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Supplementary Management Procedure Evaluations for South Pacific Albacore

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Executive summary

This paper presents the results of supplementary south Pacific albacore (SPA) management procedure (MP) evaluations. It is a response to WCPFC21-2024-DP11 (SPG and Australia, 2024) and is intended to support discussions around this topic at WCPFC21.

For the main SPA MP evaluations presented to WCPFC21 (SPC-OFP, 2024) two of the key assumptions are that the MP does not apply to fisheries operating in the EPO region of the model and that total catches of fisheries operating in the EPO region of the model are fixed at 22,500 mt per annum.

Here, an MP with a new HCR is tested that is designed to achieve the interim target reference point (iTRP) in the long-term but with future catches in the EPO model region fixed at 13,500 mt per annum, consistent with the request in WCPFC21-2024-DP11, i.e. the MP has comparable long-term median $SB/SB_{F=0}$ as the MP with HCR 1 in the main set of results. The new MP has a constraint of +10% -5% and outputs a catch limit. The shapes and coordinates of the HCRs are in Figure 1 and Table 1.

Noting that the expected performance of MPs will be affected by the level of catch in the rest of the EPO, as WCPFC has no direct control over this level, the level of fishing within that region is an assumption that should be monitored following MP implementation.

The same six performance indicators as used in the other SPA MP evaluations are used to compare the relative performance of MPs with HCR 1 and HCR 12 (SPC-OFP, 2024). The results are presented in Figure 2 and Table 2. The new MP is also included in the online app, SPAMPLE (<https://ofp-sam.shinyapps.io/spample>).

The main difference in the results is that the MP with HCR 12 (where future annual catches in the EPO are set to 13,500 mt) has higher catches in the WCPFC-CA in all three time periods. The MP with HCR 12 has slightly lower vulnerable biomass but this is because it also achieves slightly lower $SB/SB_{F=0}$. The MP with HCR 12 has lower catch variability in the short-term. This is because the first time the MP is called the output catch limit is closer to the assumed level of catches in the simulated period 2023-2025, therefore a smaller change in catch in the short-term is required. The MPs provide comparable performance across the other indicators and time-periods.

References

- SPC-OFP (2024). Evaluation of candidate management procedures for south Pacific albacore. Technical Report WCPFC21-2024-30, Suva, Fiji, 28 November - 3 December 2024.
- SPG and Australia (2024). Proposed Conservation and Management Measure on a Management Procedure for South Pacific Albacore. Technical Report WCPFC21-2024-DP11, Suva, Fiji, 28 November - 3 December 2024.

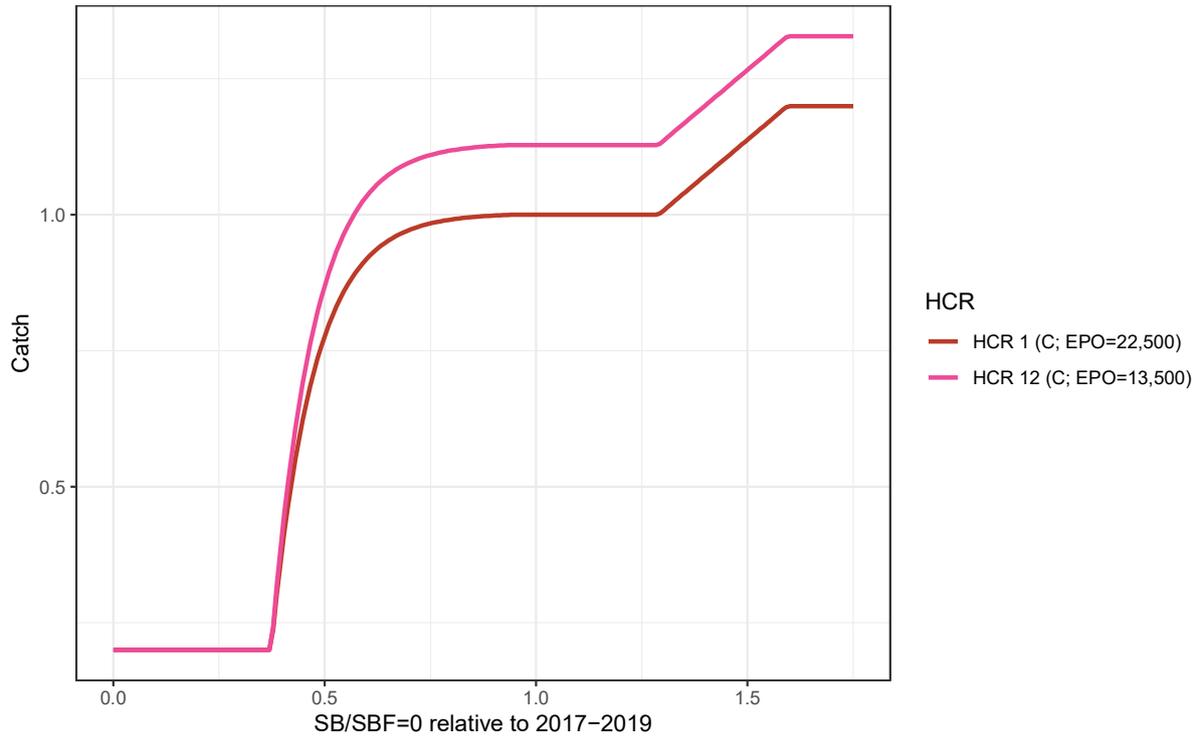


Figure 1: The HCR shapes. The input to the HCR is the mean $SB/SB_{F=0}$ of the last three years relative to 2017-2019. The output is a scaler applied to 2020-2022 levels of catch.

Table 1: Parameter values of the HCR shapes.

HCR	Limit	Step start	Step end	Maximum
HCR 1 (C; EPO=22,500)	0.37	0.94	1.29	1.59
	0.20	1.00	1.00	1.20
HCR 12 (C; EPO=13,500)	0.37	0.94	1.29	1.59
	0.20	1.13	1.13	1.33

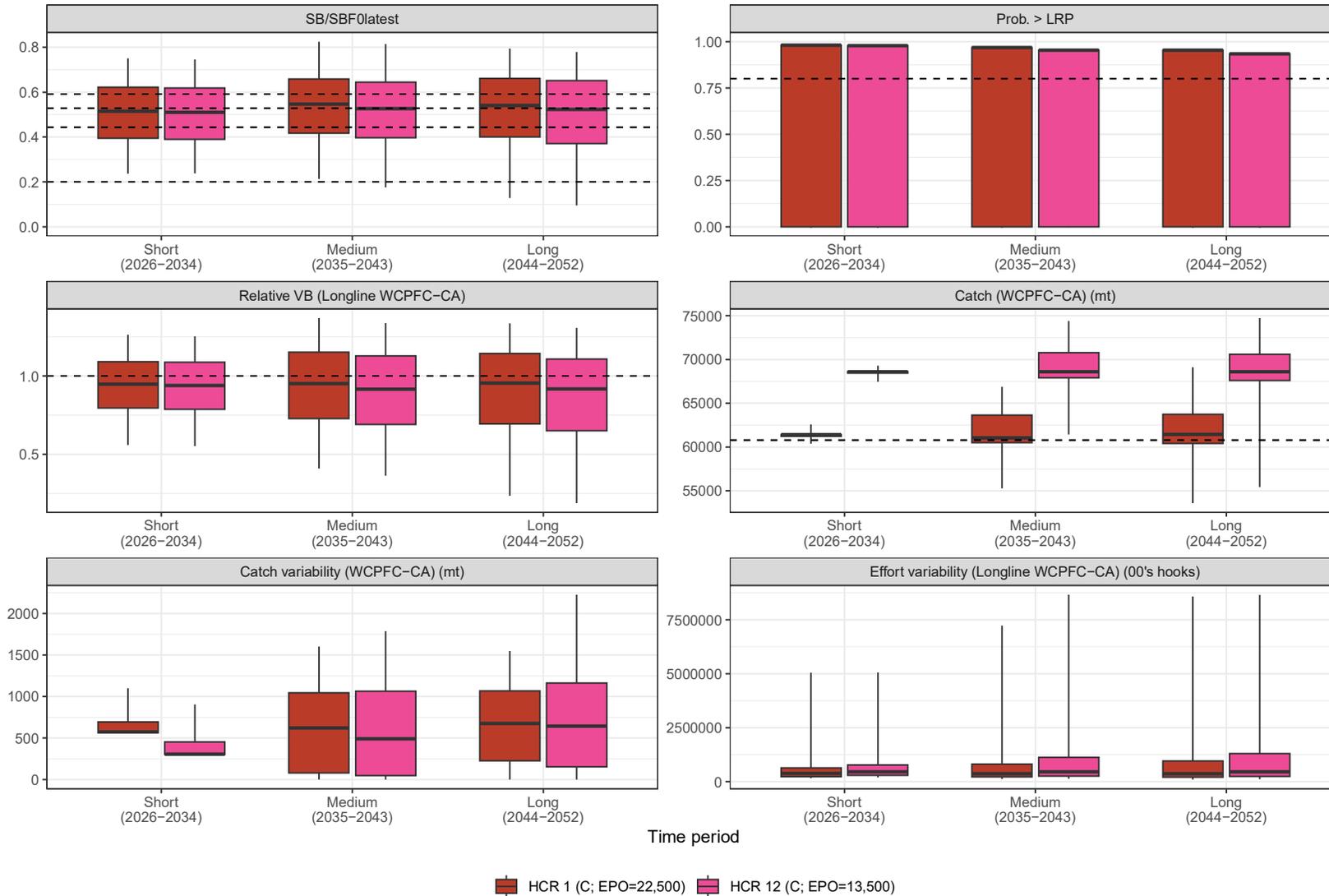


Figure 2: Box plots of performance indicators across the three time periods (probability of being above the LRP is presented as a bar chart). Whiskers show the 95th percentile range, the box shows the 60th percentile range, and the horizontal line is the median value. Horizontal lines on the SB/SB_{F=0} plot are the iTRP, proposed TRPs from WCPFC20 and the LRP. The horizontal line on the Prob. > LRP plot is at 0.8, the minimum required by WCPFC. Vulnerable biomass is relative to the level in 2020-2022. The horizontal line on the catch plot is the HCR baseline, the average catch in 2020-2022.

Table 2: Performance indicators for each MP in the long-term (2044-2052). The value outside the parenthesis is the median, the values inside the parenthesis are the 95th percentile range. Note that the equivalent value of the iTRP for the operating model grid is 0.53.

HCR	SB/SBF=0	Prob. > LRP	Relative VB (Longline, WCPFC-CA)	Catch (WCPFC-CA) (mt)	Catch variability (mt)	Effort variability (000s hooks)
Short-term (2026-2034)						
HCR 1 (C; EPO=22,500)	0.514 (0.237, 0.75)	0.981 (0, 0.981)	0.947 (0.558, 1.26)	61400 (60400, 62600)	573 (566, 1100)	382000 (162000, 5050000)
HCR 12 (C; EPO=13,500)	0.51 (0.238, 0.745)	0.978 (0, 0.978)	0.94 (0.551, 1.25)	68600 (67500, 69300)	308 (302, 905)	453000 (201000, 5070000)
Medium-term (2035-2043)						
HCR 1 (C; EPO=22,500)	0.547 (0.213, 0.825)	0.969 (0, 0.969)	0.95 (0.408, 1.37)	61100 (55300, 66900)	621 (0, 1600)	370000 (120000, 7230000)
HCR 12 (C; EPO=13,500)	0.526 (0.176, 0.814)	0.955 (0, 0.955)	0.916 (0.362, 1.34)	68600 (61400, 74400)	490 (0, 1790)	457000 (137000, 8670000)
Long-term (2044-2052)						
HCR 1 (C; EPO=22,500)	0.541 (0.128, 0.794)	0.954 (0, 0.954)	0.954 (0.234, 1.34)	61400 (53600, 69100)	676 (0, 1550)	363000 (96500, 8580000)
HCR 12 (C; EPO=13,500)	0.523 (0.095, 0.779)	0.935 (0, 0.935)	0.917 (0.187, 1.31)	68600 (55400, 74700)	643 (0, 2230)	453000 (111000, 8650000)