INTER-AMERICAN TROPICAL TUNA COMMISSION

94TH MEETING

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DOCUMENT IATTC-94-04 ADDENDUM 1

UNFUNDED PROJECTS

This document lists projects proposed by the IATTC scientific staff that are not funded. The staff's work plans for 2018-2023 and its current and planned research activities are listed in Document IATTC-94-04, 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 9 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-94-04; 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.a: Develop an effective and reliable floating-object marking scheme to assist scientific advance		
THEME: 1. Data collection **GOAL:** C. Improve quality and expand coverage of data-collection programs **TARGET:** C.1. Purse-seine fleet **EXECUTION**: Bycatch and IDCP Program & Stock Assessment Program		
Objectives	Establish a robust and reliable marking scheme to accurately identify and track floating objects throughout their lifetime	
Background	• Current FAD data collection forms and procedures are inadequate for marking, identifying and tracking floating objects throughout their lifetime. • This is impeding scientific progress in many fields (*e.g.* ecological impacts, operational characteristics and effort, stock assessment). • All tuna RFMOs, FAO, the United Nations, and other international organizations recognize the need for marking all fishing gears, including floating objects. • Very little progress has been made in this area worldwide.	
Relevance for management	A suitable scheme for marking and identifying floating objects would help refine analyses to develop recommendations for managing tropical tunas in the EPO.	
Duration	18 months	
Work plan and status	• [M 1-6] Define marking prototypes. Explore databases and start developing programs to connect them. Identify gaps and potential solutions. • [M 3-4] Workshop with stakeholders, technology companies, fishing industry, observers and captains to discuss options and adopt best prototype for testing. • [M 5/6-12/14] Obtain materials, conduct sea trials and trials with specific electronic technologies under controlled laboratory conditions. • [M 12/14-16] Analyze data and feedback from observers and captains. Continue developing potential connections between databases. • [M 16-18] Improve marking system, develop recommendations. • [M 16-18] Prepare for modifications/implementation and, likely, for a second stage that considers a web-based floating-object registration database.	
External collaborators	Fishing industry, technology companies	
Deliverables	• Proposal for a marking scheme, with a summary of pros and cons of all the methodologies considered, including electronic and physical marking. • Programs to connect different floating-object related databases. A document including best practices, protocols, difficulties, data gaps and potential solutions. • Reports for the WG -FADs, the SAC and the Commission, with recommendations to improve data quality and collection and best marking options.	
Budget (US$)	Regional workshop	40,000
	Post-doctoral researcher (18 months)	90,000
	Material for prototypes (2000 physical marks + electronic marks + materials + shipping)	80,000
	Travel	10,000
	Total	**220,000**

PROJECT C.4.b: Long-term sampling program for shark catches of artisanal fisheries in Central America: Phase 1		
THEME: 1. Data collection **GOAL:** C. Improve quality and expand coverage of data-collection programs **TARGET:** C.4. Artisanal longline fleet **EXECUTION**: Stock Assessment Program		
Objectives	Conduct Phase 1 (1st year) of a long-term sampling program of shark catches by artisanal fisheries in Central America, using sampling methods and logistics developed under the extended FAO-GEF project.	
Background	• Assessment modelling for shark species in the EPO is severely hampered by a lack of reliable data on shark catches. • Previous work by IATTC staff identified specific data gaps and data collection needs, including the critical need for catch data from Central American fisheries, some components of which are believed generate a large fraction of the EPO catches of sharks. • The current FAO-GEF-funded project on developing sampling designs for the composition of the shark catches by artisanal fisheries in Central America, supplemented with IATTC capacity-building funds, will be completed at the end of 2019. • This extended FAO-GEF project has generated, and continues to generate, a wealth of information with which to develop sampling designs for various fleet components of Central American coastal fisheries that land sharks (SAC-10-16). • However, no funding is available to implement a long-term sampling program using the methodology developed under the FAO-GEF project. • Without data provided by a properly designed long-term sampling program for Central American artisanal fisheries, the IATTC will not be able to meet the goal of Resolution C-16-05 of EPO assessments of silky and hammerhead sharks. • Phase 1 of the long-term sampling program will provide the necessary extensive field testing required to fine-tune sampling methodology, logistics and costs for Phase 2 (regular sampling).	
Relevance for management	Data collected under a long-term monitoring program based on fully-tested sampling designs will allow for development of stock status indicators and conventional assessments of key shark species	
Duration	1 year	
Work plan and status	2020: Implement the sampling designs developed under the extended FAO-GEF project.	
External collaborators	OSPESCA, Central American national authorities	
Deliverables	• Sampling designs and logistical plans for estimating the species and size composition of shark catches in Central American artisanal fisheries. • SAC-11 (2020): report on final sampling design methodology and costs for Phase 2.	
Budget (US$)	Sampling technicians (including salaries, travel, insurance)	295,800
	Technician training (including travel, materials, insurance)	25,000
	Total	**320,800**

2. LIFE-HISTORY STUDIES FOR SCIENTIFIC SUPPORT OF MANAGEMENT

PROJECT E.2.a: Investigate spatiotemporal variability in the age, growth, maturity, and fecundity of yellowfin tuna in the EPO		
THEME: Life-history studies for scientific support of management **GOAL:** E. Life history, behavior, and stock structure of tropical tunas **TARGET:** E.2. Reproductive biology of tropical tunas **EXECUTION**: Biology and Ecosystem Program		
Objectives	Estimate age, growth, maturity, and fecundity of yellowfin from four distinct areas of the eastern Pacific for use in spatially-structured stock assessment models	
Background	• Current estimates of age, growth, maturity, and fecundity of yellowfin are based on otolith and ovarian tissue samples collected over 30 years ago. • During 2009-2016 observers collected otolith and ovarian tissues samples at sea throughout the EPO • Tagging and morphometrics data indicate there are multiple stocks of yellowfin in the EPO, probably with different life history characteristics • Heavily-exploited fish stocks often show trends towards earlier maturation • Spatially-structured stock assessments should incorporate geographically-explicit life-history parameters	
Relevance for management	Spatially-structured stock assessments based on geographically-explicit life history parameters will provide a more accurate basis for the staff's management advice	
Duration	4 years; initiated in 2017	
Work plan and status	• 2017-2020: Preparation and reading of otolith samples for age estimates • 2019-2020: Preparation and reading of ovarian tissues for fecundity estimates • 2020: Analyses of age and growth and reproductive biology data, and preparation of manuscripts The life-history group will be very occupied with the tagging program (E.4.a) in 2020 and have very limited time for this project. A laboratory technician will be needed to avoid major delays with this project.	
External collaborators		
Deliverables	• Presentation for SAC-12, 2021 • Updated, geographically-explicit life-history parameters for use in spatially-structured stock assessments	
Budget (US$)	Laboratory technician (1 year)	60,000

3. SUSTAINABLE FISHERIES

PROJECT H.1.d(ext): Improve indices of abundance and length composition based on longline data		
THEME: Sustainable fisheries **GOAL:** H. Research and development of stock assessment models and their assumptions **TARGET:** H.1. Improve routine tropical tuna assessments **EXECUTION**: Stock Assessment Program		
Objectives	• Improve the yellowfin and bigeye indices of relative abundance from longline data • Determine methods to identify targeting in longline fisheries • Develop spatio-temporal models for creating indices of relative abundance from longline data • Develop appropriate longline length-composition data for the index of abundance and for the catch	
Background	• Indices of relative abundance derived from longline CPUE data are the most important piece of information in the bigeye and yellowfin stock assessments • Only the Japanese data are currently used to create these indices • The characteristics, tactics, and spatial distribution of the fishery have changed over time • The same length-composition data are used for the index and for the catch, but these could differ • New methods, such as spatio-temporal modelling, have been developed and should be used in the creation of the indices • Research and a workshop in 2019 have substantially progressed the work towards achieving the objectives. • Additional research is needed to finalize indices of abundance and composition data • Access to operational-level data for longer time periods is essential for advancing the research. Several CPCs have indicated that they will grant such access to the staff under strict confidentiality. • Research conducted to resolve issues in using the longline CPUE and composition data needs to be presented and discussed with scientists of the relevant CPCs	
Relevance for management	The indices have a direct impact on the stock assessment, and any improvements in the indices will directly improve the management advice for bigeye and yellowfin	
Duration	Winter 2020	
Work plan and status	• Jan-Feb 2020: work with CPC scientists to progress longline research • Jan-Feb 2020: one-week workshop to discuss the results of the research conducted to resolve issues in using the longline CPUE data	
External collaborators	• CPCs involved in the longline fishery, mainly China, Japan, Korea, Chinese Taipei • Invited speakers	
Deliverables	• Workshop report • Indices of relative abundance • Length compositions • Project report to SAC-11, 2020	
Budget (US$)	Workshop and research expenses and invited participant travel costs	50,000

PROJECT H.7.b: South Pacific swordfish assessment		
THEME: Sustainable fisheries **GOAL:** H. Research and development of stock assessment models and their assumptions **TARGET:** H.7. Develop conventional stock assessments for data-rich prioritized species and species of specific interest **EXECUTION**: Stock Assessment Program		
Objectives	Conduct an assessment for South Pacific swordfish	
Background	• The South Pacific swordfish stock has not been assessed since 2011. • The longline fishery has recently increased targeting of swordfish • An updated assessment is needed to provide management advice	
Relevance for management	The stock assessment is needed to provide management advice	
Duration	2020	
Work plan and status	• Obtain data • Conduct assessment • Report to SAC-12 in 2021	
External collaborators		
Deliverables	Report to SAC-12 in 2021	
Budget (US$)	Workshop	50,000

PROJECT H.8.b: Survey for dolphins in the eastern tropical Pacific Ocean (ETP)	
THEME: Sustainable fisheries **GOAL:** H. Research and development of stock assessment models and their assumptions **TARGET:** H.8. Assess the status of dolphin stocks in the eastern tropical Pacific **EXECUTION**: Stock Assessment Program	
Objectives	Implement a ship-based line-transect survey for ETP dolphin species, both a trial survey and a main survey, and produce new estimates of dolphin abundance and updated abundance trends.
Background	• Population dynamics modelling has been the preferred approach for evaluating the stock status of ETP dolphins, and those models have relied on estimates of abundance from fishery-independent surveys conducted by the US National Marine Fisheries Service (NMFS). • As a result of a hiatus in the NMFS surveys since 2006, there are currently no reliable indicators with which to monitor the status of ETP dolphin populations. • This lack of information poses obvious problems for management. For example, the Antigua Convention requires that the status of all species potentially impacted by the tuna fisheries in the EPO be monitored. • Abundance estimates are needed to ensure that incidental dolphin mortalities are both sustainable and insignificant, because the AIDCP stock mortality limits are based on estimates of abundance. • A recent study of existing survey data found that previous estimates of abundance may be biased low due to imperfect detection of dolphin herds on the survey trackline, which, if corroborated with a field study, would have implications for management. • These considerations provide impetus for a new ship-based line-transect survey to obtain new estimates of absolute abundance so that population trends and management can be updated.
Relevance for management	Improve the management of dolphin stocks in the ETP
Work plan and status	• August 2019 – April 2020: plan and conduct trial survey; analyze trial survey data; plan main survey. • May 2020 – May 2022: plan and conduct main survey; estimate abundance and update population trend estimates. • For details, see MOP-37-02 (Section 2.3.3) and MOP-39-01 ADDENDUM.
Duration	32 months (August 2019 – May 2022)
External collaborators	University of St Andrews, Scotland; Instituto Nacional de Pesca, México; Gtt NetCorp; other collaborators to be determined once drone trials are completed.
Deliverables	• Presentations for SAC-11, SAC-12, and SAC-13 (May 2020, 2021, 2022) • Final report for May 2022
Budget	See Document MOP-39-01 ADDENDUM

4. ECOLOGICAL IMPACTS OF FISHERIES: ASSESSMENT AND MITIGATION

PROJECT M.5.c: Evaluate and reduce post-release mortality of mobulid rays

THEME: Ecological impacts of fisheries: assessment and mitigation
GOAL: M. Mitigating ecological impacts
TARGET: M.5. Develop best practices to mitigate anthropogenic impacts on EPO habitats
EXECUTION: Bycatch and IDCP Program

Objectives	• Quantify post-release mortality of mobulid rays and the factors influencing their survival. • Develop science-based handling and release guidelines. • Improve species identification of mobulids using genetic methods.	
Rationale and Relevance for management	• Mobulid populations are experiencing steep declines in many regions including the tropical EPO, and bycatch is a significant threat. • Post-release mortality of mobulids in the EPO is considered 100%, but data from other regions suggest lower, species-specific rates. • Tracking survival of released individuals will allow evaluation of existing and proposed handling and release methods, and development of best-practice guidelines. • Quantifying post-release mortality will reduce uncertainty about impacts on mobulid populations. • Genetic analyses will improve species identification of mobulid rays and help determine impacts of bycatch mortality and mitigation efforts.	
Workplan	• Deploy satellite tags and collect tissue samples and relevant biological data. • Quantify mortality rates using different release methods • Compare genetic and observer species identifications • Quantify effects of handling and release methods, species, and environmental covariates on post-release mortality. • Develop handling and release guidelines for dissemination to the fleets.	
Duration	36 months	
Budget	Survivorship Satellite Tags 50 @US$2,000	100,000
Confirmed co-funding from: Monterey Bay Aquarium, Save Our Seas Foundation (US$ 278,000)	Archival Satellite Tags 25 @US$4,000	100,000
	Satellite fees	7,500
	Tagging kits 25 @US$100	2,500
	Observer tagging rewards 75 @US$100	7,500
	Miscellaneous tag costs (shipping, deployment tips, *etc*.)	5,000
	Travel for training workshops 2 @US$5,000	10,000
	Genetic sample processing 300 @US$30	9,000
	Observer sampling rewards 300 @US$20	6,000
	Sample shipping	1,000
	Researcher analysis 2 yrs @US$30,000	60,000
	Miscellaneous genetic costs (e.g. reagents, lab equip.)	5,000
	Total	**313,500**

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

PROJECT O.1.a: Develop a fishery-dependent ecological sampling program for EPO tuna fisheries		
THEME: Interactions among the environment, the ecosystem and fisheries **GOAL:** O. Improve understanding of the EPO ecosystem **TARGET:** O.1. Conduct trophodynamic studies for defining key assumptions in EPO ecosystem models **EXECUTION**: Biology and Ecosystem Program		
Objectives	• Develop a comprehensive ecological monitoring program for species impacted by EPO fisheries to improve our understanding of the potential ecological effects of fishing and climate change. • Use collected data to develop ecological indices and parameterize ecological risk assessment and ecosystem models for supporting EBFM.	
Background	Studies on trophic ecology, using stomach contents, stable isotopes and fatty acids, are essential for parameterizing ecosystem models and for developing ecological indices to assess the ecological impacts of fishing. Mid-trophic forage species for example form critical trophic linkages from the bottom to the top of the food web, but are poorly understood, therefore limiting overall efficacy of forecasting changes in ecosystem structure under fishing and/or climate change scenarios.	
Relevance for management	Accurate depictions of trophic connections are the foundation of ecosystem models that represent and quantify the complexity of ecological interactions among species or functional groups. Improving our understanding of the trophodynamics of the pelagic EPO by undertaking comprehensive trophic ecology studies for populating ecosystem models provides an important step towards evaluating ecological sustainability under the Antigua Convention.	
Duration	5+ years	
Work plan and status	• Late 2019: identify species and tasks, develop proposal • 2020: develop external collaborations for collecting and analyzing samples (share research proposal), research logistics (e.g. cost, storage, supplies, etc.), and design sampling protocol • 2021: implement sampling protocol; develop database to house sampling information; begin stomach contents identification • 2022: continue sampling, analysis, and database development • 2023: continue sampling, analysis, and database development	
External collaborators	CPCs, fishers, universities, government agencies, etc.	
Deliverables	• Development of an ecological sampling program and a comprehensive ecological and biological database	
Budget (US$)		250,000

6. KNOWLEDGE TRANSFER AND CAPACITY BUILDING

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7. SCIENTIFIC EXCELLENCE

PROJECT X.1.c: Workshop on good practices in fisheries stock assessment		
THEME: Scientific excellence **GOAL**: X. Promote the advancement of scientific research **TARGET**: X.1. Continue the annual CAPAM workshops **EXECUTION**: Stock Assessment Program		
Objectives	Initiate the development of a good practices guide for the application of stock assessment models	
Background	• Assumptions made in stock assessments vary widely among applications • There is no clear agreement on the best assumptions • There has been substantial progress made recently in understanding stock assessment models • CAPAM has held (or will hold) workshops on all the key population and fishery processes • CAPAM's major focus is the Program on Good Practices in Stock Assessment Modeling • The workshop will provide the background information to develop the good practices guide	
Relevance for management	• Stock assessments are the basis for the staff's management advice • Several aspects of the stock assessments need to be improved • A good practices guide will help improve the assessments	
Duration	18 months	
Work plan and status	• Fall 2020: invite keynote speakers, prepare background materialsFall 2020: • Winter 2020: conduct workshop, write workshop reportWinter 2020: • May 2021: report to SAC-12	
External collaborators	Invited speakers	
Deliverables	Workshop report	
Budget (US$)	Workshop expenses and invited participant travel costs	50,000