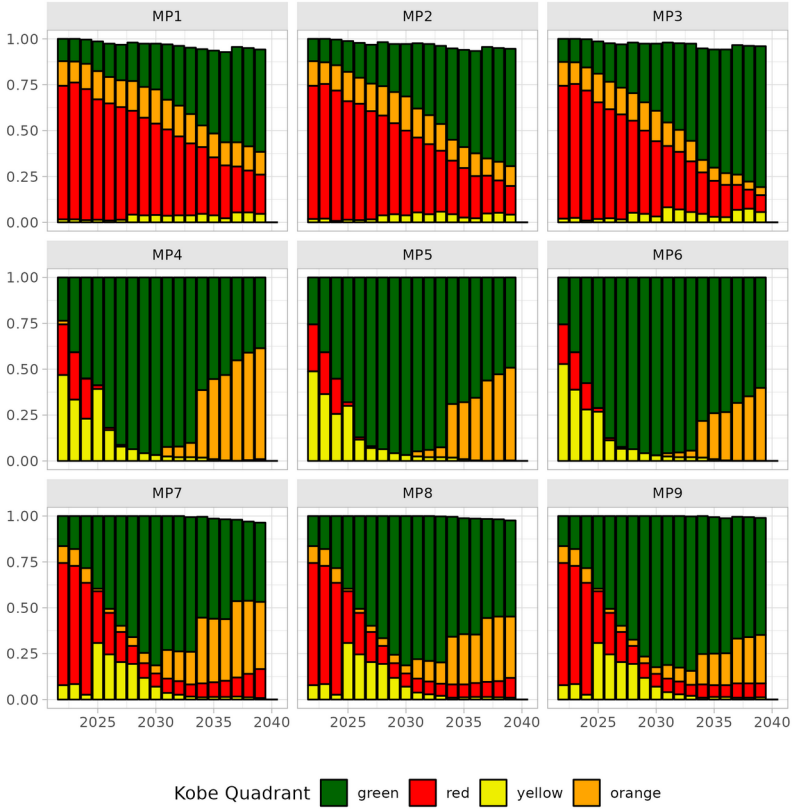
Kobe time series 2022-2040

P(kobe=green) 50% 60% 70%

Data based MPs

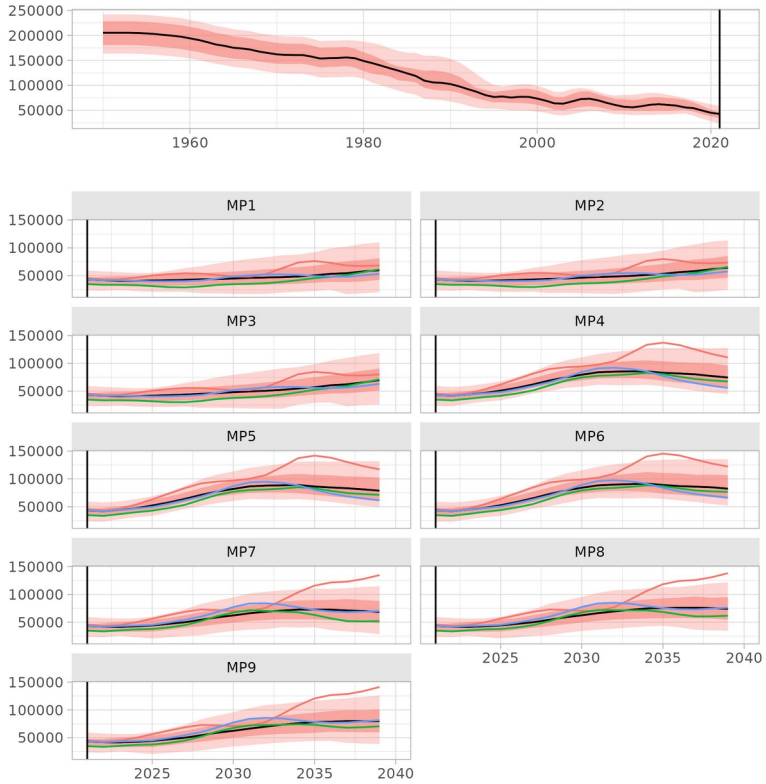
Model-based MPs

Model trend-based MPs



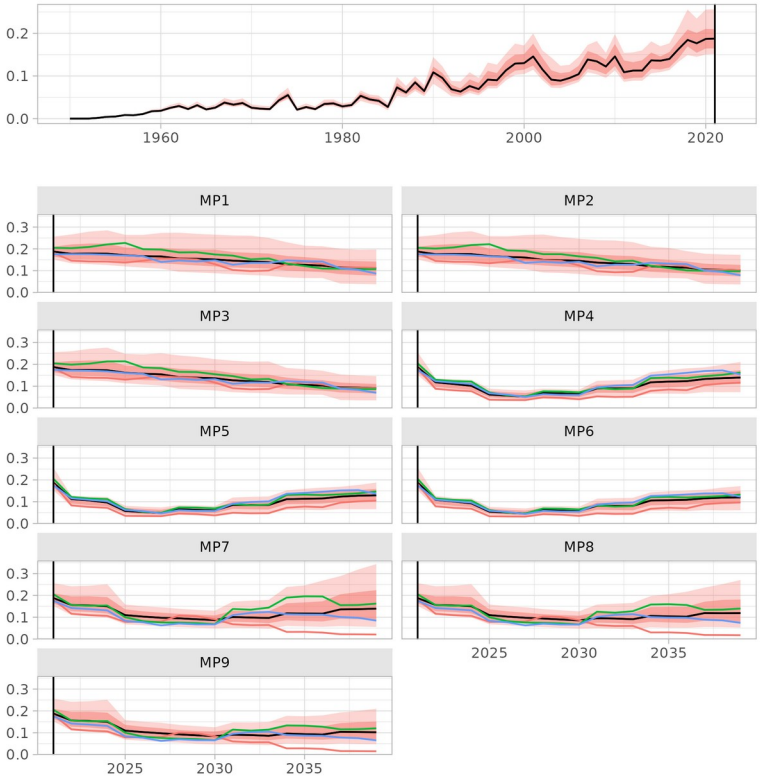
WAGENINGEN
UNIVERSITY & RESEARCH

SB trajectories (OM and simulated 2022-2040)

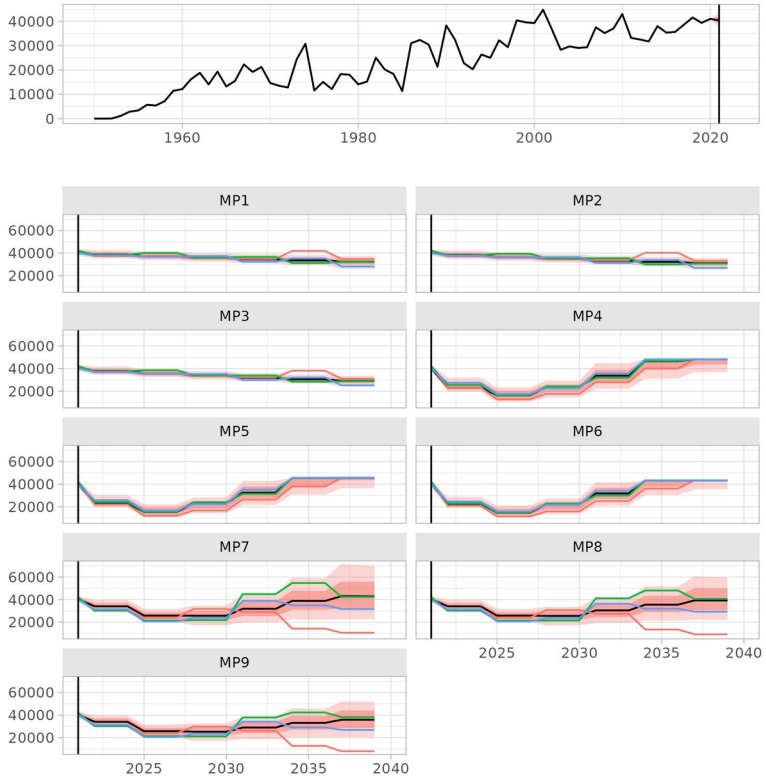


WAGENINGEN
UNIVERSITY & RESEARCH

F trajectories (OM and simulated 2022-2040)



Catch trajectories (OM and simulated 2022-2040)



WAGENINGEN
UNIVERSITY & RESEARCH

Summary

- Results driven both by management objective and MP type, as speed of recovery varies.
- MPs able to drive recovery.
- Albacore OM is a candidate for conditioning outside of stock assessment.
  - Runs could not sustain 2018-2020 catches
- Detailed results may change when an actual JABBA is applied.

Next steps

- Solve issues in JABBA usage
- Re-run tunning with full model, improve it for trend-based MP
  - Recovery objectives to be defined for stocks in the red?
- Robustness tests
- Revisit OM conditioning after WPTmT 2022.

Feedback from TCMP

- Management objectives still relevant?
- Acceptance of alternative trend-based MP.
- Recovery objectives to be defined for stocks in the red?
  - Recover to Kobe=green in 1-2 generation time
  - Time frame for evaluation of performance
- Move for certain stocks towards OM not fully based on stock assessment.

Thank you for your attention

iago.mosqueira@wur.nl

thomas.brunel@wur.nl