INTER-AMERICAN TROPICAL TUNA COMMISSION

100TH MEETING

Phoenix, Arizona USA
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DOCUMENT IATTC-100-02b

UNFUNDED PROJECTS

This document lists projects proposed by the IATTC scientific staff that are not funded. The staff's work plans for 2019-2023 and its current and planned research activities are listed in Document IATTC-100-02, and its broader and longer-term goals are set out in Document IATTC-93-06a, *IATTC Strategic Science Plan*.

CONTENTS

A. INTRODUCTION

This document presents brief summaries of 6 research projects that the staff considers important, but lacks the resources, human, technical, or financial, to undertake. The summaries include, for each project, background information, a work plan, and a status report, as well as details of its relevance and purpose, external collaborators, duration, deliverables, and an indicative budget.

Research projects that are funded and/or under way are included in IATTC-100-02; it also contains the staff's work plans, which include many of the projects listed in this document.

The staff's research activities are structured into the seven main areas of research, called *Themes*, of the proposed Strategic Science Plan (SSP; IATTC-93-06a). In addition to better accommodating a strategic planning approach, this new structure is intended to foster stronger collaboration among the different programs (recommendation 17 of the 2016 IATTC Performance Review), with researchers from different programs contributing to activities under a common *Theme*. The seven *Themes,* the strategic pillars of the SSP, are the following:

1. Data collection for scientific support of management
2. Life history studies for scientific support of management
3. Sustainable fisheries
4. Ecological impacts of fishing: assessment and mitigation
5. Interactions among the environment, ecosystem, and fisheries
6. Knowledge transfer and capacity building
7. Scientific excellence

Each *Theme* is divided into strategic *Goals*, and the principal tasks that will be carried out to achieve a particular goal within the SSP's five-year window are called *Targets* (IATTC-93-06a). The specific activities that the staff will carry out in order to fulfil those tasks are called *Projects*, which are in some cases grouped into *Work Plans* aimed at achieving a broad objective not limited to a particular *Theme* or *Goal*.

The general *Themes*, and the more specific *Goals*, reflect what the staff considers to be its primary responsibilities, and form an integral part of the five-year SSP. The more focused *Targets*, and the concrete *Projects*, are generally of shorter duration, and operate on a biennial cycle. Whether any *Projects* are undertaken under a particular *Goal* or *Target* in any given period will depend on the staff's research priorities, the human, logistic, and financial resources available, and any specific instructions from the Commission.

B. UNFUNDED PROJECTS, BY THEME

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1. DATA COLLECTION FOR SCIENTIFIC SUPPORT OF MANAGEMENT

PROJECT C.1.b: Sampling design development for the Best Scientific Estimate of tropical tuna catch composition	
THEME: Sustainable fisheries **GOAL:** C. Facilitate the improvement of data quality, coverage, and reporting by CPC data collection programs **TARGET:** C.1. Purse-seine fleet **EXECUTION**: Stock Assessment Program	
Objectives	• Extensively sample the catch of vessel wells in port to obtain data for simulation studies. • Through simulation, explore improved port-sampling protocols for the fleet-level Best Scientific Estimate (BSE) of tropical tuna catch composition and its variance.
Background	• The port-sampling protocol currently used by IATTC, which was initially developed as a protocol for estimation of catch size composition, dates back to simulation studies for estimation of yellowfin length composition conducted about 30 years ago (IATTC Bulletin 21(1)) using data from wells with catch from sets on dolphin-associated and unassociated tuna schools. • Although that protocol was modified in the late 1990s to allow estimation of both species and size composition for all fleet components (IATTC Stock Assessment Report 4), the performance of the modified protocol has not been fully evaluated, in part because of a lack of appropriate data. • In particular, since the modification of the protocol, the fishery on floating objects has expanded considerably, yet the performance of the current sampling protocol for that fleet component is unknown. • The current BSE methodology relies entirely on port-sampling data to estimate the species and size composition of the total fleet catch, which makes it important to fully evaluate the performance of the current protocol for all fleet components. • Although not its primary purpose, the Individual Vessel Limit (IVL) program pilot study (Resolution C-21-04; SAC-13 INF-E) will generate data that can be used in simulation studies to test sampling designs for the BSE. However, the IVL sampling is designed to estimate catch of a well, trip, and/or vessel and not of the whole fleet. • Thus, there is a need for data collection and simulation studies to explore improvements to the current sampling protocol specifically for the BSE for all purse-seine fleet components.
Relevance for management	• In conjunction with work done during the IVL pilot study, will lead to development of improved port-sampling designs for the BSE of catch composition for all purse-seine fleet components. • Improved sampling designs for catch compositions will result in greater precision of the catch composition estimates, leading to more reliable stock assessments. • Results will likely benefit sampling programs of other tuna Regional Fisheries Management Organizations.
Duration	March 2023 – May 2024
Work plan and status	• March – April 2023: Hire and train port-samplers, incorporating lessons learned during the IVL pilot study. • May – October 2023: Collect data for the simulation study, focusing primarily on those countries and ports where catch from floating-object sets is primarily unloaded. • November 2023 – May 2024: Conduct simulation study to test improved sampling designs for the BSE, and prepare document and presentation for SAC 2024.
External collaborators	• CPCs • Industry and other relevant stakeholders

Deliverables	• Results of simulation study presented at SAC 2024	
Budget (US$)	Port-samplers (12 samplers) for 6 months	$110,000
	Equipment and travel	$5,000
	Total	$115,000

PROJECT C.4.c: Strengthening shark data collection for artisanal fisheries in EPO coastal States: supplementary support for the IATTC ABNJ project		
THEME: 1. Data collection **GOAL:** C. Improve quality and expand coverage of data-collection programs **TARGET:** C.4. Artisanal longline fleet **EXECUTION**: Ecosystem and Bycatch Program and Stock Assessment Program		
Objectives	• Maintain minimum shark fishery data collection efforts in Central America after completion of ABNJ project in December 2021. • Evaluate the feasibility of collecting shark morphometric data and biological samples from landings of artisanal fisheries in Central America. • Obtain additional resources for conducting the planned shark research activities under the IATTC ABNJ-TUNA II project in Mexico, Ecuador and Peru (Task 1 – identify available data sources, Task 2 – Determine locations and order of magnitude of shark catches).	
Background	• Stock assessments for shark species in the EPO are severely hampered by a lack of reliable data on shark catches, in particular for artisanal fisheries of EPO coastal States. • Since 2014, the IATTC staff has carried out extensive collaborative research with OSPESCA and IATTC's Central American CPCs to develop a robust sampling methodology to improve data collection for shark fisheries in Central American eastern Pacific Ocean (EPO) States (SAC-11-13). After almost 7 years (2015–2021), this work, funded by the FAO-GEF ABNJ project, IATTC capacity building fund, and the European Union (EU), was completed in December 2021. • Relying upon the wealth of knowledge obtained during the ABNJ-IATTC-EU project, the staff put forward a proposal for a long-term sampling program for shark fisheries in Central America (at US$ 785,900 per year, IATTC-98-02c). The data collected will be used to estimate the necessary inputs for stock assessments and also generate data for biological and ecological studies. Unfortunately, funds to implement the long-term sampling program have not been made available to date and the shark research in Central America has been temporality halted. • Meanwhile, additional funds from a second phase of the FAO-GEF ABNJ (TUNA II) project will soon be made available to IATTC, this time to expand the shark data collection improvements previous accomplished in Central America to other EPO costal States (Mexico, Ecuador and Peru). • Additional resources for the shark research are needed for 2 reasons: 1) to give some continuity to the previous research in Central America while funds for a long-term program are not available and the second phase of the ABNJ project is about to expand to other IATTC Members; 2) supplement the ABNJ funds to be used in the upcoming project (Mexico, Ecuador and Peru) to adjust for increased costs and unbudgeted resources.	
Relevance for management	Improved fishery and biological data collection for artisanal shark fisheries in the EPO is critical to improve shark stock assessments and management at IATTC.	
Duration	2023 (1 year)	
Work plan and status	• Central America (2023): Feasibility study on collecting shark morphometric data and biological samples from landings of artisanal fisheries in Central America. • Mexico, Ecuador and Peru (2023): Task 1 of IATTC ABNJ II project – identify available data sources, Task 2 – Determine locations and order of magnitude of shark catches.	
External collaborators	• OSPESCA, national authorities in Central America, Mexico, Ecuador and Peru. • Industry and other relevant stakeholders.	
Deliverables	• SAC-15 (2024): SAC reports.	
Budget (US$)	Maintain minimum data collection and feasibility study for Central	120,000

	America (team of 5 sampling technicians for 1 year, supplies) Supplementary funds to support ABNJ II activities in Mexico, Ecuador and Peru (supplement to ABNJ II funds to adjust for increased costs and additional resources) Total	 112,000 232,000

2. LIFE-HISTORY STUDIES FOR SCIENTIFIC SUPPORT OF MANAGEMENT

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3. SUSTAINABLE FISHERIES

PROJECT H.7.f: Feasibility and sampling design for close-kin mark-recapture analysis of silky and hammerhead sharks in the EPO		
THEME: Sustainable fisheries **GOAL:** H. Improve and implement stock assessments, based on the best available science **TARGET:** H.7. Develop conventional stock assessments for data-rich prioritized species and species of specific interest **EXECUTION**: Stock Assessment Program		
Objectives	• Evaluate the feasibility of conducting close-kin mark-recapture (CKMR) for silky and hammerhead shark stocks in the EPO. • Develop sampling designs for silky shark and hammerhead sharks. • Evaluate tissue quality for genetic analysis from different sampling methods, including preservation and storage methods. • Explore and develop methods and obtain permits to effectively import/export samples of protected species • Conduct a pilot sampling program.	
Background	• Estimates of absolute abundance are uncertain for many species. • Times series of data for the silky shark, hammerhead sharks, and other shark species are not sufficiently reliable to conduct stock assessments or monitor stock status. • EPO-wide traditional tagging studies are difficult and expensive to conduct. • The newly developed CKMR method can estimate absolute adult abundance and adult survival. • CKMR data can also provide information on stock structure, which is missing for most stocks, in particular sharks. • CKMR avoids issues associated with traditional tagging studies, such as the need for releasing fish alive, tagging related mortality, tag loss, and misreporting.	
Relevance for management	• Estimates of adult abundance and mortality will greatly improve stock assessments for sharks in the EPO. • CKMR, combined with the estimates of total catch from the recently introduced catch sampling program for sharks, could provide estimates of fishing mortality that could be compared with reference points to determine the status of shark stocks.	
Duration	2023-2024 (2-years)	
Work plan and status	• Pre-start: Hire researcher with genetic and CKMR knowledge and experience • Months 1-6: Collate data on sampling opportunities and do test sampling • Months 6-12: conduct feasibility study and develop sampling design for silky shark and hammerhead sharks; • Months 13-18: implement pilot sampling program; • Months 19-24: evaluate pilot program, refine sampling design, and construct budget for full sampling program	
External collaborators	• CPCs involved in the relevant fisheries • Contractors	
Deliverables	• Feasibility study report presented at SAC 2024 • Full sampling design presented at SAC 2025	
Budget (US$)	Salary (two years) Feasibility study assistance Equipment, computer, travel, and genetic tissue analysis Total	200,000 50,000 50,000 300,000

Project I.1.b: Development, communication and evaluation of management strategies (MSE) for tropical tuna fisheries in the EPO involving managers, industry, scientists and other stakeholders.	
THEME: Sustainable fisheries **GOAL:** I. Test harvest strategies using Management Strategy Evaluation (MSE) **TARGET:** I.1. Conduct a comprehensive MSE for bigeye tuna and start MSEs for the other tropical tuna species **EXECUTION**: Stock Assessment Program	
Objectives	• Continue technical development of MSE for tropical tunas. • Finalize MSE for BET and start MSE for YFT and SKJ. • Provide training and enhance dialogue/communication among scientists, industry, managers and other stakeholders regarding the MSE process for tropical tunas through the facilitation of a series of workshops.
Background	• The Performance Review of the IATTC, the Strategic Science Plan, and the SAC all recommended improving knowledge sharing, human-institutional capacity building and communication of scientific advice. • MSE is a major objective of the IATTC and other organizations. Part of the MSE process is highly technical and done by scientists. Another part, such as defining objectives, performance metrics and candidate management strategies, requires input and participation of managers and other stakeholders. Those two parts evolve in synergy. • Stakeholder participation throughout the MSE process is central to its success and will be facilitated by the understanding of the MSE process, its components and by strengthening the communication among scientists, managers and other stakeholders. • Further MSE training workshops for the tuna industry were held in 2019. The first IATTC MSE Workshop was held in 2019, second one in 2021, and a third one planned for 2022. • Current MSE funding expires at the end of 2023 (Project I.1.a). SAC has supported the MSE Workplan and recommended continued funding support for this work.
Key reference(s)	• Resolution C-16-02; IATTC Review; CAF-05-04_Appendix-1; SAC-07-07h; SAC-08-05e(ii); SAC-08-05e(iii); SAC-10 Recs; MSE Workplan, Resolution C-19-07; 1st and 2nd MSE WS Reports ; MSE Progress Report
Relevance for management	• Key elements of IATTC's current management strategy, such as its control rule and reference points, along with alternatives, are currently being evaluated via MSE. • The technical support will allow for better model development and directly influence the relevance of the MSE results. • Workshops will improve scientists, managers and other stakeholder communication and important input for the technical work. • The current proposal will advance a comprehensive MSE process for tropical tunas to assess the performance of the interim Harvest Control Rule (HCR) and other elements of the harvest strategy along with alternatives.
Duration	• 48 months (4 years), starting in 2024.
Work-plan	• Continue technical development of MSE for BET and expand to YFT and SKJ. • Development/tailoring of MSE Workshop materials and online resources to EPO tropical tuna fisheries, including presentations and hands-on working sessions. • Conduct annual Workshops with managers, industry and other stakeholders to improve understanding of the MSE process, elicit objectives, performance metrics, alternative control rules, and risk, as well as to show initial results and gather feedback.
Collaborators	• External contractor, other external tuna and communication experts
Challenges encountered and anticipated	• Need for additional workshops to cover specific topics related to IATTC's MSE work. • Turnover of commissioners and their staff makes important to revisit workshops. • Changes to timeline due to COVID or other unanticipated events. • The technical and communications work is conducted by a contractor whose funding expires at the end of 2023.

Deliverables	• Reporting to SAC of MSE development, progress, and evaluation results. • Series of Workshops, Workshop reports and associated training and online materials.
Budget 48 months	

MSE Development and Communication	**Duration: 48 months**	**Cost (US$)**
Item	**Detail**	
Contractor	Facilitating of workshops, technical work	$ 767,922
Workshops	Logistic costs for IATTC Staff, contractor (travel, lodging). Other costs covered by host CPC/sponsor.	$ 224,000
Total		$ 991,922

PROJECT I.3.b: Strengthening research for the management of dorado in the EPO	
THEME: Sustainable fisheries **GOAL:** I. Test harvest strategies using Management Strategy Evaluation (MSE) **TARGET:** I.3. Initiate MSE work to evaluate indicator-based harvest strategies for prioritized species and species of specific interest **EXECUTION**: Stock Assessment Program	
Objectives	• To provide the Commission with different options for continuing involvement of the staff in the research for the management of dorado in the EPO.
Background	• The Antigua Convention establishes that one of the functions of the IATTC is *"to adopt appropriate measures to avoid, limit and reduce the effects on associated or dependent species".* Dorado (*Coryphaena hippurus*) is a species that is caught incidentally in the tuna purse-seine and industrial longline fishery in the EPO . • Dorado is one of the most important species caught in the artisanal fisheries of the coastal nations of the EPO, ranging from Chile to Mexico. Available fisheries statistics indicate that the EPO is the dominant region in global production of dorado. • For the reasons above, some members of the IATTC requested the Commission to carry out collaborative research on dorado led by the IATTC scientific staff. • In 2013, the staff initiated dorado research collaborating with IATTC members. • The work consisted of: three technical meetings on dorado between 2014-2016; the development of an exploratory assessment of the *C. hippurus* stock in the "core" southeastern Pacific Ocean region (Aires-da-Silva *et al*, 2016); an exploratory management strategy evaluation (MSE) for the southeastern Pacific Ocean (Valero *et al*., 2016); and an evaluation of potential reference points and harvest control rules for dorado in the EPO (Valero *et al*., 2019). • Some CPCs have requested that the IATTC staff continues working with CPCs on dorado research (*e.g.* SAC-10 recommendation 2, SAC-12 recommendation 2.2, Proposal IATTC-100 H-1). • Meanwhile, the workload of the IATTC's Stock Assessment Program has greatly increase over recent years (*e.g.* stock assessments of more species, MSE work). Additional resources (human and financial) are needed for the staff to continue to be involved in any additional research on dorado.
Relevance for management	• Scientific advice for management of dorado in the EPO.
Duration	Depending on option chosen (see workplan)
Work plan and status	• Option 1: Hiring of an additional, permanent staff member for the Stock Assessment Program (SAP). Advantages: Secure dorado work in the long term and increase the ability of the SAP to handle growing stock assessment and MSE work for other species. Budget: ~$180,000 per year (salary + benefits). This option will give stability and predictability for additional help on assessment and MSE work for DOR and other species the SAP is tasked to do. • Option 2: A 2-year contract. The workplan will include a benchmark assessment for DOR in the core EPO and evaluation of alternative approaches for evaluation of status and management of DOR in other EPO areas. An alternative to the 2-year contract is to bundle this option with the proposal for tropical tuna MSE and combine the funding to secure tropical tuna MSE and DOR. This alternative could involve an update DOR assessment, followed by annual reporting of DOR indicators and guidelines for best practices for the implementation of harvest strategies for DOR fisheries in the EPO taking advantage of previous IATTC DOR work. Advantages: Have a dedicated scientist to resume DOR work for two years (or spread over the duration of the MSE for tropical tunas + DOR contractor time). Disadvantages: The success of this option will depend on the ability to contract a qualified contractor able to deliver the work in 2 years and on the availability of staff to train/supervise the contractor during that time. If combined with the proposal for

	tropical tuna MSE there is no need to train a contactor since it would be the same team that completed the previous DOR work. Budget: ~$260,000 (2 years). • Option 3: An update of the 2016 assessment is possible at no additional cost if the tropical tuna MSE proposal is secured (MSE contractor Dr. Juan Valero was involved in previous dorado research and could help staff updating the 2016 assessment). No other dorado work will be possible under this option. This is conditional on updated datasets from Ecuador and Peru becoming available to the staff. Advantages: The personnel involved (staff and contractor) are familiar with the data, analyses, and collaborators in the region as they conducted the previous IATTC-led DOR work. Disadvantages: This provides only support for an update of the 2016 assessment, not improvements to the assessment, no MSE, and no planning of inclusion of DOR work in the staff regular work.	
External collaborators	• CPCs involved in the relevant fisheries • Industry • Contractors	
Deliverables	• **Option 1:** Long-term research on DOR and other species assessment and MSE • **Option 2:** Support for benchmark assessment and MSE for DOR • **Option 3:** Update on 2016 DOR stock assessment.	
Budget (US$)	**Option 1**: ~$180,000 per year (salary + benefits) **Option 2:** ~$260,000 (2-years) **Option 3:** No additional cost, conditional on funding of tropical tuna MSE proposal.	

4. ECOLOGICAL IMPACTS OF FISHERIES: ASSESSMENT AND MITIGATION

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5. INTERACTIONS AMONG THE ENVIRONMENT, THE ECOSYSTEM, AND FISHERIES

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6. KNOWLEDGE TRANSFER AND CAPACITY BUILDING

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7. SCIENTIFIC EXCELLENCE

PROJECT T.1.a: External review of bigeye tuna assessment		
THEME: Scientific Excellence **GOAL:** T. Implement external reviews of the staff's research **TARGET:** T.1. Facilitate external reviews of stock assessments **EXECUTION**: Stock Assessment Program		
Objectives	• Review the assessment model used for bigeye tuna • Improve the assumptions made in the assessment	
Background	• The bigeye tuna stock assessment was last independently reviewed in 2019 • A new risk assessment approach that includes fourteen reference models for bigeye tuna in the EPO has been developed since the last review • Review of the assessment is important to get external input into improving the assessment	
Relevance for management	• The results of the bigeye assessment are used for management advice • Improvements in the stock assessment will improve the management advice	
Duration	The project will extend over 2024 but the workshop will be a single week in Fall	
Work plan and status	• Early 2023: Identify review panel • Mid 2023: Prepare documents describing major developments in the model • Summer/Fall 2023: Hold workshop • Fall 2023: Write workshop report	
External collaborators	Independent reviewers	
Deliverables	Workshop report	
Budget (US$)	Workshop expenses and invited participant travel costs	50,000

PROJECT T.1.b: External review of yellowfin tuna assessment		
THEME: Scientific Excellence **GOAL:** T. Implement external reviews of the staff's research **TARGET:** T.1. Facilitate external reviews of stock assessments **EXECUTION**: Stock Assessment Program		
Objectives	• Review the assessment model used for yellowfin tuna • Improve the assumptions made in the assessment	
Background	• The yellowfin tuna stock assessment was last independently reviewed in 2019 • A new risk assessment approach that includes forty-eight models for yellowfin tuna in the EPO was implemented in the 2020. • A workplan is in place to improve the assessment and address stock structure hypothesis were not fully addressed in the 2020 benchmark assessment, • Review of the assessment is important to get external input into improving the assessment	
Relevance for management	• The results of the yellowfin assessment are used for management advice • Improvements in the stock assessment will improve the management advice	
Duration	The project will extend over 2024 but the workshop will be a single week in Fall	
Work plan and status	• Early 2023: Identify review panel • Mid 2023: Prepare documents describing major developments in the model • Fall 2023: Hold workshop • Fall 2023: Write workshop report	
External collaborators	Independent reviewers	
Deliverables	Workshop report	
Budget (US$)	Workshop expenses and invited participant travel costs	50,000