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**UPDATES ON MANAGEMENT PROCEDURE EVALUATIONS FOR SOUTH
PACIFIC ALBACORE SINCE SMD01**

**WCPFC19-2022-16
16th November 2022**

**SPC-OFP
Pacific Community (SPC), Noumea, New Caledonia**

Executive Summary

To support discussions on management options for south Pacific albacore, a range of catch reduction scenarios were presented to SC18 (SC18-MI-WP-04). From these options several CCMs identified catch reductions of 10% and 20% from recent (2017-19) levels for further consideration. In considering the scope and extent of the measures required, SC18 requested additional analyses to determine the impact of including or excluding the EPO from management procedures for south Pacific albacore. SMD01 further discussed the issue with respect to the troll fishery and requested a similar analysis to determine the impact of including or excluding the troll fishery from the control of management procedures.

Analyses were run using the same approach as that described in SC18-MI-WP04. From the results of the projections it is possible to determine the additional burden to the WCPFC-CA longline fishery of excluding the EPO and troll fisheries from the control of management procedures (Figure 2).

1. If measures do not apply to the EPO an additional 2-3% catch reduction is required in WCPFC-CA longline and troll fisheries to achieve the same stock depletion outcome (approximately 1500-2000 mt less WCPFC-CA catch in these two scenarios).
2. If measures do not apply to the WCPFC-CA troll fishery an additional 0-1% catch reduction in WCPFC-CA longline and EPO fisheries to achieve the same stock depletion outcome (approx. 0 – 750 mt less catch).
3. If measures do not apply to both EPO fisheries and the WCPFC-CA troll fishery, an additional 3-4% catch reduction is required in WCPFC-CA longline fishery to achieve the same depletion outcome (approximately 2000 to 3000 mt less).

For this analysis it has been assumed that catches continue at status quo levels (2017-19). We note that more recent catch estimates for the EPO in particular (presented in WCPFC19-2022-IP06, Figure 1) indicate higher catches for 2021 than have been assumed in this analysis (approximately 45% higher than the 2017-2019 average EPO catch). In addition, it has been assumed that catch reductions in the WCPFC-CA are achieved without vessels moving across into the EPO and continuing to fish for south Pacific albacore, resulting in a spatial redistribution of albacore catches rather than a net reduction in overall catch.

These results suggest that there are notable benefits in securing compatible management in the EPO region, particularly where greater increases in WCPFC-CA southern longline vulnerable biomass are desired by managers. Consideration is therefore needed by managers on how management procedures for South Pacific albacore should be designed and implemented.

Introduction

In accordance with the updated indicative workplan for the adoption of harvest strategies under CMM 2014-06 (WCPFC18, Attachment I), WCPFC19 is scheduled to review and adopt a management procedure for south Pacific albacore. However, due to technical difficulties with the development of the evaluation framework for south Pacific albacore and delays in the agreement of defined management objectives, information to support adoption of a management procedure in 2022 is not available. Discussions on a revised timescale for the adoption of management procedures for south Pacific albacore are ongoing.

The status of the development of the harvest strategy approach for south Pacific albacore was considered at both SC18 and SMD01 with specific regard to the development of management objectives and options for setting a TRP; options for selecting operating models for testing candidate management procedures and initial design considerations for harvest control rules.

A range of catch reduction scenarios were presented to SC18 (SC18-MI-WP-04, Further analyses to inform discussions on south Pacific albacore objectives and the TRP). From these options several CCMs identified catch reductions of 10% and 20% from recent (2017-19) levels for further consideration. SC18 noted the implications of a potential MP to be developed across the South Pacific, and in particular for areas outside the WCPFC jurisdiction, and requested additional analyses to determine the impact of including or excluding the EPO from the implementation of management procedures for south Pacific albacore. SMD01 further discussed the issue with respect to the troll fishery and requested a similar analysis to determine the impact of including or excluding the troll fishery from the control of management procedures.

SMD01 made the following provisional recommendations noting that many of the outstanding issues for the development of the harvest strategy approach for south Pacific albacore would be further discussed at WCPFC19.

1. to consider 10% and 20% catch reduction scenarios as a basis for management objectives;
2. to include the EPO in the MSE framework (using the 2021 assessment models) pending further discussion at WCPFC19;
3. to consider all fisheries fishing for albacore south of the equator when designing and testing management procedures, and
4. to examine the impacts of including or excluding the troll fishery from management measures for south Pacific albacore.

This paper presents further analyses to that provided in SC18-MI-WP-04 to investigate the impact of including or excluding both the EPO and the troll fishery from 10% and 20% catch reduction measures for south Pacific albacore.

Catch reduction scenarios

Analyses were run using the same approach as that described in SC18-MI-WP04. Projections were run from the agreed 2021 south Pacific albacore assessment grid (Castillo-Jordan et. al., 2021) as follows:

1. Project the stock forward for a 30-year period (2020 to 2049) under alternative fixed catch scalars applied to the 2017-19 average catches.

2. For each catch scenario, 100 projections were run for each assessment model with future recruitments determined from the stock recruitment relationship and variability drawn from historical recruitment deviation estimates for the period 1960 to 2018.
3. Baseline 'full implementation' scenarios of no catch reduction (2017-19 average catches) and 10% and 20% catch reduction scenarios were first run where those catch reductions applied to all fishery sectors (longline and troll fisheries across the South Pacific).
4. For each scenario the long-term (2049) spawning potential depletion ($SB/SB_{F=0}$) was calculated as the average across the 72 assessment models, incorporating the model weighting criteria specified by SC17.
5. Subsequent scenarios held the catch within specific fishery components constant at 2017-19 levels, and adjusted the catch in the remaining fishery components so that the same spawning potential depletions resulting from the full implementation scenarios (step 3 above) were achieved. Catch limits were therefore applied:
 - a. to all longline and troll fisheries south of the equator in the WCPFC-CA [EPO fisheries fixed at 2017-2019 levels];
 - b. to all longline fisheries south of the equator in the WCPFC-CA and EPO [WCPFC troll fishery fixed at 2017-19 level], and
 - c. to longline fisheries south of the equator in the WCPFC-CA only [EPO fisheries and WCPFC-CA troll fisheries at 2017-2019 levels].

This allowed the additional catch change needed within WCPFC fishery components to achieve comparable stock depletion levels to be identified.

From the results of the projections (Table 1) it is possible to determine the additional burden to the WCPFC-CA longline fishery of excluding the EPO and troll fisheries from management measures (Figure 2).

4. If measures do not apply to the EPO an additional 2-3% catch reduction is required in WCPFC-CA longline and troll fisheries to achieve the same stock depletion outcome (approximately 1500-2000 mt less WCPFC-CA catch in these two scenarios).
5. If measures do not apply to the WCPFC-CA troll fishery an additional 0-1% catch reduction in WCPFC-CA longline and EPO fisheries to achieve the same stock depletion outcome (approx. 0 – 750 mt less catch).
6. If measures do not apply to both EPO fisheries and the WCPFC-CA troll fishery, an additional 3-4% catch reduction is required in WCPFC-CA longline fishery to achieve the same depletion outcome (approximately 2000 to 3000 mt less).

Discussion

While indicative catch levels for the WCPFC Convention Area (total longline and troll) have been provided here, the actual level that would achieve outcomes will be dependent upon the level of catch that occurs in the remainder of the EPO. For this analysis the simplifying assumption that catches will continue at status quo levels (2017-19) has been made. We note that more recent catch estimates for the EPO (presented in WCPFC19-2022-IP06, Figure 1) indicate higher catches for 2021 than have been assumed in this analysis (approximately 45% higher than the 2017-2019 average EPO catch). These results suggest that there are notable benefits in securing compatible management in the EPO region, particularly where greater increases in WCPFC-CA southern longline vulnerable biomass are desired by managers.

Consideration is therefore needed by managers on how management of South Pacific albacore should be implemented.

We note that the catch reduction scenarios considered in this analysis assume there is no net transfer of fishing effort between the WCPFC-CA and the EPO. That is, that catch reductions in the WCPFC-CA are achieved without vessels moving across into the EPO and continuing to fish for south Pacific albacore, resulting in a spatial redistribution of albacore catches rather than a net reduction in overall catch.

Acknowledgements

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Table 1. Outcomes under alternative future longline catch levels (scalars) for south Pacific albacore. Outcomes are in terms of longline vulnerable biomass relative to alternative historical periods and median (weighted) stock depletion level within the WCPFC-CA.

| Catch Scalar (cf 2017-2019 average) | Approx Catch (mt) | | | Vulnerable Biomass | | Long-term avg SB/SB _{F=0} (WCPFC-CA) |
|---|-------------------|-------------------|-----|--------------------------|-----------------------|---|
| | WCPFC-CA LL | WCPFC-CA Troll | EPO | VB/VB _{2013+8%} | VB/VB ₂₀₁₃ | |

WCPFC-CA LL + Troll + EPO

| | | | | | | |
|-----|--------|-------|--------|------|------|------|
| 1 | 69,430 | 2,770 | 15,600 | -38% | -33% | 0.43 |
| 0.9 | 62,490 | 2,500 | 14,100 | -26% | -20% | 0.49 |
| 0.8 | 55,540 | 2,200 | 12,500 | -18% | -11% | 0.55 |

WCPFC-CA LL + Troll

| | | | | | | |
|------|--------|-------|--------|------|------|------|
| 1 | 69,430 | 2,770 | 15,600 | -38% | -33% | 0.43 |
| 0.88 | 61,100 | 2,440 | 15,600 | -26% | -20% | 0.49 |
| 0.77 | 53,460 | 2,130 | 15,600 | -18% | -11% | 0.55 |

WCPFC-CA LL + EPO

| | | | | | | |
|------|--------|-------|--------|------|------|------|
| 1 | 69,430 | 2,770 | 15,600 | -38% | -33% | 0.43 |
| 0.9 | 62,490 | 2,770 | 14,100 | -26% | -21% | 0.49 |
| 0.79 | 54,800 | 2,770 | 12,324 | -18% | -11% | 0.55 |

WCPFC-CA LL

| | | | | | | |
|------|--------|-------|--------|------|------|------|
| 1 | 69,430 | 2,770 | 15,600 | -38% | -33% | 0.43 |
| 0.87 | 60,400 | 2,770 | 15,600 | -26% | -20% | 0.49 |
| 0.76 | 52,770 | 2,770 | 15,600 | -18% | -11% | 0.55 |

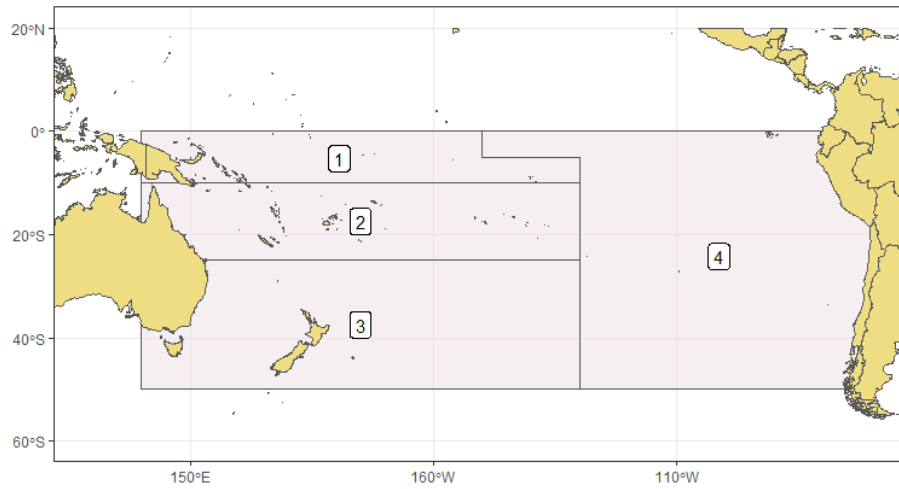


Figure 1. Regional structure within the 2021 south Pacific albacore stock assessment.

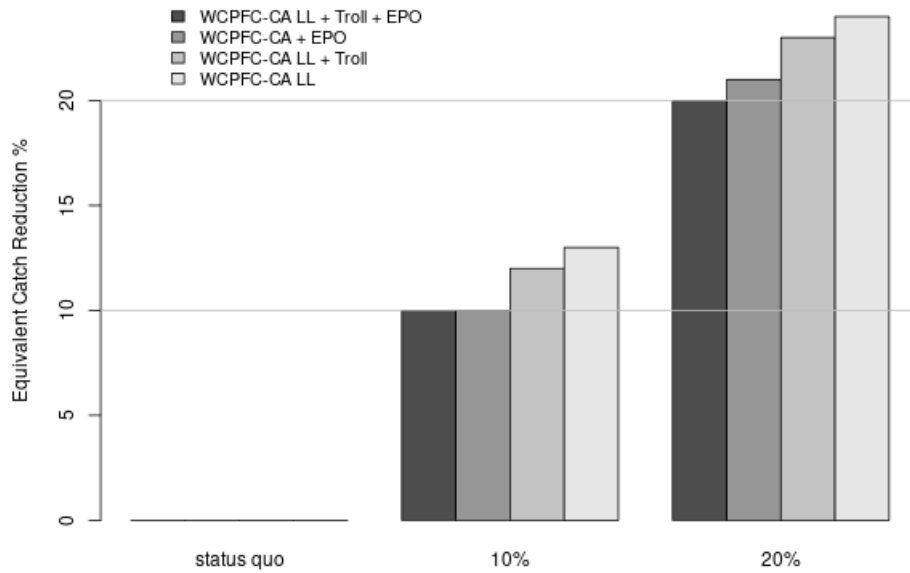


Figure 2. Catch reduction (%) required to achieve equivalent spawning biomass depletion levels under 10% and 20% catch reduction scenarios applied to all fisheries or subsets of fisheries catching south Pacific albacore (see Table 1).