EASME
Executive Agency for SMEs
European Commission

BIOFAD
Testing designs and identify options to mitigate impacts of drifting FADs on ecosystem

BIOFAD project: exploring the use of biodegradable materials on drifting FADs to reduce their impact on the ecosystem

Iker Zudaire et al.

IATTC and AIDCP Meeting – Permanent Working Group on FADs
10-13 May 2018

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ISSF INTERNATIONAL SEAFOOD SUSTAINABILITY FOUNDATION
ANABAC OPTUC ASOCIACIÓN NACIONAL DE ARMADORES DE BUQUES ATUNEROS CONGELADORES
OPAGAC
SEYCHELLES FISHING AUTHORITY

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1 Project context & details

IOTC Res 13/08

ANNEX III

PRINCIPLES FOR DESIGN AND DEPLOYMENT OF FADS

1. The surface structure of the FAD should not be covered, or only covered with non-meshed material.
2. If a sub-surface component is used, it should not be made from netting but from non-meshed materials such as ropes or canvas sheets.
3. To reduce the amount of synthetic marine debris, the use of natural or biodegradable materials (such as hessian canvas, hemp ropes, etc.) for drifting FADs should be promoted.

ICCAT Rec 16/01

Non-entangling and biodegradable FADs

24. In order to minimize the ecological impact of FADs, in particular the entanglement of sharks, turtles and other non-targeted species, and the release of synthetic persistent marine debris, CPCs shall:

    i. replace by 2016 existing FADs with non-entangling FADs in line with the guidelines under **Annex 6** of this Recommendation.

    ii. undertake research to gradually replace existing FADs with fully biodegradable and non-entangling FADs, with a view to phase out non-biodegradable FADs by 2018, if possible.

CPCs shall report on an annual basis on the steps undertaken to comply with these provisions in their FADs Management Plans.

CONTEXT

Increasing use of DFADs built with no biodegradable materials

FADs lost – Increase marine litter

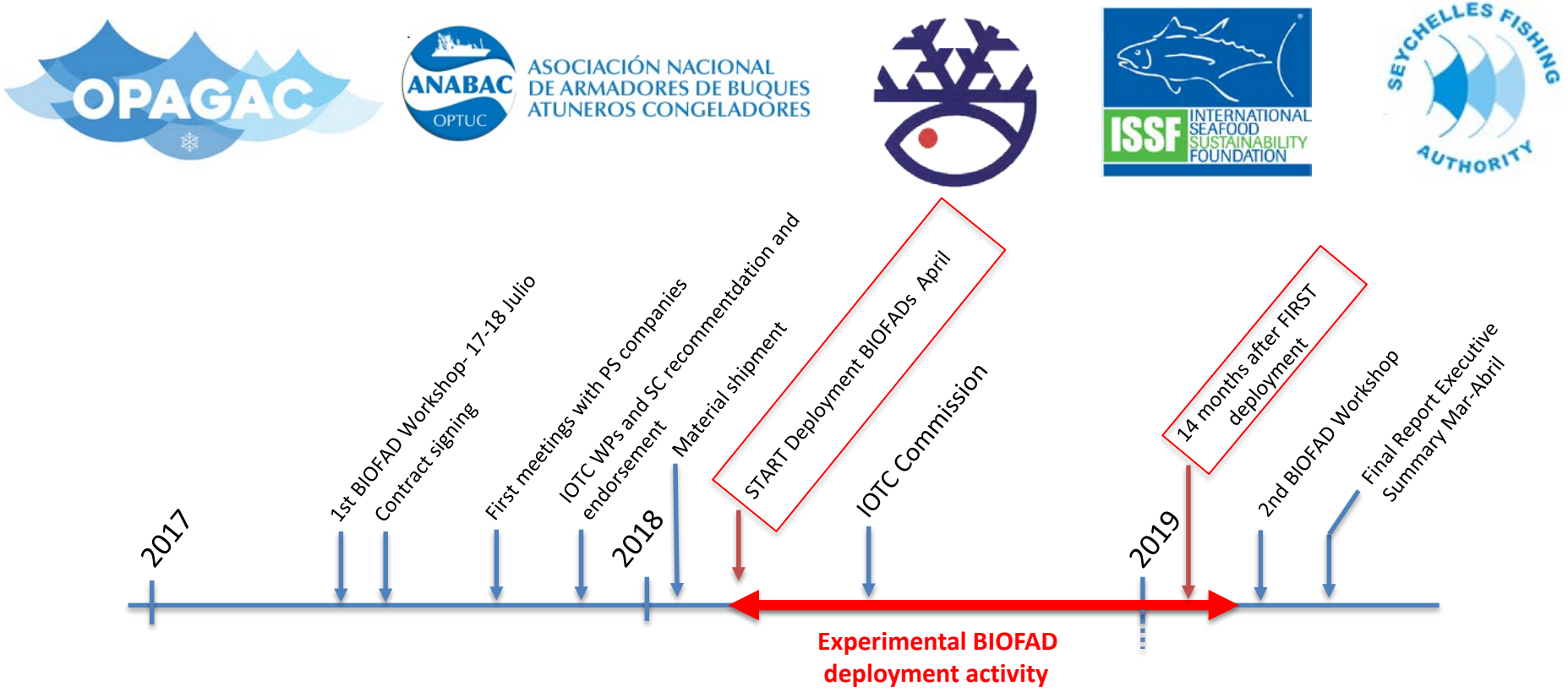
FAD Beaching

DETAILS

Main details:

- Consortium members: **AZTI, IRD and IEO**
- Project period: August 2017 – May 2019 (21 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:



TO TEST THE FUNCTIONALITY FADs BUILT WITH BIODEGRABLE MATERIALS IN NATURAL ENVIRONMENTAL CONDITIONS TO REDUCE IMPACT IN THE ECOSYSTEM

DETAILS: 5 Specific Objectives

1. **Review state of the art of three types of FADs**
   - "conventional FADs" (i.e. entangling and non-biodegradable)
   - "NE FADs" (i.e. non-entangling and non-biodegradable)
   - "BIO FADs" (i.e. non-entangling and biodegradable)

2. **Evaluating materials and designs for BIO FADs constructions**
   - Performance in natural environment
   - Address the problems with marine litter, impacts on habitat, etc.

3. **Test, compare and measure the efficiency BIO FADs vs NE FADs**
   - Aggregation capacity of tuna and non-tuna sp in real conditions
   - 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 fleet and recommendation of an optimum BIO FAD prototype.

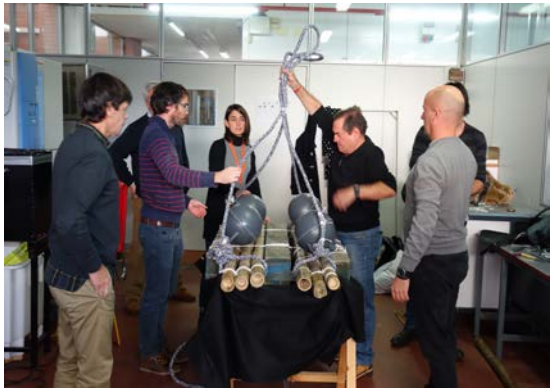
DETAILS: Collaborators

- KNOWLEDGE/EXPERTISE
- CONSTRUCTION/DEPLOYMENT
- DATA COLLECTION
- RESULTS DISCUSSION

EXPERIMENT PROCEDURES

CONSORTIUM OVERSEES FOLLOWING PROCEDURES:

A) Selection of biodegradable materials & prototypes.
B) BIOFAD Identification & deployment strategy.
C) BIOFAD Data collection & report.



SETING PROCEDURES UNDER CONSORTIUM SUPERVISION:

1st BIOFAD Workshop 17-18 July

- To find agreements between consortium members and the fleet.
- Starting point, previous work done by ISSF Workshop (San Sebastian 2016)

Meetings with each PS company (Sep 2017–Apr 2018):

- To inform skippers/captains about the project.
- To clarify any doubts and to strengthen the objectives with PS and suppliers.

EXPERIMENT PROCEDURES

Consortium has planned a large scale experiment:

- Deployment of 1000 experimental BIO FADs → 250 BIOFAD by trimester.
- EU PS fleet strong engagement with:
  - 42 PS vessels participating in the project.
  - 6 BIOFADs per trimester and vessel.
  - Deployment activity to be conducted during 14 months.

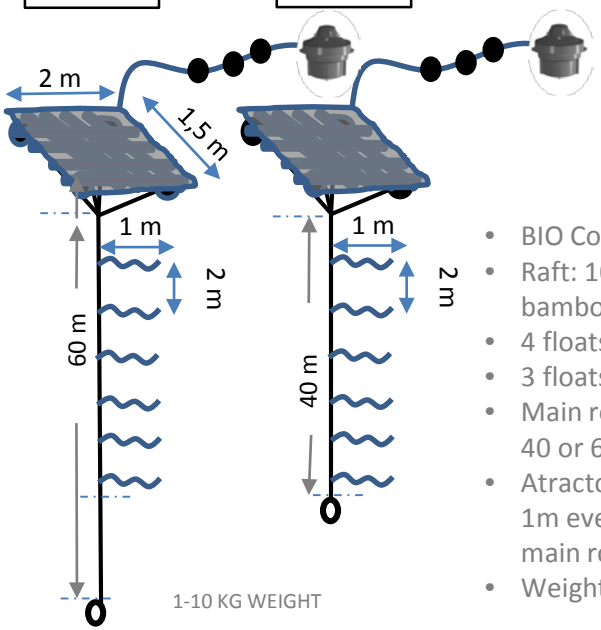
Consortium with this strategy seeks:

- to assess seasonality effects
- to avoid limitations found in previous smaller scale trials and to ensure:
  - Traceability of ALL experimental BIOFADs
  - Assessment of effectiveness of experimental BIOFADs vs NEFADs
  - Collaboration of large part of the fleet operating in IO.

2 Materials & prototypes

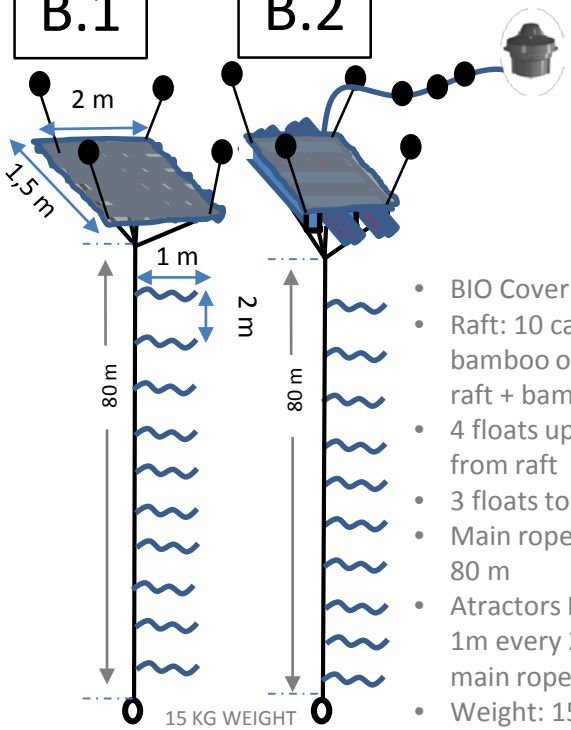
MATERIALS & PROTOTYPES

A.1 A.2



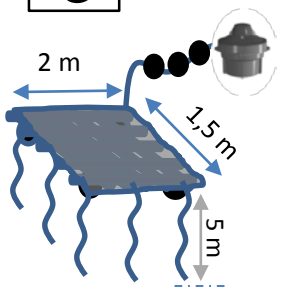
- BIO Cover
- Raft: 10 canes of bamboo
- 4 floats in raft
- 3 floats to buoy
- Main rope BIO: 40 or 60 m
- Atractors BIO: 1m every 2m of main rope
- Weight: 1-10 Kg

B.1 B.2



- BIO Cover
- Raft: 10 canes of bamboo or pallet raft + bamboo
- 4 floats up 1,5 m from raft
- 3 floats to buoy
- Main rope BIO: 80 m
- Atractors BIO: 1m every 2m of main rope
- Weight: 15 Kg

C



- BIO Cover
- 10 canes of bamboo
- 4 floats in raft
- 3 floats to buoy
- Atractor BIO: 8 units of 5m looped rope
- There is not weight

Materials/construction:

- **<u>ELIMINATE: plastic bottles/drums, nets, metallic frame</u>**
- ISSF: supply of biodegradable materials (260K €): ropes and cover tissue.
- PS company: supply raft (bamboo+ floats) and echo sounder buoy.
- Seek 100% biodegradable FAD

Premise:

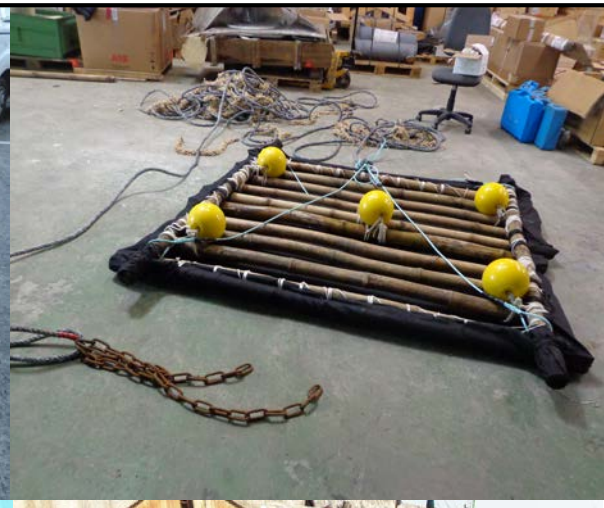
The simplest the better:

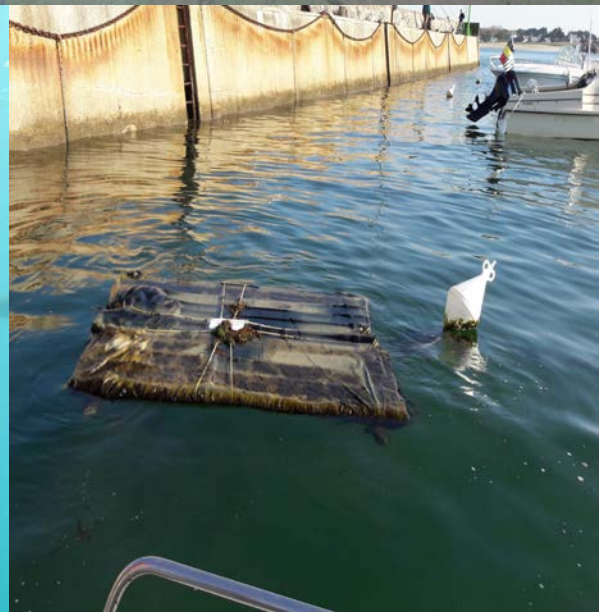
- ✓ Reduce materials
- ✓ Reduce litter
- ✓ Reduce costs
- ✓ Easy for construction
- ✓ …

MATERIALS & PROTOTYPES

Testing the “prototypes” (Port of Mutriku, Explorer II and Port of Concarneau) before the BIOFADs deployment in real conditions at sea

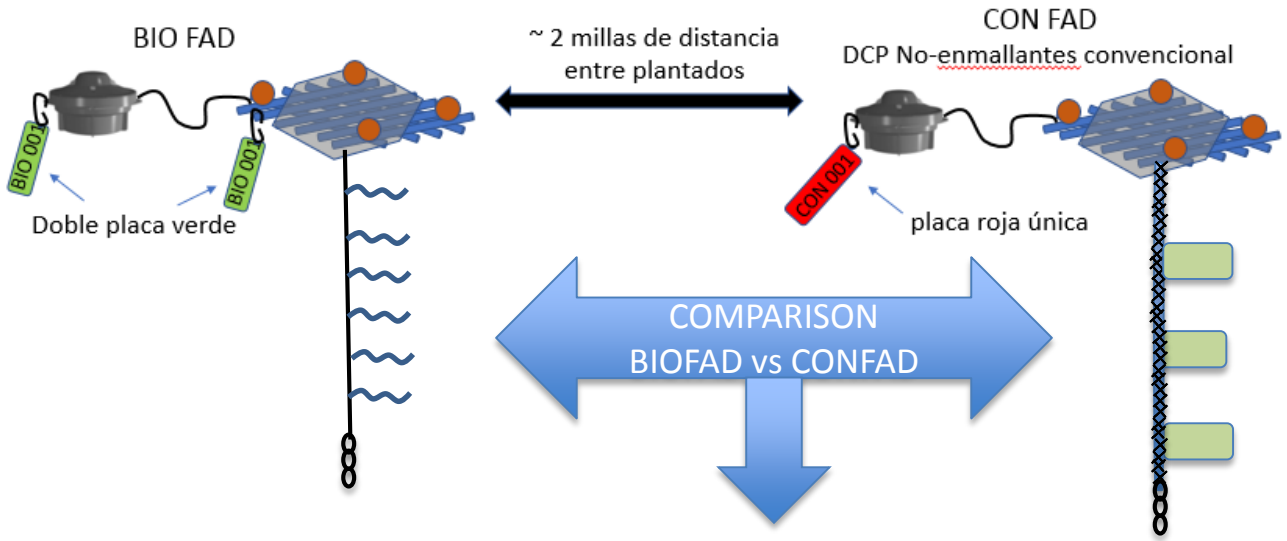




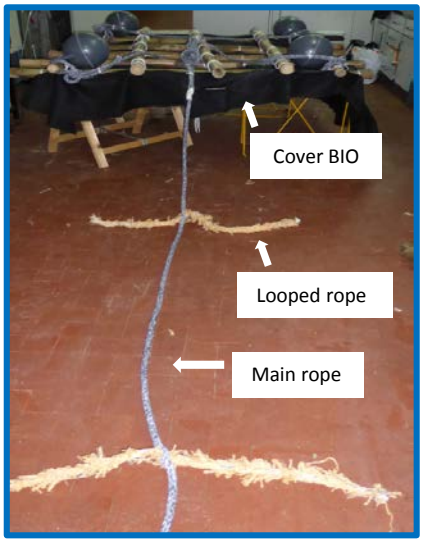



3 Identification & deployment

IDENTIFICATION & DEPLOYMENT OF BIOFADs and CONFADs



- ✓ Comparison of tuna and non-tuna species aggregation capacity
  - ✓ Data from Observer and Logbook
  - ✓ Echo-sounder buoy information
- ✓ Comparison of FADs behavior:
  - ✓ Trajectory (drift)
  - ✓ Life-Cycle Assessment (LCA) of materials and designs



VERY IMPORTANT: EVERY TIME there is an exchange of the buoy associated to a BIOFAD or CONFAD by its owner or not, the identification plate (green or red) that was associated to previous buoy will be transfered to newly attached buoy associated to BIOFAD or CONFAD.

4 Data collection & Report

DATA COLLECTION & REPOTING

In the following three possible activities with BIOFAD/CONFAD PS will inform Consortium about: Prototype, ID plate number, echo-sounder buoy code, state of the components.

- ✓ **In the case of new deployment and redeployment.**
- ✓ **In the case of set, visit with bouy tranfer or retrieval.**
- ✓ **In the case of simple visit or removal:** they will provide information only if possible.

BIOFAD and CONFAD STATE CONTROL: BIOFAD or CONFAD components' state will be valued form 1 to 5 (see table below).

BIOFAD and CONFAD REPARATION/REPLACEMENT: Any component reparation and replacement will be noted in the table. Biodegradable material will only be used to repair BIOFAD.

REPORTING: Every activity will be reported to the Consortium via email.

Status control of BIOFAD and CONFAD						REPLACEMENT	
Floating parts	1	2	3	4	5	YES	NO
Bamboo canes							
Pallet/Metallic frame							
Floats							
Cover/canvas							
Hanging parts	1	2	3	4	5		
Main rope							
Attractor (looped rope)							
Weight							

1	Very good, not damaged	**5**	Component missing
2	Good, a bit damaged	**Blank**	Unknown state
3	Bad, quite damaged		
4	Very bad, close to sinking		

Vessel name

Date / Hour:

Activity (add a X in the correct cell)

New deployment	Visit/buoy transfer	Set	Retrieval	Redeployment	Removal

Prototype (add a X in the correct cell)

A1	A2	B1	B2	C

BIOFAD or CONFAD Code:

BIO or CONFAD ownership (Yes/No):

Echo-sounder buoy Code:

NEW Echo-sounder buoy Code:

Lift up (Yes/No):

Thank you!!!

Questions

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48160 Derio, Bizkaia

IDENTIFICATION & DEPLOYMENT OF BIOFADs and CONFADs

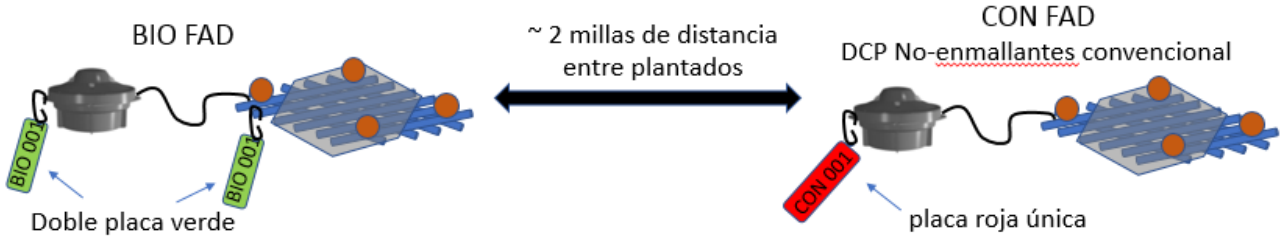
1. **SELECTION of PROTOTYPES**: Select one of the BIOFAD prototypes and build it following the desing (materials and dimensions). IMPORTANT: be sure that not allowed synthetic materials are not used, for example metallic frame, nets or plastic drums and bottles.

2. **IDENTIFICATION of BIOFAD and its BUOY before deployment**: Each BIOFAD and its associated buoy are identified with a single number (ej., BIO-0001) with 2 Green metallic plates. One plate is attached to the raft and the other is attached to the associated buoy. This identification number will always associated to the same BIOFAD, from its first deployment until the removal of the experimental FAD.

3. **"PAIRING" CONFAD DEPLOYMENT** (Conventional non-entangling FAD): Each time a BIOFAD is deployed, it will go with its pair CONFAD of similar dimension but built by synthetic materials used currently by PS fleet (metallic frame, nets, synthetic ropes, etc). BIOFAD and its pairing CONFAD will be conducted between an aprox distance of 2 milles.

4. **CONFAD IDENTIFICATION and its associated buoy**: Same identificaiton number will be used for BIOFAD and its pairing CONFAD. In the case of CONFAD a single red plate will be attached to the associated buoy. The buoys associated to BIOFAD and its pairing CONFAD will be equipped with echo-sonder.

VERY IMPORTANT: EVERY TIME there is an exchange of the buoy associated to a BIOFAD or CONFAD by its owner or not, the identification plate (green or red) that was associated to previous buoy will be transfered to newly attached buoy associated to BIOFAD or CONFAD.



DATA COLLECTION & REPOTING

- ✓ **En caso de plantado nuevo o replantado:** Anotar prototipo (ej., A1), número de placa identificativa (ej., BIO-0001), código de la baliza asociada (M3i+xxxx) y el estado de las partes del objeto.
- ✓ **En caso de lance, visita con trasplante o recogida de objeto:** Izar el objeto siempre que se pueda. En todos los casos anotar: número de placa identificativa (ej., BIO 0001), código de la baliza asociada, estado de las partes del objeto y si se puede el prototipo. Si hay un trasplante de baliza anotar el nuevo código de baliza y el código de la antigua o ajena.
- ✓ **En caso de SIMPLE visita (sin trasplante) o baja del objeto:** Intentar anotar lo indicado en los dos casos anteriores.

ESTADO del BIO o CONFAD: Indicar siempre el ESTADO de las partes del BIO o CONFAD: valorar el estado del 1 al 4 (ver tabla de abajo). Si la parte evaluada ha desaparecido anotar como 5. Si se desconoce el estado dejar en blanco.
REPARACIÓN de BIOFAD y CONFAD: En caso de reparación indicarla en la tabla. SOLO utilizar material biodegradable para reparar los BIOFAD.
INFORMAR: Toda la información de actividades se rellena en la plantilla-email y envía a biofad@azti.es Si es posible tomar fotos del BIO o CONFAD, se adjuntan en el email.

Status control of BIOFAD and CONFAD						REPLACEMENT	
Floating parts	1	2	3	4	5	YES	NO
Bamboo canes							
Pallet/Metallic frame							
Floats							
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Main rope							
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Prototype (add a X in the correct cell)

A1	A2	B1	B2	C

BIOFAD or CONFAD Code:
BIO or CONFAD ownership (Yes/No):
Echo-sounder buoy Code:
NEW Echo-sounder buoy Code:
Lift up (Yes/No):