

24th meeting of LDAC

Working Group 1 - Highly Migratory Stocks and Tuna RFMOs

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EU Scientific initiatives on FAD use and management



AZTI. Tuna Research Area

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Current research areas

- Non-target species → Unwanted by-catch reduction
- Target species (small sizes)-> reduction
- Post-release survivorship (whale shark, silky shark)
- Monitoring and Management of FADs
- Fishing effort, strategy and technology to improve CPUE
- Fishery independent abundance index
- Other impacts of FAD fishing:
 - Habitat and Biodiversity
 - Biomass
 - Ecology, Biology, Behavior and Movement, including Ecological Trap.
- Minimize impact of FAD fishing

Cooperation between Industry, Managers and Scientist!!!

Some key examples:

- BIOFAD
- CECOFAD2
- RECOLAPE
- Support IOTC YFT stock assessment

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Specific contract N°7: Testing designs and identify options to mitigate impacts of drifting FADs on the Ecosystem (BIOFAD)

UNDER FRAMEWORK CONTRACT – EASME/EMFF/2016/008

Provision of scientific advice for fisheries beyond EU waters



Main details:

- Consortium members: **AZTI, IRD and IEO**
- Project period: August 2017 – extended until December 2019 (28 months)
- Study area: Indian Ocean
- Deployment objectives: 1000 BIO FADs
 - ~2 BIOFADs per vessel and month (~6-8 by trimester)
 - ISSF support for material purchase

Collaborators:



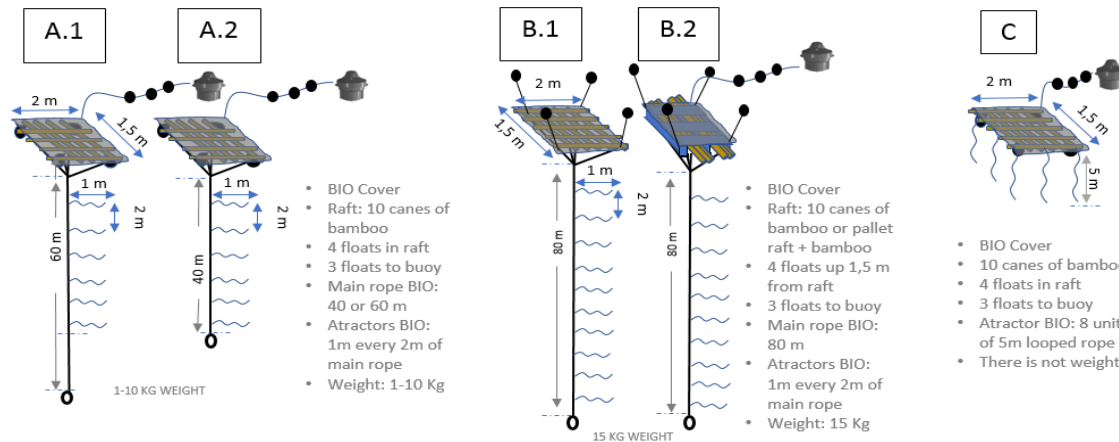
ASOCIACIÓN NACIONAL
DE ARMADORES DE BUQUES
ATUNEROS CONGELADORES



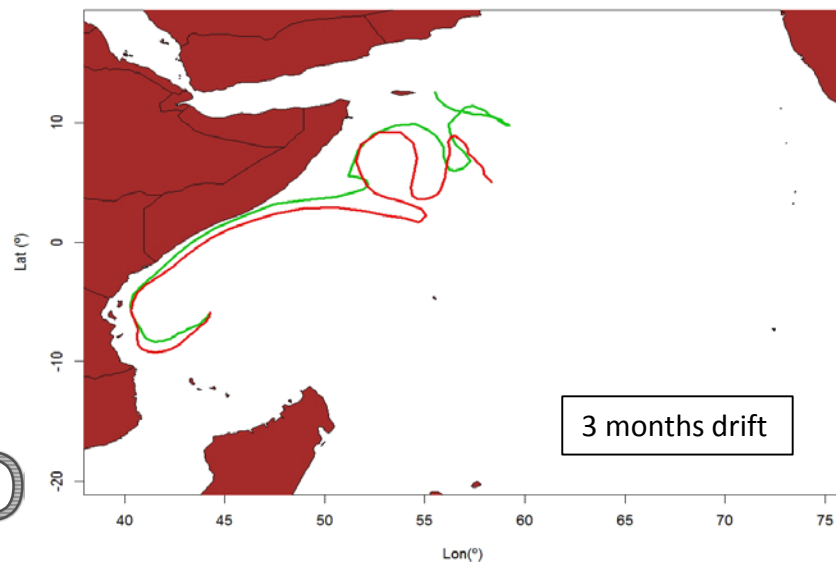
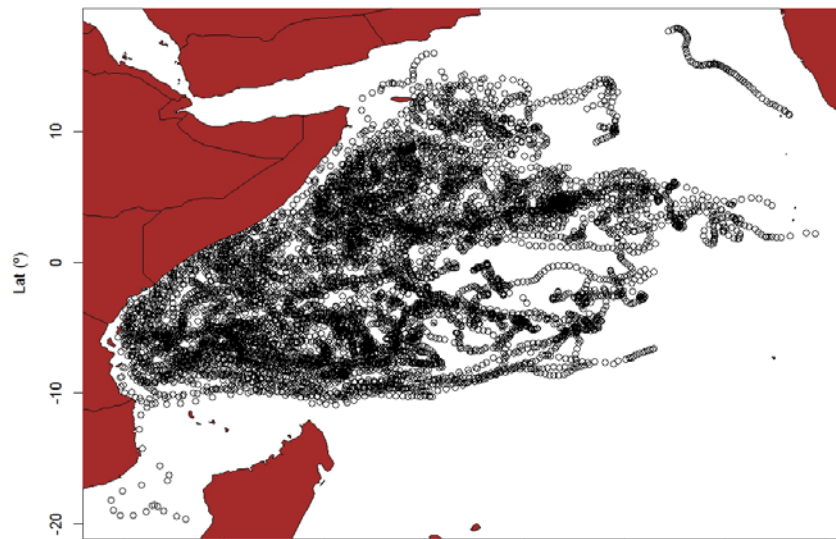
Main Objective:

TO TEST FUNCTIONALITY OF FADs BUILT WITH BIODEGRADABLE MATERIALS FOR IN NATURAL ENVIRONMENTAL CONDITIONS TO REDUCE IMPACT IN THE ECOSYSTEM

BIOFAD



1. Review state of the art of three types of FADs (FAD, NEFAD, BIOFAD)
2. Evaluating materials and designs for BIOFADs constructions
 - Performance in natural environment
 - Address the problems with marine litter, impacts on habitat, etc.
3. Test, compare and measure the efficiency BIOFADs vs NEFADs
 - Aggregation capacity of tuna and non-tuna sp in real conditions (EU PS Fleet)
 - Life-Cycle Assessment (LCA) of materials and designs
4. Assessing the socio-economic impacts of BIO FADs use
 - Assess possible cost and incomes of phasing in
 - Possible market incentives
5. Assessing the feasibility of using new biodegradable materials by the European fleet and recommendation of an optimum BIO FAD prototype.

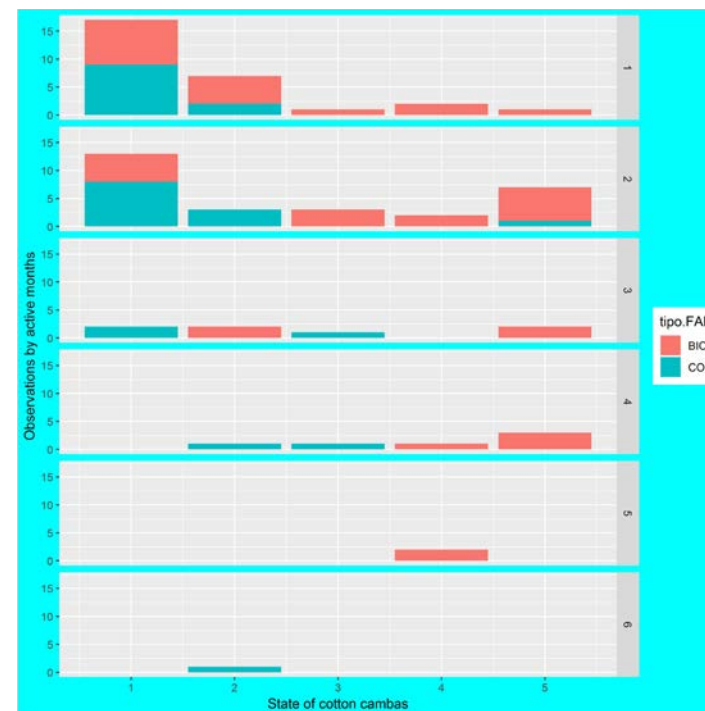


BIOFAD

EU Fleet TOTAL ~450 BIOFADs deployments

- ✓ 3rd quarter 60% of the goal
- ✓ Nº sets:
 - 17 BIOFAD / 14 CONFAD
- ✓ Prototypes:
 - A1 (66%) / A2 (21%) / B1 (8%) / C1 (5%)

Biodegradable material degradation assessment



- **DESPITE THE INITIAL DELAY, THANKS TO THE ENGAGEMENT OF THE FLEET DEPLOYMENTS HAVE INCREASED SIGNIFICANTLY**
 - **VERY IMPORTANT STEP TOWARDS BIODEGRADABLE FADs**
 - **First time of BIOFAD large scale deployments**
 - **Similar research projects in:**
 - **the Atlantic Ocean (ISSF)**
 - **the East Pacific Ocean (IATTC)**
- **ALL TROPICAL TUNA PURSE SEINE FLEETS ARE COLLABORATING WITH THE PROJECT AND BIOFAD DEPLOYMENTS**
 - **Engagement of EU Fleet and Korean Fleet**
- **INFORMATION IS REPORTED BUT FURTHER INFORMATION ABOUT THE FISHING ACTIVITY AND DEGRADATION CONDITION OF THE MATERIAL IS REQUIRED**
 - **Interaction with the fleet is very good**

THANKS ALL COLLABORATORS FOR YOUR EFFORT

Strengthening Regional cooperation in the area of large pelagic fisheries data collection (RECOLAPE)

MARE/2016/22 “Strengthening regional cooperation in the area of fisheries data collection”,
Annex III “Biological data collection for fisheries on highly migratory species”



General objectives

- Improve coordination among Member States involved in large pelagic data collection, and pave the way towards a fully cooperative and coordinated regional data collection environment under the requirements of **European Union Data Collection Framework (EU-DCF)**.
- Provide solutions to certain needs, in terms of data collection, identified both by the scientists involved in the stock assessment of the tuna RFMOs and by the RCM-LP.

Specific objectives

- Facilitate the evolution of the large pelagic RCM towards the large pelagic RCG Design regional sampling plans for large pelagic stocks, thus facilitating the transition from individual national Work Plans towards regional Work Plans Develop tools and protocols for collecting new data needs identified by end users around the FADs
- Test alternative data collection methods for those cases where traditional methods present data deficiencies
- Facilitate cooperation among Member States in order to improve the procedures to assess the quality of biological data on large pelagic stocks, both at the national and regional levels

Project overview

WP1. Large Pelagic Regional Coordination Group structure

Define future structure of the RCG-LP

WP2. Design of Regional Sampling Plan for 2019

Two CS; Mediterranean SWO & Tropical tunas in the AO

WP3. Specific pilot studies

WP3.1- Development of tools for FAD data collection/transmission

Develop protocols for FAD data collection and data storage tools to meet the requirements of the tuna RFMOs

WP3.2- EMS feasibility study for longlines

Determine if EMS can be used to reliably collect unbiased data onboard longline fleet

WP4. Data collection strategy for use in standardization of CPUE or in alternative abundance indices in tropical tuna fisheries

WP5-Procedures to assess the quality of biological data collected at regional level

Develop a practical framework for the implementation of the minimum data quality checks to be conducted both at national and regional level

WP6- Regional consultation and training of Member States

Discuss the results of the WPs 1 to 5 with MS and end users, in order to identify points of consensus and/or disagreement

Specific contract N°9: Catch, Effort, and eCOsystem impacts of FAD-fishing (CECOFAD2)

UNDER FRAMEWORK CONTRACT – EASME/EMFF/2016/008

Provision of scientific advice for fisheries beyond EU waters



The aim of this specific study is to provide the DG MARE with scientific advices on the use of drifting Fish Aggregating Devices (dFADs) by the European tropical tuna purse seine fisheries and on their impact on the tuna resource and the environment of the Atlantic and Indian oceans

With these considerations in mind, the study has **three specific objectives**:

- Estimate the contribution of the **new fishing technologies**, implemented by the tropical tuna purse seine fisheries, to **fishing mortality**;
- Estimate the **accuracy and precision of direct indices of abundance** based on echo sounder buoys records;
- Improve the knowledge of the environmental impact of tropical tuna fisheries and **develop management measures accounting for ecosystem considerations**.

KEY MESSAGE

With this specific contract n°9 we'll attempt to take the **unofficial information on dFAD** into account in the definition of a unit of fishing effort useful within the framework of the **dFAD Catch per Unit of Effort (CPUE) standardization procedure**.

In addition to the CPUE-based standardized abundance indices, we'll explore the **development of direct indices of abundance from echo sounder buoys**.

Finally, we'll analyze the **impact of FAD-fishing on the associated fauna and the vulnerable habitats**. Based on simulations studies, a special attention will be paid in terms of **concrete and relevant mitigation measures**

Specific contract Nº14: Plan for improving IOTC yellowfin and other tropical stocks' assessment

UNDER FRAMEWORK CONTRACT – EASME/EMFF/2016/008

Provision of scientific advice for fisheries beyond EU waters



WORK IN PROGRESS

Plan for improving IOTC yellowfin and other tropical stocks' assessment

- The assessment of three Indian Ocean tropical tuna stocks faces common problems, going from uncertainty in the data to model specification, that are increasingly affecting the capacity of the IOTC Scientific Committee to provide implementable management advice.
- A recent example is the scientific advice provided during the 21th Scientific Committee (SC) of the IOTC. The SC was not able to provide a scientific advice with regards to the catch limits that would allow the recovery of the stock with different levels of probability.
- This was because the many uncertainties identified in the model used in the assessment, its low predictive power and the also on the many uncertainties in the information used.

Plan for improving IOTC yellowfin and other tropical stocks' assessment

- In order to address these issues and the consequent scientific advice to be provided in 2019, the IOTC-SC considered necessary to carry out a series intersessional works during 2019.
- The workplan identifies a series of specific tasks towards reducing the current uncertainty on models and data used in the recent stock assessments of yellowfin (and tropical tunas in general).
- This project aims to support the EU's scientific contribution to the IOTC's workplan to improve the current advice provided to the IOTC Commission.

Structure of the work

TASK 1: UNCERTAINTY IN DATA

1.1. Catch data: explore scenarios of various catch series.

1.2. Tagging data: perform a review of the tagging data and reassess the scientific publications that estimated tag mortality used in the recent YFT- and SKJ assessments.

1.2.1. Evaluate how the raw data from the available tagging programs is modified to address mixing, tag loss, reporting rates etc. in order to make them available for the stock assessment model.

1.2.2. Investigate key parameters, in particular tag-release mortality, and recommend values for the three tropical tuna stocks: YFT, BET, and SKJ..

1.2.3. Analyse the information provided by tagging data on movements and biomass of different regions including the sensitivity of tagging information on the stock assessment.

1.3. Size data: Review of size frequency data and comment as adequate for further improvements of their quality and coverage.

1.4. Catch per Unit of Effort (CPUEs):

1.4.1. Review and explore options for alternative series for purse seine, longline and other fishing gears. The biological, technical and statistical justifications and interpretations shall be provided.

1.4.2. Develop an advanced protocol for joint CPUEs iterations.

1.4.3. Calculate CPUEs for the whole Indian Ocean as well as for relevant sub-regions. The biological, technical and statistical justifications and interpretations shall be provided.

Structure of the work

2. TASK 2: MODEL UNCERTAINTY

2.1. Alternative/Complementary models: key uncertainty inputs- characterization and control of structural uncertainty integration amongst models:

2.1.1. Use alternative assessment models and parameter settings (biomass dynamic, age/size structured, fully integrated).

2.1.2. Develop a suite of diagnostics, including also graphic plots, to be used by the WPTT and support in the following (The rationale underpinning the different diagnostics shall be provided and duly justified):

2.1.2.1. Deciding on SS3 alternatives

2.1.2.2. Integrating models ensemble (mpb, JABBA, VPA, SS3 etc.)

2.1.2.3. Decision on alternative options

2.1.3. Review the current assessment structure for the YFT (and if possible BET) and identify potential drawbacks and improvements on key uncertainty inputs (e.g. spatial structure, weighting data sources; key parameters inputs etc.).

2.1.4. Develop and provide a protocol to explore statistical uncertainty on the model in an efficient manner.

2.1.5. Investigate and use alternative values for key parameters (e.g. growth, natural mortality and others).