

INTER-AMERICAN TROPICAL TUNA COMMISSION

SCIENTIFIC ADVISORY COMMITTEE

12TH MEETING

(by videoconference)

10-14 May 2021

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1. OPENING OF THE MEETING

The Director *ad interim* of the IATTC and Chairman of the SAC, **Jean-François Pulvenis**, opened the videoconference meeting, for which a quorum had been achieved, and welcomed the participants. The participants agreed that, without setting precedence, the meeting will proceed under the *ad hoc* procedures used for the previous teleconference meeting.

2. ADOPTION OF AGENDA

The agenda was amended to include a presentation on dorado by Ecuador and Peru (item 3b) and the revised agenda was adopted.

3. RESEARCH PLANNING

a. Staff activities and research work plan

Alexandre Aires-da-Silva presented the document on staff activities and research work plan ([SAC-12-01](#)). This document describes the staff's research and work plans, as well as brief summaries of the 57 research projects that are currently under way, or planned for the near future and funded under the 5-year Strategic Science Plan (2019-2023). The summaries include, for each project, background information, a work plan, and a progress report, as well as details of its relevance and purpose, external collaborators, duration, and deliverables; also, for existing projects, an update on activities since the previous year's report (the 'reporting period'; September 2020-March 2021 in this report)

Discussion:

- Appreciation was expressed for the accurate detail provided in the document and this presentation.
- In answer to a question about the assessment plans for skipjack and southern albacore, Aires-da-Silva pointed to [SAC-12-01](#) and [SAC-12-06](#) for details of the skipjack assessment work plan that will culminate in a benchmark assessment in 2024. For the southern albacore, the staff, with Haikun Xu serving as the point person, is working in collaboration with SPC, and we expect to have the results of this assessment this year, which will probably be presented first at the WCPFC Scientific Meeting.
- Support was expressed for a recommendation to continue the shark sampling program in Central America at least until after reliable shark assessments are accomplished. In response to a question about that status of the shark sampling program in Central America (Project C.4.b), and the assessments for silky and hammerhead sharks scheduled for 2023, Aires-da-Silva noted that great challenges still persist regarding the data collection and availability of reliable data sources for conventional stock assessments for sharks in the EPO. The staff's shark assessment work plan has evolved to deal with this data-limited situation and contemplates three fronts: EASI-fish assessments are planned for next year (short term), a proposal for a close kin mark and recapture (CKMR) study is put forward by the staff this year (medium-term), and conventional stock assessments will be possible if improvements in data collection such as the Central American program are maintained (long-term). Likewise, the CKMR program has long-term value, but it will need funding. This discussion will be continued under the close kin mark and recapture item on the agenda (item 11.a).
- There was a discussion about scientific excellence, one of the themes in the IATTC Work Plan. One participant questioned whether this should be a separate theme as it is now, because scientific excellence should be implied across all activities of the staff's work plan. Aires-da-Silva explained that this theme encompasses any opportunities for external reviews of all the staff's work.
- One participant commented that one of the best ways to measure scientific excellence is through publications in peer review journals. So perhaps a good way of proving the science the staff is doing is high value is to have it published in scientific journals. If it makes it through that screening, then the results demand respect. Aires-da-Silva replied that peer review is important and the existence of the SAC to provide just such review demonstrates that. While the first duty staff is to serve the needs of the Commission, but you can see in [SAC-12-01](#) a list of 37 peer-reviewed articles published in the last three years. The staff is very active on peer review publication in

addition to all the technical literature work it delivers to the Commission.

b. Dorado work plan

Ana Alegre presented a proposed regional research plan for dorado ([SAC-12-INF-D](#)) developed in a 2020 workshop held by the Institute of the Sea of Peru (IMARPE) and the Public Institute for Aquaculture and Fisheries Research of Ecuador (IPIAP). Following up on previous IATTC support for research and management strategies for dorado in the EPO, and subsequent SAC recommendations for continued collaboration with CPCs on research on dorado, this plan is being presented to the IATTC for future collaboration and for assistance in locating funding, and as an invitation for the rest of the EPO countries to join this initiative.

Key Points:

- a. Some projects have partial startup funding, with the support of NGOs such as the Sustainable Fisheries Partnership and the Comité Regional del Mahi Mahi, and further steps have been taken to raise funding.
- b. The original plan included five research projects, three of which need the support of the IATTC because they are projects that must be carried out regionally in the EPO. These three projects are:
 - 1) Improved data collection from the fisheries and data maintenance;
 - 2) Tagging studies to determine horizontal movements and stock boundaries;
 - 3) Stock assessment.

Discussion:

- Alexandre Aires-da-Silva explained that this proposal comes from a group of members that followed up on a SAC recommendation that the staff continue collaborative research with Members. The recommendation was not clear on what work would be done, so this group has taken the initiative of making a proposal. It must be understood that the Commission does not have resources to allocate to this, neither in terms of funding nor assigning a staff member to do this work. The group of members is proposing to take the lead on most of the work among themselves with some support by the staff in a technical advisory role (e.g. experimental design of the tagging program). The staff is open to hearing if the SAC believes this support should be provided, but with the understanding that if there is additional staff time needed for something like an assessment, this would imply the need for additional resources.
- Guillermo Moran (ECU) stated that this is important work and the IATTC has played an important role. Ecuador supported a SAC recommendation to fund an assessment and possibly the other activities proposed and assist in looking for external funding. Ana Alegre added that the purpose of presenting the proposals here is precisely to seek funding, and that getting external funding will be easier with IATTC involvement and support. The SAC and staff agreed that this work would fall within the framework of the Convention, and the SAC requested that a recommendation be drafted for further discussion.
- Steve Teo (USA) cautioned again about the limited resources of the staff, but given that there is a capacity building effort to develop a regional sampling program for the shark (and other large pelagics) artisanal fisheries and a dorado stock assessment model has been established, it might be best to consider this a capacity-building project, where the staff helps the country scientists execute this work themselves.

- The Chairman noted that the research would be done by the Members, and that the role of the IATTC would be largely advisory, and suggested keeping this proposal on the table with the understanding that it will not interfere with the core work of the staff. Aires-da-Silva added that some member scientists have the expertise to run the stock assessment model.
- Ecuador will propose a recommendation for IATTC consultation and technical advice on the Ecuador/Peru dorado project.

4. REVIEW OF THE IMPLEMENTATION OF RECOMMENDATIONS ADOPTED AT PREVIOUS SAC AND WORKING GROUP MEETINGS: PROGRESS AND OUTCOMES

Alexandre Aires-da-Silva provided a summary of the progress towards implementing previous recommendations ([SAC-12-02](#)).

There was no discussion following this presentation.

5. THE FISHERY

a. The tuna fishery in the EPO in 2020

Nick Vogel presented a review of the fishery in 2020 ([SAC-12-03](#)), based on the most detailed and recent data available. Not all data are available in time for the SAC meeting; for example, CPCs are not required to submit longline data until 30 June. The participants were asked to bear in mind that this presentation was a brief summary and more-detailed discussions would come later in the meeting.

Key points:

- Catches: The catches of 595,000 metric tons (t) of yellowfin, skipjack, bigeye, and Pacific bluefin tunas by purse-seine and recreational gears in the EPO in 2020 were lower than in 2019, but still higher than the 15-year average.
- Catches by species and flag: Ecuadorian vessels took about 46% of the total tuna catch in the EPO in 2020, including 64% of the skipjack and 61% of the bigeye. Mexican vessels caught 47% of the yellowfin and nearly all the bluefin.
- Yellowfin: Most of the yellowfin catch was taken in the DEL fisheries during the first half of the year, with smaller amounts taken in the OBJ-N fishery in the first quarter and the NOA-N fishery in the second quarter. Large yellowfin (140-160 cm) were caught in the NOA-S fishery in the second quarter, while yellowfin in the 110-150 cm range were caught in the DEL-N fishery throughout the year. Smaller yellowfin (<60 cm) were taken in the OBJ fishery primarily in the first and second quarters. The average weight of yellowfin in 2020, 10.6 kg, was much higher than the previous 4 years (6.3 - 7.7 kg), and the size distribution also showed a trend toward larger fish, with the greatest quantity around the 100-150 cm range.
- Skipjack: Most of the skipjack catch was taken in the OBJ-N, OBJ-E, and OBJ-S fisheries in the second, third, and fourth quarters, and in the NOA-S fishery in the first and second quarters. Larger skipjack (60-70 cm) were caught in the NOA-S fishery in the second quarter. The smallest (<40 cm) were caught primarily in the OBJ-N, OBJ-E and OBJ-S fisheries in the third quarter, and in the OBJ-S fishery in the fourth quarter. The average weight of skipjack in 2020 (2.0 kg) was consistent with previous years (1.8-2.2 kg).
- Bigeye: Most of the bigeye catch was taken in the OBJ-N fishery in the first and second quarters, and in the OBJ-S fishery throughout the year. Lesser amounts were caught in the OBJ-E fishery in the third quarter. The average weight of bigeye in 2020 (5.1 kg) was slightly higher than the previous five years (4.7-5.0 kg). More large bigeye in the 50-100 cm range were caught in 2020 than in previous years, while fewer of the largest bigeye (>120 cm) were caught.

- f. Pacific bluefin: PBF catches by purse seine vessels in the EPO in 2020 were 3,383 mt. PBF length composition data from Mexico's National Fisheries Institute (INAPESCA) for 2020 was not available at the time of preparation of this report.

Discussion:

- It was suggested that averaging catches of SKJ over 15 years is too broad because of potential changes in the fleet and fleet capacity and that it would be better to look at 2015 going forward. Vogel replied that this could be done for next year. The Chair noted that we should talk about active fleet capacity, and not overall capacity.
- It was noted that there were fewer FAD sets in 2020. The question of whether this was due to reduced effort or reduced observer coverage due to the pandemic was asked but the staff will discuss this in more detail under Section 6.
- It was also noted that there was a decrease in unassociated sets, a stable number of dolphin sets and an increased mean weight of BET. The question was posed whether the latter was related to loss of sampling opportunities due to the COVID-19 pandemic. The staff responded that the drop in sampling and resulting potential for bias is indeed a concern, and this possibility will be discussed in more detail later in the meeting (Section 6).

b. National reports

No national reports on national fisheries and research have been received.

c. Longline observer program reports

Brad Wiley presented the longline observer program reports ([SAC-12-04](#)).

Key Points:

- The staff presented some recommendations for this item of the agenda, and the Bycatch Working Group recommended maintaining at least 20% observer coverage in longline fleet, because this is considered the minimum to obtain sufficient data to estimate total catch for more commonly-caught bycatch species.
- Possible cost-effective options for improving bycatch data are electronic monitoring and the submission of set-by-set logbook data that include bycatch species. Such options should not completely replace human observers.

There was no discussion following this presentation.

d. Transshipment observer program

Ricardo Belmontes presented a summary of the transshipment observer program at sea in 2019.

Key points:

- The program records information regarding captures by area for the main tuna species and sharks. It was proposed two years ago to record the number of sharks transshipped by species but the

Commission has yet to accept this proposal.

There was no discussion following this presentation.

6. STOCK ASSESSMENTS

a. Stock status indicators (SSIs) for tropical tunas in the EPO

Mark Maunder presented the stock status indicators for tropical tunas in the EPO. A summary of the SSIs can be found in [SAC-12-05](#).

Discussion:

- The discussion focused on the possibility of bias in the 2020 stock status indicator values due to the consequences of the COVID 19 pandemic on the fishing activities as well as on related activities such as sampling. The staff was encouraged to continue its investigations on this bias, the potential impact of the bias, and to recommend possible courses of action.
- The staff was requested to provide detailed information on the number of sets and catch by vessel and vessel size for the entire purse-seine fleet to be able to determine whether bigeye tuna catches are associated with most, or only a few, vessels.

As a follow-up to the discussion on bias, Haikun Xu presented a preliminary analysis that underlies the staff's concern about the potential bias related to the COVID-19 pandemic. Among the most important points, these are:

- a. Fleet capacity declined 10% in 2020 compared to the previous year.
- b. The number of sets have not experienced a significant change among DEL and NOA sets, but OBJ sets dropped by more than 20%.
- c. OBJ catches have remained high despite the fewer number of sets. Possible explanations include a good BET recruitment, or more efficient fishing strategies on BET.
- d. COVID-19 did not have a meaningful effect on observer coverage. The observer coverage was 94% on Class-6 vessels; therefore, potential biases in the 2020 fishery data were not related to observer coverage.
- e. Port sampling was 50% less due to COVID-19 restrictions on entering dock areas. This could bring potential biases on the incoming stock assessments on BET. The years of 2020 and 2021 cannot possibly be ignored in future assessments, but they will need to be carefully examined to detect and correct, if necessary, potential sources of bias.
- f. The scientific staff will invest some of its research efforts in identifying and correcting these potential biases.

Discussion (cont.):

- It was suggested that while the 2020-2021 data may have some bias and more uncertainty than previous years due to the effects of the COVID-19 pandemic, it may be worth including these data in the assessment if the level of uncertainty is not too high. Aires-da-Silva clarified that any upcoming assessment would have to include the fishery data for 2020 and 2021. However, the staff will need to carefully investigate these years for potential biases and make appropriate corrections as needed.
- Ecuador suggested that the relationship between fishing mortality (F) and the number of OBJ sets needs to be standardized to account for factors such as the time between the deployment of the FAD and the set. Ecuador maintained that, without standardization, the relationships among

areas are not comparable and the hypothesis about local depletion cannot be fully evaluated. In addition, it was noted that environmental factors need to be considered when interpreting the relationship in Area 3, and they requested that the staff take fishing strategies and environmental factors into account in their analyses of the relationship between F and number of OBJ sets.

b. Workplan for the bigeye and yellowfin tuna benchmark assessments: progress report

Alexandre Aires-da-Silva provided a progress report on the bigeye and yellowfin tuna assessments ([SAC-12-01](#)). Mark Maunder and Alexandre Aires-da-Silva provided a summary on the proposed three-year assessment and management cycle taking into consideration the COVID-19 impacts.

Discussion:

- The SAC generally found the workplan to be a reasonable one.
- One concern was that the workplan anticipates the adoption of a 3-year management cycle. What happens to the workplan if the Commission does not adopt a 3-year measure? Aires-da-Silva clarified that the staff would continue to provide stock status indicators (SSIs) on an annual basis. This will allow an evaluation of whether the *status quo* fishing mortality conditions (2017-2019) have been exceeded, or not.
- Participants argued that the timeline should be advanced so that the exploratory assessments are presented in 2022, the benchmark assessments are presented in 2023, and that progress is made beyond the interim PSA rationale for skipjack. One participant urged that exploratory assessments not be publicly released from the SAC and not be used for management advice.
- It was requested that the impact of the pandemic in 2020 and 2021 be evaluated to determine if the *status quo* should be modified. It was requested that closure days be re-estimated, taking into consideration the impact of the pandemic on the fishery and abundance of tunas. Mark Maunder explained that the COVID-19 pandemic had an impact on the fishing strategy. In particular, strong changes were observed in fishing effort variables (e.g. capacity at sea, number of OBJ sets), all of which related to the coefficient of proportionality (catchability) which defines the relationship between fishing mortality (F) and closure days. Therefore, the years of 2020 and 2021 which were affected by the COVID-19 pandemic should be considered anomalies and not used to define management actions (i.e. closure days) in the next management cycle. Instead, the fishing mortality corresponding to the *status quo* period defined in the latest assessments (2017-2019) should be considered.
- Concern was expressed that concentrating three assessments in a single year is not desirable. It was suggested that the skipjack and bigeye assessments be completed before 2024 and that exploratory assessments be presented to the SAC at its next meeting in 2022.
- It was requested that the SAC reexamine at its next meeting the effect of the COVID-19 pandemic on the fishing mortality after the analyses have gotten beyond the preliminary stages. It would be interesting to examine whether the pandemic effect on fishing will decrease pressure on the stocks and contribute to their recovery. Mark Maunder explained that the reduction in effort due to COVID during 2020-2021 is likely to reduce fishing mortality and subsequently might increase spawning biomass estimates. However, the IATTC management for tropical tunas is based on setting fishing mortality at FMSY for the species with the highest F relative to FMSY (estimated to be equal to the 2017-2019 average for bigeye tuna, which is defined as status quo) not the spawning biomass, unless the spawning biomass is below the limit reference point. Therefore, conducting an update assessment to determine how the spawning biomass has been impacted

by COVID will not impact the management advice offered by the staff.

- Alexandre Aires-da-Silva clarified that the benchmark assessments planned for 2024 would include the pandemic years, and the effect of the pandemic years will be estimated, but those years would not be used as reference years for calculating the fishing mortality used to determine the length of the temporal closure.

c. Assessment methods for skipjack in the EPO: a proposal using recent tagging data

Mark Maunder presented a review of assessment methods and a proposal for a new framework relying on tagging data planned to be used for the assessment of skipjack in the EPO. A summary of the proposal and SKJ assessment workplan can be found in [SAC-12-06](#).

Discussion:

There were suggestions from the SAC:

- a. Implementing a tagging program from commercial vessels, during their ordinary operations, similar to what CAMLAR does, to ensure that we have a program with better coverage over time.
- b. Analyzing skipjack abundance indices derived from buoy data.

d. Updates from ISC working groups

- I. Pacific bluefin tuna
- II. North Pacific albacore tuna

Alexandre Aires-da-Silva summarized the activities of the ISC Working Groups on temperate tunas, in particular the 2020 stock assessments for Pacific bluefin and North Pacific albacore tuna.

There was no substantive discussion after this presentation.

e. Other species

- I. South EPO swordfish assessment: progress report

Carolina Minte-Vera presented the progress on the work related to the S EPO swordfish assessment ([SAC-12-07](#)).

Key Points:

- a. The 1st Technical Workshop on South EPO swordfish was organized in collaboration with CPCs and other stakeholders to start the assessment work. The videoconference meeting took place on 15-17 December 2020. The objectives of the workshop were to promote a regional investigation, review the current knowledge, construct a conceptual model, and understand data sets and plan the next steps to complete the S EPO stock assessment. There were 74 participants and several recorded presentations from the participants on topics ranging from biology to assessment and highlighting the latest information on stock structure. The group agreed to consider the area south of 5°S and west of 150°W as the core area for the 2021 assessment and to add the area north of 5°S and south of 10°N either in the main model or as sensitivity, depending on analysis on stock structure.
- b. The staff also participated on initiatives related to the other swordfish assessments in 2021 (Northern Pacific Ocean swordfish: participation in the ISC Billfish Working Group meeting regarding stock structure assumptions, Southwest Pacific swordfish assessment: participation on Preparatory Workshop for 2021). The staff's proposal to the ISC Billfish Working Group to include

the EPO area north of 10°N in their assessment was accepted.

- c. A revised workplan, which is conditional on data submission, will include videoconferences to discuss data inputs and model assumptions and assessment results and should be completed by the end of 2021. A report is expected to be presented at the 13th meeting of the SAC in 2022.

Discussion:

- The group discussed delays in CPC data submission and goals of upcoming workshops.
- Minte-Vera presented preliminary analyses which support high CPUE in the 5°S to 10°N, east of 130°W area in quarters 1 and 4, consistent with the use of the area by swordfish that move from the south, and in quarters 1 and 2, in the same latitudes, between 130°W and 180°W, which is consistent with the use of this area by fish that move from both the north and the south in different times. She added that new analyses will be done with the operational data that are being submitted.

7. MODELLING

- a. **Workplan for Management Strategy Evaluation (MSE): reports of the 1st and 2nd IATTC workshops on MSE for tropical tunas**

Juan Valero summarized recent work on the Management Strategy Evaluation (MSE) for tropical tunas, a process of testing the performance of alternative specific combinations of data collection, data analyses, harvest control rules and management actions in achieving management objectives, while including multiple sources of uncertainty.

Key points:

- a. MSE success benefits from the involvement of all stakeholders in different stages, involving two components that should evolve in synergy:
 - 1) the specification of alternative management strategies and their elements, such as management objectives, harvest control rules performance metrics
 - 2) the technical evaluation via computer simulations of alternative strategies.
- b. There is an ongoing MSE process for tropical tunas at the IATTC, which has included externally funded (WWF, ABNJ, FAO, GEF) introductory workshops for the fishing industry, managers and other stakeholders as well as technical development of the MSE technical framework and improvement of models for the simulation work.
- c. Two IATTC-sponsored workshops were recently conducted (December 2019 and May 2021) to elicit input on MSE components such as objectives, performance metrics, harvest control rules and reference points. The current MSE workplan has recently been funded by the European Union from 2021 to 2023 and consists of dialogue and technical workshops to elicit input on MSE elements and feedback on MSE results as well as technical development and simulation work.
- d. The dialogue component includes the three tropical tuna species, while the initial technical work focus is on bigeye tuna. The rationale for this approach is severalfold, including:
 - 1) historically, bigeye has been the species requiring the strictest management action and has been used to determine management for all three species,
 - 2) the recent year's modeling improvements to incorporate main uncertainties on bigeye tuna assessment into MSE operating models,
 - 3) lack of assessment models (or operating models) for skipjack tuna,

- 4) need for additional yellowfin tuna modeling work to incorporate hypotheses for assessment and operating models,
- 5) as skipjack and yellowfin models are developed, they can be included in the MSE work initially built on bigeye.

There was no discussion following this presentation.

b. Managing the floating-object fishery: additional precautionary measures recommended by the staff

Mark Maunder and Jon Lopez provided a summary on the rationale behind the need for additional precautionary measures for the floating-object fishery ([SAC-12-08](#)). Notes on this discussion are given on section 12 on the staff recommendations.

8. DATA COLLECTION

a. Improving species and catch data reporting (Resolution C-03-05)

Alexandre Aires-da-Silva presented the rationale for revisions to the main data provision in Resolution C-03-05 for both target (including recent challenges with the stock assessments for BET and YFT) and non-target species, including limited data availability on bycatch species needed for Ecological Risk Assessments, ecosystem models and annual reporting ([SAC-12-09](#)).

Key points:

- a. The staff recommended a series of workshops be held for the purposes of revising C-03-05, in consultation with CPCs.
- b. The staff recommended that each CPC submit to the IATTC set-by-set catch and effort and ancillary operational information, from longline logbooks for both historical and current periods, and updates thereafter following data fields listed in SAC-12-09 Annex 1, Appendix 2 TASK II. Additionally, each CPC should submit to the IATTC size composition data by sex with date of collection and fine-resolution location information for both historical and current periods.
- c. The staff recommended that small purse-seine vessels (≤ 363 t fish carrying capacity) be included in the provision of TASK II operational-level logbook catch (retained and discarded) and effort data be submitted to the IATTC for target species and principal bycatch species (e.g., dorado, wahoo).
- d. The staff recommended that other gears be included in the provision of TASK I catch and effort statistics be reported for both target and bycatch species. Additionally, the staff recommended strengthening capacity-building opportunities through workshops with CPCs to discuss the possibility of providing TASK II operational-level logbook data by fishing day or fishing trip.

Discussion:

- The staff requested participants to consider modernizing data provision resolutions, in particular finalizing the process of reviewing and improving Resolution C-03-05.

b. Development of an Electronic Monitoring (EM) program for the tuna fishery in the EPO

i. Minimum standards

Marlon Roman provided an update of the staff's work and recommendations regarding the implementation of an EM program for the tuna fishery in the EPO. These were focused in great detail at the 1st IATTC workshop on the implementation of an EMS ([SAC-12-10](#)).

Discussion:

- The participants were supportive of implementing EMS monitoring.
- Participants noted that EM is a fundamental tool for managing and providing transparency in the data collection processes for science and compliance. The process for implementing EM should be expedited but concern was expressed that more time to formally discuss the EM workplan was needed.
- The staff noted that the purpose of this presentation is to promote a structured working plan and to formalize the process of developing EM for implementation in the coming years. The Acting Director requested that delegates provide in writing their ideas to reflect their position on EM.

ii. Roadmap

Marlon Roman presented the staff's proposed workplan for the implementation of an EM program for the tuna fishery in the EPO ([SAC-12-11](#)).

- The discussion centered on the timeline of the proposed workplan. There was a suggestion to expedite the process by shortening the time between workshops, but there was also a concern that more time would be required for further formal discussion for the Commission.

9. FADs

a. Report of the working group on FADs

Josu Santiago summarized the [recommendations](#) of the Working Group on FADs.

Discussion:

- There were editorial suggestions but no substantive comments, and thus the SAC adopted the recommendations (see Appendix 1).

10. ECOSYSTEM AND BYCATCH

a. Ecosystem considerations

Leanne Fuller described some important recent improvements in the IATTC's Ecosystem Considerations report ([SAC-12-12](#)).

Key points:

- a. Improvements to annual routine reporting of bycatch included disaggregating broad species groups (e.g., hammerhead sharks) into species-specific catches (e.g., smooth hammerhead shark).
- b. A time series of catch was presented to provide greater transparency, which may serve as an early warning system for potentially vulnerable species.
- c. Continued improvements to bycatch data collection for fisheries other than the large purse-seine is necessary to improve estimations of total catch (SAC-12-09).
- d. Environmental indicators were reported, specifically interannual events shown by the Oceanic Niño Index (ONI) and interdecadal events shown by the Pacific Decadal Oscillation (PDO).
- e. Average of environmental variables (sea-surface temperature and chlorophyll-a concentration) over a time series and for the current year, with the distribution of tropical tuna catches overlaid, were presented, which can assist in explanations of changes in catches.
- f. Various Conservation and Management Measure scenarios can be simulated in the EASI-Fish ecological risk assessment framework; an update of the leatherback turtle work is detailed in BYC-

10 INF-B.

- g. The ecosystem model of the ETP was updated using data through 2018 and is detailed in SAC-12-13; ecological indicator values changed substantially after about 1990 due to inclusion of new longline catches of sharks.
- h. Together, improvements to reporting of bycatch, environmental indicators, ecological risk assessments and ecological indicators provide greater transparency in IATTC's goal to consider the ecological impacts of EPO fisheries.

There was no discussion following this presentation.

b. Ecosystem model of the eastern tropical Pacific Ocean: progress report

Updates have been made on the ecosystem model of the ETP which is used by the staff to explore potential impacts of increased fishing effort on floating objects. A document was published and included on the agenda ([SAC-12-13](#)), but due to time constraints it was not presented or discussed in-session.

Key points:

- a. Since 2019, the IATTC has annually reported on 7 ecological indicators derived from the "ETP7" Ecopath ecosystem model of the eastern tropical Pacific Ocean (ETP).
- b. The inclusion of revised bycatch estimates for longline fleets required the model to be re-structured to contain multi-stanza delay-difference models for small and large sizes of 10 taxa, and biological parameters of functional groups were updated.
- c. The model then required re-calibrating to time series data of relative biomass or abundance, fishing mortality, and catch (retained and discards) for 10 groups and catch only for another 16 groups.
- d. Ecological indicators showed fishing impacts on the ecosystem to be more pessimistic than in the 2019 assessment with a significant decline in the mean trophic level of the catch from 4.77 in 1991 to 4.65 in 2018, which coincided with an increase in the number of OBJ sets.
- e. Under fishing effort scenarios for the period 2018–2024 reflecting the possible tuna conservation measures, the model predicted declines in the biomass of bigeye, yellowfin and skipjack tunas by 0.67–3%. Small and large sharks declined in biomass by 13.8% and 10.4%, respectively.
- f. Predominant FAD-associated bycatch species (dorado, wahoo, and marlins) increased in biomass by up to 3.3% due to a significant reduction in predation mortality from sharks and tunas.
- g. Perpetual increases in purse-seine fishing effort on FADs, coupled with the impacts of the industrial longline and coastal fisheries, is likely to continue to alter the structure and dynamics of the ETP ecosystem.

c. Report of the Working Group on Bycatch

Manuel Correa summarized the report of the Working Group on Bycatch and its [recommendations](#). There were seven presentations made at the virtual 10th meeting of the Working Group (WG), resulting in six recommendations. The recommendations and SAC discussion of each one are as follows.

1. That IATTC staff host a virtual workshop prior to its 11th meeting to analyze scientific information regarding different circle hooks sizes and their effectiveness at mitigating on bycatch and target species with the specific goal of defining the characteristics of an adequate hook for the purpose of mitigating bycatch of sea turtles in accordance with Resolution C-19-04.

- There was no discussion of the first recommendation.

2. That IATTC staff, based on Resolution C-19-08, consider a work plan to gradually increase the coverage of longline observers to 20% on vessels >20 m LOA.

- A delegate noted that since there is no requirement for staff to increase observer coverage to 20%, the phrase "based on Res C-19-08" should be deleted.
- The WG co-chair agreed that the phrase can be deleted.

3. To consider procedures to complement the existing observer system by implementing electronic monitoring (EMS) to be gradually incorporated over time, as appropriate according to regional fleet standards.

- A delegate questioned the meaning of fleet standards (KOR). The WG co-chair explained that each fleet may have different equipment characteristics according to different regions, and that the goal is to maintain a combination of inputs from human and electronic observers.
- The staff noted that use of the word 'standards' is of concern, and suggested it would be better to use the term 'according to regional fleet characteristics.' The SAC accepted the proposed change.

4. That the IATTC adopt a provisional Terms of Reference for the next workshop on electronic monitoring (EMS), as well as the adoption of a Work Plan, aimed at adopting definitions and minimum standards for EMS (installation, minimal data, image review, etc.).

- It was noted that the EMS data should complement information provided by human observer coverage, and offered to provide text reflecting this point.
- The following alternative language for the recommendation was proposed and endorsed by the SAC Chairman and the co-chairs of the bycatch WG, and adopted by the SAC.

"(1) That the IATTC staff develop and the Commission adopt Terms of Reference for future workshops on electronic monitoring aimed at adopting definitions and minimum standards for EMS (installation, minimal data, image review, etc.) (2) the SAC and Commission provisionally use definitions drafted by the staff (EMS-01-01), and (3) the Commission provisionally adopt the workplan proposed by the staff."

5. That CPCs with missing or unavailable longline observer data, as described in document BYC-10 INF-D, provide additional information to IATTC staff explaining the way and timeframe when such CPCs shall improve data provision.

- There was no discussion of the fifth recommendation.

6. To encourage further research on methods of handling and releasing of elasmobranchs (sharks, mantas, rays) from purse-seine vessels to maximize the survival of bycatch species, through structural changes aimed at good management practices.

- The WG co-chair noted that 'structural changes' pertain to changes in procedure, not changes in the physical vessels themselves.

The SAC Chair noted that all of the recommendations were not examined by the full WG during its virtual meeting, but were developed after the meeting through Basecamp resulting in acceptance by the WG. The Chair noted that the recommendations were considered tentatively approved by the WG until final consideration by the SAC, and thanked the co-chairs of the WG for their efforts in guiding the WG.

11. SHARKS

a. Considerations for conducting close-kin mark-recapture of stocks managed by IATTC

Mark Maunder presented a staff proposal to conduct a close-kin mark-recapture study of stocks managed by IATTC, beginning with silky shark and bigeye tuna in the EPO (see [SAC-12-14](#)).

Discussion:

- The participants expressed support for the staff recommendations regarding Close Kin Mark-Recapture and for continued shark sampling.

12. LIFE HISTORY

a. Review of research at the Achotines Laboratory

A document was posted which present an update of the research conducted at the Achotines Laboratory ([SAC-12-15](#)). The document was not presented at the meeting due to time limitations.

13. STAFF RECOMMENDATIONS TO THE COMMISSION

Alexandre Aires-da-Silva presented the 2021 staff's recommendations for management and conservation of tropical tunas ([SAC-12-16](#)):

1. Establish a triennial management cycle for the tropical tuna fishery in the EPO (2022-2024).
2. Maintain the provisions of the current resolution (C-20-06), except paragraph 8, which will be modified per item 4.
3. Within the management cycle (2022-2024), adopt the operational rule described in [SAC-12-08](#) to implement, if needed, an extension of the temporal closure for both floating-object and unassociated set types, to apply to all purse-seine vessels, except those that historically made mostly unassociated sets (vessels that have made 75% or more of their sets on unassociated schools in each of 3 of the past 5 years (2015-2019)).
4. Establish individual-vessel limits (IVL) on the daily number of active FADs, computed independently for each vessel from its active FAD data for 2018-2019.

Mark Maunder presented the rationale for the staff's recommendation 3 for tropical tunas that calls for an extended FAD closure because this is the set type primarily impacting BET (details in document [SAC-12-08](#)). The goal is to constrain effort on FADs to the status quo level which is defined by the average total number of FAD sets during the most recent three-year period (2017-2019) of the stock assessments.

Key points:

An extended temporal closure that applies to both OBJ and NOA sets, which is triggered only in specific situations given an operational rule, has the following advantages:

- a. A measure specifying days of closure has already been adopted by the Commission (*e.g.* Res. [C-17-02](#), [C-20-06](#)).
- b. Using the previous year's number of OBJ sets to trigger the operational rule:
 - i. Does not generate the additional data demands and/or additional infrastructure needs for data processing that would be required for near real-time monitoring of the fishery.
 - ii. Reduces problems associated with set type misreporting.
 - iii. Allows for adjustments to be made to the reported set types, if necessary, using set type classification algorithms (see Appendices A and B).

- c. Applying the extended closure to both OBJ and NOA sets reduces problems associated with set type misreporting during the closure period.
- d. The DEL fishery will not be impacted, which is supported by the results of the current YFT assessment that indicates the stock is healthy.

Jon Lopez presented the rationale for the staff's recommendation 4 on individual vessel limits (IVLs) for active FADs ([SAC-12-16](#)).

Key points:

An annual IVL on the number of daily active FADs has the following advantages:

- a. Since 2018, a limit on active FADs has been in force (Resolution [C-17-02](#); [C-20-06](#)), and a system for collecting and reporting these data monthly already exists for all purse-seine vessels¹.
- b. If individual-vessel limits on daily active FADs are established, vessels could not increase the use of active FADs with respect to the *status quo*, unlike with adjustments to capacity-class limits in [C-17-02/C-20-06](#).
- c. In general, vessels with higher numbers of active FADs make more OBJ sets ([FAD-05-INF-A](#), [SAC-11-INF-M](#)), suggesting a potential relationship between active FADs and OBJ sets, and ultimately *F* ([FAD-05 INF-D](#)).

Discussion:

For the first recommendation, there was general acceptance on expanding the closure period for fishing on FADs and for establishing a triennial cycle.

- There were concerns about the allowance for 75% NOA vessels and how that determination is made and whether this is appropriate. Alexandre Aires-da-Silva explained that the intent is to protect SKJ because we do not have an assessment for SKJ. Mark Maunder noted that for the NOA sets, very few vessels fall under that category (the ones that would be able to fish); regarding the DML vessels, they could only make dolphin sets and all of them already required to have observers.
- It was argued that if this is a monitoring and compliance problem for about 10 vessels, is it worth making this allowance or take the simpler route of applying the closure to all non-DML vessels.
- There were compliance concerns regarding the vessels whose trips would be monitored using logbook data, and how well the set type classification algorithm will perform with such data. The staff noted that the algorithm was presented at the FAD WG in detail.
- Some participants would like to know if the effects of the pandemic on fishing effort and the stocks will translate into a reduction in days of closure and whether extra precautionary measures are still required, given the drop in the number of OBJ sets.

There were concerns about the limit on active FADs in the fourth recommendation by the staff.

- It was argued that this allocation is complex and also inequitable if it means that vessels currently using a lot for FADs can largely continue to do that, while others using only a very few would not be able to expand. Alexandre Aires-da-Silva replied that the staff understands the allocation issue, but it believes that this is a better approach for limiting to the status quo than a single global limit, unlike the present measures which are not effectively limiting increases. Jon Lopez argued that it

¹ During 2018-2019, 156 vessels reported active FAD data, partially or continuously. About 75% of the vessels reported during at least 12 months and 50% reported during at least 20 months

seems to be the best option. If limits are defined by vessel class, there will undoubtedly be a situation where more increases will be possible, potentially exceeding the *status quo*. For example, with the current limits, most vessels are not anywhere near it, and so increases can still occur. Also, there are some vessels not reporting, and extrapolating for these vessels is not desirable because the range is broad.

- One participant asked for a clarification on the definition of *status quo*. Alexandre Aires-da-Silva clarified that the definition of *status quo* in the staff's recommendations relates to the terminal three years (2017-2019) in the most recent stock assessments. This is the 3-year reference period used for the recent assessments for bigeye and yellowfin.
- There was a question about how to estimate the number of FAD sets on vessels that did not have an observer for the purpose of establishing the FAD closures in the subsequent years. The staff replied that in past years, about 85-90% of logbooks for classes 1-5 were received.
- Alexandre Aires-da-Silva stated that the 2020 stock assessments for bigeye and yellowfin represent the best available science. While there are concerns about the effects of the COVID-19 pandemic in the data collection in 2020 and 2021, the core of staff's recommendations is still based on the 2020 stock assessments which did not include these years. The staff considered other possible precautionary measures ([SAC-12-INF-B](#)) and the this year's recommendations are focused on what the staff believes to be the best from within that suite of options.
- One question was asked about the effect on the FAD limits if biodegradable, non-entangling FADs are deployed instead of traditional FADs. If biodegradable FADs lasted only about 6 months, any proposed limits should take that into consideration. Jon Lopez replied that the staff's recommended IVL on active FADs does not take into consideration the use of bioFADs as these experiments are still ongoing. However, the objective is to find bioFADs that have a similar lifetime and produce similar catch rates as traditional ones. Therefore, the nature of the FADs (traditional vs biodegradable) should not be considered in the consideration of any limits on active FADs.
- It was suggested that a practical example of what the proposed active FAD limits would be (in numbers per vessel) to be able to better understand the proposed measure. It was also suggested that the proposed limits be compared to the vessel size class limits currently in effect.
- Appreciation was expressed for the many years that the staff have been trying to limit BET fishing mortality on FADs. With respect to these novel measures, it was asked how they relate to MSE. Would these additional measures and the operational rule the staff is proposing really be for just 3 years and then be replaced by other rule develop during the ongoing MSE process? Would it be included in MSE analysis? Mark Maunder and Alexandre Aires-da-Silva replied that if it is adopted and in force, it can be included in the ongoing MSE simulation work, along with other proposed rules, so that its efficiency is tested. The stakeholders can decide what rules to test, and this could be one of them.
- Venezuela noted that only 10-12% of fleet catches 50% of BET, and more juvenile BET were caught in 2020 than ever before. It was requested that the staff update the per-vessel plots of BET catch to examine this more closely and perhaps incorporate these findings into management action proposals seeking to reduce catches of BET more effectively.

Alexandre Aires-da-Silva presented the staff recommendations to the Commission on other topics ([SAC-12-16](#)).

Discussion:

- Almost all of the staff recommendations were endorsed by the SAC (see section 14 below). Colombia expressed that it cannot endorse the recommendation on electronic monitoring because the topic had not been fully discussed. Colombia will send their comments by email. El Salvador did not object to the recommendations but had concerns that the workplan schedule should advance more quickly. El Salvador will also communicate its concerns in writing. The SAC chair noted that this matter had been previously discussed very thoroughly during the 1st IATTC workshop for implementing an EMS in the EPO ([SAC-12-10](#), [SAC-12-11](#)).

14. SAC RECOMMENDATIONS TO THE COMMISSION

a. Conservation and management

1. Tropical tunas

- Recommendation 1 on the triennial management cycle was based on a staff recommendation, modified by the SAC, and adopted.
- Recommendation 2 on maintaining current Resolution C-20-06 was based on a staff recommendation, modified by the SAC, and adopted.
- Recommendations 3 and 4 on efforts to reduce fishery mortality on FADs were based on staff recommendations, integrated by the SAC, and adopted.

2. Pacific bluefin tuna

- Recommendations 1 and 2 on Pacific Bluefin Tuna were combined and adopted.

3. North Pacific albacore tuna

- Recommendations 3 and 4 on North Pacific Albacore were combined and adopted.

4. Silky sharks

- Recommendations 1, 2, and 3 on silky sharks were combined and adopted.

5. Seabirds

- Recommendation 1 on revising Resolution C-11-02 on seabirds was adopted.

b. Research in support of conservation and management

1. Tropical tunas

- Recommendations 1, 2, 3, and 4 on continuing stock assessments, risk assessments, and management strategies evaluation for tropical tunas were based on staff recommendations and adopted by the SAC.
- Recommendation 5 on continued support for tagging cruises was proposed by Ecuador to facilitate an assessment on skipjack by 2023; the recommendation was revised by the SAC and adopted.

In the discussion, it was noted by the staff that help, particularly collaboration from the industry, is needed to support our ongoing tagging operations (*i.e.*, finding schools of fish to tag, bait, permits for marine reserves, help deploying tags around FADs).

2. Mahi-mahi (dorado)

- Recommendation 1 on expanding the joint research project by Ecuador and Peru into a regional study with general guidance and technical advice provided by the Commission staff was adopted by the SAC with the caution that current resources of the IATTC are not available to do more.

3. Close kin mark-recapture

- Recommendation 1 on funding a close kin mark-recapture study was based on a staff recommendation and adopted by the SAC.

c. Data collection

1. General data provision

- Recommendation 1 on revising Resolution C-03-05 was based on a staff recommendation, modified by the SAC, and adopted.

2. Data for purse-seiners without on-board observers

- Recommendation 1 on requesting CPCs to provide logbook data for unobserved fishing trips was based on a staff recommendation, modified by the SAC, and adopted.

3. Data collection for sharks

- Recommendation 1 on establishing a field office in Central America was based on a staff recommendation and adopted by the SAC.
- Recommendation 2 requiring transshipment declaration forms be completed for all shark catches was based on a staff recommendation and adopted by the SAC.
- Recommendations 3, 4, and 5 based on proposals by three CPCs to extend the shark sampling program in scope, expand it regionally, and expand it to include billfish, dorado tunas, among others. The staff will merge these recommendations into one and the SAC adopted the recommendation.

Note: Appendix 1 still has three separate recommendations

4. Development of a fishery-dependent ecological sampling program for EPO tuna fisheries

- Recommendation 1 on developing an ecological sampling program was based on a staff recommendation and adopted by the SAC.

5. Fishing gear configuration

- Recommendation 1 on gear reporting forms was based on a staff recommendation and adopted by the SAC.

6. Observer coverage of purse-seine vessels of less than 364t carrying capacity

- Recommendation 1 establishing 20% observer coverage for smaller purse seiners was based on a staff recommendation and adopted by the SAC.

7. Longliner observer data standards and reporting

- Recommendation 1 on longline observer data submission was based on a staff recommendation and adopted by the SAC.

8. Electronic monitoring system (EMS)

- Three recommendations on electronic monitoring in documents [EMS-01-01](#) and [EMS-01-02](#) and establishing Terms of Reference were adopted by the SAC.

Several proposed recommendations were discussed but not adopted by the SAC.

- The staff recommendation to limit the number of active FADs was discussed, but there were objections to the mechanism and not adopted.
- The staff recommendation on data for large longliners was discussed. Japan and China objected to the recommendation; Japan due to domestic legal limitations and we cannot agree with this. Japan noted that it is providing this data and we will continue to do so, it can only be done through

a Memorandum of Understanding (MOU) on a voluntary basis and not through a requirement of the Commission. China echoed this position.

Ecuador argued that, even with Japan's legal limitations, this can still be a recommendation to the Commission and asked for an explanation. They stated that this is a technical science meeting, that a technical request was made, yet denied. Ecuador stated that it does not accept this denial. Both Japan and China repeated that they could provide the necessary data through an MOU and could be cooperative. Alexandre Aires-da-Silva noted that the staff are always grateful for the MOU data, but there is a short window of time to use it. We would like to have regular access and we understand that this data is provided to WCPFC without an MOU as part of regular data submissions and that is what we would like. The Chairman also noted that the rules of confidentiality protect individual vessel data.

This recommendation was not adopted, although it remains as a recommendation of the Staff.

- Ecuador proposed 15 additional recommendations, which are listed in Appendix 2. The SAC did not consider these proposed recommendations from Ecuador because they were submitted only 30 minutes prior to the start of the day's meeting and because some are contrary to staff recommendations. El Salvador noted, however, that there are other delegations interested in exploring these proposals.

Mark Maunder stated that one of these proposals, to update the BET assessment, would not be useful. Conservation and management advice are based on changes in F , not changes in effort or biomass, and since the data available under COVID will not be useable to revise estimates of F , we would still be giving recommendations based on previous assessment.

Ecuador prepared a letter (Appendix 2) that discusses the SAC recommendation process and presents a series of recommendations that the delegation from Ecuador believes should be adopted.

- Peru and Ecuador supported a recommendation that requested that the staff prepare a plan to update the dorado stock assessment and to evaluate the human and financial resources required.

In the discussion of this recommendation, Peru and Ecuador urged not only technical and scientific advice from the Commission staff, but also support and assistance from the Commission in procuring funding. These countries also requested support for tag recoveries from the Commission. They suggested that updating the dorado assessment be included in the IATTC Work Plan as an unfunded project, with the possibility that unused resources could be redirected to that.

The United States, however, objected to this recommendation in a written statement (Appendix 3). While supportive of the goals of a regional dorado research effort, the United States argued that such work not be funded by the IATTC. The United States stated that the appropriate role of the IATTC in the assessment and management of dorado is to guide, advise, and where necessary, train scientists from CPCs for the assessments. If the IATTC is to move beyond this supporting role, the Commission should discuss and agree upon the appropriate role of the IATTC before doing so.

The recommendation was not adopted.

- A recommendation on expanding longline fishery coverage to 20%, based on a staff recommendation, was discussed by the SAC. Taiwan argued that any increase should be gradual and that they may eventually want some subsidy for observer salaries. China, however, argued against any increase and that the 5% coverage level be maintained and after all of operational data mandated by the 5% have been collected a plan might be established. Alexandre Aires-da-Silva noted that there was a IATTC paper presented in the Bycatch Working Group that demonstrates that 20% is a minimum requirement. There was also a paper by Wang in 2020 using Chinese observer data demonstrating that 20% was needed as well.

Ecuador noted that no one is offering a technical explanation for not going beyond 5%, and especially with electronic monitoring, and this was hard to understand. The EU noted that the recommendation we are now discussing were in the recommendations of the bycatch group that were already adopted (see below).

RECOMMENDATIONS OF THE BYCATCH WORKING GROUP

Six recommendations were revised and adopted by the SAC (Appendix 1). One recommendation that proposed a work plan to gradually increase the coverage of longline observers to 20% on vessels >20 m LOA was approved with near consensus but China objected, so it will still go forward as recommendations by the Bycatch Working Group and the staff, but not as a recommendation of the SAC. China was asked to submit a formal statement of their position.

RECOMMENDATIONS OF THE WORKING GROUP ON FADS

A series of recommendations on definitions, data collection, and management measures for the FAD fishery were revised and adopted by the SAC.

15. OTHER BUSINESS

No other business was discussed.

16. ADJOURNMENT

The meeting was adjourned on 14 May 2021.

Appendix 1.

INTER-AMERICAN TROPICAL TUNA COMMISSION

SCIENTIFIC ADVISORY COMMITTEE

12TH MEETING

(by videoconference)

10-14 May 2021

**RECOMMENDATIONS OF THE SCIENTIFIC ADVISORY COMMITTEE (SAC)
TO THE COMMISSION (corrigendum*)**

A. RECOMMENDATIONS OF THE SCIENTIFIC ADVISORY COMMITTEE (SAC)

1. CONSERVATION AND MANAGEMENT

1.1. Tropical tunas (yellowfin, bigeye, and skipjack):

- 1.1.1.** The SAC recommends the establishment of a triennial management cycle for the tropical tuna fishery in the EPO (2022-2024). This cycle does not prejudice the possibility for the Commission to review and revise on a yearly basis the conservation and management measures that it has adopted, taking into account their effect on the stocks and the monitoring of the status of the stocks.
- 1.1.2.** The SAC recommends that the provisions of the current resolution (C-20-06) be maintained for 2022-2024, except those related to the FAD fishery which must be reviewed and adjusted, as needed, according to Resolution C-20-05, by the Commission.
- 1.1.3.** Within the management cycle 2022-2024, the SAC recommends that the Commission consider:
- a) the proposal for operational rule described in SAC-12-08, as part of the package of possible measures to be implemented to prevent an increase of fishing mortality beyond the status quo levels;
 - b) adopting measures to control fishing on FADs that avoid exceeding the average fishing mortality in this fishery between 2017 and 2019.

1.2. Pacific bluefin tuna:

The SAC recommends the extension of the provisions of Resolution C-18-01, as already extended by Resolution C-20-02, and that the Commission take note that increased catches based on the scenarios analyzed are possible under the harvest strategy prepared by the joint tuna RFMOs Working Group. The choice of catch scenario should take into account the desired rebuilding rate and the distribution of catch between small and large bluefin.

1.3. North Pacific albacore tuna name:

The SAC recommends that CPCs:

- a) continue to implement Resolutions C-05-02, C-18-03, presently in force;

* Recommendation 2.2.Mahi-mahi (Dorado), which comprised two subparagraphs, had been adopted provisionally and ad referendum. After it was circulated on 5 May 2021 with the other recommendations and also posted on the meeting website, one Member formally objected to the inclusion of subparagraph b) which was consequently deleted.

- b) use the results of the concluded MSE process to establish reference points and a harvest control rule (HCR) for North Pacific albacore tuna.

1.4. Silky sharks:

The SAC, considering the recent improvements in shark fishery data collection in Central America (SAC-11-13), as well as the potential expansion of the data collection program into other coastal states, recommends that:

- a) Resolution C-19-05 be extended for another biennial period (2022-2023);
- b) CPCs enhance compliance with the following provisions of Resolution C-19-05 (to be extended in the new resolution):
 - i. prohibiting the use of steel leaders during a period of three consecutive months of each year for the relevant portions of their national fleets;
 - ii. requiring that the Commission be notified of the period of the prohibition, the number of vessels subject to the prohibition, and how compliance with the prohibition will be monitored.

1.5. Seabirds:

The SAC recommends that Resolution C-11-02 be revised consistent with the current state of knowledge regarding seabird mitigation techniques.

2. RESEARCH IN SUPPORT OF CONSERVATION AND MANAGEMENT

2.1. Tropical tunas:

The SAC recommends that, in collaboration with CPCs and relevant stakeholders, including the fisheries sector:

- a) stock assessments and risk analysis for tropical tunas continue to be improved;
- b) an assessment for skipjack tuna be developed, based, among others, on recently collected tagging data, following SAC-12-06;
- c) BET, YFT and SKJ exploratory assessments be carried out in 2023 with the best available information;
- d) support for management strategies evaluation (MSE) for tropical tunas continue to be provided, following guidelines from resolutions C-16-02 and C-19-07;
- e) implementation of tagging cruises be continued, with the adoption of the most efficient and appropriate mechanisms to increase their efficiency and feasibility and facilitate their carrying out.

2.2. Mahi-mahi (Dorado):

The SAC recommends that the Commission encourage those Members participating directly or indirectly, as flag States or coastal States, in the catch of Dorado to contribute to and participate in the joint research project presented by Ecuador and Peru in document SAC-12 INF-D, with the understanding that, in the absence of the additional necessary human and financial resources, the only contribution that may be made by the Commission and its scientific staff would be to provide general guidance and technical advice as appropriate and feasible.

2.3. Close kin mark-recapture:

Considering the potential benefits of Close Kin Mark-Recapture for BET, Silky Sharks and other species, the SAC recommends that a workplan be funded, starting with Project H.7.e: *Feasibility and sampling design for close-kin mark-recapture analysis of stocks in the EPO.*

3. DATA COLLECTION

3.1. General data provision:

The SAC recommends that, through a series of workshops planned and facilitated by the staff, Resolution-C-03-05 be revised in consultation with CPCs, taking into consideration the elements presented in document SAC-12-09. These workshops will be organized by main fishery, with the purpose of:

- a) discussing improvements in data collection, any required additional resources and capacity building activities;
- b) developing standard data reporting templates (initial draft appendixes in document SAC-12-09);
- c) modernizing Resolution-C-03-05 to align data reporting requirements with the Antigua Convention, the WCPFC Scientific Service Provider (SSP) and harmonize them with FAO and other tuna RFMOs standards.

3.2. Data for purse seine vessels without on-board observers:

The SAC recommends that each CPC ensure that its competent authority collect the logbook and other pertinent data from every fishing trip made without an observer aboard at the end of the trip, and provides them to the IATTC staff as soon as possible afterwards.

3.3. Data collection for sharks:

The SAC recommends that:

- a) an IATTC field office be established in Central America near some of the ports where most shark landings occur;
- b) all vessel captains be required to complete the transshipment declaration forms of Resolution C-12-07 by species, for all shark catches;
- c) the Regional Program on long-term data collection for shark catches in the artisanal fisheries of Central America (Project C.4.b.) be extended:
 - d) to the other CPCs bordering the Antigua Convention Area as an important mean to improve the monitoring of these species as well as the implementation of the commitments and obligations related to their conservation;
 - e) to other species such as dorado, billfishes, among others, as appropriate.

3.4. Development of a fishery-dependent ecological sampling program for EPO tuna fisheries:

The SAC recommends that a fishery-dependent ecological sampling program be developed in collaboration with CPCs and relevant stakeholders, to collect stomach and tissue samples from key predators for ecological analyses of contents, stable isotopes and fatty acids.

3.5. Fishing gear configuration:

The SAC recommends that vessels be required to submit the purse-seine and longline gear description forms appended to Document SAC-05-05. Any significant modifications made to the gear subsequently should be reported on these forms prior to departing port with the modified gear.

3.6. Observer coverage of purse seine vessels of less than 364t carrying capacity:

The SAC recommends that a plan be developed to establish a fleet-wide observer program for purse-seine vessels of less than 364t carrying capacity, with a sampling coverage of 20%, which may include the use of electronic monitoring.

3.7. Longliners observer data standards and reporting:

The SAC recommends that CPCs submit all operational longline observer data collected from 1 January 2013 to present, consistent with the minimum data standards contained in Annex B of C-19-08, or provide a clear and complete explanation as to why the missing datasets have not been submitted.

3.8. Electronic monitoring system (EMS):

The SAC recommends that:

- a) the definitions in Annex 1 of document EMS-01-01 be adopted, at least on a provisional basis;
- b) the EMS workplan detailed in document EMS-01-02 be adopted, at least on a provisional basis, and work be carried out intersessionally to make adjustments as necessary;
- c) the staff be tasked, in consultation with the members and other relevant stakeholders, with the development of a draft for the Terms of Reference for the EM workshops, for potential adoption by the Commission at its annual regular meeting in 2021.

B. RECOMMENDATIONS OF THE WORKING GROUP ON BYCATCH AS ENDORSED BY THE SAC:

1. That IATTC staff host a virtual workshop prior to analyze scientific information regarding different circle hooks sizes and their effectiveness at mitigating on bycatch and target species with the specific goal of defining the characteristics of an adequate hook for the purpose of mitigating bycatch of sea turtles in accordance with Resolution C-19-04.
2. That IATTC staff consider a work plan to gradually increase the coverage of longline observers to 20% on vessels >20 m LOA.
3. To consider procedures to complement or replace the existing observers' system by implementing electronic monitoring (EMS) to be gradually incorporated over time, as appropriate according to the various fleets' characteristics.
4. That the IATTC Staff develop and the Commission adopt Terms of Reference for future workshops on electronic monitoring aimed at adopting definitions and minimum standards for electronic monitoring system (installation, minimal data, image review, etc), (2) the staff, SAC and Commission provisionally use definitions drafted by the IATTC Staff (EMS-01-01), and (3) the Commission provisionally adopt the workplan proposed by staff.

5. That CPCs with missing or unavailable longline observer data, as described in document BYC-10 INF-D, provide additional information to IATTC staff explaining the way and timeframe when such CPCs shall improve data provision.
6. To encourage further research on methods of handling and releasing of elasmobranchs (sharks, mantas, rays) from purse-seine vessels to maximize the survival of bycatch species, through structural changes aimed at good management practices.

C. RECOMMENDATIONS OF THE WORKING GROUP ON FADS AS ENDORSED BY THE SAC:

1. On definitions:

The Commission to adopt the set of terms listed in Annex 1 as interim draft definitions related to FAD fishing operations.

2. On data collection:

- a) CPCs to provide the forms on FAD interactions from each fishing trip that is made without an observer aboard, to the IATTC staff as soon as possible after the trip terminates, and that these forms are those provided by the IATTC staff or downloaded from the IATTC website, without modifications.
- b) The Secretariat to contact CPCs no later than 80 days before the SAC to check the status of incomplete data submissions regarding the requirements of the Resolution C-19- 01.
- c) CPCs to require their vessels to record data related to interactions with FADs of purse-seine vessels without an observer aboard using exclusively the standard form developed by the IATTC staff (Fish- aggregating device form (FADS), Sep. 2018 ver.2)
- d) CPCs to provide to the IATTC staff the same raw buoy data received by original users (i.e. vessels, fishing companies), including both trajectories and acoustic biomass information.
- e) The Commission scientific staff and CPCs to continue exploring technologies to mark and read automatically and remotely marking identification to improve FAD/buoy marking and to solve errors on data collection.
- f) The Commission and its members to reactivate the mechanisms of cooperation between the various tuna RFMOs regarding FADs, including in particular the Joint tuna- RFMO FAD Working Group. This will allow work on harmonization of data collection, definitions, indicators, and other cross-cutting issues.

3. On management measures:

The Commission to consider additional options -- along with active FAD limits -- to lower the number of FADs in the water, such as clarifying controls on remote activation and deactivation and controls on numbers of deployed FADs.

Appendix 2.

Ecuador – Position regarding the 12th Meeting of the Scientific Advisory Committee

The Inter-American Tropical Tuna Commission (IATTC), since its creation in 1949, has been one of the pioneers in the management and conservation of the hydrobiological resources of the Eastern Pacific Ocean (EPO), especially tropical tunas. Since 1974, Ecuador has been one of its most committed Members in the compliance of management and conservation measures, providing relevant information, presenting selected scientific studies, as well as technical and economic contributions for the functioning of the Directorate and therefore the Commission.

Currently, we have the largest participation of active capacity in the EPO, which is operated through our fleet and even capacity from third countries through close joint collaboration. For these reasons and more, as a Member committed to the objectives of the IATTC and aware of the responsibility we have in ensuring the long-term conservation and sustainable use of the fish stocks covered by this Convention, it is in our interest that all CPCs should act in accordance with these same principles.

To this end, the Scientific Advisory Committee (SAC) is the arm of the Commission that is in charge of providing scientific recommendations by the Staff and its Members, for taking decisions related to the reality of the fisheries within the Commission. However, for some years now, this Delegation has been very concerned about the development and the direction that this space dedicated to science is taking; since, in our opinion, it has become an extension of the Regular Meetings, devoid of a debate with scientific/technical basis on the part of the Members; in accordance with the Antigua Convention, which establishes in Article XI Scientific Advisory Committee, paragraph 1 (first): *“The Commission shall establish a Scientific Advisory Committee, which shall be composed of a representative designated by each member of the Commission, who shall have appropriate qualifications or relevant experience in the area of competence of the Committee, and who may be accompanied by such experts or advisers as that member may deem advisable.*

In addition to this, we do not consider that an error and lack of organization in the agenda of the meeting would undermine the seriousness and reputation of the Scientific Advisory Committee; even more so, when important sections of our proposal and contribution to the improvement of the scientific debate were omitted. We are aware that the virtual format is an alternative to face-to-face meetings due to the current issues we are experiencing worldwide, which limits certain actions; but we also believe that this should not diminish the quality and effectiveness of a meeting of this organization.

Ecuador listened attentively to the presentations of the scientific staff, the presentations of the working groups and the criticisms of the Members; and on this basis, our Delegation submitted scientifically based alternatives and technical studies to improve the performance of the Committee, which were not taken seriously, giving them inadequate time and simply dismissing them without scientific basis.

Ecuador feels highly prejudiced by the lack of consideration given to its proposals and the unwillingness to deal with them at the highest level of scientific debate, as is the duty of this Committee. In addition, it is recalled that, on other occasions, if necessary, we have extended the meetings in order to validate our work. We believe that the objective of the 12th Meeting of the

Scientific Advisory Committee was not achieved, that the recommendations put forward do not represent the richness of our scientific staff and therefore we are very disappointed that other interests are winning the race against science in this space.

In view of the above, Ecuador, within the framework of the Antigua Convention, where Article XI of the Scientific Advisory Committee, paragraph 7 (seventh) states that "*At the request of any member of the Committee, the views of that member on all or any part of the reports shall also be reflected*"; in addition to everything expressed above, requests that this letter be incorporated into the country's position and sends its recommendations made in the Committee, which were not properly considered, so that they may be included verbatim in the minutes and Report of the meeting:

TROPICAL TUNAS: YELLOWFIN, BIGEYE AND SKIPJACK

1. Use the maximum annual number of sets on floating objects during the period 2017-2019, in order to ensure that the expected variations in the reference period (2017-2019) do not excessively impact the additional closure days.
2. Do not include vessels smaller than class 6 in any of the additional measures approved by the IATTC.
3. Do not include free school sets in the additional measures to be approved by the IATTC.
4. Explore an allocation of OBJ sets by country, which cumulatively across countries, would allow analysis of the limit of sets on floating objects.
5. Vessels that set on dolphins do not set on floating objects.
6. Apply from 2023 the limits by vessel class recommended by the staff in 2019 for vessels that have not deployed less than 20% of their active FADs that are 100% degradable. In the case of vessels that deploy from 20% of their total active FADs, maintain the provisions in resolution C-20-06.
7. [BIGEYE TUNA RESEARCH PLAN] Perform annually during the 2022-2024 triennium, an updating of the bigeye assessment, reviewing the exploitation condition under the reference points framework and risk analysis referred to in resolution C-16-02.
8. [[BIGEYE TUNA RESEARCH PLAN] Review during the years 2022 and 2023 the impact of the weighting process of reference models on the exploitation condition under the reference points framework and risk analysis referred to in resolution C-16-02
9. [SKIPJACK RESEARCH PLAN] To shorten the research plan to two years, 2022-2023, in order to clarify and specify the exploitation status of Skipjack.
10. [SKIPJACK RESEARCH PLAN] Evaluate a possible interim stock assessment of Skipjack that would allow to dissociate the inferences about its exploitation status t from the exploitation status of Bigeye Tuna.
11. [SKIPJACK RESEARCH PLAN] Seek a traceability process for the activities leading to the baseline assessment for Skipjack. Ecuador proposes a plan of frequent workshops (e.g. every six months) with the active participation of the CPCs, which would: (i) promote the participation of the CPCs in the tagging data collection, (ii) detect potential deviations from the research plan aimed at implementing the benchmark assessment in 2023, and (iii) assist in the identification of interim assessment methodologies for Skipjack.
12. [SKIPJACK RESEARCH PLAN] The proposals by Ecuador for modifications to the research plan are also based on environmental considerations (seasonal and inter-annual oceanographic variations, El Niño, La Niña) that impact the dynamics of tropical tunas. It is suggested that the staff consider flexibility for modifications in their research plan and species-specific activities.

DATA COLLECTION

1. [TAGGING] Discuss the mechanisms that are most efficient and conducive to increasing the frequency of tagging data collection on fishery-independent cruises, increasing the likelihood of recaptures for the purposes of a 2023 baseline assessment.

DORADO (MAHI MAHI)

1. That the staff prepare a technical and financial proposal for the IATTC meeting for the purpose of updating the stock assessment of Mahi-mahi (Dorado) and have this information available by the next meeting of the commission in 2023.

DRAFT

Appendix 3.

United States comments on IATTC involvement in dorado research

The assessment and sustainable management of dorado in the EPO is important to the United States. The United States therefore supports the efforts of CPCs to continue working on dorado assessments as described in SAC recommendation 2.2a. However, the United States objected to the recommendation, proposed by some CPCs, for the IATTC to plan for and seek funding from the Commission to perform an update assessment of dorado in the EPO. The United States notes that dorado is considered a species caught in association with tuna and hence a secondary bycatch species for the IATTC. There has also been no evidence to suggest that the stock status of dorado in the EPO is of concern, nor that dorado is best assessed and managed on an EPO-wide basis. Based on this and the role of the IATTC, with regards to fisheries management in the EPO, the United States believes that the appropriate role of the IATTC in the assessment and management of dorado is to guide, advise, and where necessary, train scientists from CPCs for the assessments. By doing so, the IATTC would be in its appropriate role of supporting, rather than performing, the assessments of dorado. If the IATTC is to move beyond this supporting role, the United States believes that it is important for the Commission to discuss and agree upon the appropriate role of the IATTC before doing so.

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Appendix 4.

STATEMENT BY THE BOLIVARIAN REPUBLIC OF VENEZUELA TO THE SCIENTIFIC ADVISORY COMMITTEE (SAC) REGARDING BIGEYE TUNA

Our Delegation is very concerned because, during the 12th meeting of the Scientific Advisory Committee (SAC), Document SAC-12-INF-B "Review of Alternative Conservation Measures for the Purse-Seine Fishery for Tropical Tunas in the EPO" was not reviewed, nor were alternative conservation measures discussed. At the 96th Extraordinary Meeting of the IATTC, our country made it clear that it would support a conservation measure for tropical tunas in the EPO for 2021, provided that in 2021 complementary measures were reviewed for inclusion in the conservation and management measures for 2022 and subsequent years.

We consider and are aware that 2020 data should be viewed with caution; however, the 25% decrease in sets on floating objects and the reported 11% increase in bigeye catches, a trend that has been observed since 2017, added to the fact that most of the individuals of this species are caught at ages when they have not yet reached sexual maturity, could affect the replacement of the biomass of this species in the future.

In data requested by this Delegation and others on catches by vessels and catches of tropical tunas, it could be observed that 10-12% of the vessels that fish on floating objects catch more than 50% of all bigeye tuna. On the other hand, bigeye catches have been increasing since 2016 and those of 2020 are higher than the 2017-2019 average, which the scientific staff recommends not be exceeded to maintain the *status quo*. However, the longline fleet has been decreasing its catches since 2015 and the preliminary data for 2020 show the lowest catch since 1990; moreover, the average size of tuna of this species in the last 6 years has remained between 4.7 and 5.1, when in 2000-2001 it was an average of 15.

Due to the above, it is important to take precautionary measures while there is uncertainty about the status of the stock of this species.

Finally, we consider that adopting conservation measures without additional measures to reduce bigeye tuna catches should only be adopted for one year.

Appendix 5.

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