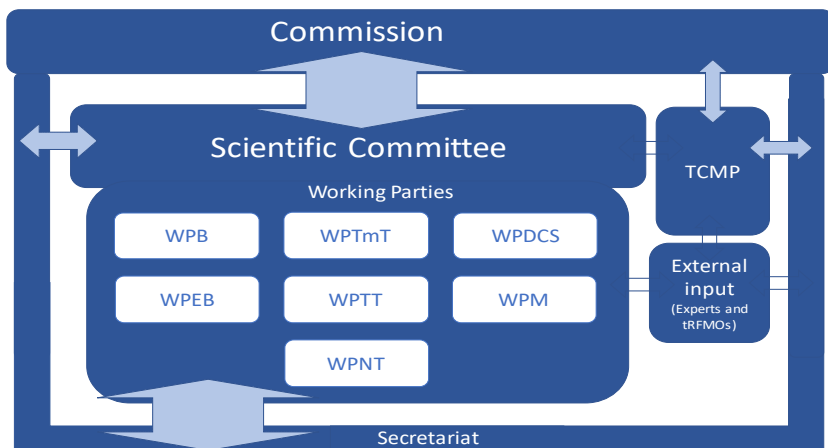# REPORT OF
7TH & 8TH SESSIONS OF THE TECHNICAL COMMITTEE ON MANAGEMENT PROCEDURES (TCMP 07/08)

CO-CHAIR: JUNG-RE RILEY KIM (COMMISSION CHAIR, KOREA)
CO-CHAIR: TOSHIHIDE KITAKADO (SCIENTIFIC COMMITTEE CHAIR, JAPAN)

28TH IOTC COMMISSION MEETING, 13-17 MAY 2024@BANGKOK, THAILAND

- The TCMP was established based on the Resolution 16/09, and its first meeting was held in 2017
- It has been providing a formal communication arena between scientists and decision makers to discuss technical and practical matters on the development of management procedures under the framework of MSE

TCMP07

- 19-20 Feb 2024 @virtual
- 57 delegates from 15 CPCs and 7 observers (including invited experts)
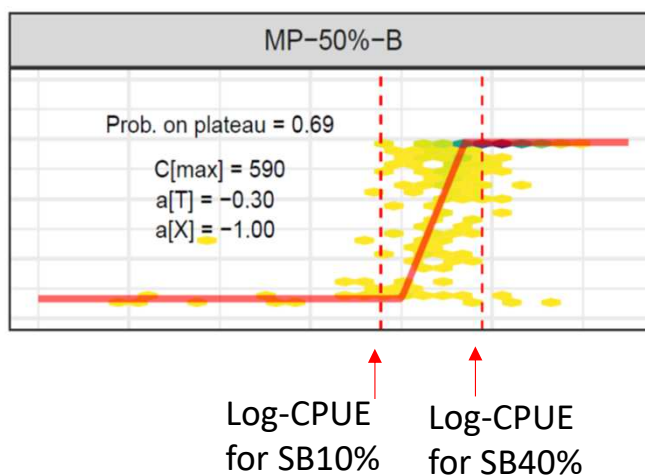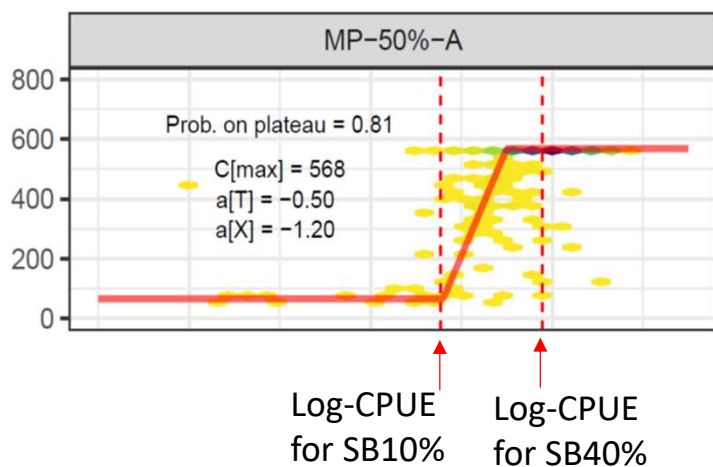
WPM15(MSE) Taskforce meeting

- 10-13 April 2024 @virtual

TCMP08

- 10-11 May 2024 @Bangkok, Thailand
- 131 delegates from 27 CPCs and 8 observers (including invited experts)

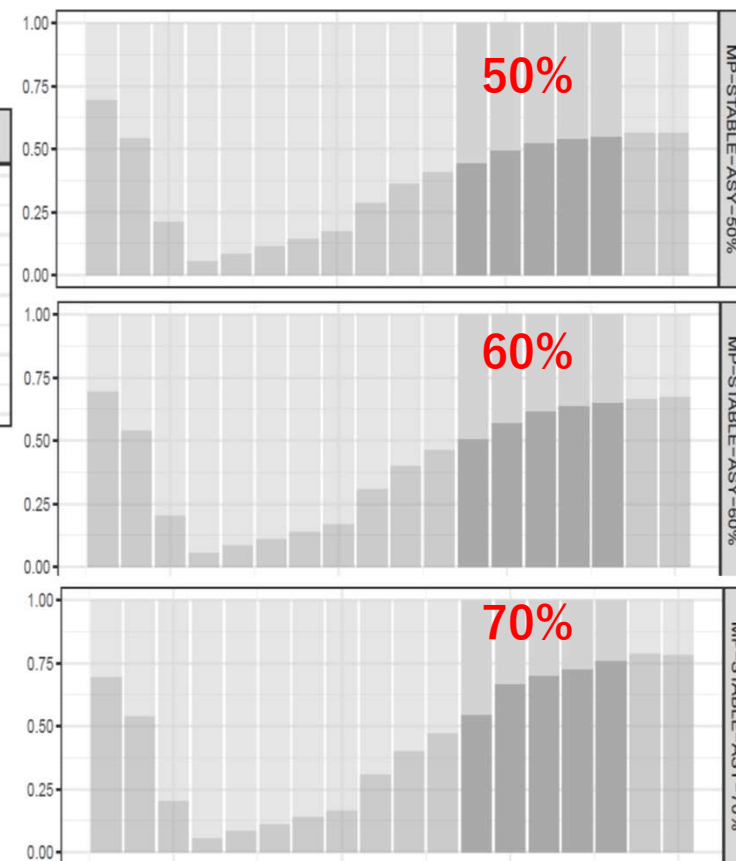Food and Agriculture Organization of the United Nations

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TCMP07 **24 candidate MPs**
- **3** tuning criteria (50,60,70%)
- **2** MP types (data-based A, B)

Prob(B>B40% & E<E40%) in 2034-38

4 Constraint options
1. Symmetric 15% (upward and downward)
2. Symmetric 25% (upward and downward)
3. Asymmetric 25% (upward) and 15% (downward)
4. Asymmetric 15% (upward) and 10% (downward)

TCMP07   **24 candidate MPs**   **= >**   **12 candidate MPs**

- **3** tuning criteria (50,60,70%)   =>   Maintained
- **2** MP types (data-based A, B)   =>   "Stable" and "Target"

Stable

MP−50%

Prob. on plateau = 0.81

C[max] = 568
a[T] = −0.50
a[X] = −1.20

Log-CPUE
for SB10%   Log-CPUE
for SB40%

MP−50%−B

Prob. on plateau = 0.69

C[max] = 590
a[T] = −0.30
a[X] = −1.00

Log-CPUE
for SB10%   Log-CPUE
for SB40%

Target

MP−50%

Prob. on plateau = 0.81

C[max] = 568
a[T] = −0.50
a[X] = −1.20

Log-CPUE
for SB10%   Log-CPUE
for SB40%

- ~~4 Constraint options~~ => **2** Constraint options
  1. Symmetric 15% (upward and downward)
  ~~2. Symmetric 25% (upward and downward)~~
  ~~3. Asymmetric 25% (upward) and 15% (downward)~~
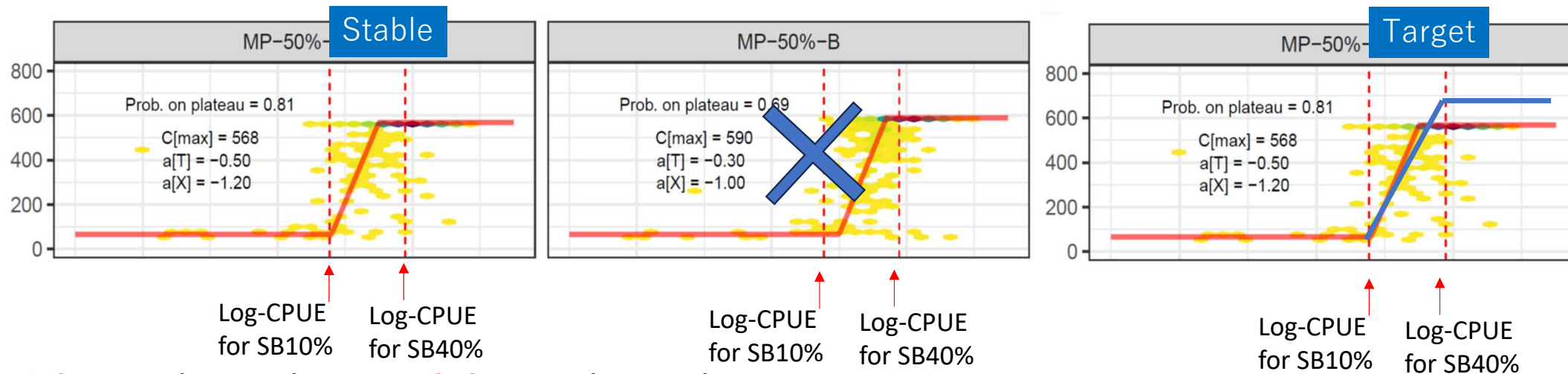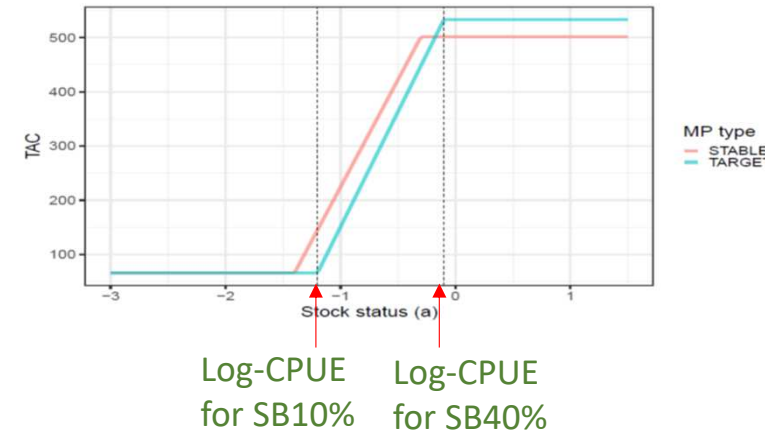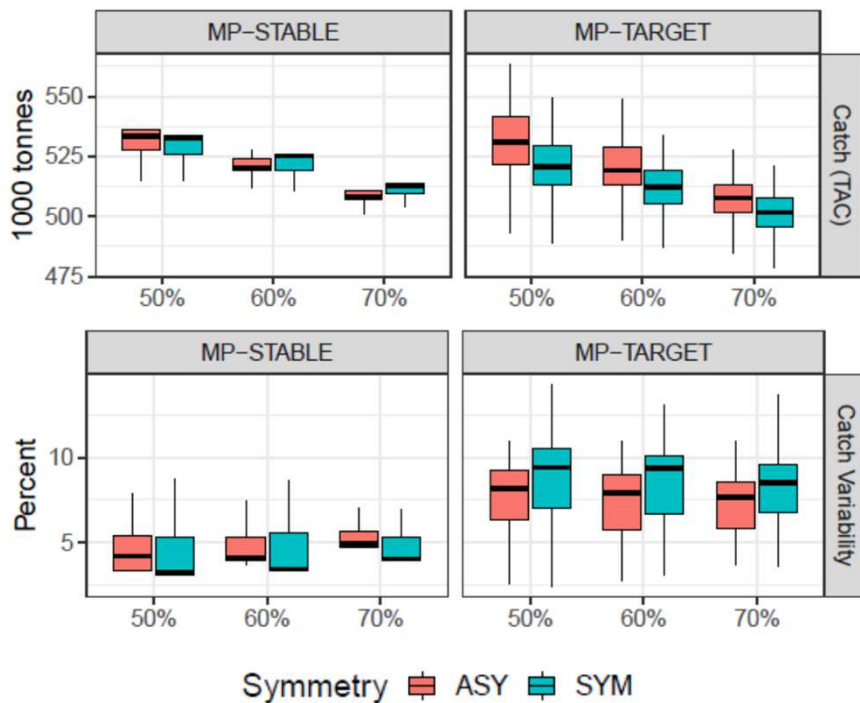 4. Asymmetric 15% (upward) and 10% (downward)

TCMP08 12 candidate MP options

- 3 tuning criteria (50,60,70%)
- 2 MP ("Stable" and "Target") with different Cmax
- 2 Constraints (15% Symmetric, 15/10% Asymmetric)

Log-CPUE for SB10%   Log-CPUE for SB40%

> Stock status and average catch are primarily determined by tuning criteria

> The 'Stable' MP-type can have a higher average TAC and lower variability whereas the 'Target' MP-type has a higher possible TAC.

> The Asymmetric TAC change limit led to more frequent TAC changes but can improve stability for the 'Target' MP-type or in the presence of overcatch.

Skipjack MSE

- Introduction of EU Proposal (Prop H)
- All MPs tested are able to maintain the stock in healthy level and above B_{MSY} level
- 70% tuning option was firstly excluded (in light of comparison to MSY-Ref points)
- "Stable" MP provided a more table time series of TAC and higher catch
- Catch reduction at the initial MP application
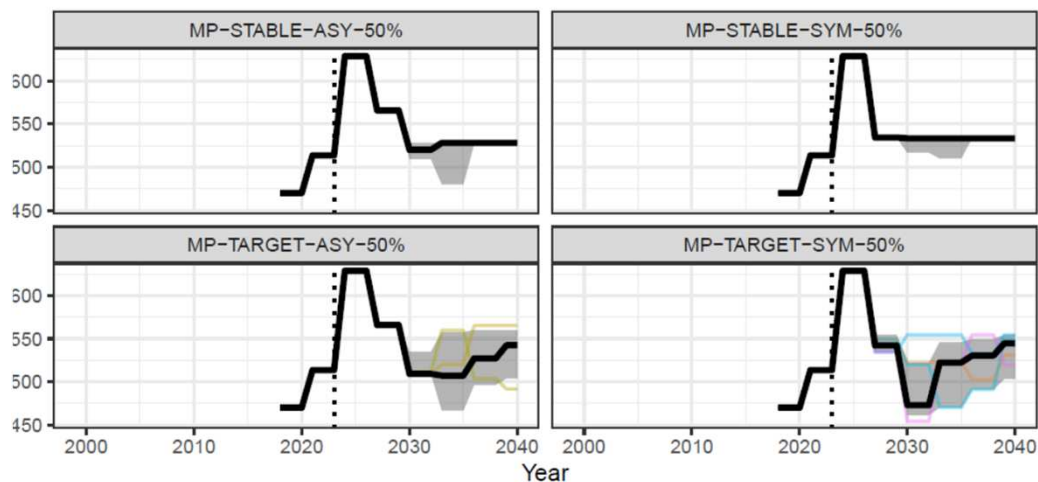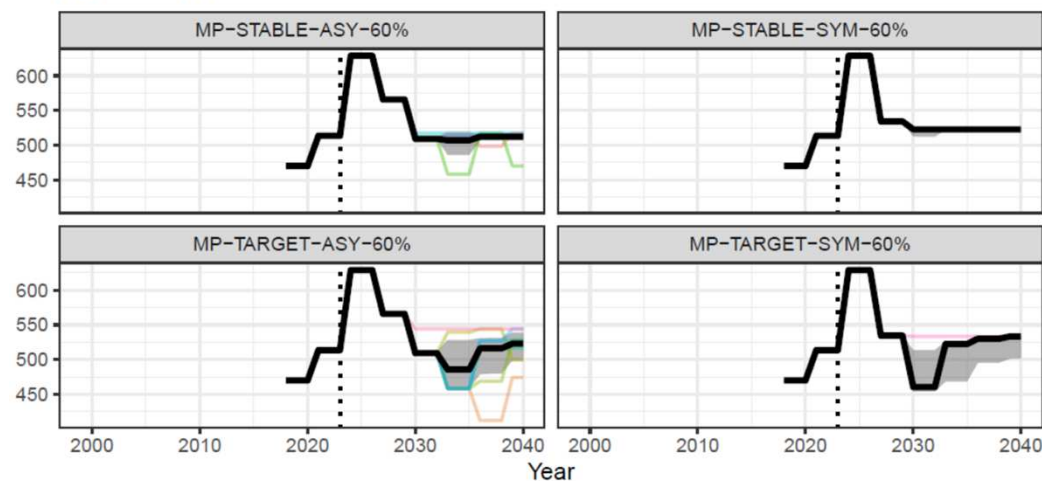
26. Considering that all Skipjack MPs tested show good performance with respect to stock status (e.g., all showing stock biomass above the LRP with high probability) and little difference among them in other performances measures under the reference set, the TCMP **NOTED** that all MPs ensure the skipjack will be managed within safe biological limits. Therefore, the TCMP **RECOMMENDED** the Commission to consider for adoption the EU proposal for the MP that has the following properties : (i) 50% probability of being at the skipjack target reference point in 2034-2038 (i.e., 40% B0), (ii) the stable type MP parameterisation, and (iii) an asymmetric TAC change clause.

27. The TCMP **NOTED** that increased catches of skipjack will also affect yellowfin and bigeye stocks which are overfished and subject to overfishing. The TCMP **RECOMMENDED** that the SC investigate and incorporate ecosystem effects in the next skipjack revision of the MP since the fishery of skipjack will impact catches in other species, such as yellowfin, bigeye, and sharks.

28. Moreover, considering that in the past skipjack catches have been greater than the recommended limits, the TCMP **RECOMMENDED** the Commission to take the necessary actions to ensure that catches do not exceed the TAC when the MP is applied.

TCMP07   **18 candidate MPs**

- **2** tuning criteria (60,70%)
- **3** MP types (2 data-based fast/slow & 1 model-based)
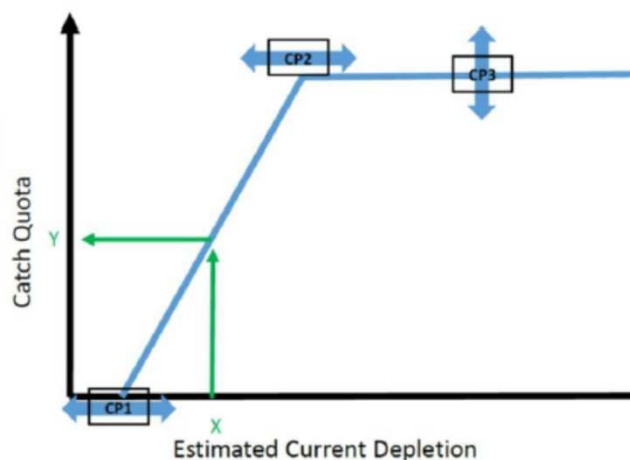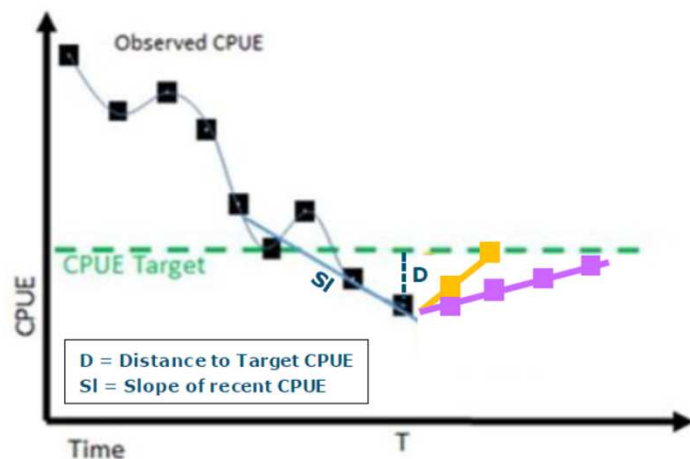
Prob(Green) in 2034-38
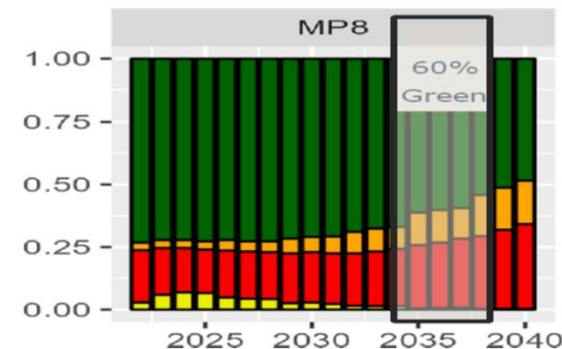
- **3** Constraint options
  - ✓ Symmetric 15% (upward and downward)
  - ✓ Symmetric 10% (upward and downward)
  - ✓ Asymmetric 15% (upward) and 10% (downward)

TCMP07   **18 candidate MPs**   **=>**   **6 candidate MPs**

- <u>2</u> tuning criteria (60,70%)   =>   Maintained
- <u>3</u> MP types (2 data-based fast/slow & 1 mode-based)   =>   Maintained
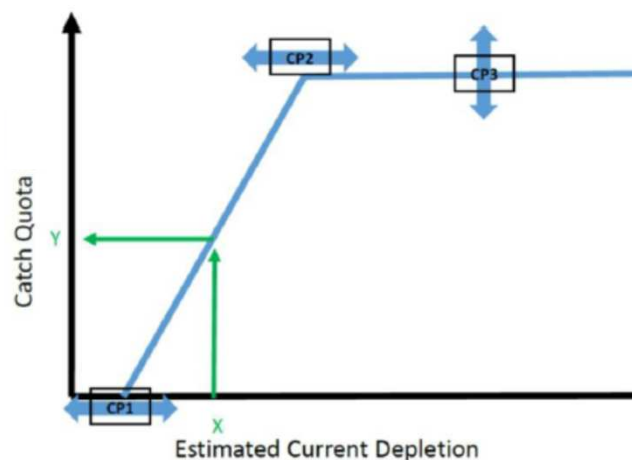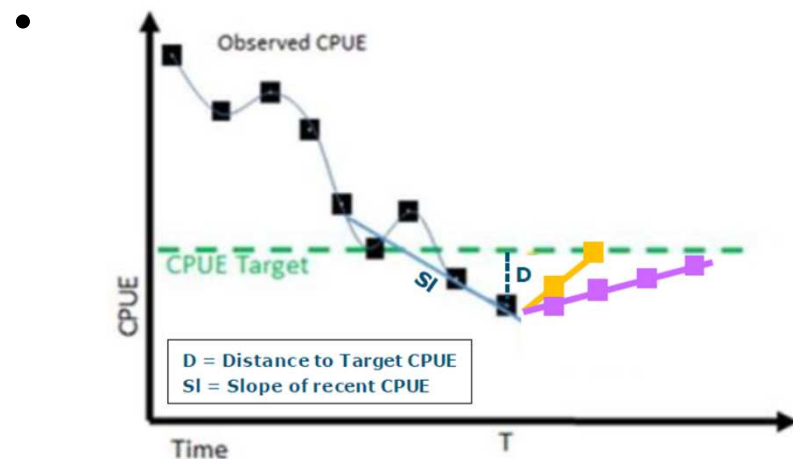-

- <u>1</u> Constraint option
  - ✓ ~~Symmetric 15% (upward and downward)~~
  - ✓ ~~Symmetric 10% (upward and downward)~~
  - ✓ Asymmetric 15% (upward) and 10% (downward)

Similarity of results

TCMP08 6 candidate MPs

MP name	descriptor	MPtype	Tuning objective P(Green)=	TAC stabilizer (max up- max down)
MP1	CPUE_Fast_60%_15-10	Faster reacting data-based	60%	15-10
MP2	CPUE_Fast_70%_15-10	Faster reacting data-based	70%	15-10
MP3	CPUE_Slow_60%_15-10	Slower reacting data-based	60%	15-10
MP4	CPUE_Slow_70%_15-10	Slower reacting data-based	70%	15-10
MP5	Modelbased_60%_15-10	Model based	60%	15-10
MP6	Modelbased_70%_15-10	Model based	70%	15-10
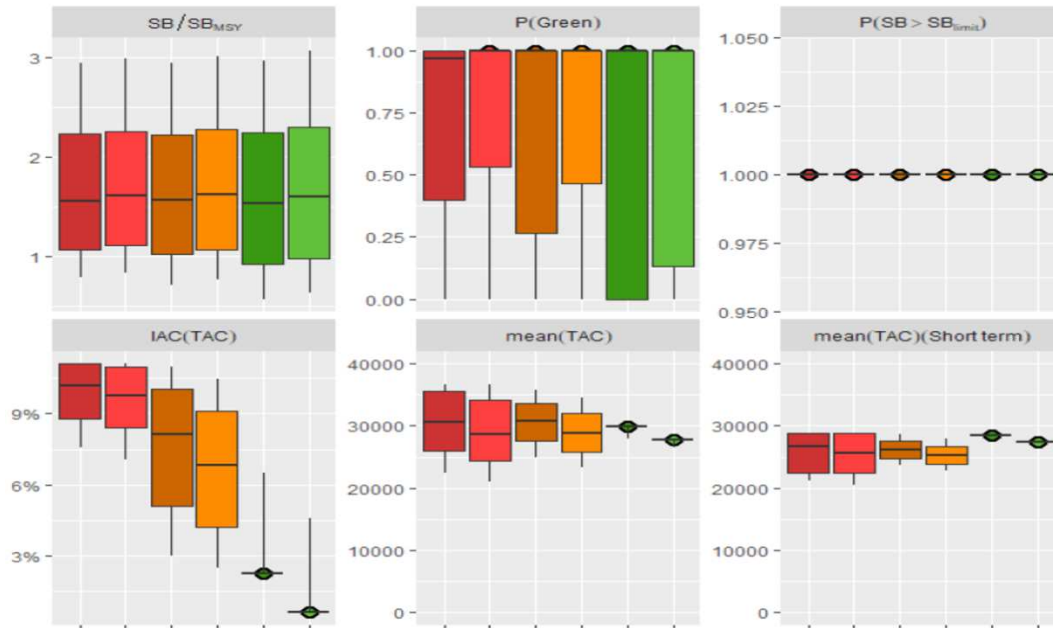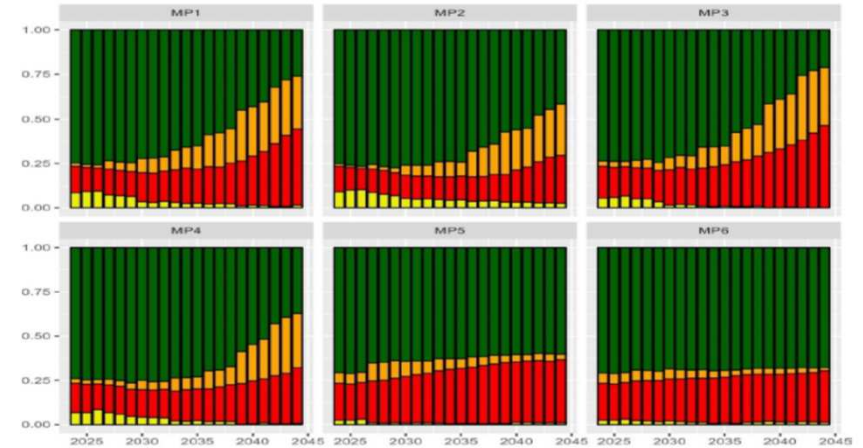
> ➤ **All MPs maintain the stock well above the target and limit reference points** and tuning criteria objective has a larger impact than MP type.

SWORDFISH MSE

- Data-based MPs achieved slightly higher TAC with larger uncertainty than model-based MP, and the TAC is more variable for fast reacting data-based MP.

- The model-based MP: there are a number of instances where the TAC decreases significantly 20 years further into the projection period.

- Introduction of Australian proposal (Prop G)

- The model-based MP exhibits less resilience to recruitment failure, which could lead to an increased risk of the stock falling below the limit reference point. In contrast, the fast, data-based MP shows a greater ability to adjust to changes in stock size.
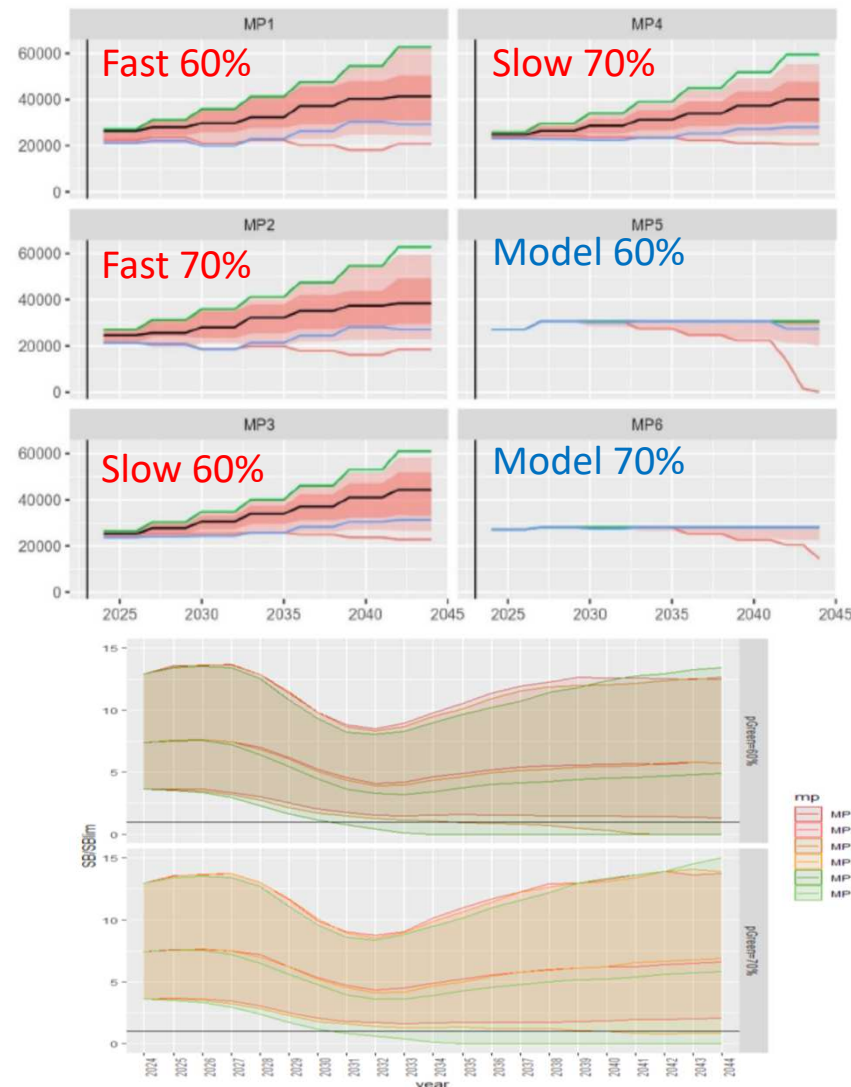
44. After considering the performance and trade-off between management objectives of the six candidate management procedures of swordfish, the TCMP **RECOMMENDED** the Commission to consider for adoption the Australian proposal for a swordfish MP: MP1 or MP2. These have the following properties: a fast reacting, data-based type MP, with either 60% (MP1) or 70% (MP2) probability of being at the target reference point in 2034-2038.

45. The TCMP also **NOTED** that changes in swordfish catch will also affect other species, particularly shark species. The TCMP **RECOMMENDED** that the SC investigate and incorporate ecosystem effects in the next swordfish revision of the MP.

"BEFORE" TCMP 08

	Bigeye	Skipjack	Swordfish
Stock status	2022	2023	2023
CMM/Prop	22/03 (MP) 23/04 (Catch limits)	Prop H	Prop G
Tuning criterion	Prob(Kobe Green) = 50%, 60%, 70%	Prob(B>B40% & E<E40%) = 50%, 60%, 70%	Prob(Kobe Green) = 50%, 60%, 70%
MP type	•Data-based •Model-based (MP1-Harvest MP2-Target)	•Data-based (stable) •Data-based (target) •Model-based	•Data-based (fast) •Data-based (slow) •Model-based
Constraints etc.	15% maximum change	•Symmetric 15% max change •Asymmetric 15%(up)-10% (down)	Asymmetric 15% (upward) - 10% (downward)
Progress in MSE	• Under peer-review process • Regular monitoring for EC	12 candidate MPs (= 3*2*2)	6 candidate MPs (= 3*2)

"AFTER" TCMP 08

	Bigeye	Skipjack	Swordfish
Stock status	2022	2023	2023
CMM/Prop	22/03 (MP) 23/04 (Catch limits)	Prop H	Prop G
Tuning criterion	Prob(Kobe Green) = 50%, 60%, 70%	Prob(B>B40% & E<E40%) = 50%, 60%, 70%	Prob(Kobe Green) = 50%, 60%, 70%
MP type	•Data-based •Model-based (MP1-Harvest MP2-Target)	•Data-based (stable) •Data-based (target) •Model-based	•Data-based (fast) •Data-based (slow) •Model-based
Constraints etc.	15% maximum change	•Symmetric 15% max change •Asymmetric 15%(up)-10% (down)	Asymmetric 15% (upward) - 10% (downward)
Progress in MSE	• Under peer-review process. • Regular monitoring for EC	1 candidate MP	2 candidate MPs

46. The TCMP **NOTED** that the adopted exceptional circumstances guidelines provide a process for annual review and method for determining management action for situations that fall outside the range of uncertainties covered by Management Strategy Evaluation (MSE) simulation testing. From this viewpoint, it was suggested that if catches reach the plateau in the HCR (for example, the Cmax in the skipjack MP), a substantial rise in CPUE could also constitute exceptional circumstances, if the increase lies outside the confidence intervals of the observed CPUE increases that have been simulation-tested.

48. The TCMP **NOTED** the new MSE timeline presented by the SC Chair as well as future application of the Management Procedures provided that SKJ and SWO MPs are adopted by the Commission next week. TCMP **REQUESTED** the SC via its WPM review the current schedule of MSE work and provide an update to the TCMP in 2025 for endorsement.

SCHEDULE (FOLLOWING THE CURRENT PROPS G AND H)

	2022	2023	2024	2025	2026	2027	2028	2029
BET	**MP adopted** •Assessment •MP run (EC check)	**Set TAC & CL 2024-25** (EC check)	MP to be run [CPUE ~2023] (EC check)	**Set TAC & CL 2026-28** Assessment (EC check)	(EC check)	MP to be run [CPUE ~2026] (EC check)	**Set TAC & CL 2029-31** Assessment (EC check)	….
SKJ		• Assessment • HCR run [CPUE ~2022] (TAC 24-26)	MP adopted?	MP to be run? [CPUE ~2024] (EC check)	**Set TAC 2027-29?** Assessment (EC check)	(EC check)	MP to be run? [CPUE ~2027] (EC check)	**Set TAC 30-32?**
SWO		Assessment	MP adopted? MP to be run? [CPUE ~2023] (EC check)	**Set TAC 2026-28 ?** (EC check)	Assessment (EC check)	MP to be run? [CPUE ~2026] (EC check)	**Set TAC 2029-31 ?** (EC check)	….

External review

Achievement and Progress on MSE in the IOTC

	Albacore	Skipjack ⭐ ?		Yellowfin	Bigeye ⭐	Swordfish ⭐ ?
Stock status	2022	2023		2021	2022	2023
Existing HCR/MP		16/02 & 21/02 (HCR)	Prop H		22/03 (MP) 23/04 (Catch limits)	Prop G
Tuning criterion	Prob(Kobe Green) =50%, 60%, 70%		Prob(B>B40% & E<E40%) = 50%, 60%, 70%	Prob(SB$_{20XX}$ >= SBmsy) = 0.5 for 20XX=2029, 2034	Prob(Kobe Green) = 50%, 60%, 70%	Prob(Kobe Green) = 50%, 60%, 70%
MP type	• Data-based • Model-based	HCR (Inputs from SS3 assessment)	• Data-based (stable) • Data-based (target) • Model-based		• Data-based • Model-based (MP1-Harvest MP2-Target)	• Data-based (fast) • Data-based (slow) • Model-based
Constraints etc.		30% max change Cmax=900,000 (t)	• Symmetric 15% max change • Asymmetric 15%(up)-10% (down)		15% maximum change	Asymmetric 15% (upward) - 10% (downward)
Progress in MSE	In Progress (new OM conditioning approach was agreed)		Close to finalizing the selection of an MP from 1 CMP	Pending (new assessment in 2024, new OM conditioning)	Under peer-review process. Regular monitoring for EC	Close to finalizing the selection of an MP from 2 CMPs

50. The TCMP **NOTED** that Maldives has obtained funding for an MSE capacity-building workshop intended for fishery managers in coastal countries and requested the Secretariat to provide technical support and coordination of the workshop, scheduled for late August.

51. The TCMP **NOTED** the limited engagement of coastal states in the discussion of MSE work at the meeting. The TCMP **acknowledged** that the importance of ongoing capacity building to enhance awareness and understanding of MP development among coastal countries. Therefore, the TCMP **RECOMMENDED** the allocation of resources to support capacity-building efforts, to bolstering the participation and contribution of coastal countries in the MSE process.

56. Considering the progress on MSE for IOTC species, the TCMP **RECOMMENDED** that a virtual TCMP be convened early in 2025 with a special focus on albacore tuna if the SC agrees that sufficient progress has been made, and a one-day TCMP be convened back-to-back with the Commission's Session in 2025. The TCMP also **RECOMMENDED** that the WPM(MSE) be held in March/April, and that the next TCMP meeting should include a capacity building component, taking into considerations of the options suggested by the small Working Group.

- All the participants for dedicated and productive discussion

- MSE developers and presenters (Edwards, Brunel and Mosqueira)

- Chairs/vice-chairs of WPM and WPTT (Murua, Preece, Merino, Adam)

- Proponents of G (Australia) and H (EU)

- IOTC secretariats

- Leading rapporteur (Science Manager Fu) with assistance of Edwards, Brunel and Mosqueira

- Commission Chair (Kim)