Comisión Interamericana del Atún Tropical
Inter-American Tropical Tuna Commission




CIAT
IATTC

Actividades de investigación – Research activities

(SAC-12-01)

12ª Reunión del Comité Científico Asesor - 10-14 de mayo de 2021 (por videoconferencia)
12th Meeting of the Scientific Advisory Committee - 10-14 May 2021 (by videoconference)

Temario - Outline

- *Informe de actividades* (SAC-12-01)
- Proyectos seleccionados (por *Tema*):
- Planes de trabajo:
  - Plan de trabajo para mejorar las evaluaciones de poblaciones de los atunes tropicales (item 6.b,c)
  - Evaluaciones de Estrategias de Ordenación (item 7.a)

- *Staff Activities Report* (SAC-12-01)
- Selected projects (by *Theme*):
- Work plans:
  - Work plan to improve stock assessments of tropical tuna (item 6.b,c)
  - Management Strategy Evaluation (MSE) (item 7.a)

Estructura del *Informe de actividades del personal* (SAC-12-01)
Structure of *Staff Activities Report* (SAC-12-01)

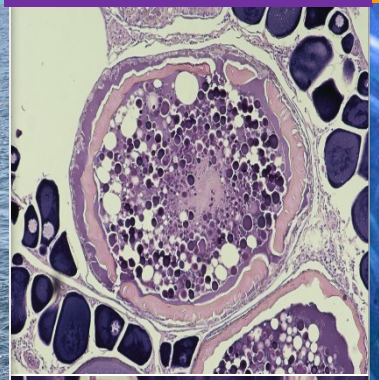
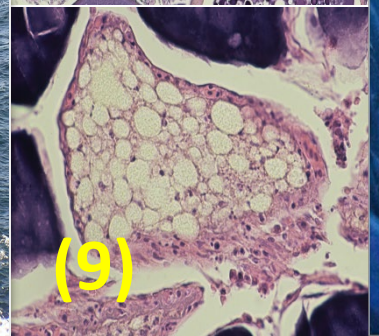
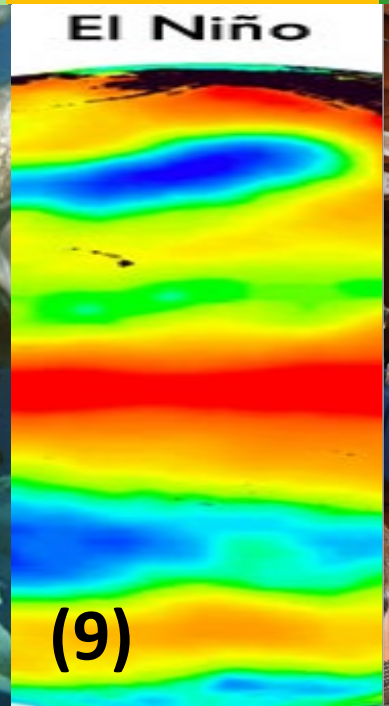
PROJECT A.3.b: Develop databases of biological and fisheries parameters to support Ecological Risk Assessment and ecosystem models	
THEME: Data Collection **GOAL:** A. Database maintenance, preservation, and access **TARGET:** A.3. Standardize and automate data submissions **EXECUTION:** Data Collection 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:

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
 (7)	  (9)	 (14)	 (12)	 (9)	 (4)	 (1)

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
C.2.b (new): Pilot study of electronic monitoring (EM) of the activities and catches of longline vessels
C.4.b: Long-term sampling program for shark catches of artisanal fisheries in Central America: Phase 1
D.1.a (new): Exploring technologies for remote identification of FADs
vessels

Estudio piloto de monitoreo electrónico (ME) en buques palangreros
Pilot study of electronic monitoring (EM) on longliners

Co-funded by the European Union

Resumen

- Proyecto empezó en febrero 2021.
- A la presente, el personal se encuentra en conversaciones y estableciendo los términos de MdE con compañías y agencias de pesquerías para incorporar embarcaciones que deseen participar en el estudio.
- Los siguientes pasos serán la recolección de registros de ME a bordo de buques palangreros, el análisis de registros de ME para producir datos de ME, y realizar comparaciones estadísticas entre los datos de ME con los del observador.
- Se estima terminar el proyecto en marzo 2023.

Summary

- Project commenced in February 2021.
- To date, staff is in conversations and establishing MoU terms with fishing companies and fishery agencies for including vessels willing to participate in the study.
- Next steps are to collect EM records aboard longline vessels, the analysis of EM records to produce EM data, and to develop statistical comparisons between EM and observer data.
- Project estimated to be completed in March 2023.

Item 8.b

Mejorar la recolección de datos de las pesquerías tiburoneras en Centroamérica
Improving data collection for Central American shark fisheries

2015 | 2016 | 2017 | 2018 | 2019 | 2020-2021

FASE 1 - PHASE 1

INTER-AMERICAN TROPICAL TUNA COMMISSION

WORKSHOP TO DEVELOP A PILOT STUDY FOR A SHARK FISHERY SAMPLING PROGRAM IN CENTRAL AMERICA[1]

La Jolla, California (USA)
25-27 September 2017

INTER-AMERICAN TROPICAL TUNA COMMISSION

SCIENTIFIC ADVISORY COMMITTEE

11TH MEETING

La Jolla, California (USA)
11-15 May 2020[1]

DOCUMENT SAC-11-13

PILOT STUDY FOR A SHARK FISHERY SAMPLING PROGRAM IN CENTRAL AMERICA

Ricardo Oliveros-Ramos, Cleridy E. Lennert-Cody, Salvador Siu, Sonia Salaverría, Mark. N. Maunder, Alexandre Aires-da-Silva, José Carvajal Rodríguez[2]

FASE 2 - PHASE 2

Estudio piloto
Pilot study

OSPESCA
Organización del Sector Pesquero y Acuícola del Istmo Centroamericano

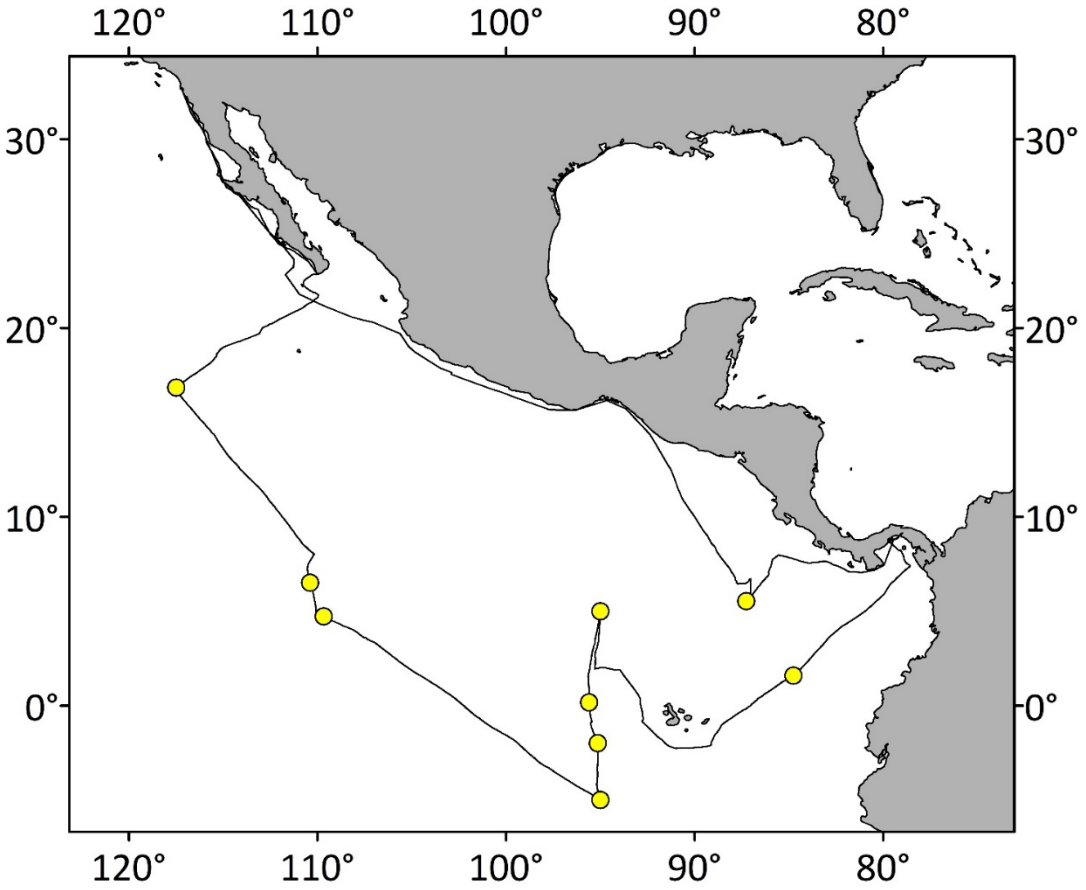
Long-term sampling program
Programa de muestreo a largo plazo
(Project C.4.b)

Estudios del ciclo vital en apoyo científico de la ordenación
Data collection for scientific support of management

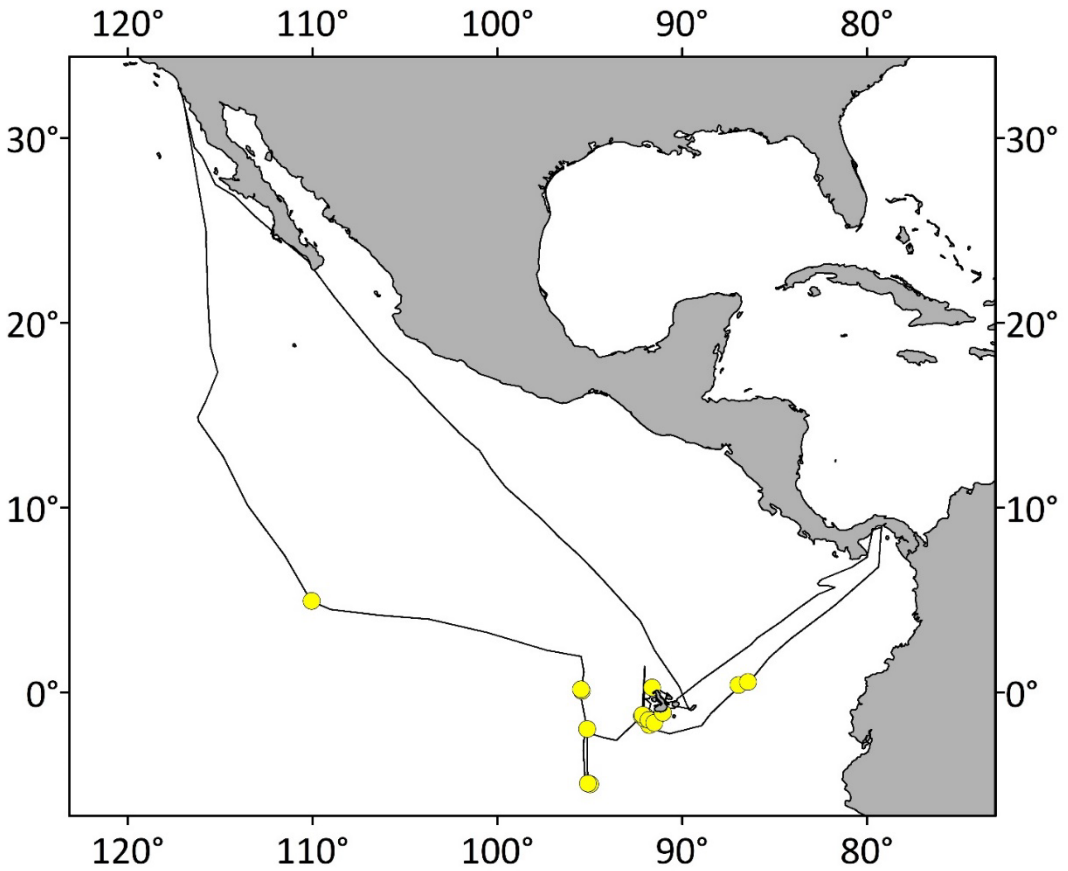
2. LIFE-HISTORY STUDIES FOR SCIENTIFIC SUPPORT OF MANAGEMENT
E.2.a: Investigate spatiotemporal variability in the age, growth, maturity, and fecundity of yellowfin tuna in the EPO
E.3.a: Investigate geographic variation in the movements, behavior, and habitat utilization of yellowfin tuna in the EPO
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
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

6 March to 30 April 2019



1 February to 30 April 2020



The yellow dots are where tagging events occurred

Co-funded by European Union

CIAT IATTC

IATTC Regional Tuna Tagging Program - Results

TABLE 1. Releases and returns of plastic dart tags, by year of release and days at liberty. Percent of total tag returns which were validated by tag recovery specialists as high confidence are provided. Fish were tagged under the IATTC Regional Tuna Tagging Program (RTTP) in the EPO (1999-2020).

TABLA 1. Liberaciones y devoluciones de marcas de dardo plásticas por año de liberación y días en libertad. Se proporciona el porcentaje del total de devoluciones de marcas que fueron validadas por especialistas en recuperación de marcas como de alta confianza. Los peces fueron marcados bajo el Programa Regional de Marcado de Atunes (PRMA) de la CIAT en el OPO (1999-2020).

	SKJ	Returned						
Year	**Released**	**<30**	**30-89**	**90-179**	**180 – 365**	**>365**	**Total (%)**	**Percent High Confidence (*n*)**
2019	177	6	19	5	2	1	35 (19.8)	60.0 (21)
2020	5854	730	466	210	71		1,569 (26.8)	18.3 (287)
All	6031	736	485	215	73	1	1,604 (26.6)	19.2 (308)

Co-funded by European Union

IATTC Regional Tuna Tagging Program - Results

TABLE 2. Releases and returns of archival tags, by year of release and days at liberty. Fish were tagged under the IATTC Regional Tuna Tagging Program (RTTP) in the EPO (1999-2020).

TABLA 2. Liberaciones y devoluciones de marcas archivadoras por año de liberación y días en libertad. Los peces fueron marcados bajo el Programa Regional de Marcado de Atunes (PRMA) de la CIAT en el OPO (1999-2020).

		Returned					
Year	SKJ Released	<30	30-89	90-179	180 – 365	>365	Total (%)
2019	43	3	0	0	2	0	5 (11.6)
2020	185	10	13	9	3	NA	35 (18.9)
All	228	13	13	9	5	0	40 (17.5)

Co-funded by European Union

IATTC Regional Tuna Tagging Program - Results

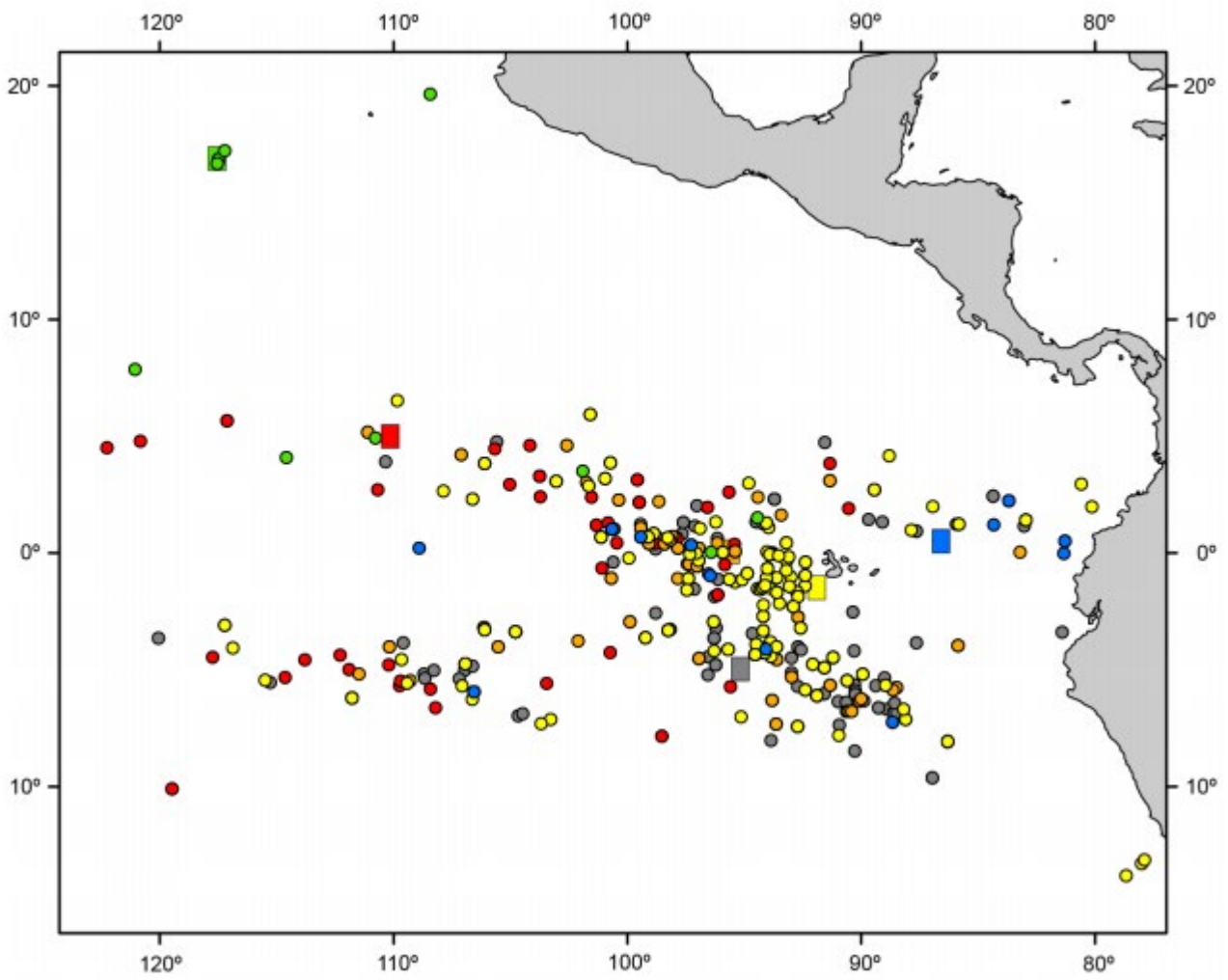


FIGURE 4. Skipjack tuna linear displacements (n = 700) for fish at liberty greater than 30 d shown as dots, color coded for six distinct release locations, shown as squares. Fish were tagged under the IATTC Regional Tuna Tagging Program (RTTP) in the EPO (1999-2020).

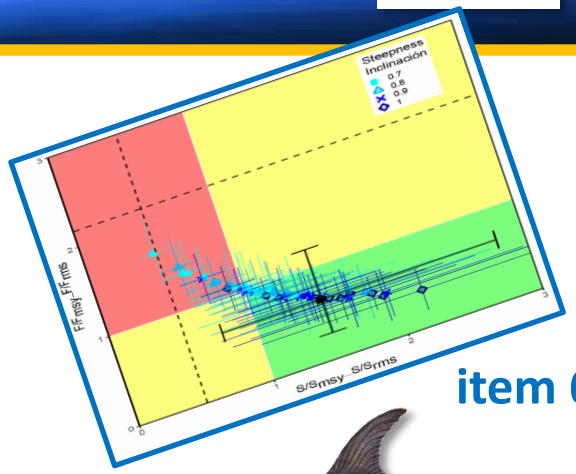
FIGURA 4. Los desplazamientos lineales del atún barrilete (n = 700) para peces en libertad mayor a 30 d se muestran como puntos, codificados por colores para seis lugares distintos de liberación, se muestran como cuadrados. Los peces fueron marcados bajo el Programa Regional de Marcado de Atunes (PRMA)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

item 6.c: SKJ assessment

Co-funded by European Union

Pesquerías sostenibles
Sustainable fisheries

3. SUSTAINABLE FISHERIES
H.1.a: Improve the bigeye tuna stock assessment
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.e: Construct indices of abundance and composition data for longline fleets
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.a: Pacific-wide exploratory assessment for bigeye tuna
H.7.b: South Pacific swordfish assessment
H.7.c: South Pacific albacore assessment
I.1.a: Conduct a Management Strategy Evaluation (MSE) for tropical tunas in the EPO
J.3.a: Developing alternative buoy-derived tuna biomass indexes
K.1.a: POSEIDON project



item 6b

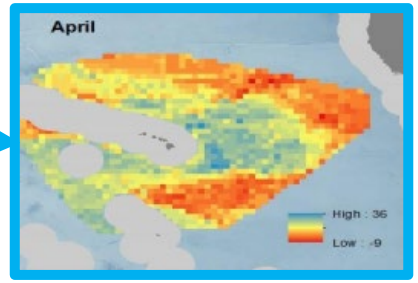
item 6e

item 7a

FAD-05 INF-E

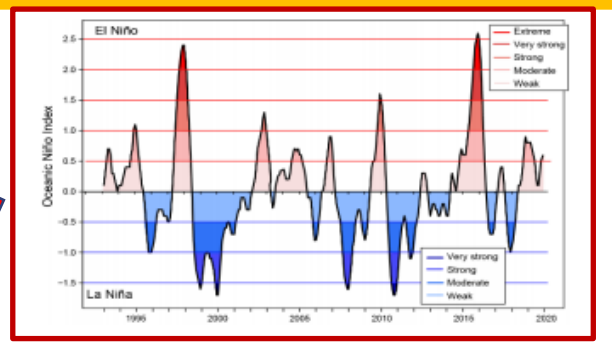
Impactos ecológicos de la pesca: evaluación y mitigación
Ecological impacts of fisheries: assessment and mitigation

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.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
M.1.d (new): Developing and testing bycatch release devices in tuna purse seiners
M.1.d (new): Developing and testing bycatch release devices in tuna purse seiners
M.2.c (new): Manta and devil ray post-release survival, movement ecology, and genetic population structure
M.3.b (new): 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 (new): Definition of guidelines to reduce the impact of lost and abandoned FADs on marine turtles

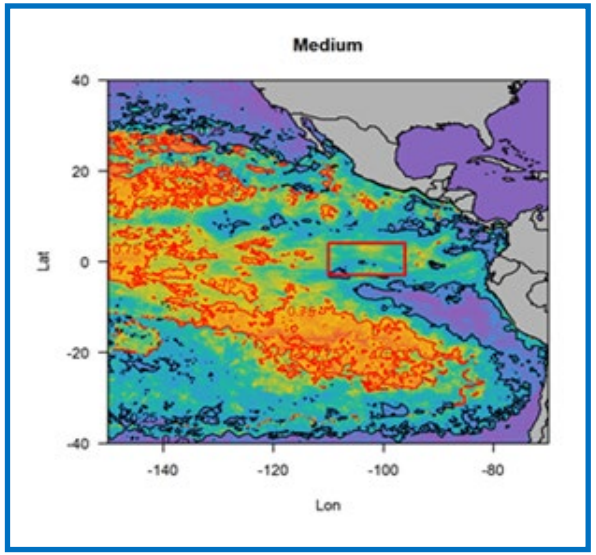


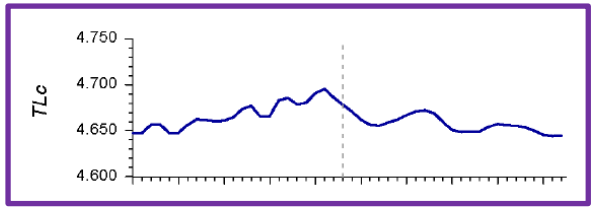
Interacciones entre el medio ambiente, el ecosistema, y la pesca
Interactions among the environment, the ecosystem and fisheries

5. INTERACTIONS AMONG THE ENVIRONMENT, THE ECOSYSTEM, AND FISHERIES
N.1.a: Analyze EPO bycatch data to assess the influence of environmental drivers on catches and vulnerability
N.1.b: Investigate the effects of wind-induced microturbulence on yellowfin larval survival
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.1.b: Quantify spatial and ontogenetic variation in the feeding ecology of skipjack tuna in the eastern Pacific Ocean
O.1.c: A review of methods to determine prey consumption rates, gastric evacuation and daily ration of pelagic fishes: a precursor to experimental estimation for key predators in the EPO
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



item 10a





item 10b

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

item 12a

Proyectos no financiados (SAC-12-01 Add.)
Unfunded projects (SAC-12-01 Add.)

1. DATA COLLECTION 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
3. SUSTAINABLE FISHERIES
H.1.d (ext): Improve indices of abundance and length composition based on longline data
H.1.f Workshop on improving spatio-temporal methods for tuna CPUE and length composition standardization
H.1.g: Workshop on improving metrics and their scoring for the IATTC risk analysis
H.7.e: Feasibility and sampling design for close-kin mark-recapture analysis of stocks in the EPO
4. ECOLOGICAL IMPACTS OF FISHERIES: ASSESSMENT AND MITIGATION
-
5. INTERACTIONS AMONG THE ENVIRONMENT, THE ECOSYSTEM, AND FISHERIES
O.1.a: Develop a fishery-dependent ecological sampling program for EPO tuna fisheries
6. KNOWLEDGE TRANSFER AND CAPACITY BUILDING
-
T.1.a: External review of bigeye tuna assessment
T.1.b: External review of yellowfin tuna assessment
T.1.c: External review of skipjack tagging analysis
X.1.c: Workshop on good practices in fisheries stock assessment

item 11a

item 11a


CIAT
IATTC
¿Preguntas?
Questions?
© ISSF (2013)
Photo: Jeff Muir

Recommendation CCA 2.a: Dorado
SAC-11 recommendation 2.a: Dorado

2.	**DORADO**	
a.	Que el personal de la CIAT continúe trabajando con los CPC en investigaciones sobre el estado poblacional del dorado (*Coryphaena hippurus*) en el OPO.	Está previsto un estudio de marcado en colaboración con la Asociación de Pesca Sostenible (SFP, por sus siglas en inglés) y COREMAHI para mejorar el conocimiento de la estructura de la población del dorado en el OPO (ver propuesta no financiada).

2.	**DORADO**	
a.	IATTC staff continue working with CPCs on research on the stock status of dorado (*Coryphaena hippurus*) in the EPO.	A collaborative tagging study is planned with the Sustainable Fisheries Partnership (SFP) and COREMAHI to improve knowledge of the stock structure of dorado in the EPO (see unfunded proposal).

Estudio piloto de monitoreo electrónico (ME) en buques cerqueros
Pilot study of electronic monitoring (EM) on purse-seiners

Co-funded by the European Union

Resumen

- Proyecto concluyó en marzo 2021.
- Registros ME fueron recolectados por cada buque, durante un año.
- Se generaron datos ME de 22 viajes (11 en dos buques clase 2-5, y 11 en dos buques clase 6).
- Datos ME de varias actividades pesqueras fueron cuantitativamente comparados con los del observador humano.
- Análisis de ME demostraron viabilidad de instalar equipo ME y generar datos ME en buques clase <= 6.
- Comparando datos de ME del proyecto con el de los observadores, ME estaría listo para colectar el 83.6% de los datos. El 16.4% necesita trabajo extra, o no es posible.
- Resultados del análisis ME fueron aplicados a los estándares ME de recolección de datos del doc. SAC-11-10 (Apéndice 2).

Summary

- Project was terminated in March 2021.
- EM records were collected for each vessel, for one year.
- EM data has been generated for 22 fishing trips (11 on two Class 2-5 vessels and 11 on two Class 6 vessels).
- EM data from different fishing activities were quantitatively compared with those collected by human observer.
- EM analysis validated the feasibility of installing ME equipment and generating ME data on class <=6 vessels.
- When comparing project EM data to observers, EM seems to be ready to collect 83.6% of the data. 16.4% would require extra work or is not possible
- Results of EM analysis were applied to the EM data collection standards of doc SAC-11-10 (Appendix 2).

Desarrollar y probar plantados no enmallantes y biodegradables
Develop and test non-entangling and biodegradable FADs

Condición del NED según el tiempo en el mar
Condición promedio de los materiales de componentes del NED

Condition of NED by time at sea
Average condition of materials by NED component

			Componente flotante / Floating component				Componente sumergido / Submerged component				
	Prototipo / Prototype	N	Bambú / Bamboo	Lona / Canvas	Balsa	Soga de amarre / Tightening rope	Canvas	Soga principal / Main rope	Soga de amarre / Tightening rope	Bambú / Bamboo	Bambú (lastre) / Bamboo (ballast)
Tiempo de remojo (días) / Soak time (days)											
1-30	1	No data	No data	No data	No data	No data	NA	No data	No data	No data	No data
31-60	1	2	1.5	2	1.5	2	NA	3.5	2	1	0
>60	1	5	2.6	2.8	1.8	1.2	NA	3.4	2.8	1	2.6
1-30	2	33	1.4	1.7	1.5	1.6	1.5	1.6	1.6	1.3	1.3
31-60	2	37	2	2.2	2.1	2.1	2.5	2.5	2.4	2.3	2.3
>60	2	8	2.4	3.9	2.4	2.8	3.3	2.8	2.8	3.3	3.5
1-30	3	1	3	3	2	3	NA	NA	NA	NA	NA
31-60	3	4	2.2	6	2.8	3	6	5	6	6	6
>60	3	1	NA	NA	NA	NA	NA	NA	NA	NA	NA

Códigos de condición
Condition codes

Código / Code	Descripción / Description
0	No observado / No observed
1	Excelente / Excellent
2	Muy Bueno / Very good
3	Bueno / Good
4	Regular / Fair
5	Malo / Bad
6	Muy malo / Very bad

Co-funded by the European Union