Comisión Interamericana del Atún Tropical
Inter-American Tropical Tuna Commission

Considerations for a shark data collection program in the IATTC

Salvador Siu, Dan Ovando, Jon Lopez and Alexandre Aires da-Silva

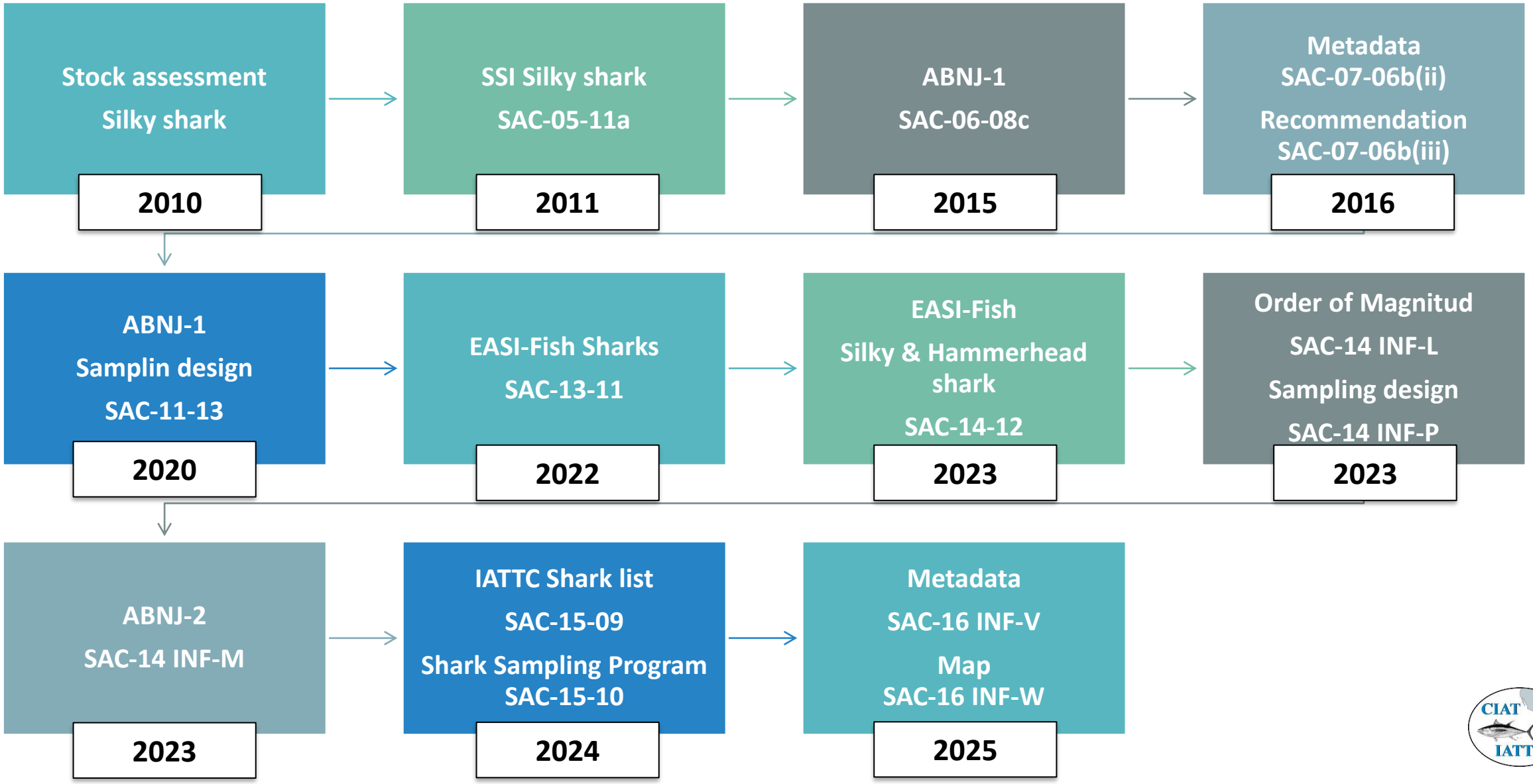
3a Reunión del Grupo de Trabajo sobre Ecosistema y Captura Incidental - 26-27 de mayo de 2025
3rd Meeting of the Permanent Working Group on Ecosystem and Bycatch, 26-27 May 2025

Contenido -Outline

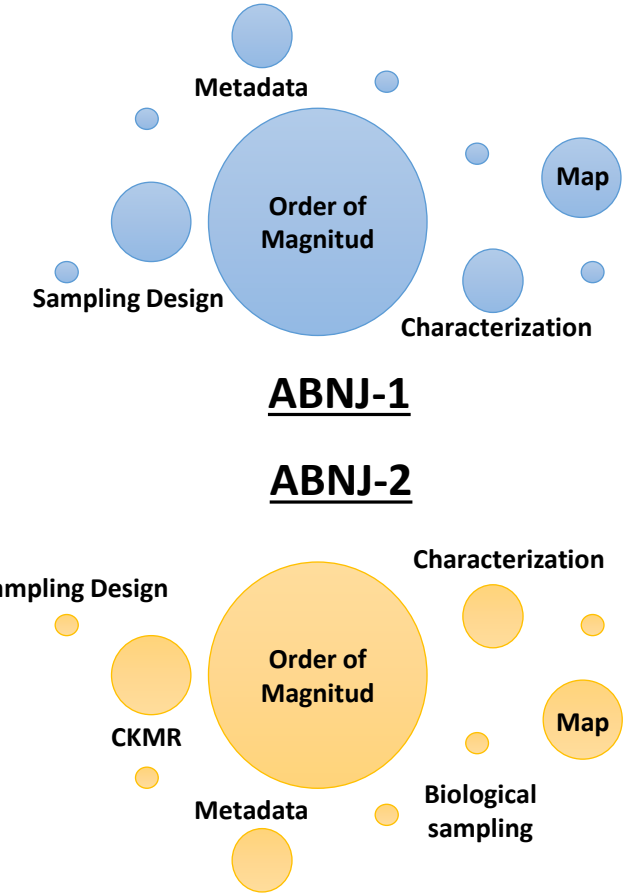
- Antecedentes
  - Common Oceans Tuna ABNJ-1 y ABNJ-2
- Lecciones aprendidas
  - Common Oceans Tuna ABNJ-1 y ABNJ-2
- Resumen
- Objetivos a largo plazo
- Presupuesto

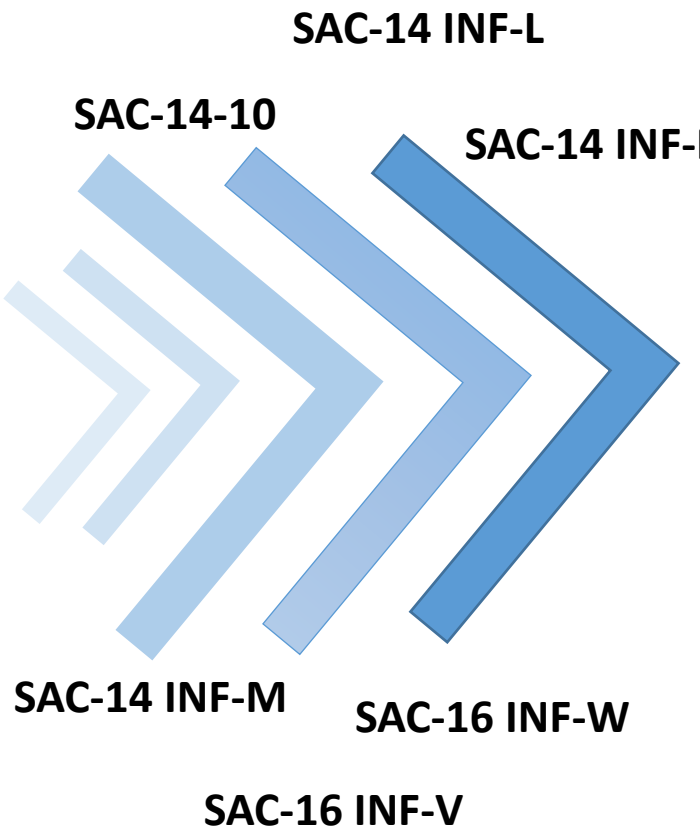
- Background
  - Common Oceans Tuna ABNJ-1, ABNJ-2
- Lessons Learned
  - Common Oceans Tuna ABNJ-1, ABNJ-2
- Summary
- Long-term objectives
- Budget

Antecedentes -Background



Antecedentes -Background

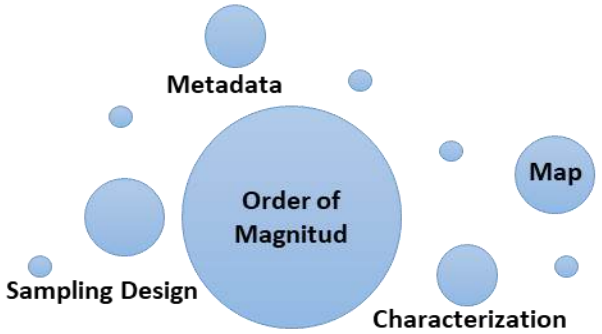




SHARK DATA COLLECTION PROGRAM, INCLUDING SMALL-SCALE COASTAL FISHERIES (C-24-05 para 14)

Lecciones aprendidas ABNJ-1 -Lessons learned ABNJ-1

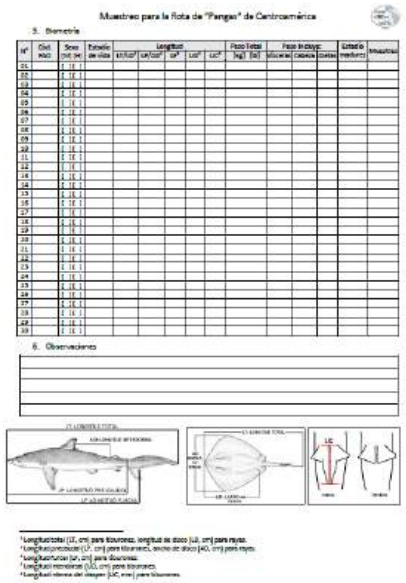
Sampling design



ABNJ-1

SHARK DATA COLLECTION PROGRAM, SMALL-SCALE COASTAL FISHERIES IN CENTRAL AMERICA (C.4.d, US$ 424,800)


Muestreo para la flota de "Pangas" de Centroamérica
Formulario A: Muestreo de Captura y Esfuerzo


Muestreo para la flota de "Pangas" de Centroamérica

ABNJ-1 Forms

- Three forms:
  - Form A, CPUE and length and sex data.
  - Form B, Embryos data
  - Form C, CPUE of neonate fisheries.
- Goal
  - Order of magnitude
  - Stock assessment (>5years of sampling data)
    - Catch and efforth data (longline, gillnet and hand line)
  - Biological samples (lengths, sex, weight, tissue)

Diseño del muestreo Flota Mediana y Avanzada – Sampling design Mediana and Avanzada fleet

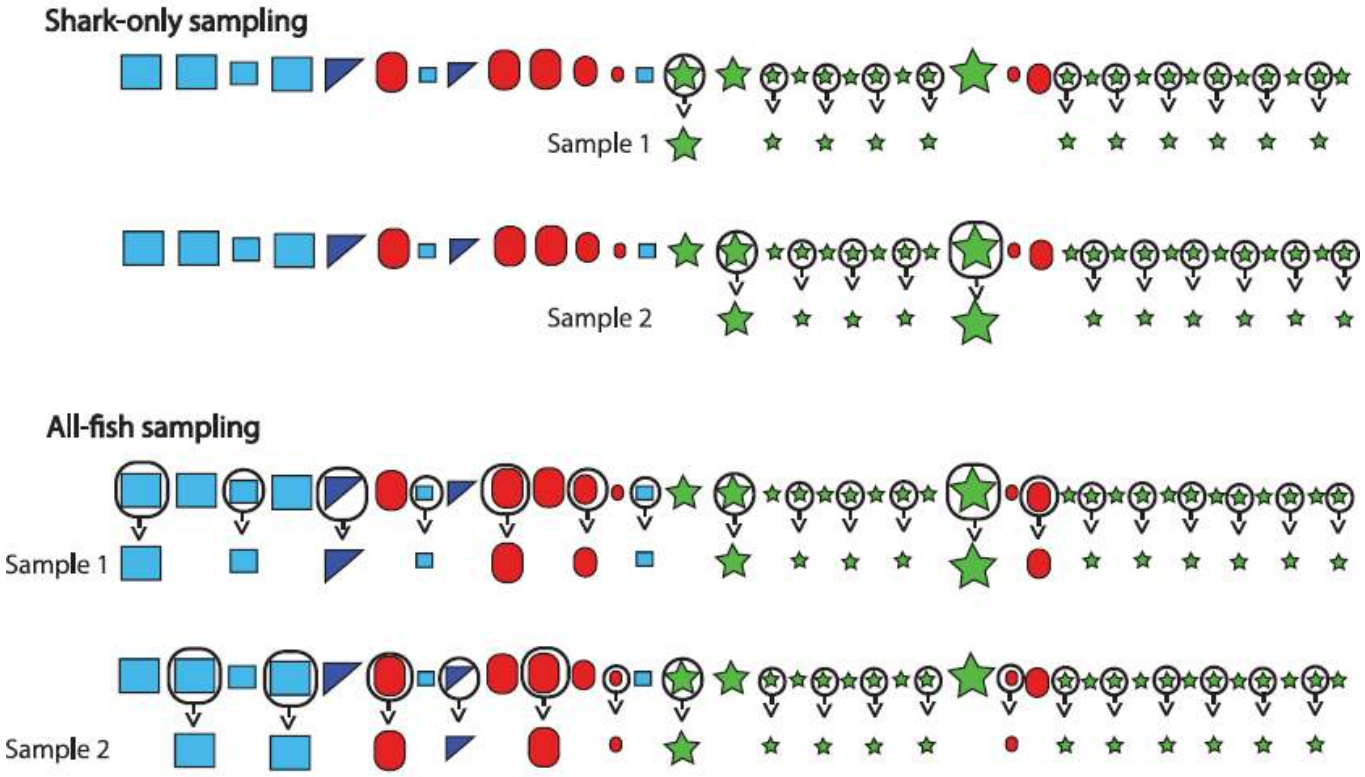
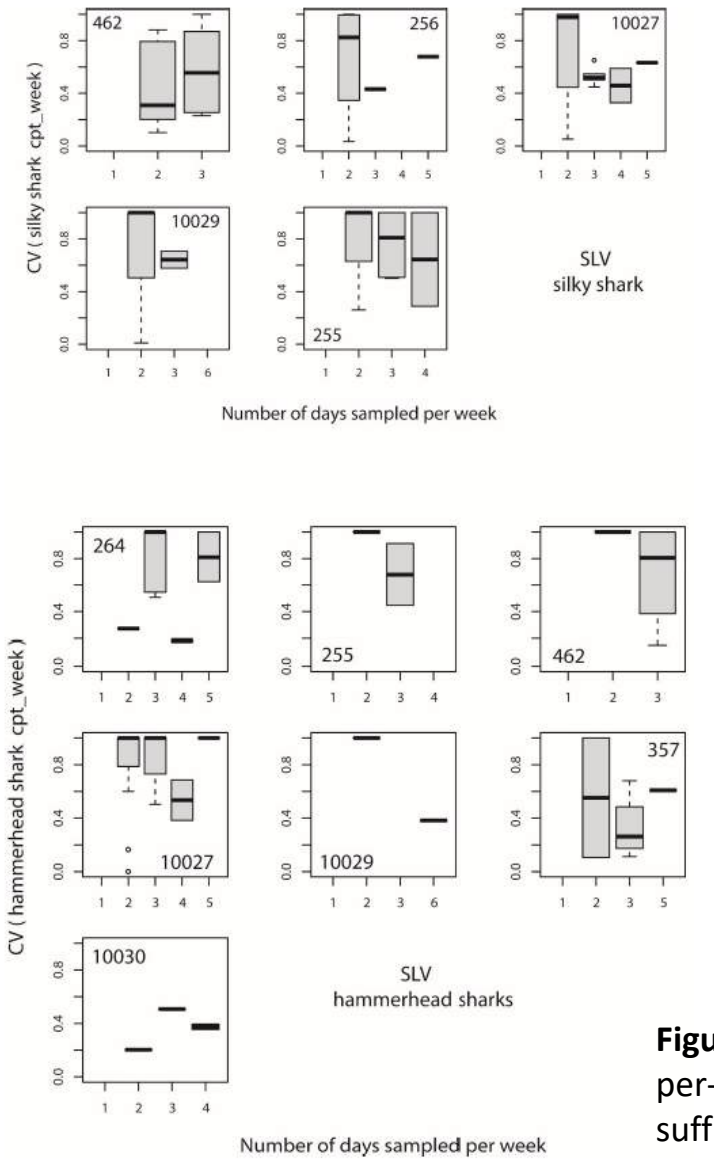


Fig. 1. Diagram illustrating the shark-only and the all-fish sampling scenarios for *k* = 2. Sharks are represented by green stars, and the three non-shark species groups by light blue rectangles, dark blue triangles and red ovals. The size of each symbol represents the weight category (small; medium; large).

- This method describes how to sample sharks using the order of the landing (one-by-one).
- It also includes how and how many sharks to sample when landing other large pelagic species.

(Lennert-Cody *et al.*, 2019)

Diseño del muestreo Flota pequeña escala (Pangas)
-Sampling design small-scale fleet (Pangas)



- Sampling design using the main shark landing sites for the small-scale “panga” fleet.
- Recommendations on how many days to sample, according to the fishing dynamics of each site.

(SAC-14 INF-P)

Figure 6. Box-and-whisker plots of the coefficient of variation for the weekly mean silky shark catch-per-trip (CPT) (top) and hammerhead CPT (bottom), at the sites in that are shown in Figure 4 (with sufficient data), *versus* the number of days sampled during the week, by country.

Lecciones aprendidas -Lessons learned

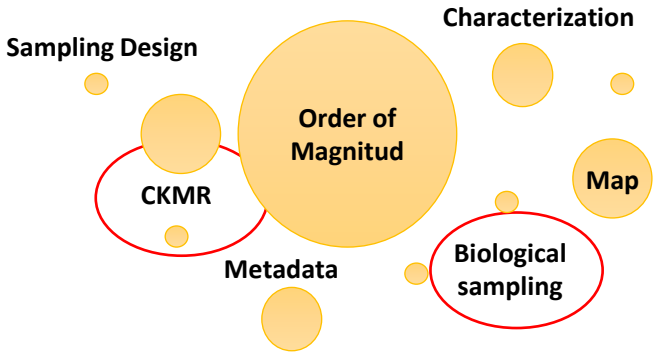
- La falta de índices de abundancia e historiales de captura consistentes y representativos han limitado la capacidad de la CIAT de evaluar las poblaciones de tiburones
- SAC-05 INF-F, SAC-14 INF-L demostraron que varias flotas pesqueras costeras no monitoreadas tradicionalmente por la CIAT contribuyen sustancialmente a las capturas totales de tiburones
- Están disponibles recomendaciones (y un presupuesto) del personal para el seguimiento de las pesquerías de pequeña escala en Centro America

- Lack of consistent and representative abundance indices and catch histories have limited IATTC ability to assess shark populations
- SAC-05 INF-F, SAC-14 INF-L demonstrated that various coastal fishing fleets not traditionally monitored by IATTC contribute substantially to total shark catches
- Recommendations (and a budget) for monitoring of small-scale fleets in Central America are available.

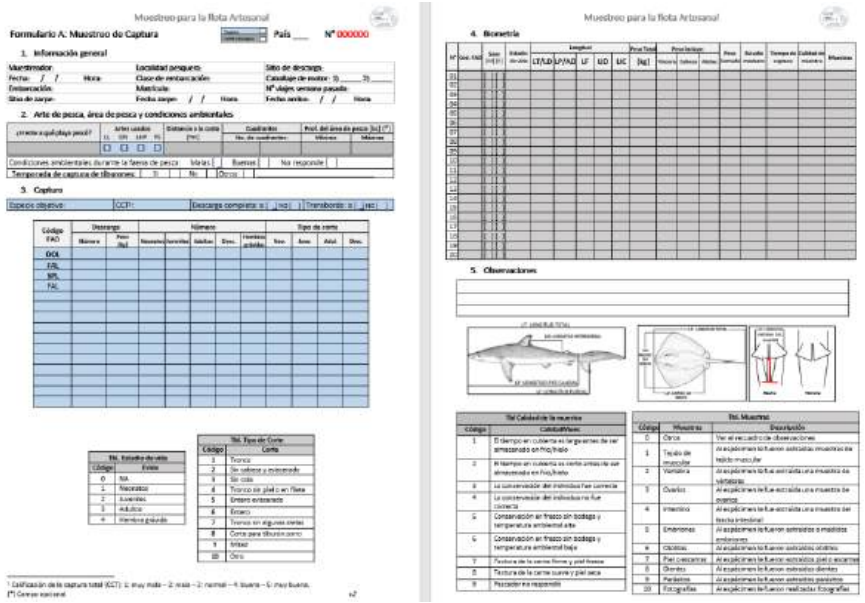
Lecciones aprendidas ABNJ-2 –Lessons learned ABNJ-2

Sampling design

ABNJ-2



PERMANENT SHARK SAMPLING PROGRAM IN ARTISANAL FLEET
Cost USD $ ¿?



ABNJ-2 Forms

- Four forms:
  - Form 0, longline and gillnet characteristics
  - Form A, Catch and biolgical data for CKMR.
  - Form B, Embryos data
  - Form C, CPUE of neonates fisheries.
- Goal
  - Order of magnitude
  - CKMR analysis
  - Biological data samples (lengths, sex, weight, tissue)
  - Gear characteristics

Resumen -Summary

- FAO-Océanos Comunes FMAM "ABNJ-1"
  - Llevado a cabo un programa de muestreo de tiburones en América Central (2015-2021)
  - Finalizado en 2021. Fondos necesarios.
  - Permitió estimaciones iniciales de las capturas artesanales de tiburón sedoso y tiburón martillo en la región (SAC-14 INF-L)
- FAO-Océanos Comunes FMAM "ABNJ-2"
  - Ampliar los conceptos de ABNJ-1 a México, Ecuador, Perú
  - Se ha completado la cartografía inicial de los sitios de descarga de tiburones y elegidos aquellos sitios principales según datos históricos para el muestreo.
- El objetivo colectivo es proporcionar una plataforma estandarizada de recolección de datos para el seguimiento de los tiburones en las pesquerías costeras del OPO

- FAO-Common Oceans GEF “ABNJ-1”
  - Conducted shark sampling program in Central America (2015-2021)
  - Discontinued in 2021. Funds needed.
  - Enabled initial estimates of artisanal silky and hammerhead shark catches in region (SAC-14 INF-L)
- FAO-Common Oceans GEF “ABNJ-2”
  - Expand concepts of ABNJ-1 to Mexico, Ecuador, Peru
  - Initial mapping of shark landing sites has been completed and the main sites chosen for sampling based on historical data.
- Collective goal is to provide a standardized data collection program for monitoring sharks in coastal EPO fisheries

Objetivos a Largo plazo – Long-Term Goals

- ABNJ-1 y ABNJ-2 proporcionan una imagen de la escala y dinámica actuales de las capturas de tiburones por las flotas pesqueras costeras del OPO
- ABNJ-2 proporciona muestras iniciales de tejido para CKMR
- Los formularios y métodos pueden entregarse a las CPC para un seguimiento continuo coherente en todo el OPO
- Indicadores y muestras de tejidos de las pesquerías costeras integrados en la evaluación continua de las poblaciones de tiburones del OPO

- ABNJ-1 and ABNJ-2 provide picture of current scale and dynamics of shark catches by coastal EPO fishing fleets
- ABNJ-2 provides initial tissue samples for Close-Kin Mark-Recapture
- Forms and methods can be handed to CPCs for consistent EPO-wide ongoing monitoring
- Indicators and tissue samples from coastal fisheries integrated into ongoing assessment of EPO shark populations

CIAT
IATTC

Presupuesto para las Recomendaciones -Budget for Recomendations

Country	Order of Magnitude & CKMR		
	Main landing site only	Samplign technician	Total cost (USD$)
Costa Rica	2	4	$ 79,200
El Salvador	2	4	$ 79,200
Guatemala	2	4	$ 79,200
Nicaragua	2	4	$ 79,200
Panama	2	4	$ 79,200
Data editor		2	$ 28,800
Total	**10**	**22**	**$ 424,800**

RECOMMENDATIONS:

Considering the recent improvements in shark fishery data collection in Central America (SAC-14 INF-L, SAC-15-10), the upcoming opportunity to expand these data collection improvement efforts into other coastal states (SAC-14 INF-M, SAC-15-10), as well as the potential benefits of Close-Kin Mark-Recapture for silky shark assessment:

1. Fund the collection and analysis of representative silky shark tissue samples throughout the EPO using CKMR methodologies (see unfunded proposal H.5.b in Document SAC-16 INF-E.b)
2. Fund sampling efforts from which to reliably estimate total EPO catches of silky sharks across industrial and small-scale coastal fleets considered to be under the purview of the IATTC, starting with Central America for which proposed sampling designs and a budget are already available (see SAC-14 INF-P and unfunded project in SAC-16 INF-E.b).
3. Fund the development a conceptual model for hammerhead sharks, similar to the one described in Talwar et al. (2025) for silky shark, which will serve as the foundation for a CKMR assessment for hammerhead sharks (see unfunded project F.2.b in SAC-16 INF-E.b).

RECOMMENDATIONS:

1. Establish, or strengthen, data collection programs for small-scale coastal fisheries in EPO coastal States to obtain reliable catch and size composition data and biological information for assessments of stock status and vulnerability.
2. Adopt, on an interim basis, the data collection forms and sampling systems developed under the Common Oceans ABNJ-1 (Central America) and ABNJ-2 (Mexico, Ecuador, Peru) shark data collection projects developed by the IATTC staff for small-scale coastal fisheries. These forms, along with the associated sampling designs, may be revised in 2026 and 2027 following the ABNJ-2 project and related feasibility studies (e.g. CKMR, biological sampling).

Preguntas -Questions

Beneficios y problemas de cada recomendación
Benefits and Issues for each recommendation

- **Beneficios**
  - ABNJ-1: los formularios y el sistema de base de datos están probados y funcionan para los objetivos previstos.
  - ABNJ-2: el coste de implantación podría ser inferior al ABNJ-1
- **Problemas**
  - ABNJ-1: El coste de implementar un programa permanente de muestreo de tiburones superó el presupuesto de cada país.
  - ABNJ-2: El proyecto está en curso.
  - ABNJ-2: Los procedimientos CITES para exportar las muestras de tejidos son lentos y, en algunos casos, pueden llevar más tiempo del previsto.

- **Benefits**
  - ABNJ-1: Forms and Database system are proven and working for the goals expected.
  - ABNJ-2: the cost to implement could be lower than ABNJ-1
- **Issues**
  - ABNJ-1: The cost to implement a permanent shark sampling program exceeded the budget of each country.
  - ABNJ-2: The Project is ongoing.
  - ABNJ-2: The CITES procedures to export the tissue samples are slow and in some cases can take more time that we expected.

¿Qué opciones existen? - What are the options?

ABNJ-1 Forms and sample design → **US$400K**

Possible start: **2026**

ABNJ-2 Forms and sampling design on going → **US$???K**

Possible start: **2027**