



ITUNNES

IMPROVING TROPICAL **TuNa**
BIOLOGICAL **k**NOWLEDGE
FOR **eNd-usErS**



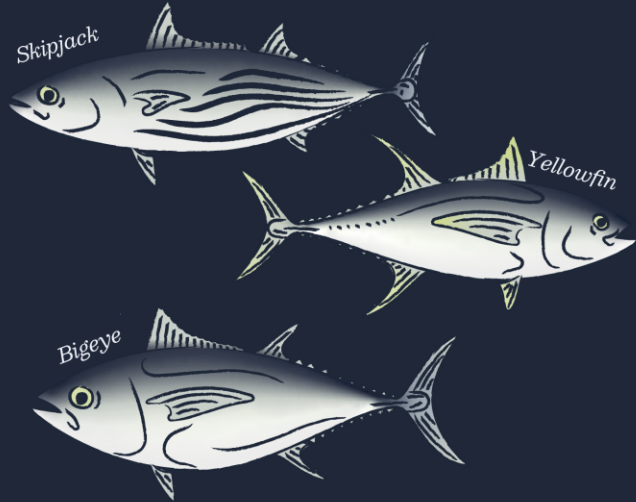
Co-funded by
the European Union

ITUNNES

Improving tropical TuNa biological knowledge for eNd-usErS

LDAC (Brussels), 14 Oct 2026

How to improve scientific advice for better tuna management?



Data are collected to study the biology and ecology of tunas.



Scientists analyze this data and catch information declared by fishers, to understand how many tuna there are, where they live, and how healthy the populations are.



More robust scientific advice supports better management decisions.



Co-funded by the European Union



Presentation



Consortium

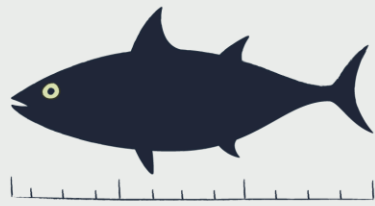


Partners

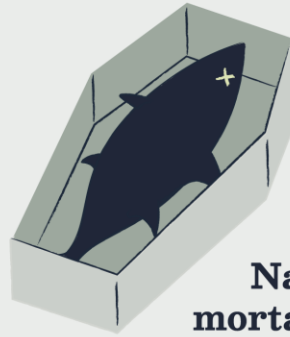
Which data do scientists collect?

Scientists need two types of data, which in conjunction with catch data from fishers, are used to evaluate stocks health.

Tuna biology



Age and growth

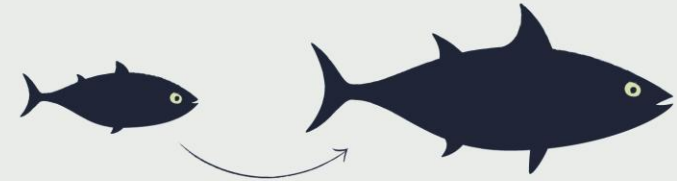


Natural mortality rate



Reproduction
(sexual maturity)

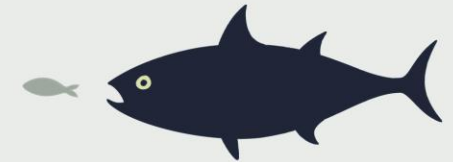
Tuna ecology



Life cycle
(When and where tunas migrate, reach maturity, spawn)



Connectivity
(Exchange between populations)

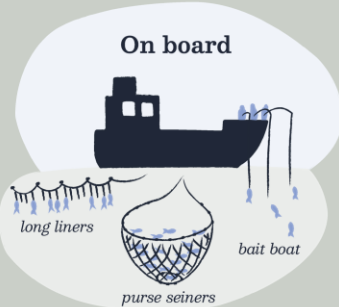


Habitat
(Influence of the environment on tunas' behaviors)

What is the sampling methodology?

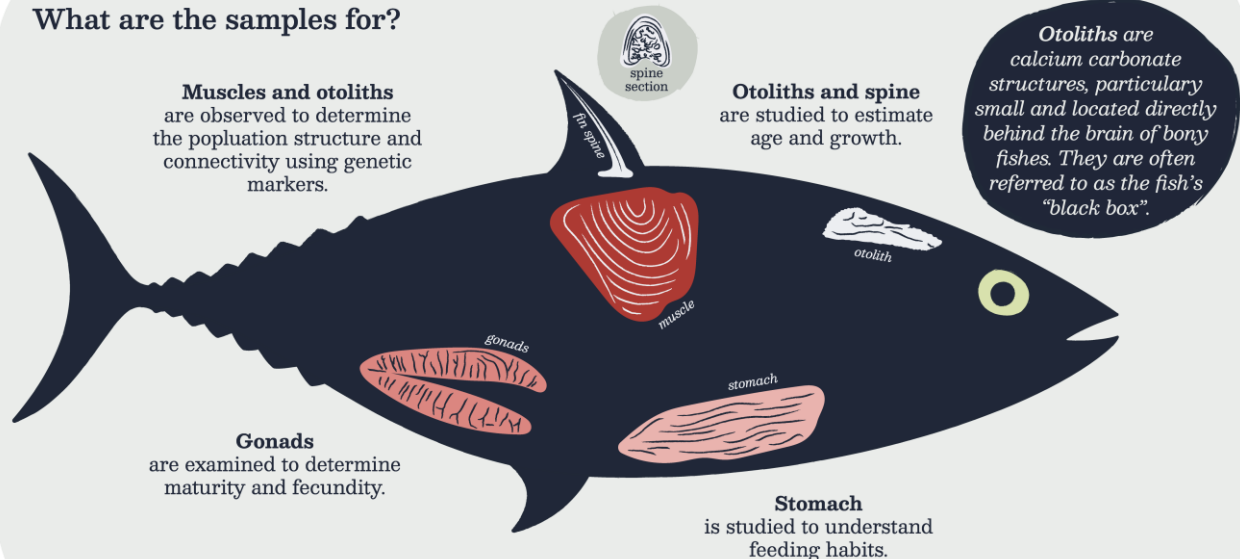
Where and how do we collect the samples?

Collecting biological data on tuna is challenging and expensive, especially in certain fisheries. Our aim is to fill these data gaps by **sampling across all fisheries**, helping **improve stock assessments** and **support sustainable management**.



ITUNNES also uses **archived samples** from previous projects to increase availability and reduce duplication.

What are the samples for?



Science-industry collaboration



ITUNNES plans to collect 1300 tuna samples



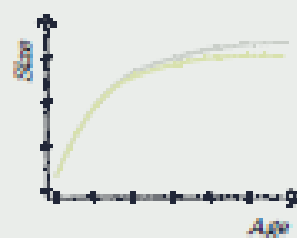
82% on purse seiners



18% on longliners, baitboat and other boats

What are the results?

Tuna biology



Eastern size-at-age growth curve derived from 126 fish (27-169 cm SFL)



Maximum observed age is 9 years

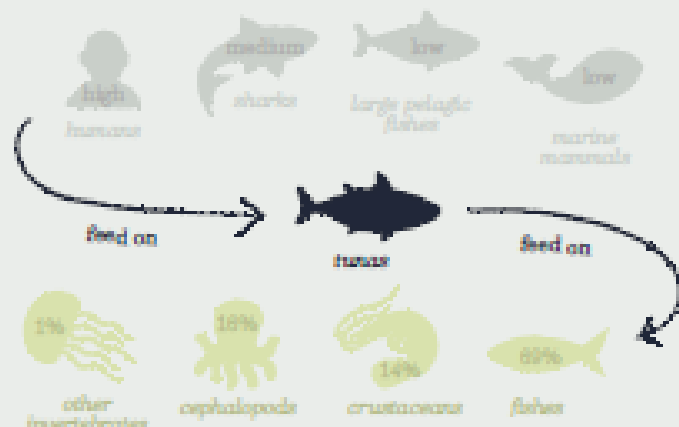


Female sexual maturity is reached at 118,8 cm SFL

Tuna ecology



Transatlantic mixing with Eastern Atlantic nursery dominance



Better understanding of prey/predator interactions*

* Preliminary results provide by ITUNNES.

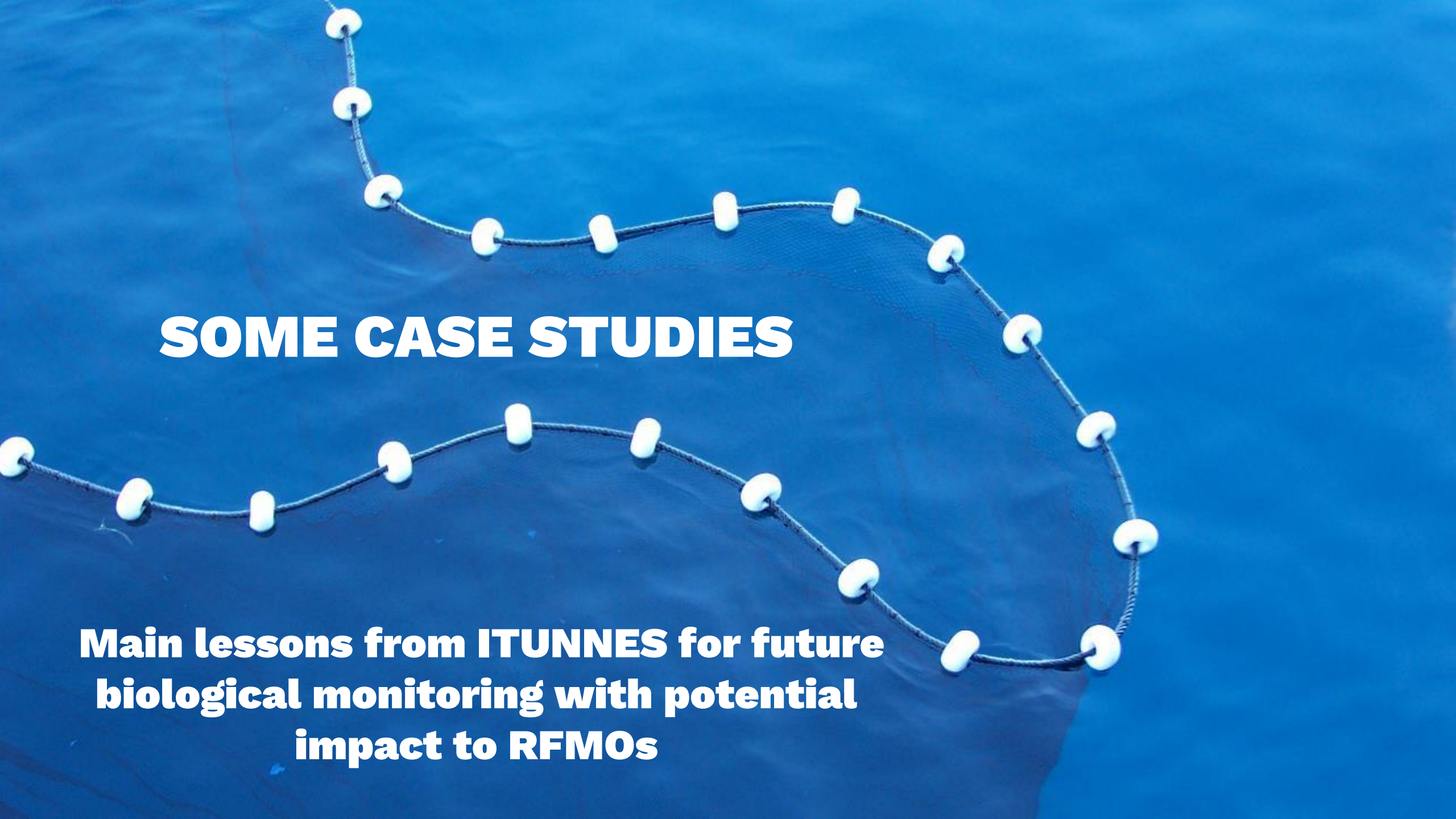
3. Want to learn more?

Here the list of the main project outcomes:

- Overall sampling strategy and gaps identification (D1.1) & Sampling protocol (D1.2).
- Legal and administrative requirements for sensitive species sampling (D1.3).
- Sampling outcomes for tropical tunas in the AO (D2.1).
- Thematic and capacity building workshops on age, growth, reproduction, and trophic ecology (D3.1).
- Results for age and growth, reproduction, trophic ecology and population structure (D3.2).
- Data Management Plan (D4.1), Brochures and Infographics (D4.4) and Shiny App for data visualization (D4.2).
- Policy brief (D5.6).



Discover more deliverables on the EU portal

A blue fishing net with white floats is draped across the frame. The net is made of a fine mesh and has a series of white, cylindrical floats attached to its top edge. The background is a solid, vibrant blue color.

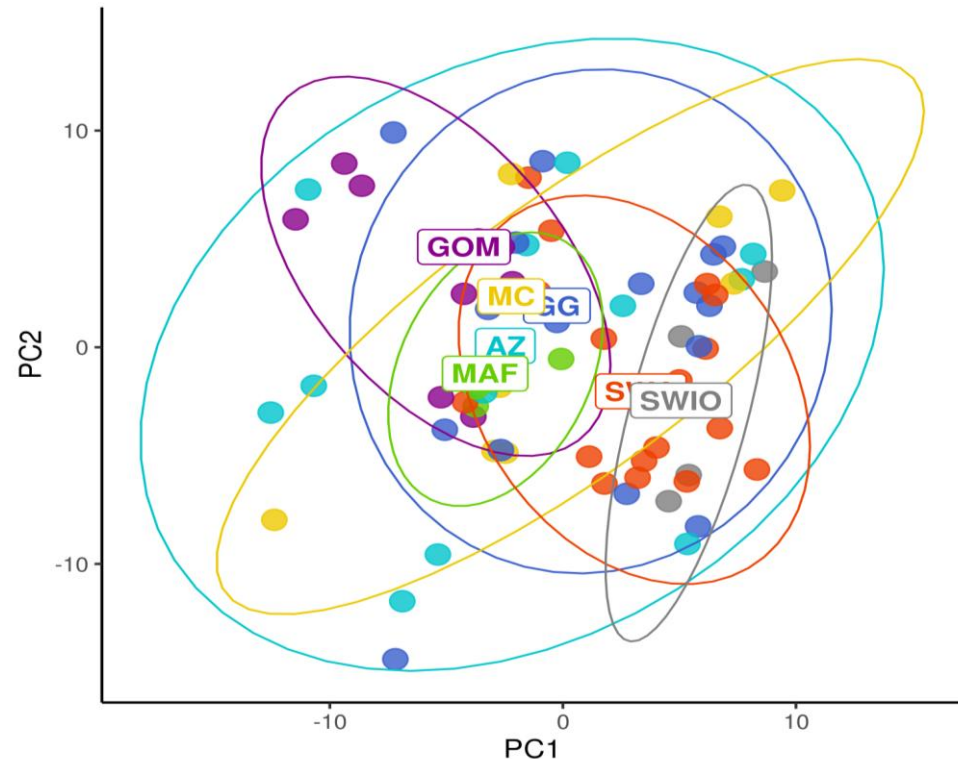
SOME CASE STUDIES

**Main lessons from ITUNNES for future
biological monitoring with potential
impact to RFMOs**

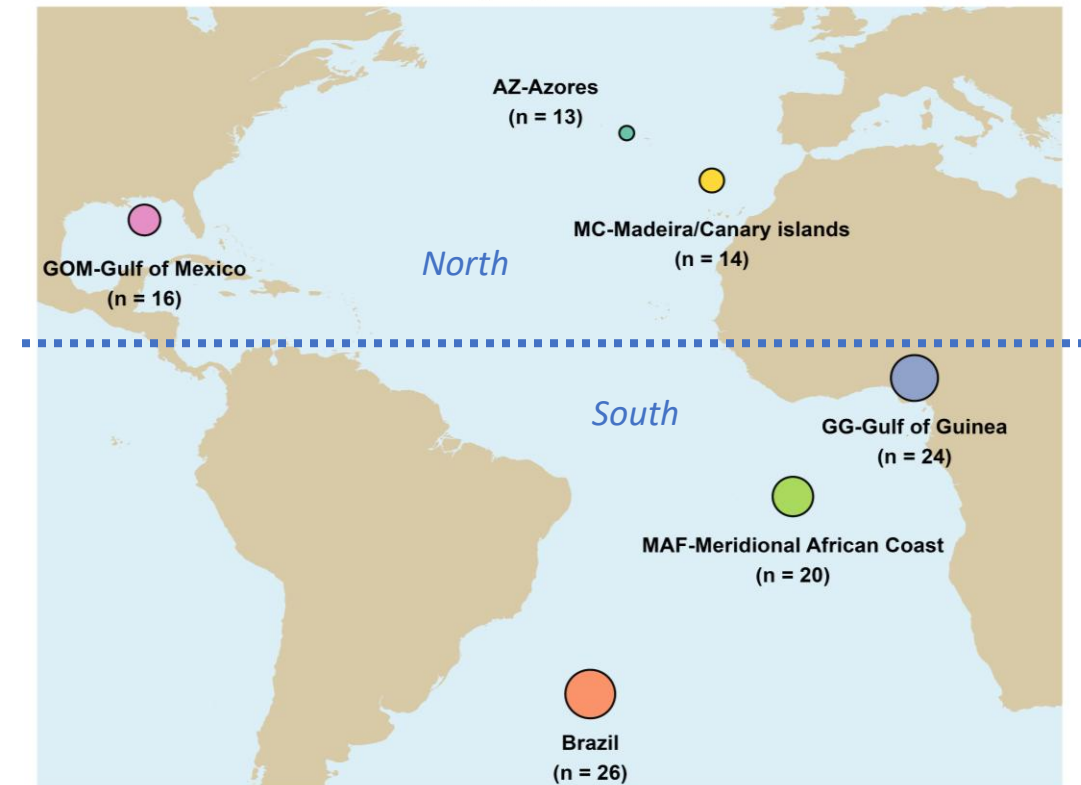
SKJ (ICCAT) – Genetic markers

Very weak structure within the Atlantic (mixing)

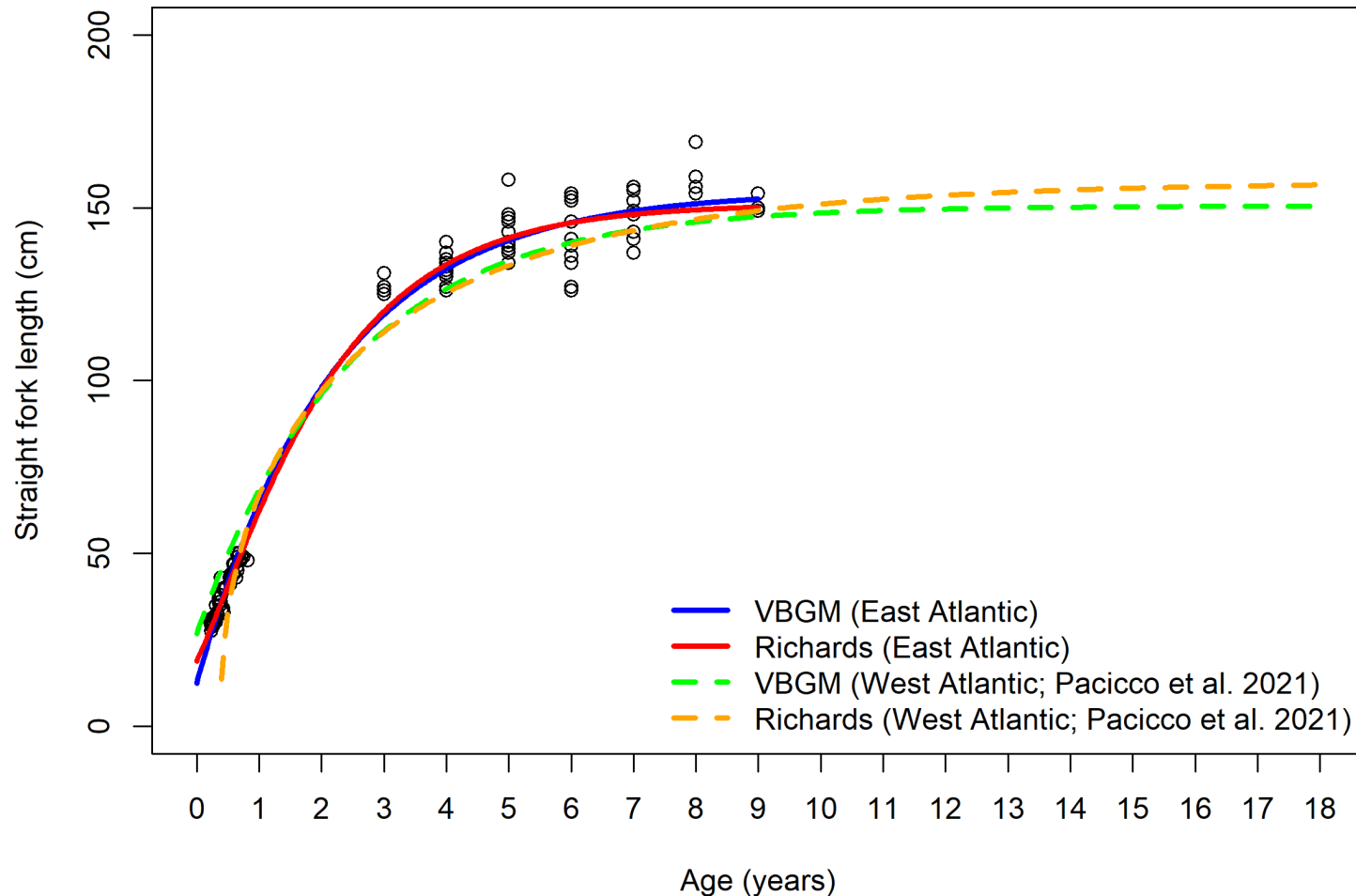
26,500 genetic markers (SNPs)



Sampling locations



YFT in Atlantic ocean (ICCAT)



- Whether eastern Atlantic yellowfin tuna exhibit the same growth patterns as those currently assumed in ICCAT?
- SA largely based on western Atlantic data

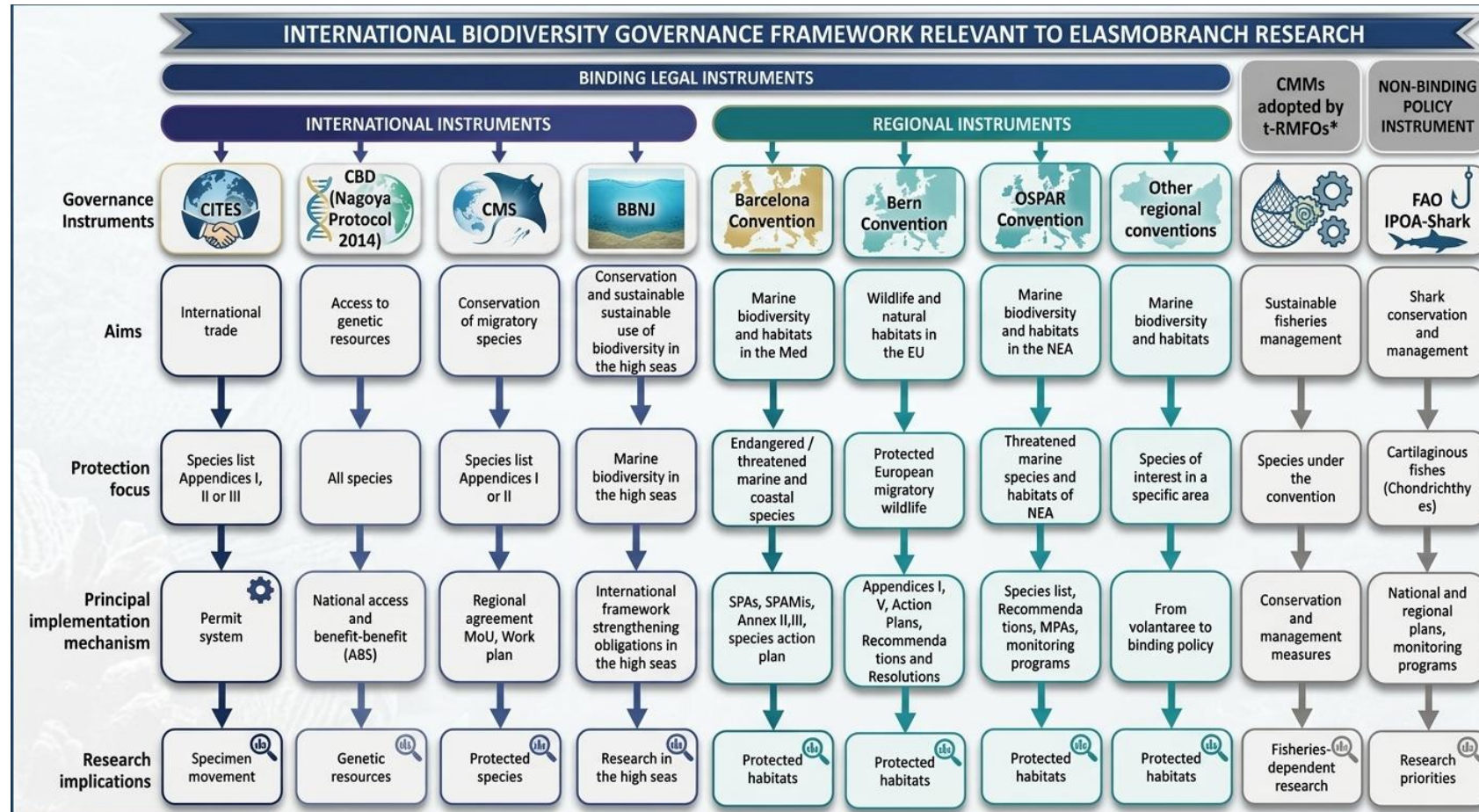
SIMPLIFICATION TO FACILITE RESEARCH ON SENSITIVE SPECIES



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IMPROVING TROPICAL TUNA
BIOLOGICAL KNOWLEDGE
FOR END-USERS

When Conservation Regulations for sensitive species Become a Barrier to Conservation Science



What can be done to ensure that **regulations designed to protect biodiversity also enable the science needed to conserve it?**

1. **Establish a harmonized EU-wide framework** for research permits and regulatory guidance, providing a clear and consistent pathway for projects involving sensitive species.
2. **Strengthen coordination among key stakeholders** (e.g., DG MARE, DG Environment, national competent authorities, RFMOs, SFPAs, and research institutions)
3. **Develop centralized digital tools** for permit management, a database of competent national and international authorities, and decision-support systems to help researchers navigate regulatory requirement
4. **Facilitate and support multinational research initiatives** through standardized documentation for streamlined transboundary sample and data exchanges.

SCIENTIFIC OUTPUTS

NEW KNOWLEDGE GENERATED



Growth

Updated growth curves and age estimates



Reproduction

Maturity and fecundity parameters



Trophic ecology

Diet composition and ecosystem role



Population structure

Genetic and other stock markers



Biological datasets

Quality-controlled and harmonised datasets



Standardised methodologies

Common protocols across institutions and oceans

MORE
KNOWLEDGE

LOWER
UNCERTAINTY

STRONGER
ASSESSMENTS

IMPACTS

FROM SCIENCE TO SUSTAINABLE MANAGEMENT



SCIENTIFIC IMPACTS

- Reduced uncertainty in biological parameters
- Better understanding of population connectivity and ecology
- Stronger biological basis for stock assessments



OPERATIONAL IMPACTS

- Improved scientific advice
- Better policy and operational planning
- More robust inputs for stock assessments



LONG-TERM IMPACTS

- Support ecosystem-based management and EAFM
- Climate-resilient fisheries management
- Better-informed decisions at national, EU and RFMO levels



PARAMETERS
(data)



KNOWLEDGE
(reduced uncertainty)



ASSESSMENTS
(improved inputs)



ADVICE
(science-based)



MANAGEMENT
(sustainable fisheries)



Data visualisation

Open science for informed decisions

1. ACCESS TO SAMPLES

Scientists from different institutions can have access to the **catalog of available samples** that may be of interest for different types of studies.



2. EASY VISUALIZATION FOR MANAGEMENT

People in charge of management advice have a **quick and user friendly tool** for visualization and filtering of **life history parameters** (e.g. growth curves, L50, maximum age) that are necessary when developing the models for the assessment.

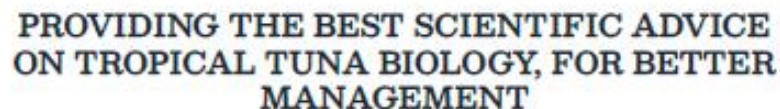


3. FINAL PRODUCT




bioTuna

<http://aztidata.es/BioTuna>



**More robust scientific advice
supports better management
decisions**

Scientist need two type of data, which in conjunction with catch data from fishers, are used to evaluate stocks health.

Reproduction
(sexual maturity)

Life cycle
(When and where tunas migrate, reach maturity, spawn)

Connectivity
(Exchange between
populations)

Habitat
(Influence of the environment
on tunas' behaviors)



USA
CAN
MEX
CAR

Consortium

Partners

ITUNES also uses archived samples from previous projects to increase availability and reduce duplication.

What are the samples for?

Muscles and otoliths are observed to determine the population structure and connectivity using genetic markers.

Otoliths and spine are studied to estimate age and growth.

Otoliths are calcium carbonate structures, particularly small and located directly behind the brain of bony fishes. They are often referred to as the fish's "black box".

Gonads are examined to determine maturity and fecundity.

Stomach is studied to understand

Why sampling different tuna sizes?
Studying tuna at different ages, maturity and growth stages helps us better understand their entire life history.

Why do some fisheries lack data?
Some fishing boats are too small to carry observers, so data can only be collected when they land — which gives an incomplete picture. Also, there are so many boats and landing sites that it's hard to cover them all. Currently, most of our biological data comes from purse seine vessels, but others are also important and need to be included in the sampling strategy.

Why is it important to sample from different vessels and fisheries, as well as in different places? Different fisheries catch different tuna sizes in different places. Collecting samples from all these fisheries provides a complete picture of tuna populations.

Why is sampling important to understand stock mass and health?
Like a poll, studying a small number of tuna helps us estimate the whole population. By looking at parameters like age, growth, and reproduction, along with catch data, scientists can figure out tuna biomass and how healthy they are.

Fish Species	Percentage of Catch	Vessel Type
500 yellowfin	82%	on purse seiners
500 skipjack		
300 bigeye	18%	on longliners, baitboats and other boats

How do science and industry collaborate towards sustainable management?

1. Co-designing and implementing sampling protocols

Scientist: We generate evidence to ensure tuna stocks remain productive and resilient.

Fishery: We operate to deliver reliable supplies and make a living.

Joint goal: This is sustainable fishery, profitable and built on sound science. Let's define what matters to both science and industry.

2. Allowing past and current data collection and sharing

Scientist: How will sampling fit with your fishery activity?

Fishery: Don't worry, I will adapt the logistics and make sure I do not disturb the fishing and landing process.

3. Enabling access to fish and samples

Scientist: Could you provide specific sizes or species needed for sampling?

Fishery: Yes, as long as it doesn't affect our ability to sell the fish. If it does, you can purchase it at market price, with no added benefit for us.

4. Transport of the specimen to the laboratory

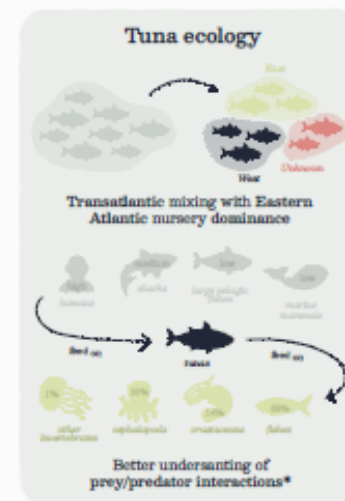
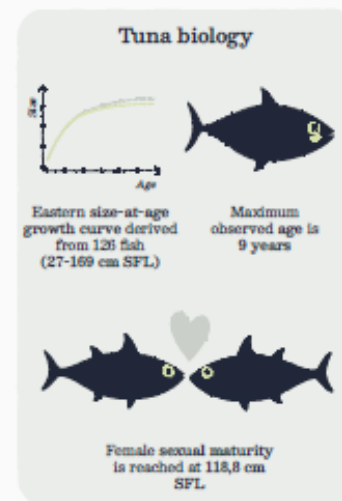
Scientist: Where can I collect the tuna samples for analysis?

Fishery: I'll deliver them to your laboratory at no cost. Logistics shouldn't be a barrier!

Thank you to the vessels and crew from the European tuna purse seine fleet, Madeiran and Azorean pole and line fleet, Artisanal fleet of Côte d'Ivoire, Taiwanese Long-line and Spanish Long-line fleet who participated in the data collection.

What are the results?

The research has been conducted on three species of tropical tuna (yellowfin, skipjack and bigeye). For clarity, results presented here focus on Atlantic yellowfin tuna.



Scientific impacts

- Reduced uncertainty in tuna growth, reproduction and lifespan
- Foundation for long-term population monitoring
- Better informed stock assessment

- Better understanding of how tuna populations are connected
- Better knowledge on tuna and ecosystem (including habitat) interactions

Operational and policy impacts

- Short term**
- Better informed scientific advice
 - Better informed policy and operational planning
 - More robust TAC recommendations

- Long term**
- Reduced uncertainty in ecosystem-based management advice
 - Adaptive, climate-resilient fisheries management strategies
 - Better-informed management decisions at national, EU and RFMO levels

A 10-year-old scientific tag still tells a story!

A bigeye tuna chemically marked in 2016 was recaptured 10 years later by a Galician longliner. ITUNNES will analyse its otolith, where the chemical mark can help validate the species' growth curve.



Learn more about the story



Questions & answers

Why is age important?
Age helps us understand how fast tuna grow and how populations can recover from fishing.

Why is maturity important?
Knowing when tuna start to reproduce helps ensure that enough tuna can spawn before being caught.

Why study population structure?
Different tuna populations may respond differently to fishing pressure and environmental changes.

Why study ecology?
Understanding what tuna eat and where they live helps predict how they may respond to climate change.

SCIENCE-INDUSTRY COLLABORATION

A shared effort for sustainable tropical tuna fisheries

1

Successful long-term collaboration with the tropical tuna purse-seine fleet



Access to samples at different points

- On board
- In port
- At processing plants



Access to metadata (operational data)

- Fishing effort
- Location
- Gear and set information
- Catch composition



Continuous coordination

- Planning and adaptation of protocols
- Joint problem-solving
- Maintaining commitment over time



2

Main limitations and challenges



Coverage of extreme sizes

- Small individuals
- Large individuals



Use of critical metadata for the industry

- Confidentiality concerns
- Data-sharing limitations



Spatial and temporal coverage

- Uneven coverage among areas
- Seasonal gaps
- Variability between fleets and countries

3

Recommendations for long-term success



Multi-stakeholder involvement

Science and industry working together



Multi-fishery and multinational participation

Ensure spatial and temporal coverage



Continuous coordination

Adapt protocols and maintain effort and motivation



Sustainable and stable funding

Support a minimum long-term sampling effort

THANK YOU



PARTNERS

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