

MI-WP-09 Evaluation of CMM 2023-01 (Tropical Tuna CMM)

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Content

- CMM evaluation

Step 1: Develop alternative scenarios for future fishing levels possible under CMM2023-01

Step 2: Evaluate the consequences of each scenario for tropical tuna stocks, and compare to CMM2023-01 objectives

Presentation won't cover additional analyses in appendices

Evaluated up to 2023 - when CMM 2021-01 in place

Evaluations from 2025 will include 2024 data.

Appendices are ~longer than the main paper – could do with rationalising...





- What's new? Changes include:
 - Shorter FAD closure (by 50%)
 - Potential increases in Table 3 LL BET catch by flag, tied to observer coverage increases
 - KR 5% increase in 2024
 - TW 2% increase in 2024
 - Changes to LL limits in Table 3 (US)

CMM 2023-01 evaluation

Step 1: Scenarios to bracket potential futures under CMM 2023-01:

- **‘2019-2021 avg’** = recent conditions continue
 - **‘Optimistic’** = incorporate shorter FAD closure period specified in CMM 2023-01, effort at 2019-21 levels; LL take limits or 2019-21 levels if lower
 - **‘SKJ MP/Table 3’** = shorter FAD closure + 2012 effort levels; LL fleets indicating higher Table 3 catches achieve this
 - **‘Fully utilised’** = all opportunities under the CMM maximised; 2012 PS effort as per skipjack MP, high seas FAD sets maximised, LL BET catch limits taken + Table 3 extras. NOTE: don’t assume Table 1 total levels – not seen in recent yrs.
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- Evaluated for BET (recent and long-term recruitment), YFT and SKJ
 - For YFT and SKJ, PS impact is primarily through the overall PS effort
 - For BET PS impact is primarily through the FAD set effort x effort change
 - For YFT – continue assuming BET LL catch scalars are applied to yellowfin

Evaluating stock impacts

- 30 yr projections off latest assessment model grids
 - BET run for the two recruitment scenarios ('recent' and 'long term')
- Future PS effort and LL catch set at scenario levels (scaled off 2019-2021 levels)
 - Most domestic ID/PH/VN fisheries set at 2016-2018 average catch **effort** levels for yellowfin tuna evaluation
- Outcomes presented:
 - 'equilibrium' outcomes (depletion $SB/SB_{F=0}$ and F/F_{MSY}) at end of 30 yr projection
 - Risk relative to LRP (and F_{MSY}) at end of 30 yr projection
 - 'Snapshot' evolution of stock status (see Tables 6 & 8)

BET outcomes

Scenario		Scalars relative to 2019-2021	
Recruit	Fishing level	Purse seine	Longline
Recent	2019-21 avg	1.00	1.00
	Optimistic	1.19	1.00
	SKJ	1.40	1.12
	MP/Table 3		
	Fully utilised	1.43	1.67
Long-term	2019-21 avg	1.00	1.00
	Optimistic	1.19	1.00
	SKJ	1.40	1.12
	MP/Table 3		
	Fully utilised	1.43	1.67

CMM objective $SB_{2012-2015}/SB_{F=0} = 0.34$

YFT/SKJ outcomes

Stock	Fishing level	Scalars relative to 2019-2021		Median $SB_{2051}/SB_{F=0}$	Median $SB_{2051}/SB_{F=0}$ v $SB_{2012-15}/SB_{F=0}$	Median $F_{2047-2050}/F_{MSY}$	Median ratio $F_{2047-2050}/F_{MSY}$ v $F_{2017-20}/F_{MSY}$	Risk (%) ¹	
		Purse seine	Longline					$SB_{2051} < LRP$	$F > F_{MSY}$
Yellowfin	2019-21 avg	1	1	0.41	0.93	0.57	1.14	0%	0%
	Optimistic	1	1	0.41	0.93	0.57	1.14	0%	0%
	SKJ MP/Table 3	1.17	1.12	0.38	0.86	0.62	1.24	0%	0%
	Fully utilised	1.17	1.67	0.34	0.77	0.67	1.34	2%	2%

$SB_{2012-2015}/SB_{F=0} = 0.44$

Median $SB_{2051}/SB_{F=0}$ v $SB/SB_{F=0} = 0.50$

Skipjack	2019-21 avg	1	1	0.53	1.07	0.31	0.97	0%	0%
	Optimistic	1	1	0.53	1.07	0.31	0.97	0%	0%
	SKJ MP/Table 3	1.17	1.12	0.50	1.00	0.35	1.09	0%	2%
	Fully utilised	1.17	1.67	0.50	1.00	0.35	1.09	0%	2%

SKJ TRP: $SB/SB_{F=0} = 0.50$

Recent levels v expected under CMM

	Average 2019-21	2021	Scalar 2021	2022	Scalar 2022	2023	Scalar 2023
Purse seine effort (FAD sets) ¹	15,878	17,408	1.10	18,447	1.16	16,609	1.05
Longline bigeye catch (mt)	56,048	50,950	0.91	52,656	0.94	54,158	0.97
Longline yellowfin catch (mt)	66,084	57,790	0.87	67,906	1.03	62,599	0.95

Fully utilised: LL = 1.67, FAD sets =1.43

Summary

- Fully utilised CMM 2023-01 achieves objectives (skipjack MP TRP) for **skipjack**
- Fully utilised CMM 2023-01 does not achieve objective (2012-2015) for **bigeye** under either recruitment scenario
- No CMM 2023-01 scenario achieves objective (2012-2015) for **yellowfin** (caveat around assumption that yellowfin is scaled consistent with bigeye LL catch, YFT R2 effort based)

BET – time series snapshots

Scenario		Scalars relative to 2019-21		Median $SB_{2023-2026}/SB_{F=0}$	Median $SB_{2032-2035}/SB_{F=0}$	Median $SB_{2048-2051}/SB_{F=0}$	Risk $SB_{2026} < LRP$	Risk $SB_{2035} < LRP$	Risk $SB_{2051} < LRP$
Recruitment	Fishing level	Purse seine	Longline						
Recent	2019-21 avg	1.00	1.00	0.39	0.45	0.46	0%	0%	0%
	Optimistic	1.19	1.00	0.39	0.43	0.43	0%	0%	0%
	SKJ	1.40	1.12	0.36	0.40	0.39	0%	0%	0%
	MP/Table 3 Fully utilised	1.43	1.67	0.34	0.32	0.30	0%	0%	3%
Long-term	2019-21 avg	1.00	1.00	0.38	0.40	0.43	0%	0%	0%
	Optimistic	1.19	1.00	0.38	0.38	0.41	0%	0%	0%
	SKJ	1.40	1.12	0.36	0.35	0.36	0%	0%	1%
	MP/Table 3 Fully utilised	1.43	1.67	0.34	0.27	0.27	0%	15%	30%

YFT/SKJ time series snapshots

Scenario		Scalars relative to 2019-21		Median SB ₂₀₂₃₋₂₀₂₆ /SB _{F=0}	Median SB ₂₀₃₂₋₂₀₃₅ /SB _{F=0}	Median SB ₂₀₄₈₋₂₀₅₁ /SB _{F=0}	Risk SB ₂₀₂₆ < LRP	Risk SB ₂₀₃₅ < LRP	Risk SB ₂₀₅₁ < LRP
		Purse seine ¹	Longline						
Yellowfin	2019-21 avg	1.00	1.00	0.43	0.40	0.41	0%	0%	0%
	Optimistic	1.00	1.00	0.43	0.40	0.41	0%	0%	0%
	SKJ MP/Table 3	1.17	1.12	0.43	0.37	0.38	0%	0%	0%
	Fully utilised	1.17	1.67	0.43	0.34	0.34	0%	0%	2%
Skipjack	2019-21 avg	1.00	1.00	0.50	0.54	0.53	0%	0%	0%
	Optimistic	1.00	1.00	0.50	0.54	0.53	0%	0%	0%
	SKJ MP/Table 3	1.17	1.12	0.46	0.50	0.50	0%	0%	0%
	Fully utilised	1.17	1.67	0.46	0.50	0.50	0%	0%	0%