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Bilbao, 22 septiembre 2022

MONTHLY PROGRESS REPORT – SEPTEMBER REPORT

To Echebaster Sustainability Working Group,

Both parties agreed below chronogram to carried out the Tasks described in the project entitled “Study of the interaction of derelict FADs on coral communities in the Indian Ocean”. The work corresponding to Phase 1 and Phase 2:

PHASE 1.

Task 1 “Analysis of the dynamics of dFADs, especially those that are lost and may become derelict, and their potential interaction on coral communities in the IO” has initiated in June 2021.

- AZTI has analysed Echebaster buoy data corresponding to years 2016-2020 in order to research on dFAD drift to understand the dynamics with identification of possible beaching location by region.
- Buoy data has been analysed to develop a risk matrix assessment based on Productivity Susceptibility Analysis (PSA) approach to identify the areas/regions affected by beaching of dFADs.
- Searching of available maps of coral location in the IO using generalized grid data set at 500 m resolution as developed by the World Resources Institute is being conducted.
- A review of available information on the structure of reefs and species composition in the potentially main affected regions is in progress.

Task 2 “Analysis of the potential impact of derelict dFADs on coral communities in the context of other risks” has initiated in July 2021.

- A review of available information to identify and describe other risk factors (e.g., climate change, pollution, marine debris, impacts of anchoring from recreational and fishing vessels) that may reduce the structure and function of the coral reefs to a point where there would be serious or irreversible harm has been conducted.





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Task 3 “Review of the current understanding of the risk to coral communities from interaction with derelict dFADs” has initiated in September 2021.

- Preliminary review of available information to identify the potential risk to corals from derelict dFADs and identify factors that could be extrapolated or linked to dFAD generated impacts is in progress.

Task 4 “Identification and analysis of measures to reduce the potential impacts on coral communities from derelict dFADs” has initiated in October 2021.

- Internal survey with key experts from different fields (fishery, environment, management, etc.) to identify measures to reduce the potential impacts on coral communities from derelict dFADs” has been conducted.

Task 5 “Review of IOTC policy and Stakeholder Views on the recovery of lost / derelict dFADs” has initiated in December 2021.

- External survey with key experts from different fields (fishery, environment, management, etc.) to identify measures to reduce the potential impacts on coral communities from derelict dFADs” has been conducted.
- A review of available information to identify IOTC policy and Stakeholder view on the recovery of lost / derelict dFADs is in progress.

PHASE 2.

“The design and implementation of a project to provide empirical evidence on the nature and extent of damage to corals resulting from interaction with a dFAD.”

All the necessary permissions from pertinent institutions have been obtained to carry out this second phase:

- A Memorandum of Understanding has been signed between Echebaster, Save Our Seas Foundation (SOSF) and AZTI to carry out the field work in the D’Arros and St Joseph Islands.
- Approval was obtained from Seychelles Bureau of Standards (SBS) to carry out the study.
- SIOTI’s participation in the project was consolidated.
- All logistical planning regarding fieldwork and necessary permits/paperwork was carried out by AZTI, Echebaster and SOSF.



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- Fieldwork for the first survey was carried out by AZTI-SOSF Teams lead by Dr. Maria Calvo Uyarra from 12th to 25th April:

Objective: to assess the potential impact of derelict dFADs on reef communities; and to test an approach that may be used by more large-scale research. To achieve this objective the following topics were addressed:

1. Selection and description of the study area
2. dFAD localization
3. dFAD characterisation
4. Benthic and fish survey experimental design
5. Impact assessment of dFADs on benthic and fish communities
6. Knowledge transfer

Team: Collaboration between Echebestar, Save Our Seas Foundation (SOSF) and AZTI was established.

Fieldwork location: SOSF is established in D´Arros/St Joseph, Seychelles, where fieldwork was conducted. D´Arros is suitable for this study as it fulfils the following criteria:

- The tuna fisheries in the area
- dFADs has been found in the islands
- It holds diving infrastructure
- Coral reefs habitats are available
- There are limited external risks.

Pre-fieldwork: Under request, ANABAC (Echebestar, Pevasa and Atunsa), SAPMER and CFTO fleets provided the coordinates of activated dFAD buoys. In total, 13 dFADs were localized within these areas, of which four were within the area of D´Arros Island and Saint Joseph Atoll. With this information, SOSF team searched for these and any additional dFAD. Four dFADs were finally identified for the survey. One dFAD was located at the reef, 2 on patch reefs, and 1 on seagrass.

Fieldwork: Three members of the AZTI team went to D´Arros and worked for two weeks in May with the SOSF team. During this period, the team carried out the following tasks:

- a. **dFAD characterisation**

To characterise the dFADs, an excel template was designed and developed based on the one used by onboard observers. It was structure into three parts: 1) general information, 2) dFAD structural parts, and 3) observations. These information was collected for surveyed dFADs.

b. Benthic and fish survey standardization

The impacts of dFADs on coral reefs are poorly studied. The present study aimed at providing a standard methodology for the characterisation of the potential impacts of dFADs on coral and fish communities. Several methodologies were tested, from which we selected those that could be applied to different habitats (e.g., coral reefs, seagrasses, patch reefs). This will allow standardization for future studies.

c. Coral reef benthic surveys

At each dFAD site, coral reef surveys were carried out as follows:

- Record the GPS coordinates
- Mark the dFAD/control site using a marking buoy in the centre of the study site.
- Note the general characteristics of the area
- Apply the line intercept transect method to survey the area. Four 10m perpendicular transects, centered at the dFAD, were surveyed, recording the length of the transect line covered by the different benthic types. This was replicated at a control site
- Apply the photo quadrat methodology. 50cm x 50cm were placed along the 4 transect lines at 0m, 2,5m, 5m, 7,5m and 10m fix distances. Photos of each quadrat were taken for later identification and cover processing of the different benthic components in the computer
- Estimate the approximate damaged area
- The number of broken colonies and size was recorded within the affected area. Although useful information, this was time consuming and considered that it may not be possible to include this information on future studies.

d. Fish surveys

For this fish surveys the following steps were taken:

- Mark with a buoy the dFAD
- Fish counts. For a period of 150 seconds one diver would count and identify all the fish living at or passing between the diver and the reference point, considering a visual angle that cover 2.5m each side of the reference point. After this, the divers would get close to the substrate for another 150 seconds to count and identify fish living in the crevices/dFAD within this same area. This procedure was repeated from



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the opposite side of the buoy mark. Thus, the total time counting and identifying fish would last 10 minutes, plus additional time for fish to re-establish their normal activity after diver movement in the area at the start of the survey and after changing side.

- Abundances and species richness were recorded on an excel file for analysis.

e. *Impact assessment of dFADs on benthic and fish communities*

The analysis implies comparing information between dFADs and control sites. Due to diversity of habitats, depths, etc. Information cannot be analyzed statistically. However, a good overview of the main threats that dFADs may pose on coral reefs, as well as the potential damage that may cause has been revealed. As a pilot study, no conclusions can be established, but guidelines for the future can be determined.

f. *Knowledge transfer:*

During fieldwork, the SOSF team was trained on:

- dFAD characterization
- dFAD underwater survey

Future steps: Another fieldwork campaign is planned for December. The aim of this campaign will be to implement the standardized methodology only to dFADs found on reef sites. It has been defined that the fieldwork campaign will be carried out if a minimum of four dFADs are found on reef habitats.

First draft of the report including first phase outcomes and preliminary results of second phase was submitted to Echebaster Sustainability Working Group by June 2022. However, some of the tasks pending in December have been subjected to a delay in their delivery date, for example, consolidation work for the implementation of tasks 3-5 is still in progress according to the chronogram agreed between Echebaster Sustainability Working Group and AZTI. Second phase schedule will also be modified as the dates for the second field survey are still to be confirmed in 2022.



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