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A REVIEW OF THE SCOPE AND FEASIBILITY OF AN ASSESSMENT OF CMM SUSCEPTIBILITY TO CLIMATE CHANGE IMPACTS

WCPFC-NC20-2024/WP-05

WCPFC Secretariat and SPC-OFP[1]

PURPOSE

The purpose of this paper is to present the Secretariat and Scientific Services Provider's (SSP) findings on the scope and feasibility of assessing active Conservation and Management Measures (CMMs) to determine specific CMM provisions that may be susceptible to the impacts of climate change. This paper responds to a directive from WCPFC20 to present this information to the Science Committee, the Technical and Compliance Committee, and the Commission in 2024[2].

This paper also provides additional information to supplement the assessment of CMMs susceptible to climate change regarding non-target, associated, and dependent species-related CMMs, MCS-related CMMs, and incorporating climate change impacts into the WCPFC harvest strategy framework.

INTRODUCTION

Discussions at WCPFC20 reflected several ideas from CCMs on possible approaches to assist the Commission with understanding climate change impacts on its conservation and management framework. Since its first meeting in 2005, the WCPFC Scientific Committee has been including climate-related factors in its discussions, which reflected a continuation of discussions that had been ongoing since at least 1995 when SPC developed the Spatial Ecosystem and Population Dynamics Model (SEAPODYM) to better understand interactions among populations of different species and their physical and biological environment. It wasn't until SC4 (2008) when climate change was incorporated in SEAPODYM.v2 and introduced by SPC as a tool that could "…forecast the spatial dynamics of stocks in the context of environmental variability and climate change." The release of SEAPODYM.v2 gave recognition that climate-related variability was an important environmental factor in understanding tuna species growth, movement, and fisheries interactions.

[1] Oceanic Fisheries Programme of the Pacific Community
[2] For completeness, this paper is also being provided to the Northern Committee for consideration.

Significant advancements have been made in understanding climate-induced impacts on tuna fisheries and related ecosystems, largely supported by SPC's comprehensive modeling efforts to project the combined effects of fishing and climate change on tuna resources and oceanic ecosystems. Scientific data reported by CCMs form a robust foundation for ongoing environmental research, aimed at providing evidence-based information and advice for science-based CMMs. Enhanced data collection could further strengthen WCPFC's understanding of how climate change-induced ocean temperature changes affect marine species and ecosystems. With the continued dynamic changes of marine environments due to climate change and the vulnerability of species, area, and fishery-based CMMs to the impact of climate change, the Commission recognized the need to review and develop CMMs that prevent and mitigate the impact of climate change on WCPFC-managed fisheries.

Most recently, in May 2024, the International Tribunal for the Law of the Sea ("ITLOS") has issued a landmark Advisory Opinion confirming that the parties to the United Nations Convention on the Law of the Sea ("UNCLOS") are obliged to take measures to combat marine pollution caused by climate change. In this context, the Commission in December 2023 at WCPFC20 agreed to the following decisions:

218. The Commission requested that the Ecosystem and Climate Indicator Report Card be updated and presented annually to the Commission and its subsidiary bodies.

219. The Commission recognized that there is increased importance for the Commission to ensure relevant information and data collection is adequate to support improved and updated understanding by the Commission on the impacts of climate change and implications for management of WCPFC fisheries.

220. The Commission tasked SC and TCC to include as part of the standing agenda item on climate change a review of available data to inform the Commission on climate change impacts to stocks and ecosystems in the WCPO, and the potential effects of climate change on related fishing activities.

222. The Commission requested the Secretariat with the SSP explore the scope and feasibility of undertaking an assessment of active CMMs and to determine specific CMM provisions that may be susceptible to be impacted by climate change, and present the findings to the Science Committee, the Technical and Compliance Committee and the Commission.

223. The Commission recommended co-leads are identified to develop a Commission workplan for addressing climate change on WCPFC fisheries in the Convention Area.

The decisions from WCPFC20 provide direction for future work that aims to ensure that relevant information and data collection are adequate to support improved and updated understanding by the Commission on the impacts of climate change and implications for the management of WCPFC fisheries. This paper responds to the tasking from WCPFC20 to the Secretariat and the SSP, considering the broad context provided by the above five outcomes of WCPFC20 on climate change. The objective is to provide information that would support consideration by NC20, SC20, and TCC20 in considering advice and recommendations about the most viable and practical approach to factoring climate change impacts into conservation and management objectives without compromising other key Commission activities (i.e.,

development of harvest strategies), and mindful of the global urgency attached to addressing climate change and its impacts across the globe.

SCOPE AND FEASIBILITY OF CMM ASSESSMENT

In early 2024, the Secretariat and the SSP met with the Co-leads on Climate Change (USA and RMI) and discussed a possible approach to carrying out a climate change vulnerability assessment of active CMMs as requested by the Commission at WCPFC20. As a follow-up outcome of this meeting and as an initial response to the WCPFC20 tasking, the Secretariat and SSP have prepared a preliminary review of two CMMs: CMM for Tropical Tunas (CMM 2023-01) and the Seabirds (CMM 2018-03). This is presented in **Attachment 1** to this paper, which focuses on how climate change impacts might affect existing CMM provisions. The aim of preparing this preliminary review is to provide examples that might further support consideration by the subsidiary bodies of a comprehensive assessment approach and what its outcomes might look like.

One option for progressing this work is through a consultancy, and the Climate Co-leads have submitted a draft Terms of Reference (TOR) for consideration by CCMs, contained in Attachment B in NC20-WP-04. The scope of the CMM assessment would cover 42 active CMMs with over 100 obligations. Compared to a preliminary review of two CMMs contained in **Attachment 1**, a full assessment is expected to be more comprehensive in reviewing an obligation's susceptibility to climate change impacts. Moreover, the assessment could also include possible actions in response to an obligation's level of vulnerability to climate change that could inform a subsequent work program of the Commission.

A multi-year schedule is proposed for the comprehensive assessment by an external consultancy with significant SSP input and Secretariat support. This work will necessitate significant resources to ensure optimal outcomes for the Commission. Subject to the selected volume of CMMs to be assessed, the Secretariat anticipates that a comprehensive assessment could be completed within 2-3 years, reflecting the complexity of the task.

A key element of consideration for NC20, SC20, and TCC20 is whether the level of data and information is sufficient to meet perceived needs. For example, the current assessment framework focuses on how climate change impacts might affect existing CMM provisions, not how those changes may affect the subsidiary body's ability to assess compliance with them.

FRAMEWORK FOR CMM ASSESSMENT

Many of the WCPFC CMMs are implemented based on species, geographic area, and fishing gear types. The framework for assessing the susceptibility of CMMs to climate change impacts will involve identifying active CMM provisions that are likely to be affected by climate change and a Commission-approved TOR for this activity that outlines the scope, objectives, rationale, methodology, timeline, and needed resources (e.g., human and financial). The comprehensive assessment of the WCPFC CMMs may require setting reasonable criteria to identify relevant CMMs or their provisions that require assessment, such as those CMMs/provisions related to catch limits and/or fishing effort limits.

In addition, the criteria for selecting those CMMs/provisions may include the expected level of susceptibility that can be measured by considering the strength of the potential impact, the duration over which the susceptibility is expected to manifest, and the ecological, economic, and social implications. For example, provisions that set catch limits or specify fishing areas may be particularly susceptible to changes in stock abundance and distribution due to climate change, which could lead to the adjustment of the provisions and may have significant economic and social consequences to those fishing communities and the broader ecosystem.

RESULTS AND NEXT STEPS

The results of the comprehensive CMM assessment are expected to guide the Commission's next steps by providing recommended actions that could help mitigate the potential impacts of climate change on WCPFC-managed fisheries. Possible potential actions may include an amendment to the CMM provisions, such as modifying the fishing seasons, fishing operations, or catch/effort limits. It is acknowledged that any amendment to the CMM provisions will require significant consultations and deliberations among Commission members, which could take several months or years, depending on the complexity of the required actions. The main goal is to ensure that the Commission's CMM remains effective and adaptive in the face of climate change, thereby ensuring the long-term sustainability of WCPO fisheries resources.

CMM ASSESSMENT AND HARVEST STRATEGY

Incorporating climate change into the WCPFC harvest strategy framework and improving the collection of data and information to support a better understanding of climate-related impacts on WCPFC fisheries and ecosystems will be important processes to supplement the CMM vulnerability assessment to climate change impacts. These activities have been recognized through the work of SPC (e.g., SEAPODYM, Ecosystem and Climate Indicator Report Card) for many years.

A key question for subsidiary bodies' consideration is how information gained through the CMM assessment will be used to inform the Commission's necessary actions on mitigating climate change impacts. All tunas, billfish, and bycatch species are expected to be biologically impacted to varying degrees by the changes in the marine environment. The level of vulnerability will be a combination of exposition (climate change stressors such as increased SST, ocean acidification, decreased dissolved oxygen, etc.), sensitivity of the species (inherent biological and ecological traits such as reproductive rates, habitat requirements, trophic levels, etc.), and adaptive capacity of the species (genetic diversity, behavioral flexibility, resilience to past environmental changes, etc.). All subsidiary bodies of the Commission will provide compiled advice on the priority and strength of the impacts and duration of the vulnerability so that the Commission can take appropriate actions to the fisheries management framework, including revision of relevant CMMs and Resolutions.

In addition, the outcomes of the CMM assessment could enhance the refinement of ongoing harvest strategy development. The assessment may raise the need to enforce data and information on specific areas within a harvest strategy framework to address and mitigate the impacts of climate change, which should also be strengthened by the monitoring strategy

while implementing a management procedure. In other words, this is the process of incorporating the climate change factors (such as sea surface temperature, dissolved oxygen concentration, ENSO variability, warm pool index, etc.) into the harvest strategy framework.

CMM ASSESSMENT AND NON-TARGET AND ASSOCIATED OR DEPENDENT SPECIES (NTADS)

There are several WCPFC CMMs for NTADS, but those do not consider the impacts of climate change on those species. The outcome of this CMM assessment work will provide a motive to refine the measure based on the subsequent analyses of species-specific vulnerability or risk assessment related to climate change impacts. The CMM assessment on NTADS also provides an opportunity to evaluate the potential for climate-induced changes in species distribution or population dynamics, which could address in a precautionary manner the species interactions with fisheries due to the impacts of climate change and enhance the effectiveness of the relevant CMMs.

ASSESSMENT OF MCS-RELATED CMMS

Other CMMs related to Vessel Monitoring Systems (VMS), High Seas Boarding and Inspection (HSBI), Regional Observer Programmes (ROP), and Electronic Monitoring-Electronic Reporting (EM-ER) are key tools in managing WCPFC fisheries. Climate change is expected to significantly affect the distribution of marine species, leading to shifts in their geographic ranges. These changes may require increased monitoring in areas where stocks are shifting as traditional fishing grounds may no longer support the same populations. Adaptive management strategies will be crucial to respond to these changes, ensuring that CMMs remain effective in protecting species and maintaining sustainable fisheries. Therefore, the assessment of MCS-related CMMs enhances the monitoring, control, and surveillance of fishing activities along with the impacts of climate change, which is vital to the sustainability of fisheries resources.

RECOMMENDATIONS

Subsidiary bodies are invited to:

1. Note this paper and consider the general approaches to implement the assessment of CMMs susceptible to the impact of climate change, including consideration of an appropriate timeframe for completing the assessment and the required resources to support it.

2. Review the Terms of Reference (TOR) for CMM assessment in Attachment B in NC20-WP-04 and provide advice on refining it.

Attachment 1

Candidate framework for the review of the susceptibility of existing WCPFC CMMs to climate change (CC). Row 1 provides a summary of the proposed information to be provided. Main rows 2 and 3 provide an example application of this approach to the tropical tuna CMM (CMM 2024-01) and seabird CMM (CMM 2018-03).

CMM	CMM duration	Climate awareness	Paragraph	Concern	Evidence	Notes
Enter CMM number	*Duration of the CMM if specified*	*Is there any mention of climate change in the existing CMM*	*Paragraph of CMM for which potential CC impact identified*	*Potential CC impact on this CMM paragraph (e.g. stock reduction, stock movement, etc)*	*Evidence – link to WCPFC, scientific or other documentation*	*Add any notes for consideration*
CMM 2023-01 (tropical tuna)	Until 15 Feb 2027 (3yrs)	Yes – CC noted in preambular paragraphs	Paras 2, 10-12	Potential impact of CC on stock biology and abundance that may affect the ability of stated stock levels to achieve desired objectives (TRPs) and avoid limits (LRP). Note skipjack interim MP is being tested for robustness to CC impacts (para 11).	e.g. Bell et al. 2021; Lehodey et al. 2021; Nicol et al. 2022	3 yr duration suggests current CMM clauses unlikely to be seriously impacted by longer-term climate change
			Paras 2, 3, 9, 13, 24-26, 30, 33, 34, 43, 49, 51	Geographic areas specified may be influenced by longer-term stock (and hence fishery) redistributions under CC, noting that projected changes outside 20N20S are relatively small.	e.g. Bell et al. 2021	
			Para 24, 38, 41, 48	Specified catch limits may be affected by impacts of CC on stock biology, abundance/catchability/geographic redistribution	e.g. Bell et al. 2021; Lehodey et al. 2021; Nicol et al. 2022	
CMM 2018-03 (seabirds)	Review by SC within 3 years	No	Paras throughout (given measures	Geographic areas specified may be influenced by longer-term stock (and hence fishery) redistributions under CC, and potential CC-driven changes in regional of	e.g. Bell et al. 2021; Lehodey et al. 2021;	Unanticipated impacts of CC, e.g. on the effectiveness of mitigation measures at different

	[currently underway]		are specified by latitude bands)	productivity that may influence bird/fishery interactions.	Barbraud et al. 2012	latitudes, or those leading to operational changes, will need to be monitored – review of the CMM is therefore warranted at appropriate timeframes. Projected changes in the polar regions and implications for bird foraging and breeding habitats are likely to affect interaction rates in WCPFC-CA temperate waters.

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