Actividades de investigación – Research activities

(IATTC-100-02a)

100ª Reunión de la CIAT – 100th Meeting of the IATTC
1-5 de agosto de 2022, 1-5 August 2022 Phoenix, Arizona EE.UU-USA

Temario - Outline

- *Informe de actividades* (IATTC-100-02a)
- Proyectos seleccionados (por *Tema*):
- Planes de trabajo:
  - Evaluaciones de Estrategias de Ordenación (EEO) para los atunes tropicales
  - Monitoreo electrónico
  - Tiburones
- Proyectos no financiados (IATTC-100-02b)

- *Staff Activities Report* (IATTC-100-02a)
- Selected projects (by *Theme*):
- Work plans:
  - Management Strategy Evaluation (MSE) for tropical tunas
  - Electronic monitoring
  - Sharks
- Unfunded projects (IATTC-100-02b)

Estructura del *Informe de actividades del personal* (IATTC-100-02a)
Structure of *Staff Activities Report* (IATTC-100-02a)

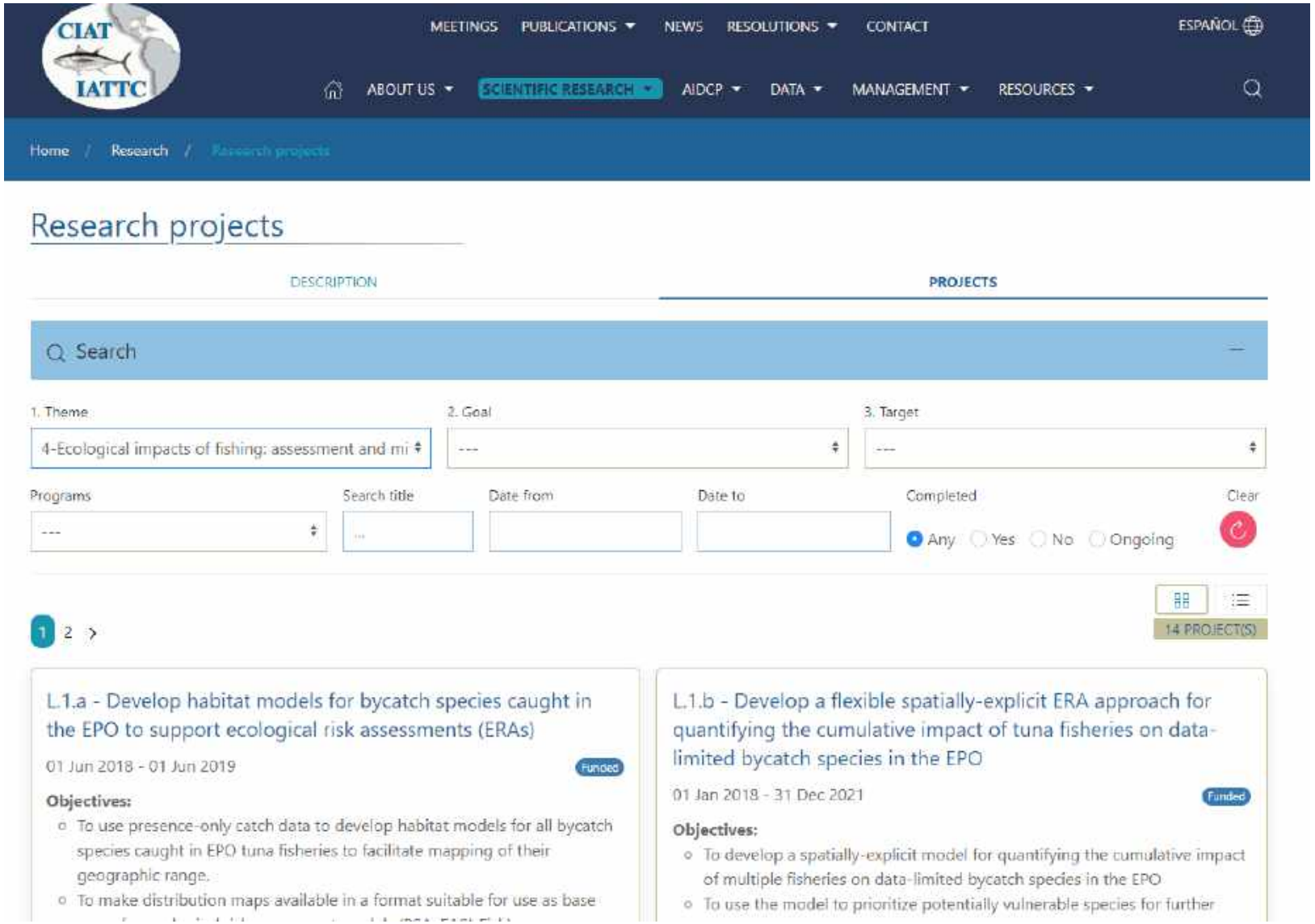
PROJECT A.3.b: Develop databases of biological and fisheries parameters to support Ecological Risk Assessment and ecosystem models	
THEME: Data Collection **GOAL:** A. Database maintenance, preservation, and access **TARGET:** A.3. Standardize and automate data submissions **EXECUTION:** Data Collection and Database Program, Biology and Ecosystem Program	
Objectives	Develop a comprehensive database of best-available biological and fisheries data to provide key parameters for Ecological Risk Assessment (ERA) and ecosystem models
Background	• The Antigua Convention requires the IATTC to ensure the sustainability of target, associated, and dependent species affected by EPO tuna fisheries, and the ecosystem to which they belong. • ERA and ecosystem models, used by IATTC staff to assess the ecological impacts of tuna fisheries in the EPO, require information on biological, physiological and trophodynamic characteristics of thousands of species in the EPO ecosystem. • A database with the most up-to-date information for impacted species is required to expedite the initial parameterization, or updating, of future models.
Relevance for management	• The database will contain data needed for ERAs and ecosystem models, used to identify and prioritize data collection, mitigation, and/or management measures for vulnerable species. • The databases could be shared with scientists of CPCs.
Duration	48 months
Workplan and status	• Jan–Apr 18: Create a basic database structure ready to be populated with biological parameters and associated literature sources. • Ongoing: Conduct biological and ecological literature searches for species that interact with EPO fisheries • Ongoing: Conduct literature searches for species that interact with EPO fisheries, identify fishery-related susceptibility parameters for bycatch species, create database
External collaborators	Scientists from CPCs interested in contributing to and/or using the databases
Deliverables	Comprehensive life history and susceptibilit information that can be shared with IATTC for a particular region and/or fishery.

Descripción del proyecto (primera página)
Project description (first page)

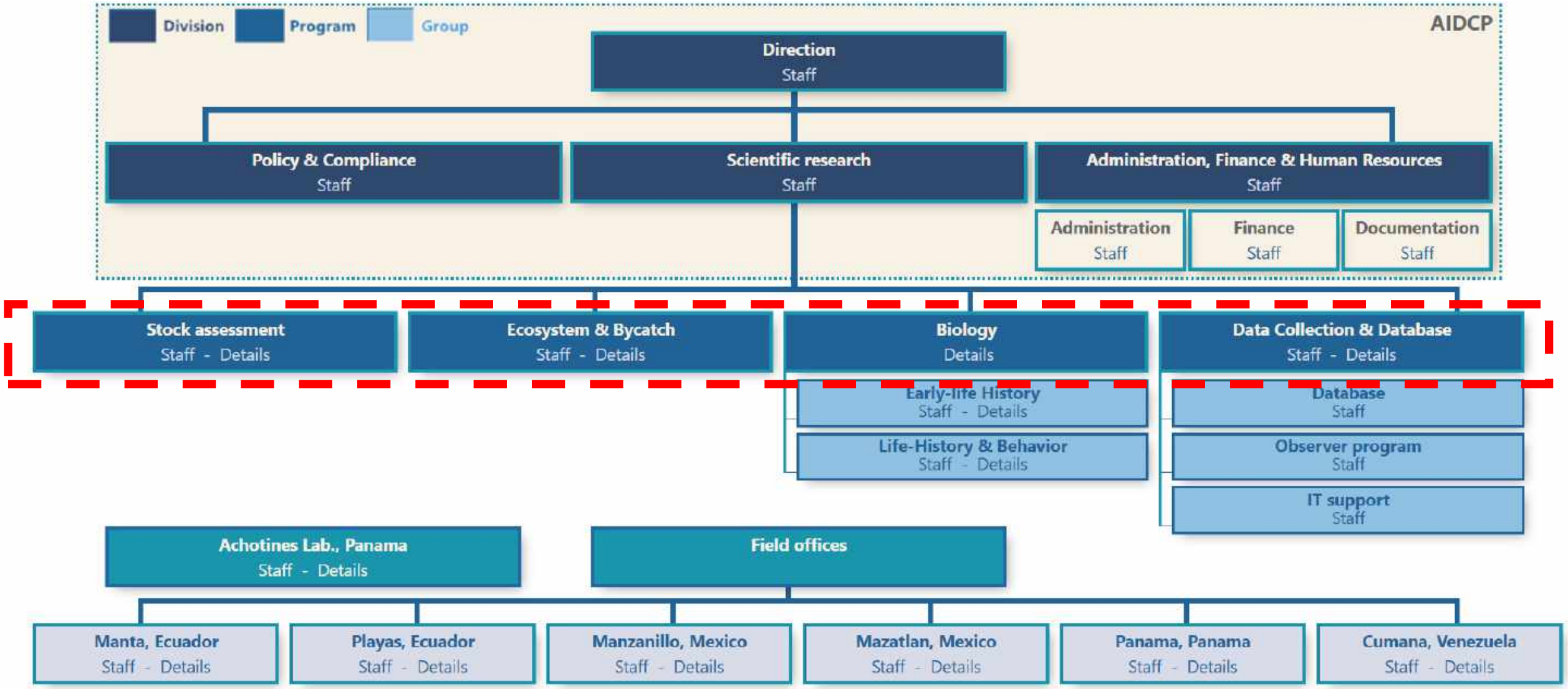
Informe de avances del proyecto (segunda página)
Project progress report (second page)

PROJECT A.3.b: Develop databases of biological and fisheries parameters to support Ecological Risk Assessment and ecosystem models
Updated: March 2019
Progress summary for the reporting period • Life history database is in development for all species reported to have interacted with purse-seine and large-scale longline fisheries • Values for fisheries-related susceptibility parameters have been obtained for many of the bycatch species
Challenges and key lessons learnt • Database development will be ongoing and parameter values will be updated as new literature and improved data becomes available
Reports/publications/presentations Two manuscripts that use this life history and susceptibility data have been submitted to scientific journals
Comments:

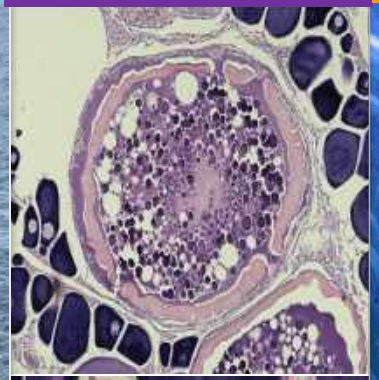
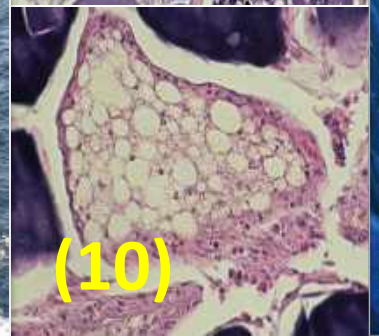
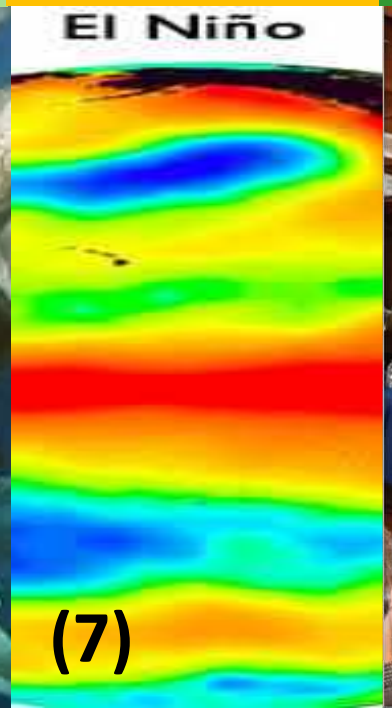
Uso de la nueva página web de la CIAT para buscar proyectos del PCE
Use new IATTC website to browse the SSP for projects



Organigrama de la CIAT
IATTC organigram



Temas - Themes

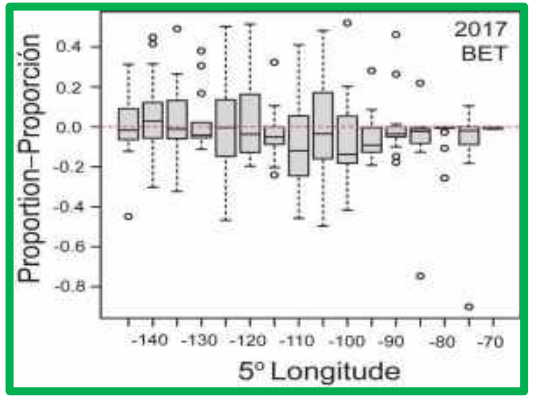
Recolección de datos en apoyo científico de la ordenación - Data collection for scientific support of management	Estudios del ciclo vital en apoyo científico de la ordenación - Life-history studies for scientific support of management	Pesquerías sostenibles - Sustainable fisheries	Impactos ecológicos de la pesca: evaluación y mitigación - Ecological impacts of fisheries: assessment and mitigation	Interacciones entre el medio ambiente, el ecosistema, y la pesca - Interactions among the environment, the ecosystem and fisheries	Transferencia de conocimientos y fomento de capacidad - Knowledge transfer and capacity building	Excelencia científica - Scientific excellence
 (8)	  (10)	 (22)	 (14)	 (7)	 (3)	 (2)

Recolección de datos en apoyo científico de la ordenación
Data collection for scientific support of management

1. DATA COLLECTION FOR SCIENTIFIC SUPPORT OF MANAGEMENT
A.1.a: Database and Observer Data Collection Program Regular Activities
A.3.a. Conversion of all remaining Visual Basic 6 (VB6) computer programs to Visual Basic Net (VB.net).
A.3.b: Develop databases of biological and fisheries parameters to support Ecological Risk
B.1.a (new): Improving smart species identification tools
B.3.a (new): Individual Vessel Limit pilot study
C.1.a: Investigation of purse-seine catch composition bias associated to the COVID-19 pandemic
C.2.b: Pilot study of electronic monitoring (EM) of the activities and catches of longline vessels

SAC-13 INF-E

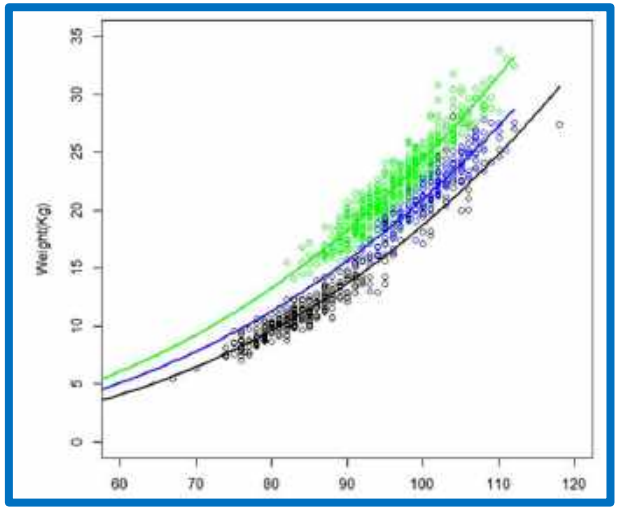
SAC-13 INF-D



SAC-13-05

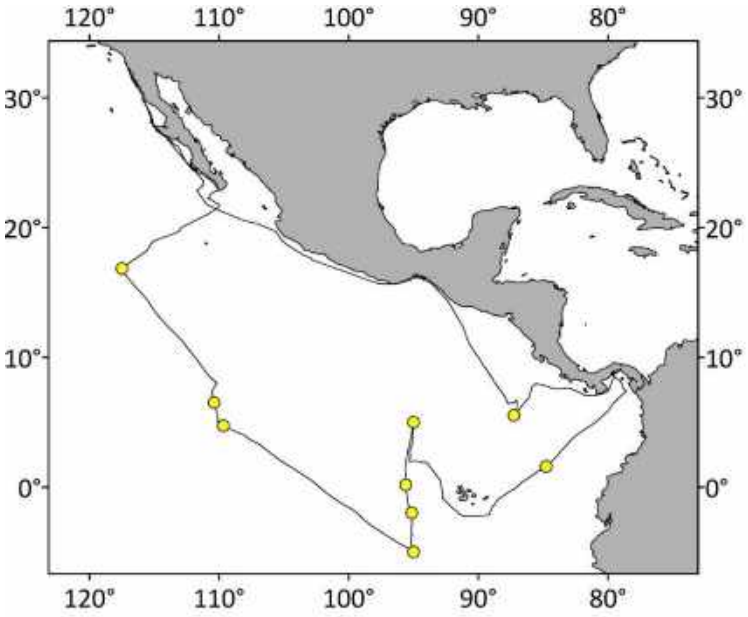
Estudios del ciclo vital en apoyo científico de la ordenación
Life-history studies for scientific support of management

2. LIFE-HISTORY STUDIES FOR SCIENTIFIC SUPPORT OF MANAGEMENT	
E.2.a: Investigate spatiotemporal variability in the age, growth, maturity, and fecundity of yellowfin tuna in the EPO	
E.3.a: Investigate geographic variation in the movements, behavior, and habitat utilization of yellowfin tuna in the EPO	
E.4.a: IATTC Regional Tuna Tagging Program (RTTP) - EPO	
E.5.a: Evaluate the Pacific-wide population structure of bigeye and skipjack tunas, using genetic analyses	
E.5.b: Investigate the spawning ecology of captive yellowfin tuna, using genetic analyses	
F.2.a: Investigate the movements, behavior, and habitat utilization of silky sharks in the EPO	
F3.a: Feasibility study to develop a sampling program for updating morphometric relationships and collecting biological samples for priority species in EPO tuna fisheries: Phase 1	
G.1.a: Studies of pre-recruit survival and growth of yellowfin tuna, including expanding studies of early-juvenile life stages	
G.2.a: Develop comparative models of pre-recruit survival and reproductive patterns of Pacific tunas	
G.3.a: Develop a larval growth index to forecast yellowfin recruitment	

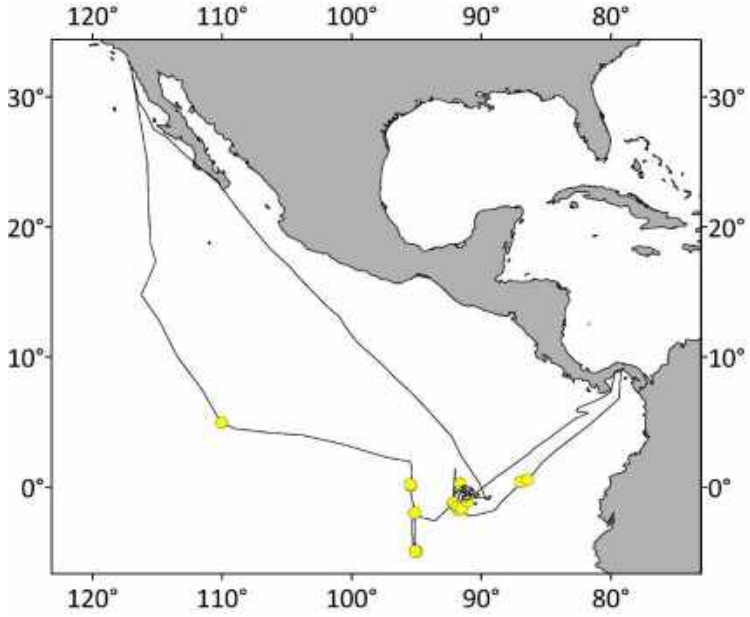


IATTC Regional Tuna Tagging Program - Results

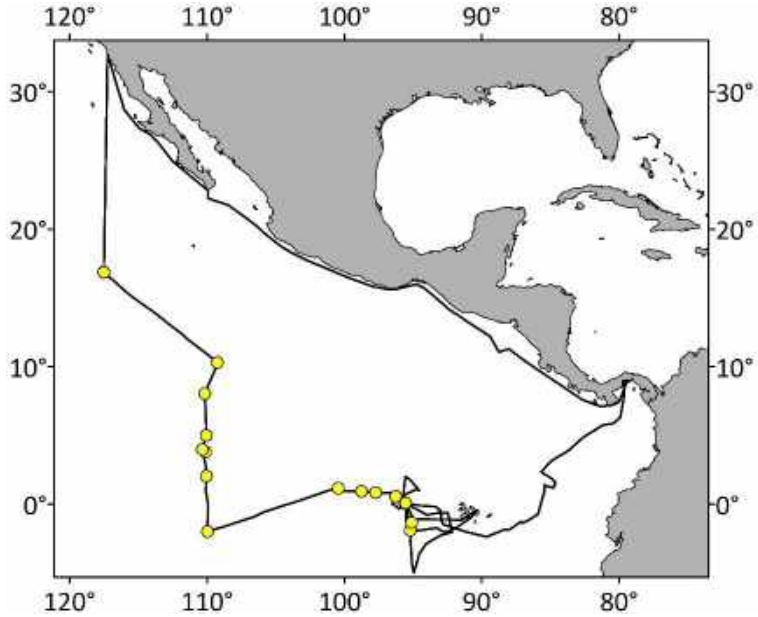
Cruise 1
6 March to 30 April 2019



Cruise 2
1 February to 30 April 2020



Cruise 3
1 March 2020 to 20 May 2022



Co-funded by
European Union

The yellow dots are where tagging events occurred

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IATTC Regional Tuna Tagging Program – summary results

Year	Tag Type	SKJ	YFT	BET	Total
2019	Plastic Dart	177	804	143	1,124
	Archival	43	242	46	331
2020	Plastic Dart	5,854	265	8	6,127
	Archival	185	9	-	194
2022	Plastic Dart	135	611	114	860
	Archival	26	218	11	255
Total	Plastic Dart	6,166	1,680	265	8,111
	Archival	254	469	57	780

Co-funded by European Union

SKJ spatiotemporal modeling – preliminary results

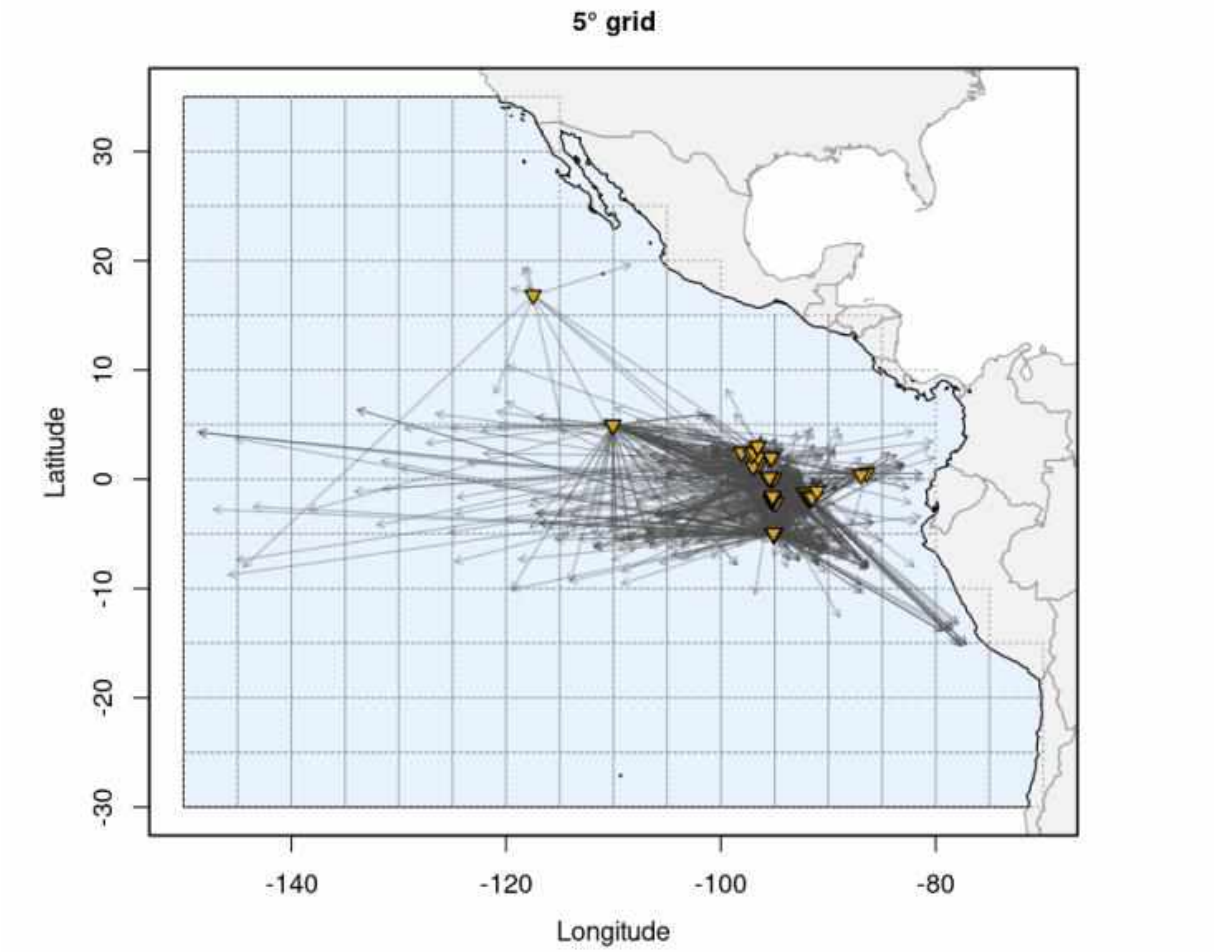

FIGURE 4. Skipjack tuna linear displacements (n = 700) for fish at liberty greater than 30 d shown as dots, color coded for six distinct release locations, shown as squares. Fish were tagged under the IATTC Regional Tuna Tagging Program (RTTP) in the EPO (1999-2020).

FIGURA 4. Los desplazamientos lineales del atún barrilete (n = 700) para peces en libertad mayor a 30 d se muestran como puntos, codificados por colores para seis lugares distintos de liberación, se muestran como cuadrados. Los peces fueron marcados bajo el Programa Regional de Marcado de Atunes (PRMA) de la CIAT en el OPO (1999-2020).

SAC-13-08

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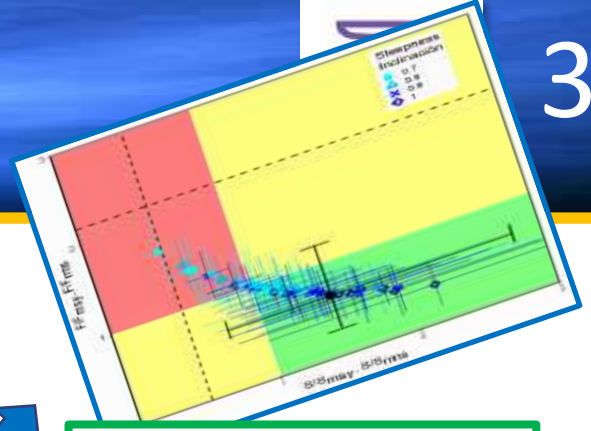
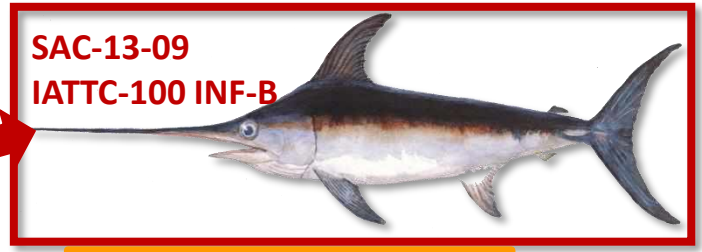
Pesquerías sostenibles
Sustainable fisheries



3. SUSTAINABLE FISHERIES
H.1.a: Improve the bigeye tuna stock assessment phase 2
H.1.b: Improve the yellowfin tuna stock assessment phase 2: Explore alternative hypotheses of stock structure and life-history for YFT in exploratory stock assessment models
H.1.c: Investigate potential changes in the selectivity of the longline fleet resulting from changes in gear configuration
H.1.d: Improve indices of abundance based on longline CPUE data
H.1.f: Improving the methodology of the risk analysis
H.3.a: Analysis of recent skipjack tagging data
H.3.b: Skipjack Stock assessment
H.3.c: Estimate skipjack growth rates from recent tagging data
H.4.a: Conduct routine stock assessments of tropical tunas
H.6.a: Participate in assessments of shared species by the International Scientific Committee (ISC)
H.7.b: South Pacific swordfish assessment
H.7.c: Participate in south Pacific albacore assessment
H.8.b: Second trial dolphin survey
H.8.c: Cow-calf separation
I.1.a: Conduct a Management Strategy Evaluation (MSE) for tropical tunas in the EPO
J.2.a: Quantify the relationship between v…
J.2.b (new): Identifying operational charac… eastern Pacific Ocean
J.3.a: Developing alternative buoy-derived tuna biomass indexes
K.1.a: POSEIDON project



SAC-13-01
POSEIDON

22

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IATTC Staff Activities and Research Plan (REVISED)
Actividades y Plan de Trabajo del Personal de la CIAT (REVISADO)

MSE tropical tunas – *EEO atunes tropicales*

DOCUMENT SAC-13-INF-C link

GREEN: COMPLETED; BLUE: FUNDED; RED: UNFUNDED, Text ~~struck through~~ indicates completed or terminated projects

SSP ref.	Target/Project	2018		2019		2020		2021		2022		2023		2024	
		1	2	1	2	1	2	1	2	1	2	1	2	1	2
	1. SUSTAINABLE FISHERIES														
	Goal I: Test harvest strategies using Management Strategy Evaluation (MSE)														
I.1.	Conduct a comprehensive MSE for bigeye tuna and plan MSEs for the other tropical tuna species														
I.1.a	1. Stakeholder and technical MSE workshops														
	a. Technical meetings to agree on overall/revised MSE Plan by IATTC staff and collaborators														
	b. Stakeholder workshops on training and communication on MSE development and results														
	2. Technical development of MSE, HCR, MP, outputs														
	~~a. Improve the bigeye assessment for use as spatial OM~~														
	~~b. Run preliminary simulations with spatial OM~~														
	a. Run preliminary MSE based on initial input from managers and stakeholders														
	b. Run final MSE based on revised input from managers and stakeholders														
	c. Present evaluated HCR/MP to Commission, plan work for other tropical tunas														

Transition of MSE work to other tropical species (YFT, SKJ) after 2024 to be outlined in the new IATTC Strategic Science Plan (planned in 2023)

Transición a EEO de otros atunes tropicales (YFT, SKJ) en 2024 detallado en el nuevo Plan Estratégico Científico de la CIAT (planeado en 2013)

Funds?
¿Fondos?
(see IATTC-100-2b, proposal I.1.b

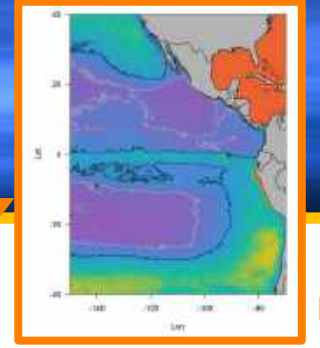
Cronograma de evaluaciones – atunes tropicales
Stock assessment schedule – tropical tuna

New triennial assessment and management cycle (2022-2024)

SPECIES	2021	2022	2023	2024
Tropical Tunas	**Indicators**	**Indicators**	**Indicators**	**Indicators**
SKJ	**Review of assessment methods**	Interim SKJ assessment **Initial results of tagging analysis; External review**		**Benchmark assessment**
YFT		**WS on longline data; WS on improving spatio-temporal methods for CPUE and L-F standardization (Project H.1.f)**	**Exploratory assessment; External review (Nov-Jan)**	**Benchmark assessment**
BET		**WS on longline data; WS on improving spatio-temporal methods for CPUE and L-F standardization (Project H.1.f)**	**Exploratory assessment; External review (Nov-Jan)**	**Benchmark assessment**
Risk analysis		**WS to improve metrics and scoring in risk analysis (Proposal H.1.g)**		**Risk analysis**
MSE process	**MSE WS, Tech. Work**	**MSE WS, Prelim. results**	**MSE WS, Prelim. results**	**MSE WS, BET HS, Future Work**

Impactos ecológicos de la pesca: evaluación y mitigación
Ecological impacts of fisheries: assessment and mitigation

4 ECOLOGICAL IMPACTS OF FISHERIES: ASSESSMENT AND MITIGATION	
L.1.a: Develop habitat models for bycatch species caught in the EPO to support ecological risk assessments (ERAs)	
L.2.b (new): Vulnerability assessment of shark bycatch in EPO tuna fisheries using the EASI-Fish approach	
species in the EPO	
L.2.d (new): Pacific-wide vulnerability assessment of pelagic shark species caught as bycatch in tuna fisheries	
L.2.e (new): Vulnerability assessment and efficacy of potential conservation measures for the east Pacific leatherback turtle stock	
M.1.b: Test sorting grids	
M.1.c: Acoustic discrimination to avoid purse seine catches of undersized yellowfin tuna	
M.1.d: Developing and testing bycatch release devices in tuna purse seiners	
M.2.b: Evaluate best handling practices for maximizing post-release survival of silky sharks in longline fisheries, and identification of silky shark pupping areas for bycatch mitigation	
M.2.c: Manta and devil ray post-release survival, movement ecology, and genetic population	
M.3.b: Spatial and temporal closures and the tradeoff between bycatch and target catches	
M.5.a: Develop and test non-entangling and biodegradable FADs	
M.5.c: Definition of guidelines to reduce the impact of lost and abandoned FADs on marine turtles	



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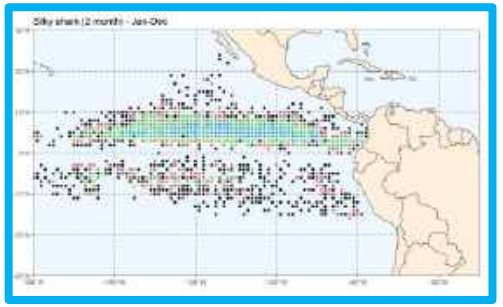
BYC-11-02



BYC-11-04

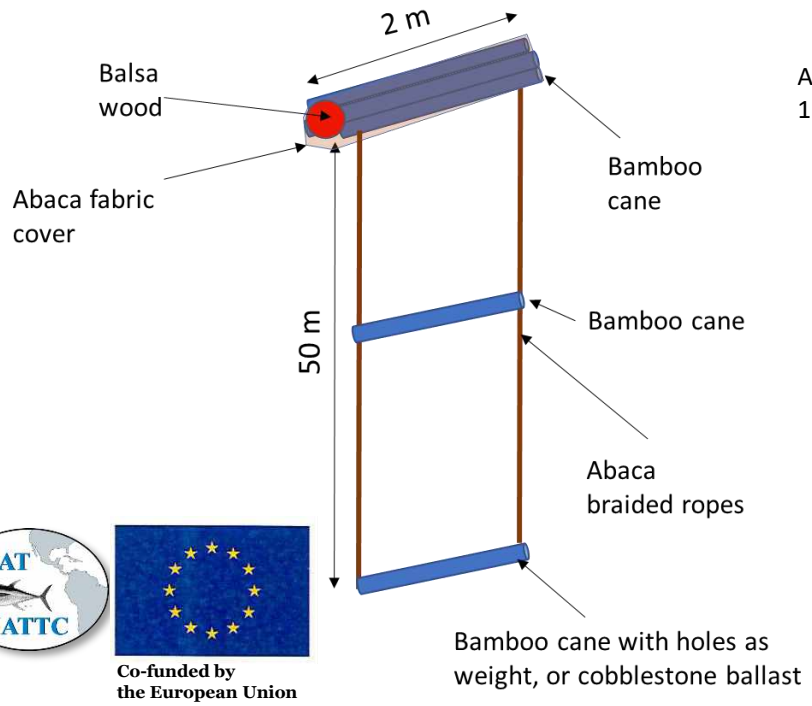
FAD-06-02

BYC-11 INF-A

Prototypes tested in the project (n = 730; 45 participant vessels)

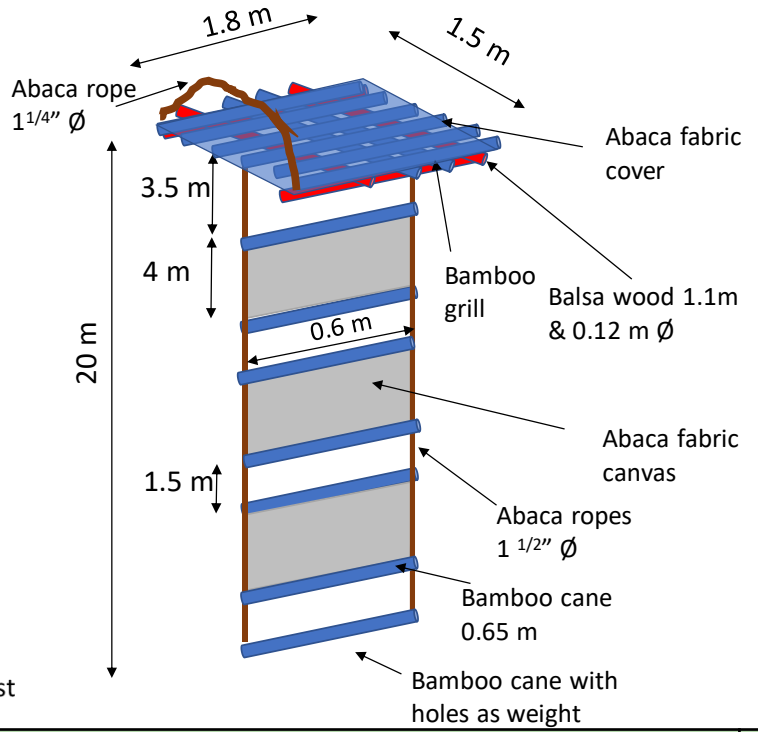
Prototype 1

- **Abaca** as main vegetal fiber component
- Sausage-like bamboo/balsa as floating component
- Two ropes as submerged component



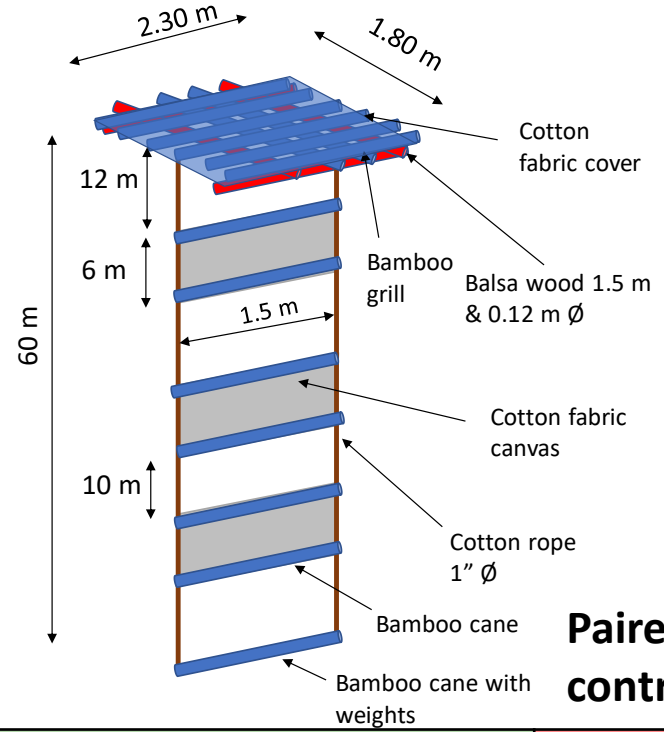
Prototype 2

- **Abaca** as main vegetal fiber component
- Gridded-like bamboo/balsa as floating component
- Three abaca fabric canvas as submerged component



Prototype 3

- **Cotton** as main vegetal fiber component
- Gridded-like bamboo/balsa as floating component
- Three cotton fabric canvas as submerged component



CIAT IATTC

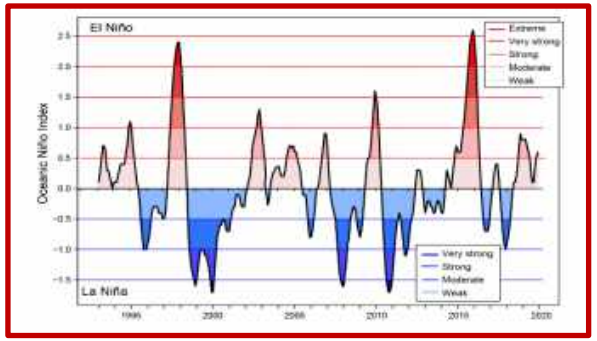
Co-funded by the European Union

Paired control FADs

Deployments	114	392	224	720
Visits	5	73	8	106
Sets	8	46	2	134
Catch per set	61	29.2	38	31.2

Interacciones entre el medio ambiente, el ecosistema, y la pesca
Interactions among the environment, the ecosystem and fisheries

5. INTERACTIONS AMONG THE ENVIRONMENT, THE ECOSYSTEM, AND FISHERIES
N.1.b: Investigate the effects of wind-induced microturbulence on yellowfin larval survival
N.1.c: Developing dynamic species distributions models to inform conservation and management of non-target species and communities in the eastern Pacific Ocean
N.2.a. Develop models of the effects of climate change on pre-recruit life stages of tropical tunas
N.2.b: Supporting climate-ready and sustainable fisheries: using satellite data to conserve and manage life in the ocean and support sustainable fisheries under climate change
O.2.a. Develop and implement analytical tools for understanding the trophic ecology of apex predators
O.2.b: An updated ecosystem model of the tropical EPO for providing standardized ecological indicators for monitoring of ecosystem integrity
O.2.c: Temporal network analysis of bycatch communities caught in purse-seine fisheries



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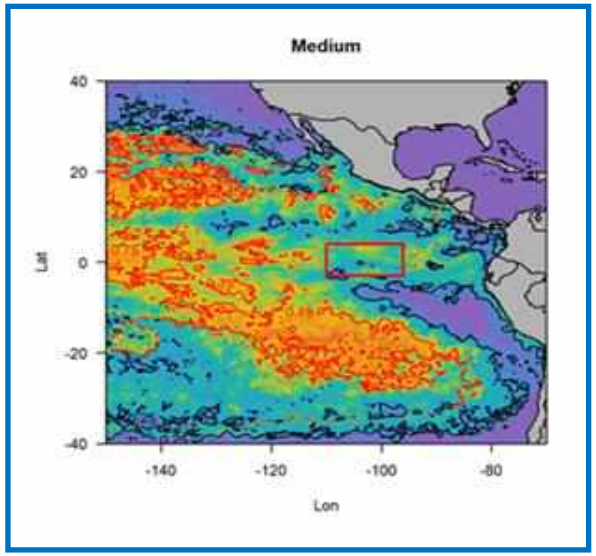

6. KNOWLEDGE TRANSFER AND CAPACITY BUILDING
P.1.a: Fulfil requests for development of database and data processing applications for entities outside the IATTC
P.1.b: Respond to requests for scientific analyses
Q.1.a: Achotines Laboratory support of Yale University's Environmental Leadership Training Initiative (ELTI) in Panama

7. SCIENTIFIC EXCELLENCE
U.1.a: Long-term plan to strengthen research at the Achotines Laboratory

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- Proyectos seleccionados (por *Tema*)
- Planes de trabajo:
  - Evaluaciones de Estrategias de Ordenación (EEO) para los atunes tropicales
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- Proyectos no financiados (IATTC-100-02b)

- *Staff Activities Report* (IATTC-100-02a)
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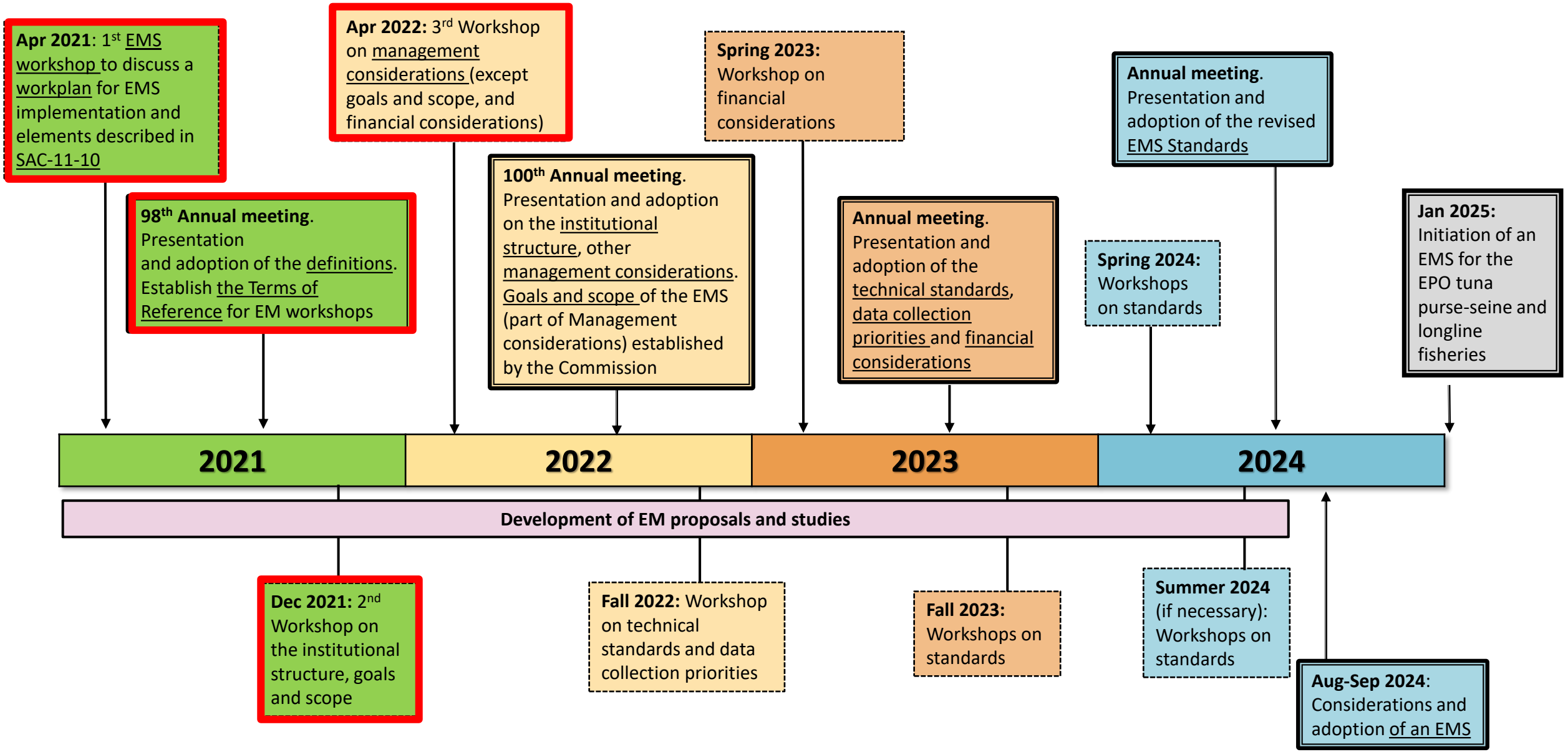
  - Sharks
- Unfunded projects (IATTC-100-02b)

Plan de trabajo del SME para la pesquería atunera en el OPO
Workplan of the EMS for the tuna fisheries in the EPO



Establecimiento de un grupo de trabajo *ad hoc* y futura adopción de un 'paquete'
Establishment of an *ad hoc* working group and future adoption of a package

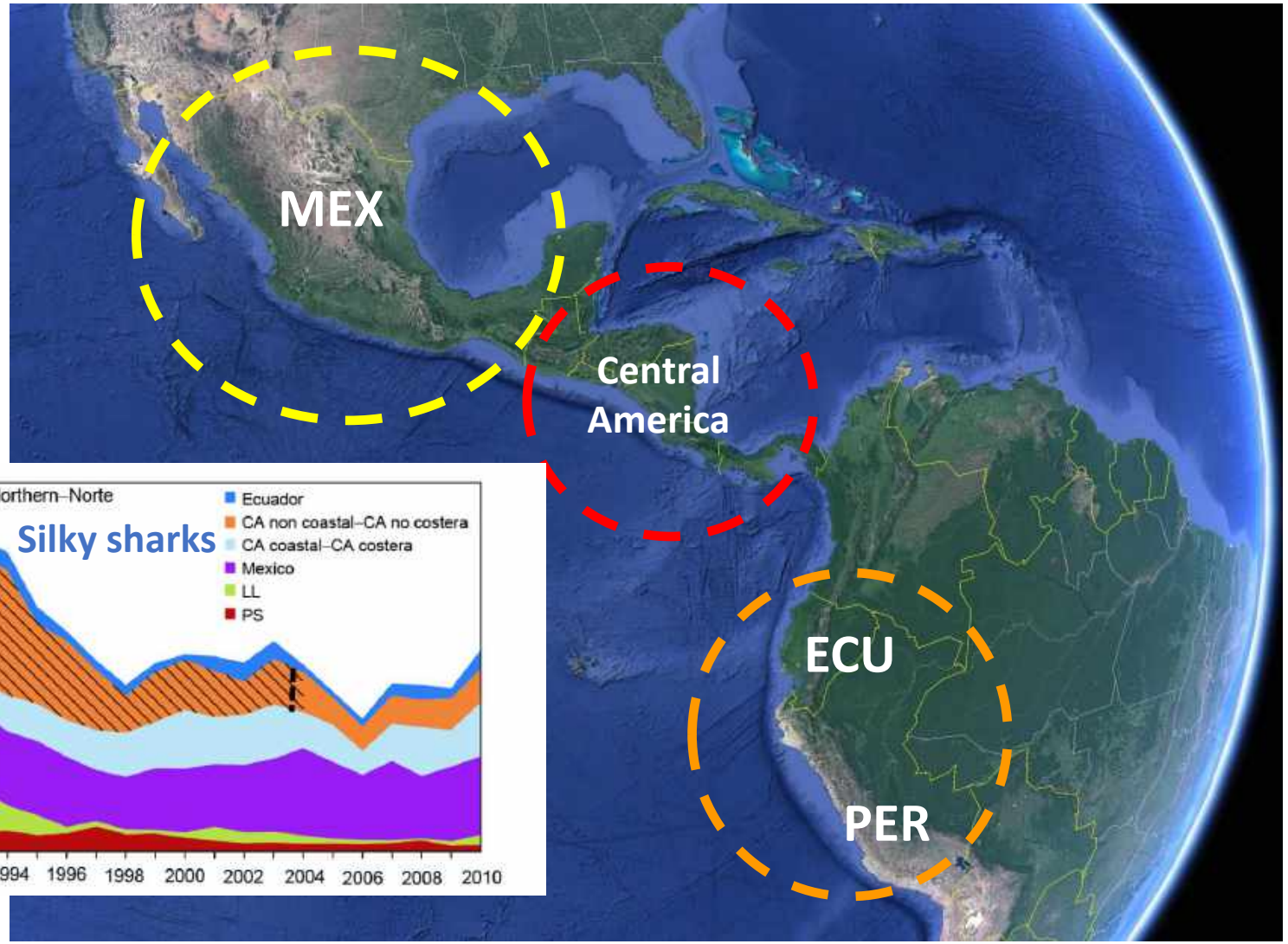
- El proceso ha demostrado que la Comisión probablemente debería considerar ahora el establecimiento de un Grupo de Trabajo *Ad Hoc* que complemente el proceso de los talleres, tal y como se establece en el plan de trabajo que fue aprobado, sin duplicarlo.
- Ofrecer a los Miembros un foro para discutir sobre los asuntos en consideración y llegar a conclusiones y eventuales recomendaciones que no podrían resultar de los talleres técnicos e informales.

- The process has demonstrated that the Commission should most probably consider now the establishment of an *Ad Hoc* Working Group which would complement the process of the workshops, as set in the approved workplan, without duplicating it
- Offer to Members a forum to discuss issues and reach conclusions and eventual recommendations that cannot be resulting from technical and informal workshops.

Plan de trabajo para los tiburones
Shark workplan

SSP ref.	Target/Project	Timeframe & status					
		2018	2019	2020	2021	2022	2023
Goal D: Investigate the use of new technologies to improve data quality							
D.2.a	Pilot study of electronic monitoring of the activities and catches of purse-seine vessels						
	LIFE HISTORY DATA						
F.2.a	Investigate the movements, behavior, and habitat utilization of silky sharks in the EPO						
	MONITORING POPULATION STATUS AND MANAGEMENT ADVICE						
Goal H: Improve and implement stock assessments, based on the best available science							
H.5	Undertake the research necessary to develop and conduct data-limited assessments for prioritized species (Assessments of silky and hammerhead sharks in the EPO)						
H.5.a	Revise trend estimation methods for purse-seine silky shark indices for the EPO						
Goal L: Evaluate the ecological impacts of tuna fisheries							
J.2.b	Identifying operational characteristics associated with mobulid bycatch in the eastern Pacific Ocean						
L.1.a	Develop habitat models for bycatch species caught in the EPO to support ecological risk assessments (ERAs)						
L.1.b	Develop a flexible spatially-explicit ERA approach for quantifying the cumulative impact of tuna fisheries on data-limited bycatch species in the EPO						
L.2.a	Develop and update Productivity-Susceptibility Analyses (PSAs) of tuna fisheries in the EPO						
L.2.b	Vulnerability assessment of shark bycatch in EPO tuna fisheries using the EASI-Fish approach						
L.2.c	Assessing the efficacy of potential management options for highly vulnerable shark species in the EPO						

Tiburones: mejoras en la recopilación de datos para las pesquerías artesanales
Sharks – data collection improvements for artisanal fisheries



2015-2017

Activities in Central America

Actividades en Centroamérica

CIAT- FAO/GEF ABNJ Project

- **Metadata (SAC-07-06b (ii))**
- **Challenge and Recomendations to improvement SAC-07-06b(iii)**
- **Capacity building**

2018-2019

Pilot study for shark sampling program (SAC-11-13)

- **Mapping shark landing sites**
- **Landing sites characterization**
- **Catch and effort survey**
- **Order-of-magnitude estimates**
- **Catch sampling designs**

2020-2021

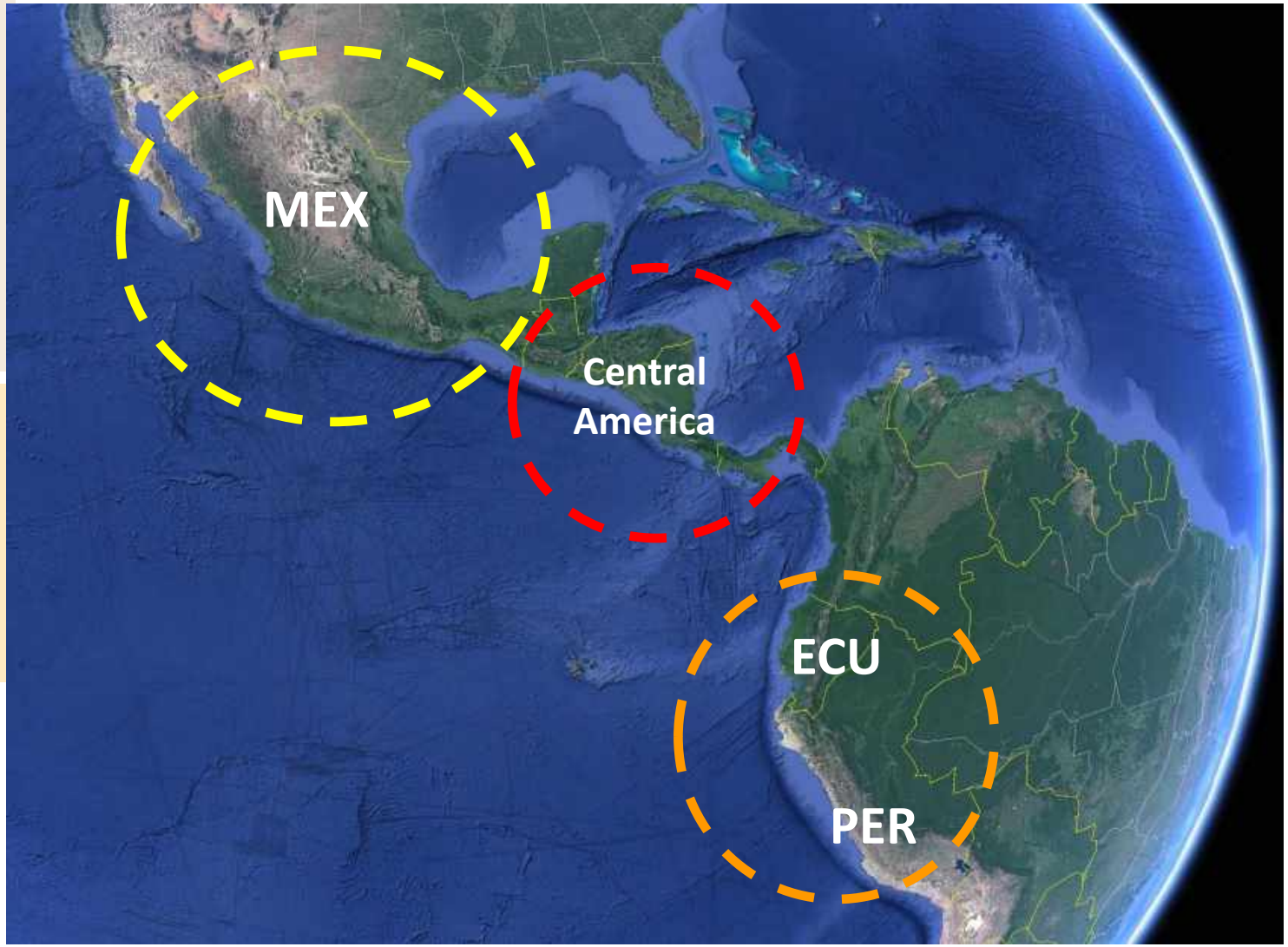
Long-term Shark sampling Program

- **Catch and Effort**
- **Catch sampling design for artesanal fleet**
- **Catch sampling design for median and advance fleet**
- **Pilot tissue sampling (Mobulidae)**

Próximos pasos
Next steps

- Mejorar la recolección de datos para las pesquerías tiburoneras en México, Ecuador y Perú (ABNJ 2)
- Mantener esfuerzos mínimos de muestreo y recolectar datos biológicos en Centroamérica para apoyar el proyecto ABNJ 2.

- Improve data collection for shark fisheries in Mexico, Ecuador and Peru (ABNJ 2)
- Maintain minimum sampling efforts and collect biological data from Central America to support the ABNJ 2.



See Proposals and C.4.c H.7.f (IATTC-100-02b)

Propuestas no financiadas por tema (IATTC-100b)
Unfunded proposals by theme (IATTC-100-02b)

1. DATA COLLECTION FOR SCIENTIFIC SUPPORT OF MANAGEMENT
C.1.b: Sampling design development for the Best Scientific Estimate of tropical tuna catch composition
C.4.c: Strengthening shark data collection for artisanal fisheries in EPO coastal States: supplementary support for the IATTC ABNJ project
2. LIFE-HISTORY STUDIES FOR SCIENTIFIC SUPPORT OF MANAGEMENT
-
3. SUSTAINABLE FISHERIES
H.7.f: Feasibility and sampling design for close-kin mark-recapture analysis of silky and hammerhead sharks in the EPO
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
I.3.b: Strengthening research for the management of dorado in the EPO
4. ECOLOGICAL IMPACTS OF FISHERIES: ASSESSMENT AND MITIGATION
-
5. INTERACTIONS AMONG THE ENVIRONMENT, THE ECOSYSTEM, AND FISHERIES
-
6. KNOWLEDGE TRANSFER AND CAPACITY BUILDING
-
7. SCIENTIFIC EXCELLENCE
T.1.a: External review of bigeye tuna assessment
T.1.b: External review of yellowfin tuna assessment


CIAT
IATTC
¿Preguntas?
Questions?
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