INTER-AMERICAN TROPICAL TUNA COMMISSION

1ST WORKSHOP ON CLIMATE CHANGE

La Jolla, California (USA)
24-26 February 2025
(*by videoconference*)

DOCUMENT CC-01-01

GOALS AND SCOPE OF THE IATTC CLIMATE CHANGE WORKPLAN

1. BACKGROUND

In recent decades, research has shown the direct and indirect impacts of climate change on marine species, ecosystems, and fishing communities. In recognition of these impacts on IATTC fisheries, and the conservation and sustainability of target and non-target species covered by the Antigua Convention, the IATTC adopted Resolution C-23-10 on climate change in 2023. The Resolution states that the Working Group on Ecosystem and Bycatch (EBWG), the Scientific Advisory Committee (SAC), and the Commission will include climate change as a recurrent agenda item at their respective annual meetings, and in general, "*highlight and consider the best scientific information available on the relationships between climate change, target stocks, non-target species, and species belonging to the same ecosystem or associated with the target stocks.*" As a result, the IATTC staff conducted a review of various climate-resilient fisheries tools, frameworks, roadmaps and workplans that various countries and international organizations have developed, in order to facilitate the development and adoption by IATTC, if the Commission so decides, of a workplan which would provide a general structure to promote climate-resilient tuna fisheries in the EPO (SAC-15-12), in the understanding that the details of the workplan and its implementation would be elaborated in consultation as appropriate with all relevant stakeholders. This approach was welcomed and supported during the 2nd Ecosystem and Bycatch Working Group, as well as by the 15th meeting of the Scientific Advisory Committee (see SAC-15 Recommendations). It was also briefly presented and discussed during the IATTC annual meeting in Panama in 2024.

This process, as proposed, anticipates five phases: 1) Planning, 2) Deciding on goal and scope, 3) Developing a framework, 4) Creating tools, and 5) Tool application and/or management implementation. Phase 1 may be considered as completed, following the review of climate tools and frameworks, along with other resources publicly available, as well as with the development of a proposed climate change workplan for the IATTC (SAC-15-12), and associated draft Terms of Reference (ToRs) for a series of climate change workshops. These draft ToRs were also presented at the 102nd annual meeting of the Commission at its request. Although they were not formally endorsed then, there should not be any inconvenient in generally following the principles and guidelines that they contain, to the extent necessary, in order to start the proposed process of a series of workshops (see Table 1 in SAC-15-12 for a detail description of these workshops), without prejudice to their discussion and adoption by the Commission of a final version of the TORs that will be used for the remaining workshops.

Consistent with the discussion during the last meeting of the Commission, the process should continue in 2025 with the holding of a workshop on goal and scope (Phase 2), but also on the development of a framework (Phase 3) (see document CC-01-02 for details on the proposed framework). It is considered that these two phases, which both anticipate the provision of inputs and elements of discussion by Members and relevant stakeholders, can be considered in the same workshop.

The purpose of this document is to focus on Phase 2, and to describe the different elements and considerations that should be taken into account when developing and making recommendations on the main goal and scope of a IATTC climate change workplan. As such, this document contains a set of preliminary recommendations prepared by the IATTC staff as a starting point and reference to foster and facilitate discussion between members and relevant stakeholders. The outcomes of this informal discussion among workshop participants will be used to revise these preliminary recommendations, and the result will be presented to the EBWG, the SAC, and later to the Commission, at their annual meetings in 2025.

2. MAIN GOAL

The objective of the Antigua Convention is *"to ensure the long-term conservation and sustainable use of the fish stocks covered by this Convention, in accordance with the relevant rules of international law."* The Convention reflects however the awareness of its negotiators that this long-term objective cannot be reached through a narrow focus on the targeted fish stocks only. In the end, the long-term health of these stocks and of the societies that depend upon them socioeconomically and for their food security is linked through a two-way relationship with the long-term health of other species, their habitats, ecosystems and the marine environment in general. Fishing of course may have its own impacts, but others, sometimes greater, can have their origin outside the fisheries sector and activities. Among these, is climate change, because it threatens to produce a rapidly changing environment which impacts many of the functions of the Commission (Article VII of the Antigua Convention), including the following subparagraphs in paragraph (1); a, c, d, f, g, h, l, and v that directly focus on the science and management of target and non-target species conservation and sustainability. With climate change potentially threatening and impacting the core objectives and functions of the Commission, it is critical to ensure that fisheries, that is not only the targeted resources but also the non-target species, ecosystems, and habitats the species live in, are climate-resilient. Considerable resources have been invested globally over the last couple decades in understanding the cause and effects of climate change on the physical and biogeochemical processes in the ocean. These data will constitute an important resource and basis to improve fishery science and management as the ocean changes.

In their vast majority, fishery management systems across our globe rely only on historical experiences and models to guide fishery management. Fortunately, now there are tools available that allow predictions, projections, and simulations of potential environmental effects on species and fisheries to better inform these systems. Climate-ready and climate-resilient fisheries can apply these tools to help with climate change adaptation and mitigation while supporting healthy and productive resources and the communities that rely on them. Climate-resilient fisheries are expected to be flexible, dynamic, responsive, and anticipatory and take into account uncertainty as well as social and ecological interactions. In addition to being flexible, resilient fisheries should also be robust to change and be able to buffer climate impacts. Based on the information described above and in the climate change workplan (SAC-15-12), the IATTC staff recommends the main goal of the climate change workplan be:

To achieve the long-term objective of the Antigua Convention, appropriate measures should be taken to ensure that the fisheries, comprising the species covered under the Antigua Convention, their ecosystems, and habitats are climate resilient.

3. SCOPE

Scoping is one of the first stages that needs to be considered initially in the development of a workplan. This exercise should be approached and carried out with some degree of flexibility, especially in this

specific context of the development of a climate change (i.e., climate resilient fisheries) workplan. To foster and facilitate the discussion, the following questions have been identified:

- What decisions are this climate change plan intended to support?
- Who will be implementing the plan?
- What are the conservation targets (species, habitats, fisheries, communities)?
- What is the geographic and temporal scope of the plan?
- Who are the key partners and stakeholders and how are they involved?
- What resources are available/needed, and how will they be covered?

Examples of preliminary answers to many of these questions are provided below, each followed by a recommendation by the IATTC staff.

3.1 What decisions are this climate change plan intended to support?

Without ignoring the broader aspects and components of climate change and its challenges, since the plan is framed within the IATTC, it must be understood as primarily focused on supporting climate resilience in fisheries governed by the Antigua Convention, in particular, through the adoption of appropriate conservation and management measures. Secondly, the plan can also support decisions on how to best assess and account for the magnitude and impacts of climate change. For example, there are ways for stock assessments and management strategy evaluation to consider climate change. Based on this information, the staff recommends:

The workplan supports the development of science-based and appropriate conservation and management measures aimed at ensuring climate-resilient fisheries under the Antigua Convention and in the framework of the IATTC.

3.2 Who will be implementing the plan?

Development of the climate change workplan, but also its implementation, should take an “all-hands-on-deck" approach given the wide range of expertise needed to adapt to and mitigate the effects of climate change. Based on the framework and tools selected, different phases of the plan may require implementation from various groups. The IATTC with the support of its scientific and policy staff and the input from relevant stakeholders, as appropriate, would contribute to promote and steer the process, among others through undertaking assessments of potential climate impacts and exploring, discussing, and recommending potential adaptation plans, whereas any management actions will need to be ultimately adopted and implemented by the Commission and CPCs. Given this information:

The workplan should be led, and its implementation monitored, by the IATTC, with the support of IATTC scientific and policy staff and the participation of all relevant stakeholders.

3.3 What are the conservation targets?

Selection of the appropriate conservation target(s) is a critical step that varies across existing climate change workplans and one that needs to be made clear before moving forward, as it may have direct implications on the selected tools and availability of resources. Such targets may vary from specific species or habitats, to various ecosystems, multiple fisheries, and dependent communities.

In the EPO, under the Antigua Convention and leaving open the question of the fishing activities carried out near the coast by very small and artisanal vessels, the two largest categories of fishing gear are the

industrial purse seine and longline fleets. Given the very high catches and the mobility of these two fleets and their target species and associated non-target species (i.e., highly migratory species), which often respond to environmental conditions, it is expected that both fisheries are expected to be impacted (directly and indirectly) by the effects of climate change. Specifically, climate change threatens the sustainability and conservation of tuna and tuna-like species, on which both fisheries heavily rely, as well as of associated or dependent non-target species and habitats. An example of such impacts is the introduction by climate change of an additional stressor to bycatch species, whose effects and magnitude we currently do not know. Therefore, it is important to understand the full range of potential climate change impacts, particularly on both target and non-target species and how it could influence their sustainability and conservation when it comes to both purse seine and longline fisheries. With the current knowledge available it is recommended that:

The conservation targets of the workplan should be inclusive and cover all species under the Antigua Convention as well as their habitats and ecosystems as appropriate, without prejudice to defining priorities, for instance with regards to the industrial purse seine and longline fleets.

3.4 What is the geographic scope?

The geographic scope of the workplan as a whole comprises primarily the Antigua Convention area although specific components and actions may be more directly tied to specific areas used by the conservation target(s). In addition, it cannot be ignored that certain fleets and target and non-target species populations often move between the Western and Central Pacific Fisheries Commission (WCPFC) and the IATTC Convention Areas. Therefore, the workplan and its implementation and the tools that are required should take into account this multiplicity of geographic scales both within the Convention Area and beyond, as needed, while keeping in mind the limits attributed to major oceanographic features and management bodies.

The IATTC staff recommends:

1. The primary geographic scope be the IATTC Convention Area as a whole.
2. Encouraging Pacific-wide climate research and management by promoting collaboration with the WCPFC and its scientific bodies and service providers.

3.5 What is the temporal scope?

The temporal scope of a climate workplan refers to the management timeframe of interest or concern. For example, are managers, fishers, and industry workers interested or concerned about what happens tomorrow, next week, next month, next year, or 10, 50 or 100 years from now? Different stakeholder groups may have different interests or concerns, and these may change depending on the time scale. Selecting specific or multiple time scales will directly influence the type of tools that can be used and how they are applied. Table 1 (taken from Holsman *et al*. (2019)), showcases the different time scales that could be considered, provides management examples that could be appropriate for each particular time scale, suggests the spatial scale that might be appropriate for that time scale, illustrates how often an update would need to be made, and provides examples of tools that would be appropriate for each time scale.

The time scales are usually broken up into three main categories as observed in Holsman *et al*. (2019): short-term (i.e., days, weeks, months), medium-term (i.e., 1-25 years), and long-term (i.e., 50-100 years). The IATTC staff considers that resources and stakeholders could benefit from thinking about management across multiple time scales. For example, a bycatch avoidance tool could be developed *daily*, *weekly, monthly*, or *seasonally* to help reduce bycatch interactions, whereas catch limits or biological reference

points could vary *multi-annually*, and rebuilding plans for overfished stocks or protected species are often thought about in *decadal periods.* Finally, when considering the long-term health of these stocks and their associated ecosystems, including for instance decisions to build infrastructure (e.g., a fishing port) or invest in a future fishery, may require thinking on multi-decadal periods, i.e., *50 to 100 years* in the future.

To not limit the scope of the potential tools and future research and management applications, the IATTC staff recommends that:

The temporal scope of the workplan considers multiple time scales, ranging from short (daily to annual) to medium term (annual to 10-25 years) to long term (25-100 years in the future), in a way appropriate for each of these timescales.

TABLE 1. Examples of the various management time scales and how climate-resiliency can be incorporated (taken from Holsman *et al*. (2019)).

Management measures	Example	Spatial scale	Frequency of update	"Climate-informed" methods
Short-term				
Rapid intervention	Harvest closures due to harmful algal blooms (HABs) and toxicological exposure	Subbasin	Daily	Risk assessment via climate nowcasts or forecasts; rapid response infrastructure; emergency funds.
Dynamic to seasonal measures	Bycatch reduction measures; endangered species protection; habitat impact reduction	Subbasin, subregional	Daily to annual	Predictive scenarios using projections of catch and bycatch.
Adaptive annual or biannual measures	Annual updates to harvest limits and targets; acceptable take limits	Basin, regional	Annual; biannual	Short-term projections to provide context for management decisions and/or environmentally based predictions of recruitment/ production (e.g. 1–2 years).
Medium-term				
Adaptive biological and ecological reference points	Climate- or multispecies based estimates of unfished biomass; annually varying natural mortality; aggregate maximum sustainable yield.	Basin, regional	1–10 years	Development of climate- and trophic-dependent BRPs based on mechanistic relationships among biological processes and environment.
Fishery stock management approaches	Rationalization programmes/catch-share programmes/essential fish habitat designations	Basin, regional	10–25 years	Projections of various alternative and *status quo* management measures under various climate and socioeconomic scenarios; climate and species projections for future stock share value.
Recovery and rebuilding plans	Overfished stock rebuilding plans; protected species recovery plans	Basin, regional	10–20 years	Projection of climate and environmental conditions; management scenario analyses evaluating species response to long-term climate drift and medium-term decadal variability in climate conditions.
Long-term				
Legislatively mandated conservation measures	Marine protected areas, critical species "take" protection; maximum groundfish harvest in the Eastern Bering Sea; eelgrass protection measures in Puget Sound.	Basin to regional	10–50 years depending on system and projected changes	Spatial analyses of climate-driven spatial shifts that may alter ecosystem productivity under future conditions.
Place-based conservation measures	Arctic commercial fishing moratorium area; California marine protected areas; Canadian marine parks.	Variable from subbasin to international.	10–50 years depending on system and projected changes	Projections of long-term changes in distribution; explorative evaluation of stock accessibility and productivity under future climate conditions.
International jurisdictions	International boundaries for harvest; international agreements for shared stocks	Regional, international	10–50 years depending on system and projected changes	Climate projection data to assess stock availability and access under future scenarios.

3.6 Who are the key partners and stakeholders and how are they involved?

In many fisheries related climate change workplans and tools, success occurred when multiple types of partners/stakeholders/end-users, and thus multiple voices and perspectives, were included (Carroll *et al.* 2023, MAFMC 2023) which ensured that a broad range of ideas, interests and priorities were taken into consideration during the process. On the contrary, there are also many examples of scientists or managers developing a specific tool without incorporating input from each other or the industry, resulting in a product that is incomplete, misses the important aspects, challenges implementation, and does not ultimately help fully solve the issue at hand. The IATTC manages an expansive geographical region which comprises a great diversity of species, ecosystems and fisheries. Because of this, it is considered more appropriate and efficient regarding many aspects and decision points of any climate change workplan to ensure a wide participation of experts and stakeholders through open-ended discussion-oriented workshops over the proposed timeline. As mentioned in the climate change workplan as described in document SAC-15-12, and the proposed workshop ToRs (IATTC-102 INF-B), this participatory approach will give a voice to these experts and relevant stakeholders throughout these workshops in the discussion and identification of the main goal and scope, a climate change framework, tool development, and potential management actions.

Therefore, the IATTC staff recommends that:

Workshops be participatory and open to all CPCs and other relevant stakeholders, including, but not limited to scientists, managers, fishers, industry members, NGOs, accredited observers, and subject matter experts.

3.7 What resources are available and how will they be covered?

The IATTC has some in-house resources available to provide relevant inputs in the development and implementation of a climate change workplan, including several types of data, from fisheries to environmental. Since 2023, the time of one of its scientific staff has been partially dedicated to studying short and long-term environmental effects on species and fisheries, including climate change impacts, and developing mitigation options. Thanks to his extensive experience working on various climate and fisheries related tools, particularly those focused on highly migratory species, this staff member is expected to provide major inputs and support in the necessary work laid out in IATTC's climate change suggested workplan (SAC-15-12), in addition to the contribution to be expected from the other members of the scientific and policy staff. Regarding the available in-house data, the IATTC has access to rich fisheries datasets, including, for example, Class-6 purse-seine observer program data with 100% coverage, and smaller observer data sets for Class 1-5 purse-seine and longline fleets. Other fisheries related data include those from logbooks, canneries, VMS, satellite-buoys associated to FADs, etc. (see SAC-11-11 for a complete description of the various fisheries-related data sources available at the IATTC). In addition, the IATTC also maintains a large tagging database that has been collected on tuna and tuna-like species intermittently over the last few decades. Its staff has recently developed an environmental database spanning the early 1990s to present, which has benefited indirectly from the extensive funding that has been dedicated globally, and at the regional and local levels, to studying and understanding climate impacts on the physical and biogeochemical processes in the ocean; the data acquired through such a collective effort will be most useful when combined, as it is intended, with the aforementioned fishery data.

As mentioned above, to move forward in the process embodied in the proposed workplan, it will require open discussions and drafting recommendations to the Commission in a series of workshops, in coordination with the relevant subsidiary bodies of the Commission (i.e., EBWG, SAC). Additionally, based

on the kind of tool selection to be made at a later stage of the process, additional discussions or the conduct of specific research may be necessary, which may require additional funds, particularly for tools that would benefit from in-person discussions, research that requires specific equipment or development skills, or the development of specific communication tools that are difficult to anticipate at this very moment. The importance of this first workshop and of those that will follow lies in the fact that the scoping decisions will be used to inform which tools will be necessary, how those tools will be developed, and the needed funds assessed and procured, including through grants that might become available as climate change impacts on fisheries gains more traction internationally.

Therefore, the IATTC staff recommends that:

The IATTC should make all efforts to ensure that the resources required for an appropriate development and implementation of the workplan are made available, including through extrabudgetary funding whenever feasible.

4. REFERENCES

Carroll, G., J. G. Eurich, K. D. Sherman, R. Glazer, M. T. Braynen, K. A. Callwood, A. Castañeda, C. Dahlgren, K. A. Karr, and K. M. Kleisner. 2023. A participatory climate vulnerability assessment for recreational tidal flats fisheries in Belize and The Bahamas. Frontiers in Marine Science **10**:1177715.

Holsman, K. K., E. L. Hazen, A. Haynie, S. Gourguet, A. Hollowed, S. J. Bograd, J. F. Samhouri, and K. Aydin. 2019. Towards climate resiliency in fisheries management. ICES Journal of Marine Science **76**:1368-1378.

MAFMC. 2023. East Coast Climate Change Scenario Planning. Mid-Atlantic Fisheries Management Council, Dover, DE.