

COLLECTION OF DRIFTING FISH AGGREGATING DEVICES MANAGEMENT PLANS

Prepared by: IOTC Secretariat, 16 April, 2016

At its 18th Session, the Commission adopted Resolution 15/08 *procedures on a fish aggregating devices (FADs) management plan, including more detailed specifications of catch reporting from fad sets, and the development of improved FAD designs to reduce the incidence of entanglement of non-target species.*

The paragraph 1 describes the application of Resolution 15/08:

“This Resolution shall apply to CPCs having purse seine vessels and fishing on Fish Aggregating Devices (FADs), equipped with instrumented buoys for the purpose of aggregating tuna target species, in the IOTC area of competence.”

This document contains the FAD management plans made available to the Secretariat in accordance with IOTC Resolution 15/08, to assist CPCs in analysing the FADs management plans as required in paragraph 12, in particular with the provisions of paragraph 11 of the Resolution:

“CPCs having vessels fishing on FADs shall submit, to the Commission, on an annual basis, Management Plans for the use of FADs by their purse seiners covered in paragraph 1s. Due to their specificity in terms of users, number deployed, type of boat/vessel involved, fishing method and gear used and materials used in their construction, the Management Plans and Reporting Requirements for Drifting FADs (DFAD) and Anchored FADs (AFAD) shall be addressed separately for the purposes of this Resolution. The Plans shall at a minimum meet the Suggested Guidelines for Preparation for FAD Management Plans by each CPC as provided for DFADs in Annex I and AFADs in Annex II. For the purpose of this Resolution, the term Fish Aggregating Device means drifting (DFAD) or anchored floating or submerged objects (AFAD) deployed for the purpose of aggregating target tuna species.”

The following 9 CPCs have purse seine vessels registered in the IOTC Record of Authorised Vessels:

Australia, EU (France, Italy and Spain), Indonesia, Iran, Japan, Korea, Mauritius, Philippines and Seychelles.

From those nine CPCs, eight have provided a DFADs management plan, from which two CPC have provided a revised plan in 2015/2016 (Annex 1):

- Australia (Received 01.05.14)
- European Union (Received on 15.01.14, Spain, and 11.03.16, France),
- Indonesia (Received 12.01.15),
- Iran, Islamic Rep. of (Received 26.01.14),
- Japan (Received 25.12.13; revised plan received 26.12.14),
- Republic of Korea (Received 31.12.13; revised plan received 16.03.16),
- Mauritius (Received 14.03.14),
- Seychelles (Received 27.04.2015)



IOTC-2016-CoC13-11 Add1[E]

The 2 CPCs listed below have reported they will provide a FAD management plan:

- Mozambique had indicated that it is preparing to implement its fleet development plan for tuna fisheries and will take first steps in order to develop a FAD management plan and will keep IOTC informed on the progress,
- Sri Lanka had indicated that a plan will be submitted.

No information was provided by Philippines.

Annex 1

Collection of FADs management plans

Australia FADs Management Plan



Australian Government

Australian Fisheries Management Authority



Fish Aggregation Device (FAD) Management Plan in Australia's Tropical Tuna Fisheries

 2013

Version 1.2

Important Note:

This is not a statutory Management Plan under the *Fisheries Management Act 1991*.

www.afma.gov.au



Protecting **our** fishing future

Box 7051, Canberra Business Centre, ACT 2610 Tel (02) 6225 5555 Fax (02) 6225 5500

AFMA Direct 1300 723 621



Document Information

Distribution List

Title	Name	Date
TTMAC	TTMAC members	21 Nov 2012
TTRAG	TTRAG members	
AFMA	Staff and Commissioners	

Version Control

#	Status	Change Description	Author(s)	Date
01	Version 1.0	Drafting the FAD Management Plan	Nigel W. Abery	27 Aug 2012
02	Version 1.1	Review by AFMA's Foreign Compliance Section		28 Sep 2012
03	Version 1.2	Review by AFMA's Bycatch Section		12 Nov 2012

ACRONYMS

AFMA	Australian Fisheries Management Authority
FAD	Fish Aggregation Device
IOTC	Indian Ocean Tuna Commission
WCPFC	Western and Central Pacific Fisheries Commission



TABLE OF CONTENTS

SCOPE OF THIS POLICY	4
OBJECTIVE OF THIS POLICY	4
BACKGROUND.....	4
What is a fish aggregation device?	4
Issues with FADs.....	5
FADs use in Australian fisheries.....	6
COMMONWEALTH FISHERIES FAD MANAGEMENT.....	6
Registration of FADs.....	7
Deployment and retrieval of FADs	7
Lost and replaced FADs	7
Marking of FADs	7
Design, Construction, operation and maintenance of FADs	8
Location of FADs	8
Navigational routes and shipping.....	8
Closed areas.....	8
Fishing on FADs	9
Bycatch minimisation relating to FADs.....	9
Management of the catch of Yellowfin Tuna and Bigeye Tuna	9
Catch and Effort Reporting Relating to FADs	10
International FAD management.....	10
Implementation of this plan.....	10
DURATION, MONITORING AND REVIEW OF THIS POLICY.....	10
REFERENCES	10



SCOPE OF THIS POLICY

The Australian Fisheries Management Authority (AFMA) is the Australian Government agency responsible for the efficient management and sustainable use of Commonwealth fish resources on behalf of the Australian community.

This policy applies in both the Australian Fishing Zone and on the High Seas to Commonwealth managed commercial tropical tuna fisheries that permit purse seining as a fishing method. These include the Western Tuna and Billfish Fishery, the Western Skipjack Tuna Fishery and the Eastern Skipjack Tuna Fishery.

OBJECTIVE OF THIS POLICY

The objective of this policy is to describe AFMA's requirements for the use of fish aggregation devices by fishing concession holders in Commonwealth managed commercial tropical tuna fisheries.

This policy fulfils Australia's obligations to regional fisheries management organisations; the Indian Ocean Tuna Commission (IOTC) and the Western and Central Pacific Fisheries Commission (WCPFC). IOTC Resolution 12/08 (*Procedures on a Fish Aggregating Devices (FADs) Management Plan*) requires a Management Plan for the use of Fish Aggregation Devices (FADs). Management of FADs is also an issue under discussion at the WCPFC.

BACKGROUND

WHAT IS A FISH AGGREGATION DEVICE?

FADs are floating objects that attract fish. There are two main types of FADs: natural and man-made. Natural FADs are naturally occurring floating objects such as logs, branches, debris and large live marine organisms (whales, whale sharks, manta rays, etc). Man-made FADs can be found either drifting or anchored.

Tropical tuna such as Bigeye tuna, Yellowfin tuna, and Skipjack tuna show a natural behavioural tendency to aggregate around such floating objects. Fish aggregation devices are used in commercial tuna fisheries to target schooling tuna using a purse seine.

Fishing beside/under FADs takes advantage of the fact that tuna and other pelagic fish naturally congregate around floating objects in the open ocean and can be substantially more efficient than setting on unassociated schools. Man made FADs, improve the efficiency of fishing by aggregating tuna and reducing the time needed for searching. This is especially the case of technologically advanced FADs, with satellite beacons that enable fast location and sonar to monitor the presence and size of aggregations beneath them (Bromhead et al. 2003) thus, FAD fishing saves time, resources and fuel, and has



become a major tool of the industrialised purse seine tuna fleet globally. Tuna that school around FADs are also easier to encircle and catch than free-swimming schools. It is estimated that fishing sets around floating objects have a higher success rate (90%) than those made on free-swimming schools (50%) (Dagorn et al. 2012). FADs are also used by hand line, troll, pole and line and even gillnet fisheries. Livelihoods, food security and the economies of many regions and countries are dependent on FAD fishing.

ISSUES WITH FADS

Fishing by its very nature impacts the marine environment, yet fish are a vital source of protein and income for communities throughout the world. Fishing on FADs can have additional impacts compared to fishing around free schools:

1. It can increase the catch of 'non target' species and sizes of tunas (especially undersized, juvenile Bigeye and Yellowfin Tunas);
2. There can be relatively high bycatch of sharks, threatened, endangered and protected species (e.g. turtles and manta rays), and of other unmarketable fish species and sizes of fish;
3. Without clear ownership they can become persistent marine debris impacting marine habitats such as reefs; and
4. The ecological impact of a network of thousands of artificial drifting and anchored FADs aggregate tunas and other pelagic species from surrounding waters has not been assessed.

Catches associated with FADs (associated catches) typically consist of adult skipjack tuna, juvenile yellowfin tuna and juvenile bigeye tuna. Free-swimming school catches (un-associated catches) typically consist of adult yellowfin tuna and adult skipjack tuna. However, there is a large regional and seasonal variation in the catch compositions of fish caught in both FAD and free-school sets.

A summary of the divergence in catch composition between sets on FADs and free-swimming schools in different regions for the period 2000-2009 is provided in Table 1.

FADs also attract non-tuna species (byproduct and bycatch) (e.g., sharks, turtles, cetaceans, rays, whale sharks, countless variety of other bony fishes) which can be caught with the purse seine in associated sets on FADs. Free-swimming school catches typically contain low levels of non-target (non-tuna) species. It is estimated that the amount of non-tuna and discarded tuna is between 2.8 to 6.7 times more in FAD associated catches than free-swimming school catches (Dagorn et al. 2012).

Large numbers of FADs put into the ocean may change the movement behaviour of tunas, as they move with the FAD instead of following their natural movement pattern exhibited without the addition of extra FADs. However, it has been suggested that where floating objects are naturally present in the environment the impact from the use of additional FADs would be minimal.

Issues of FADs have been acknowledged and are in the process of finding solutions to address these issues on a regional/international scale through Regional Fisheries Management Organisations. FAD closures are being used in the WCPFC to reduce the Bigeye catches and the IOTC requires that Contracting Parties and Cooperating non-



Contracting Parties using FADs have a FAD management plan to collect information on which to base management decisions.

Table 1. Percentage composition of catches of Yellowfin, Skipjack and Bigeye tuna under floating objects (FADs) and in free-swimming schools by region for the period 2000-2009. Reproduced from Dagorn et al. (2012).

	Floating objects			Total	Free-swimming schools			Total
Ocean	Yellowfin	Skipjack	Bigeye		Yellowfin	Skipjack	Bigeye	
Atlantic	17%	69%	14%	100%	76%	19%	5%	100%
Indian	25%	67%	8%	100%	72%	22%	6%	100%
E. Pacific	15%	57%	28%	100%	43%	56%	1%	100%
W. Pacific	14%	82%	4%	100%	22%	77%	1%	100%
Global	16%	75%	9%	100%	35%	63%	2%	100%

FADS USE IN AUSTRALIAN FISHERIES

FADs are not commonly used in Australian fisheries as Australia's skipjack tuna fisheries have been in-active for the past several years for economic reasons.

COMMONWEALTH FISHERIES FAD MANAGEMENT

Purse seining can be used in the Western Tuna and Billfish Fishery, Western Skipjack Tuna Fishery and Eastern Skipjack Tuna Fishery. Fishing concession holders in these fisheries wishing to utilise FADs must apply to AFMA in writing¹.

Upon application the use of FADs in these fisheries is:

1. allowed anywhere in the Western Tuna and Billfish Fishery and Western Skipjack Tuna Fishery.
2. prohibited north of the parallel of latitude 20°S in the Eastern Skipjack Tuna Fishery.

¹ Statutory Fishing Rights still require amendment



REGISTRATION OF FADS

The applications to utilise FADs must include:

1. the number of FAD(s) to be deployed;
2. the type of FAD(s) (drifting / anchored); and
3. details on the design, construction and materials utilised in the FAD(s) (including any electronic devices and their specifications including the serial numbers of radio buoys and satellite transceivers).

AFMA will then issue a unique identification number for each FAD which must be displayed on the FAD.

DEPLOYMENT AND RETRIEVAL OF FADS

Fishing concession holders or their agents are required to give prior written notice and information to AFMA of their intention to deploy and retrieve FADs. The information to be provided includes:

1. location in latitude and longitude, to the nearest second;
2. whether the FAD is being deployed or retrieved;
3. date of deployment or retrieval;
4. if the FAD is a new or replacement FAD; and
5. the FAD's identification number as issued by AFMA.

If the concession holder fails to deploy or retrieve any of the FADs in the manner reported they must immediately notify AFMA in writing of any changes to their FAD deployment(s) or retrieval(s).

LOST AND REPLACED FADS

When a FAD has been lost the fishing concession holders or their agents are required to notify AFMA immediately. The replacement FADs must be of the same type, design, construction, materials and number as the FAD being replaced. Replacement of anchored FADs shall be in the same position as the FAD being replaced.

MARKING OF FADS

All FADs must be suitably marked for visibility and identification, the raft section must be clearly painted with reflective paint so that the raft can be seen from a distance of at least one kilometre. The marking must include the name of the vessel that deployed the FAD and the identification number as issued by AFMA.



In addition, the raft section of the FAD must also support a radar reflector and flashing light that must be suspended at least two meters above the waterline of the raft. At all times, the raft must register on radar at a reasonable distance. Electronic devices such as transponders and radio beacons which automatically and continuously indicate their position by means of signals may be used. Satellite transceivers and radio beacons must have their serial numbers clearly marked. These must not be operated at radio frequencies that would conflict with other devices used for navigation and search and rescue purposes.

DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE OF FADS

The design, construction, operation and maintenance of FADs will be the responsibility of the fishing concession holder deploying the FADs.

However, FADs must be constructed from natural and/or biodegradable materials and must not be constructed of any materials (e.g. netting) that may entangle fish, sharks, turtles and/ or any other non-target species. The “*ISSF Guide for non-entangling FADs*” includes best practice design recommendations (current as at 2012).

Anchored FADs must be constructed such that they can be reliably located at their place of deployment.

The design of anchored FADs should include an appropriate number of counter weights along the rope to ensure that the rope sinks to the bottom in the event that the raft section has come detached and drifted away.

Operators who register FADs must regularly maintain them, replace them as necessary and remove them from the water when they are not in use.

LOCATION OF FADS

Navigational routes and shipping

FADs shall not be set at locations of known high volume of sea traffic. General areas where FADs are deployed shall be reported to the relevant authorities to be published as Notice to Mariners. AFMA reserves the right to refuse FAD deployment in areas of known high volume of sea traffic.

Closed areas

FADs deployment is prohibited from all waters within 12 nautical miles of any land or island. Other closed areas include the Torres Strait Protected Zone, and any other area that may from time to time be declared by relevant Government bodies to be a prohibited area.







Australia will implement any area closures for FAD use as agreed by the WCPFC and IOTC.

FISHING ON FADS

Setting the purse seine or fishing around natural FADs is permitted. It is prohibited to fish around a man-made FAD that is not registered to the fishing concession holder.

BYCATCH MINIMISATION RELATING TO FADS

Fishing around natural or man-made FADs is prohibited if any of the following are present:

-  shark(s);
-  whale shark(s);
-  whale(s);
-  manta ray(s);
-  dolphin(s); or
-  Sea Turtle(s).

The fishing concession holder must take all reasonable measures to ensure that any of these species that are incidentally caught are handled in an appropriate manner and released alive as quickly as possible to maximise post release survival. The ISSF Skippers' guidebook to sustainable fishing practices, Chapter 3 Bycatch mitigation and handling provides best practice guidelines on this.

Concession holders must record interactions in their logbook or listed marine and Threatened Species Forms as usual.

MANAGEMENT OF THE CATCH OF YELLOWFIN TUNA AND BIGEYE TUNA

Yellowfin Tuna and Bigeye Tuna are subject to quota in the Western Tuna and Billfish Fishery and Eastern Skipjack Tuna Fishery.

In the Western Skipjack Tuna Fishery, fishers must retain on board and land all bigeye (*Thunnus obesus*) and yellowfin (*Thunnus albacares*) tuna taken. The total live weight that may be taken must not exceed:

- (a) two percent (2%) of the total live weight of skipjack tuna taken with the use of the boat during the season commencing 1 July in any year and ending on 30 June in the following year; and
- (b) in any trip, fifty percent (50%) of the total live weight of skipjack tuna taken during that trip.



CATCH AND EFFORT REPORTING RELATING TO FADS

Where fish are caught using a FAD, the FAD identification number for man-made FADs or the type of FAD for natural FADs and recorded in the comments section for the corresponding shot of the vessel's logbook, currently *the Purse Seine Daily Fishing Log* (PS01A).

Relevant information collected in logbooks will be reported to the IOTC as required under their standards for scientific data according to Resolution 10/02.

INTERNATIONAL FAD MANAGEMENT

Conservation and Management Measures and Resolutions agreed to by Australia at the WCPFC and IOTC will be reflected in domestic management.

IMPLEMENTATION OF THIS PLAN

This plan will be implemented through conditions on Statutory Fishing Rights or fishing permits for the relevant fisheries.

DURATION, MONITORING AND REVIEW OF THIS POLICY

This policy remains valid until revised, replaced or removed. The use and catch composition of FAD associated fishing will be monitored through the mandatory prior reporting (stated in this policy), routine observer coverage, mandatory logbook records and routine compliance activity. This policy will be reviewed after two years of data on catch and effort taken on FAD has been collected.

REFERENCES

Bromhead, D., Foster, J., Attard, R., Findlay, J. and Kalish, J. (2003) *A review of the impact of fish aggregating devices (FADs) on tuna fisheries*. Bureau of Rural Sciences, Department of Agriculture, Fisheries and Forestry. Pp 121.

Dagorn, L., Holland, K.N., Restrepo, V., and Moreno, G. (2012) *Is it good or bad to fish with FADs? What are the real impacts of the use of drifting FADs on pelagic marine ecosystems?* Fish and Fisheries. 16 May 2012 online.

Indian Ocean Tuna Commission (2012) Resolution 12/08 *Procedures on a Fish Aggregating Devices (FADs) Management Plan*.



FAD Management Plan

Introduction

Definitions

Fishing activity: Any activity relating to locating fish, laying underwater, deploying, trolling or hauling fishing gear, hauling catch on board, transshipping, retaining, processing on board, transferring and unloading fish and fish products;

Beacon: Electronic device used for locating and monitoring FADs.

Fish Aggregating Device (FAD): Floating and drifting, natural or artificial, object deployed or used by a fishing vessel in order to aggregate tuna schools that are targeted to be caught by purse seine gears. FAD-related activities are: deployment/launch, beacon setting to monitor FAD trajectory (whether it is deployed or simply found by the vessel), FAD-aggregated school fishing, FAD visiting, maintenance, repair and removal;

Traceable Fish Aggregating Device (TFAD): Floating and drifting, natural or artificial, object equipped with a beacon allowing for its localisation and tracking, hence modifying markedly a vessel's fishing strategy and effort. TFAD-related activities are similar to FAD-related ones, with additional beacon setting, exchange or removal in order to monitor FAD trajectory;

Fishing vessel: Any vessel equipped for commercial exploitation of aquatic living resources;

Support vessel: Any vessel assisting a fishing vessel in its fishing activities. The support vessel doesn't have any fishing gear.

1. Objectives

The French FAD Management Plan has 3 objectives:

- **Improving knowledge on FAD-associated fishing activities:**

A deeper knowledge of this fishing practice will allow to better assess its potential impacts and define the most appropriate management measures. In this perspective, the scope of the information entered by vessel skippers on FAD activities, specifically, will be extended and made systematic.

In addition to details regarding the type of FAD fished (natural log, artificial draft, "classic" or "non-entangling" FAD) which are already recorded, information on FAD launch, recovery or transfer/modification will be collected through a "FAD" module in electronic logbooks (ELB) that will be adapted to tuna fisheries and RFMO requirements. These data are of major interest for scientific assessments because they allow to better quantify purse seine fishing effort and consequently improve stock assessments, and they can easily be cross-referenced with the information reported by scientific observers.

Moreover, the number of activated/deactivated beacons per vessel is subject to quarterly reports from beacon suppliers since January 1st, 2010. These reports are independent of skippers and shipowners. Two control levels can be implemented by the competent authority. On one hand, at the level of buoy suppliers (Each INMARSAT or IRIDIUM identifier is assigned to a vessel (or several vessels in the case of shared buoys). The identification of the vessel(s) can be checked with each buoy supplier). And, on the other hand, at the level of satellite communication providers (To allow satellite transmission of buoy information (position/sounder messages), all buoy suppliers must activate the buoy transmitter for their customers).

- Limiting the use of FADs:

For French shipowners, the main management measure for FAD fishing is to limit the use of FADs. This limitation must apply to FAD-associated beacons (about 90% of purse seine sets made under objects involve drafts or natural logs that have already been encountered before and equipped with beacons). Since these beacons are satellite-monitored, the most efficient and accurate way to know the effective number of drafts deployed at sea is to use the data provided by the beacons (including information on their activation and deactivation). A system based on systematic reporting of beacons in use, along with a "numerus clausus" mechanism, has therefore been implemented by shipowners.

- Reducing potential impacts of FADs on ecosystems:

In addition to the reduction of potential impacts resulting from limitation of the number of FADs, the Management Plan also incorporates provisions of a more qualitative nature resulting from experimentations or additional research in the following fields: adoption of best practices (release of entangled turtles, for instance), improvement of selectivity (non-entangling FADs, "*turtle/shark free FAD*"), adaptation of fish-finding strategies, identification of fish sizes through echointegration on lateral sounders...

Given their level of use, the French FAD Management Plan does not provide, for the time being, for the supervision of support vessels that help mother vessels manage a fleet of FADs and multiply FAD deployment and tracking.

2. Scope

Vessels involved

This FAD Management Plan applies to tuna purse seiners registered in a French port and operating in the waters of Atlantic, Indian or Pacific oceans, as well as to support vessels involved in tuna fishing activities.

Limiting the use of FADs

Ship-owners should keep their annual purchase of beacons within an average of 200 beacons per vessel.

No fishing vessel is allowed to have more than 150 active beacons at any time. For a vessel, the number of active beacons at a given time corresponds to the sum of:

- the number of active beacons owned, and
- the number of joint beacons (activated by a fishing or a support vessel) divided by the number of tuna purse seiners associated with them.

Since the latter ones can't be independently controlled, the use of HF beacons is forbidden from June 30th, 2012.

Vessel skippers and owners will continue to implement all necessary measures to prevent or limit the loss of FADs at sea.

Reporting procedure for DFAD deployment

DFAD deployment is reported in logbooks as provided for in paragraph 7.

Mitigation measures for catches of FAD-associated juveniles, small tunas and bycatch

All actions aiming at improving purse seiners' selectivity when fishing under objects are encouraged so as to limit discards and, in particular, harvesting of juveniles and small individuals of targeted species, or bycatch of non-targeted species (with particular attention to sensitive species such as sharks).

Shark conservation measures (mainly FAD-associated)

Shipowners encourage crews to implement methods for live release of sharks that seem the most efficient and least dangerous to them, develop standard procedures for different types of catch (big sharks, small sharks, mantas, whale sharks) and disseminate them.

Shipowners ask crews to facilitate the work of on board scientists who tag sharks before their live release to assess their survival rate.

Shipowners make available to crews the necessary information and training to improve live release practices for sharks caught by purse seiners, under optimal security conditions for the crew, by January 1st, 2012, and provide vessels with shark and ray handling and releasing devices by January 1st, 2014.

Monitoring and recovery plans for lost DFADs

Loss reporting is made under quarterly reports on beacon deactivation.

DFAD ownership

DFAD ownership is related to the associated beacon.

3. Institutional arrangements for managing DFAD Management Plans

Institutional responsibilities

The responsibility for monitoring drifting FAD Management Plans is entrusted with the organization of producers in charge of French-flagged vessels involved.

Authorization request process for deployment of DFADs and/or DFAD beacons

Under the Management Plan, the organization of producers allows vessels to set a maximum of 150 activated beacons at any time.

Vessel owner and skipper obligations regarding deployment and use of DFADs and/or DFAD beacons: beacon record and monitoring

The vessel skipper or owner holds a specific record of beacons used by the vessel, where each beacon is referenced:

- Its serial number;
- The vessel(s) having access to the localisation information of this beacon;
- The make and type of the beacon;

The use of TFADs is subject to monitoring through quarterly reports from beacon suppliers, who track their FADs. This quarterly report establishes the number of active beacons at the beginning of the period, the number of activated beacons during the quarter, the number of deactivated beacons during the quarter, the number of active beacons at the end of the period and the number of beacons that transmitted during the quarter.

For scientific research and statistical purposes, this data, along with the recording of beacon positions, can be communicated to scientific institutions and relevant fisheries management bodies, in compliance with confidentiality requirements.

DFAD and/or DFAD beacons replacement policy

Ship-owners should keep their annual purchase of beacons within an average of 200 beacons per vessel. In parallel, from 2014 on, a gradual shift to biodegradable DFAD use will take place.

Reporting requirements

Reporting requirements are stated in paragraph 7.

Confidentiality measures regarding information on FAD fishing

Any information reported in accordance with the present Management Plan must be treated as confidential and can only be used for scientific, statistical and/or control and surveillance purposes. Any other use of this information shall obtain the vessel owner's consent.

4. Specifications and conditions for the construction of DFADs

Design features of DFADs (description)

Shipowners make available to crews the necessary information to build FADs with a very low, or even no, risk of entanglement for turtles and sharks, and provide vessels with material to build such FADs. By January 1st, 2014, shipowners will implement workshops on the construction of non-entangling FADs in each of the purse seiners home ports (Abidjan in Côte d'Ivoire, Seychelles and Mauritius).

It is forbidden for fishing and support vessels to launch a FAD that was not designed to reduce to zero the risk of turtle and shark entanglement.

These measures will enter into force on January 1st, 2012 for all vessels operating in the Indian Ocean, and on January 1st, 2013 for all vessels operating in the Atlantic Ocean.

FAD identification and marking

All TFADs launched by French tuna purse seiners are identified by a serial number on the associated beacon. This number must be visible without dismounting the beacon and designed to be sea water-proof and remain legible through the whole lifespan of the beacon. Visibility distance must be the shortest possible.

5. Implementation period of DFAD-MP

The current Management Plan is established for a duration of 3 years starting on January 1st, 2012. It will be jointly reviewed by relevant shipowners, administrative authorities and scientific institutions and shall be amended accordingly if necessary.

At the end of the current Management Plan, a new plan will have to be enacted based on the experience acquired during the implementation of the current plan and taking into account the changes in international regulations.

6. Monitoring and review methods for DFAD implementation

The monitoring and review of the DFAD-MP implementation is jointly exerted by the Ministry of Ecology, Sustainable Development and Energy (France) and the relevant organization of producers for French-flagged vessels that are involved.

7. "DFAD logbook"

Recording of FAD activities

The skippers of fishing or support vessels record in their logbooks the following activities:

- Deployment/launch of FADs
- Removal of FADs
- Visiting of FADs with or without handling (maintenance/exchange)

For each of these activities, the information collected is the following:

- Date and time;
- Position (latitude, longitude);
- Type of FAD (natural or anthropic log, artificial, "classic" or "non-entangling" draft) along with a short description (tree trunk, pile of straw, container, rope, ...) if necessary;

- Number of associated beacon in case of a TFAD;
- Number of removed beacon in case of a TFAD if the beacon belonged to the vessel, if not write "beacon of a third vessel";
- Any observation of entangled sharks or turtles when the FAD has net parts.

In addition to the information listed above, skippers of fishing vessels also record in their logbooks, for each FAD-associated fishing operation, the following information (already partly covered by regulations):

- In case of a TFAD, if the beacon belongs to their vessel or to a third vessel;
- Tons caught per species (targeted tunas or bycatch);
- Any discard quantities

For scientific research and statistical purposes, the data on FAD activities reported by vessel skippers can be communicated to scientific institutions and relevant fisheries management bodies, in compliance with confidentiality requirements (see below).

(NON OFFICIAL TRANSLATION)

MANAGEMENT PLAN FOR FISH AGGREGATING DEVICES (FAD)

1. Basis and background of this plan

The current legislation in force covers the following provisions that justify the elaboration of this management Plan for fishing aggregating devices utilized by the Spanish purse seiner fleet targeting tropical tunas:

- The United Nations Stock Agreement has as the main goal the assuring of long term conservation and sustainable exploitation of the stocks of highly migratory species.
- FAO code of good practices, with regard to fishing investigation, sets the obligation of the reliable data collection which enables the due stock assessment just like the implementation of studies on fishing gear selectivity and its environmental impact and to promote the results of the investigation as the basis to establish the management objectives.
- CE Council Regulation n 2371, 20th Dec 2002, on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy, points out as the main target is the sustainable exploitation of living aquatic and aquaculture resources in the context of sustainable development, having into account environmental, economic and social aspects in a balanced fashion.
- Law 3/2001, of Maritime Fisheries, sets amongst its goals, in article 3 the safeguard of the responsible fisheries resources exploitation, encouraging its development and adopting all necessary measures to protect, preserve and regenerate the said resources and their ecosystems and promote the fisheries and oceanographic research.
- FAO code of conduct points out that *"fishing gear should be marked according to national legislation to identify the owner of the gear. The requirements of this marking should have into account uniform marking systems and internationally acknowledged."*

Lastly, and following the FAO Code, *"the States should cooperate in the perfection and implementing of operative fishing technologies, materials and methods to minimize the loss of fishing gear and its effect as ghost fishing"*.

2.- Obligations under the RFMOs regarding FADS.

Having into account the generalization of the use of these devices by the fleet all RFMO with competencies have adopted the following provisions:

WCPFC:

- **Conservation and Management Measure for bigeye and yellowfin tuna (CMM 2008-01).** Pursuant to the provisions of points 23 and 24 of said measure, all the Parties in this Commission shall submit FAD management plans. Moreover, it sets out a FAD fishing closure for the 2009-2011 period
- **Conservation and Management Measure on the application of high seas FAD closures and catch retention (CMM 2009-02),** which sets out the specifications regarding FAD closure

CTOI:

- **Resolution 10-02, on mandatory statistical requirements for IOTC members and cooperating non contracting parties (CPCS)**, sets that all parties shall submit on a quarterly basis the number of FADS deployed per vessel.
- **Recommendation 10-03, on the recording of catch and effort by fishing vessels in the IOTC area of competence**, establishes the obligation of the recording in the log book on board the information regarding the FAD deployment, just like sets and catches carried out in association with them.

IATTC:

- **IATTC Resolution 2009-01 on the multiannual program for the conservation of tunas in the East Pacific Ocean**, which sets the intention of this Commission to undertake a pilot program for research into and gathering information on FADS.

Apart of these, all measures to avoid accidental catches of sea turtles should be taken into consideration, given the incidence of certain sort of FADS on the incidental catch of these species.

3. Objectives

- Improving information collection for scientific advice purposes.
- Contributing to enhanced knowledge of catch composition in FAD sets.
- Increasing knowledge of these devices with regard to their technical features and their possible impact on ecosystems.
- Establishing information-sharing mechanisms among operators, scientists and administrations, in order to achieve better knowledge of progress made in this field and the implications thereof.

4. Scope of application of the present plan

The present plan is aimed at Spanish-flagged freezer tuna purse seiners operating in the Indian, Atlantic and Pacific Ocean, targeting tropical tuna as well as Spanish flagged supply vessel supporting the mentioned purse seiner vessels.

5. Definitions

The following definitions shall only affect the present plan, in order to enhance understanding thereof.

- **Main vessel**: Fishing vessel making catches and to which catches made are assigned.
- **Support vessel**: Fishing vessel acting as an auxiliary vessel for main vessels, assisting in fishing; for example in deploying, monitoring and hauling in FADS.
- **Fishing activity**: Extracting fishing resources in external waters, as well as crustaceans and molluscs, using fishing gears and methods.

Fish Aggregating Device (FAD): Natural or artificial objects deposited on the surface, under which various species aggregate, thus making them more accessible for fishing vessels to locate and catch.

Types of FADs

- **Anchored FADs**: Those artificially moored to the seabed to prevent drifting, including support vessels anchored to a seamount.

- Drifting raft with a net: Unanchored FADs composed of a panel—either continuous or grill-shaped—associated with a net used as a sail at sea.
- Drifting raft without a net: Unanchored FADs composed of a panel—either continuous or grill-shaped.
- Natural FADs: Any FAD found at sea (e.g. plant remains, dead animals, man-made waste) used as a FAD.
- Other drifting FADs: Any FAD other than those above.
- FAD-related activities
 - Deployment: Operation by which a vessel release a FAD at sea.
 - Verification: Operation by which a vessel monitors a previously deployed FAD in order to perform maintenance activities or to check the aggregation of fish around the device.
 - Set: Fishing manoeuvre to catch shoals of fish associated with a FAD.
 - Hauling: Operation by which a vessel retrieves a FAD from the sea.
- Beacon: Device whose purpose is locating or monitoring a FAD.
- Types of beacons
 - GPS beacon: Beacon accompanied by a global positioning system (GPS)
 - Radio beacon: Beacon accompanied by a radio system
 - Visual beacon: Beacon without any electronic device, only identifiable by sight
- Oceanographic buoy: Buoys used for oceanographic research.

6. Identification of FADs

Each FAD shall have a sequence of characters serving as an identifier for each device to be used. This sequence shall not vary during the device's lifespan.

Operators may choose the identification system, with the only prerequisite that it be individual and unique for each FAD.

Depending on the results obtained through the implementation of the present plan, in the future—if it is considered appropriate—a single marking system may be established for all FADs used by the Spanish fleet.

7. Register and information-sharing regarding FADs

7.1. Inventory

As an initial measure, operators shall send the Deputy Directorate General for Agreements and Regional Fisheries Organizations, by 31 December 2010, a list of operative FADs being used by the fleet at that date.

This list shall include, for each FAD, the information contained in Annex I.

As far as possible, this information should be provided at the detail level of fishing vessels.

This list shall be promptly updated whenever a change takes place, and such updates must be sent at least quarterly.

The aim of this inventory is to provide as much information as possible on the characteristics of FADs being used, and to enable scientists to analyse the data collected in fishing logs thanks to the individual identification of each FAD.

7.2. Specific Activity Register

Operators shall keep a register where FAD-related activities shall be recorded.

The information that must be recorded in this register is included in Annex II of this plan.

If operators use any natural FADs, this information shall also be recorded, and in such cases deployment shall be understood as assigning a beacon, and hauling as withdrawing the beacon. Should this FAD be intended for periodical use, information regarding it shall be included within the inventory envisaged above.

Whenever an activity is conducted involving a FAD that does not initially belong to the fishing or auxiliary vessel that detected it, all the information regarding this activity shall also be reported. The word "external", together with the visible character sequence leading to its identification, shall be recorded in the section corresponding to identification.

Finally, for each activity conducted involving a FAD, every incident regarding accidental catches shall be recorded: species, number of specimens, and number of specimens released alive.

This activity register shall be sent at least quarterly to the Deputy Directorate General for Agreements and Regional Fisheries Organizations.

7.3. Records in fishing logs

In addition to the specific register set forth above, ship captains shall continue to record in the fishing logbook the following information relating to FAD activity.

- FAD sets: The position, date, identification and result of the set shall be recorded.
- As in the above section, all sets involving FADs that do not initially belong to the fishing vessels must be recorded, as well as sets involving natural FADs which will be part of the inventory.
- Catches associated with marine mammals, basking sharks, seamounts, or any element that could affect fish aggregation (dead animals, concentration of diverse materials, etc.), in order to provide the most complete information possible on the set, indicating position, date and result of the set.

8. Monitoring FADs

As far as possible, vessels must record monitoring information for each FAD that has a satellite beacon, based on its assigned number.

Moreover, efforts should be made to record information obtained from other beacons (e.g. visual, radio).

There shall be no obligation to communicate the recorded information. However, such information may be requested in order for the designated scientific personnel to conduct specific studies. This information may be requested, prior approval by the operators for its use.

9. Measures to prevent loss of FADs

Vessel operators shall prevent, as far as possible, loss of FADs at sea.

In the event of a loss or of the impossibility of hauling in a FAD (areas or seasons closed to fishing), operators must record, in the Specific Activity Register, its last known date and position.

10. Measures to mitigate the catch of juvenile tuna and non-target species

The Parties to this plan may propose pilot actions in order to advance in some of the aspects described below.

More selective methods shall be promoted in order to prevent the catch of juvenile fish and associated species, such as sorting grids incorporated into the purse seine, with the aim of reducing the catch of juvenile tuna and associated species.

The use of acoustic methods (sounders, echo sounders) shall be encouraged, aimed at more selective fishing, identifying undesired species or sizes, prior to the set.

Research on alternatives to nets hanging from FADs shall be promoted, in order to prevent the entanglement of some marine species, especially turtles, by using other materials or smaller mesh to minimize these adverse effects.

The Protocol for releasing turtles established for purse seiners by the Inter-American Tropical Tuna Commission (IATTC) shall be taken into account.

11. Specific closures on fishing with FADs

Between 1 July and 30 September, fishing with FADs is forbidden in the area of the Western and Central Pacific Fisheries Commission (WCPFC), where the following conditions have been established:

- During this closure, operators may not make sets within 1 nautical mile around the FAD.
- Operators may not catch the fish aggregated under a ship, nor may they move these fish, including the use of lights and chumming to attract them.
- FADs and beacons may only be hauled in, following authorization, provided that they are kept on board until disembarkation or the end of the closure, and that no set is made in the 7 following days or within 50 nautical miles around the FAD hauling point.
- Furthermore, regarding the above section, two ships may not cooperate to avoid this measure, and sets made by any ship within 1 nautical mile around the FAD hauling point are forbidden during the 24 following hours.

During the closure, FADs may not be deployed or hauled in.

In addition, all closures established in the rest of RFMOS on free school and FADS shall be taken into account:

- IOTC: purse seiner vessel shall not fish from 00:00 1st Nov to 24:00 1st Dec, within the area enclosed in the following coordinates: 0-10° N 40-60° E.
- IATTC: purse seiner over 182 TM of carrying capacity must cease their activity for 62 days in 2010, and 73 in 2011. Two different periods are to be chosen: for 2010, from 29th July to 29th Sep, or from 18th Nov to 18th Jan of 2011. For 2011, from 29th July to 29th Sep, or from 18th Nov to 18th Jan of 2012. A
- IATTC: apart of these periods, fishing for skipjack, bigeye and yellowfin carried out by purse seiners within area 96-110° W and 4°N 5°S shall be prohibited between 29 Sep and 24:00 of 29th Oct.
- ICCAT: from 1st Jan to 28th Feb each year, fishing for bigeye and skipjack on FADS is forbidden within the area enclosed by: African coast, 10° S; 5° W, and 5° E.

Finally, it is forbidden to make sets using oceanographic buoys as FADs, given the damage that such operations can inflict on these scientific instruments.

12. Measures to monitor and follow up the present plan

The relevant authorities may perform documentary monitoring of the provisions envisaged in the present plan, and they may require, if necessary, the data described in section 6.

The Spanish Institute of Oceanography (IEO), as the Spanish scientific authority in this regard, shall be responsible for processing and monitoring the information provided by the operators, and shall be authorized to draft the follow-up reports for this plan and to propose the measures it deems appropriate in order to improve the functioning thereof.

Moreover, the General Secretariat for the Sea may determine, in coordination with the IEO, the participation of other scientific bodies in order to fulfil the objectives set forth in the present plan.

13. Confidentiality measures for the information provided by operators

The information provided by the operators shall be treated as confidential at all times, and its use shall be restricted solely to scientific or monitoring purposes, if necessary. The General Secretariat for the Sea undertakes not to disclose this sensitive information, other than for the aforementioned purposes, without the express consent of the shipowners.

14. Amendments to the present plan

This plan shall be amended in line with future measures adopted within the different RFMOS and with the conclusions of the reports envisaged in section 13.

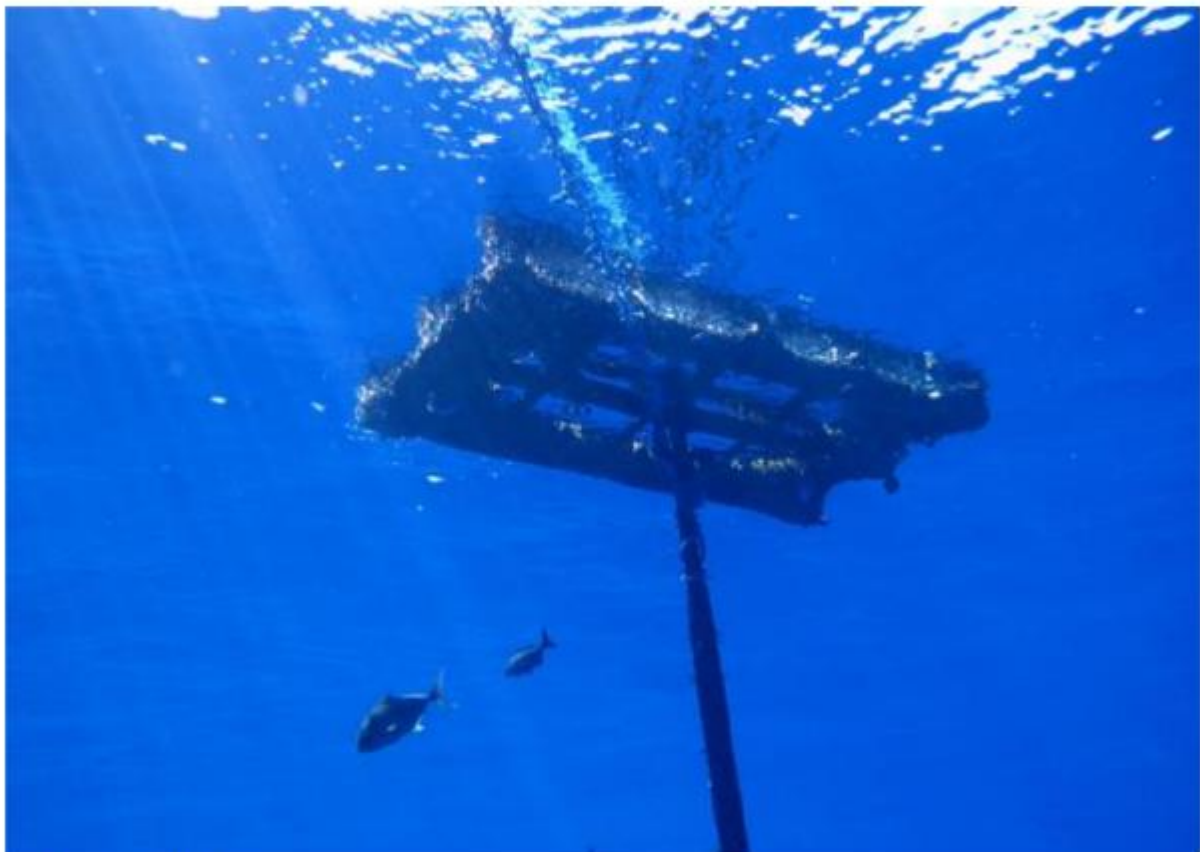
ANNEX I

IDENTIFICATION		
DESCRIPTION OF THE FAD		
SIZE	WIDTH	
	LENGTH	
	DEPTH	
NET	SIZE	
	MATERIAL	
	MESH SIZE	
	OTHER	
MATERIAL		
ASSOCIATED BEACON NUMBER		

C) SPECIFIC FAD ACTIVITY REGISTER

Vessel		Code:		Registration No.:	
Identification	Date	Ship's clock time	Activity	Position	Observations

**INDONESIA DRIFTING FISH AGGREGATING DEVICES
MANAGEMENT PLAN IN INDIAN OCEAN
(DFADs MANAGEMENT PLAN FOR 2015 – 2017)**



Source: ISSF

INDONESIA DRIFTING FISH AGGREGATING DEVICES MANAGEMENT PLAN IN INDIAN OCEAN (DFADs MANAGEMENT PLAN FOR 2015 – 2017)

1. Objective

The objective of this FADs management plan are but not limited to:

- a. Strengthen a collection of scientific data.
- b. Minimize the catch of bycatch of small tuna on FADs
- c. Strengthen catch composition data collection to purse-seine fisheries on FADs.
- d. Limit a number of deployed FAD.

2. Scope

Description of its application with respect to:

- a. Vessel Type:
 - i. Small pelagic purse-seiner with one boat;
 - ii. Large pelagic purse-seiner with one boat;
 - iii. Large pelagic purse-seiner-group
 - iv. Handline
 - v. Pole and line

- b. DFAD numbers and/or DFADs beacon numbers to be deployed:

Each eligible vessel only granted to deploy maximum 3 (three) sets of FADs.

- c. Reporting procedures.

Reporting procedure is classified into two (2) categories, namely:

- c.1 Reporting Procedure for DFAD deployment

Any company or operator or person who has deployed FADs is required to submit a FAD deployment report to Directorate General of Capture Fisheries, shall include:

- i. Date and time of FADs deployment.
- ii. Number of deployed FADs
- iii. Marking of FADs
- iv. FADs position (Latitude and Longitude)
- v. Name of fishing vessel and its gear type.
- vi. Conclusion and recommendation

c.2 Reporting Procedure for DFADs Harvesting

Any fishing company or operator or person who has harvested fish on FADs is required to submit a harvesting report to Directorate General of Capture Fisheries, shall include:

- i. FADs location (latitude and longitude)
- ii. Marking of FADs
- iii. Name of fishing vessel and it's gear type
- iv. Frequency of harvesting.
- v. Number and catch species
- vi. Catch composition

d. incidental bycatch reduction and utilization policy:

i. Catch Retention

Each eligible vessel to have FADs shall retain all catch on board, both target species and bycatch such tuna juvenile.

ii. Releasing Turtle

Each eligible vessel to have FADs shall require to release all marine turtles which are entangled in fishing gear.

e. Consideration of interaction with other gear types:

There is a potential conflict between eligible vessel to have FADs and Tuna Longline fleet.

f. Plans for monitoring and retrieval of lost DFADs

Monitoring may be undertaken at the time of deployment as well as harvesting. During this monitoring, lost DFADs will be retrieved. In this incident, investigation will be made to find out the owner of DFADs.

3. Institutional arrangements for management of the DFAD Management Plans:

a. Institutional responsibilities:

Directorate General of Capture Fisheries, Ministry of Marine Affairs and Fisheries is responsible to manage FADs to be deployed by Indonesia flagged vessels.

b. Application processes for DFAD and /or DFAD beacons deployment approval:

- b.1 Each person who is intending to deploy FADs within Indonesia Fisheries Management Area and High Seas shall require to have FAD License to be issued by Director General of Capture Fisheries.

- b.2 Application to have FAD shall be submitted to Director General of Capture Fisheries by Providing the following information:
- Date of FADs Deployment;
 - Proposed of Number of FADs;
 - Location of FADs Deployment (latitude and longitude);
 - Estimation of harvesting frequency (monthly or yearly basis);
 - Estimation of fish species and catch in each setting.
- b.3 In addition to the requirement as stipulated in point b.2, the application shall be accompanied with the following document:
- Copy of Fishing Permit;
 - Copy of ID of vessel owner or responsible person;
 - FADs layout and general specification such as material, dimension, and number of each FADs main component;
- c. Obligations of vessel owners and masters in respect of DFAD and /or DFAD beacons deployment and use
- c.1 Vessel owner and master shall submit a report to Director General of Capture Fisheries in respect of DFADs deployment shall include minimum information as following:
- Date of FADs Deployment;
 - Number of Deployed FADs;
 - Location of each FADs (latitude and longitude);
 - FADs Marking;
 - Name of vessel and type of fishing gear;
 - Conclusion and recommendation.
- C.2 Vessel owner and master shall submit a report to Director General of Capture Fisheries in respect of DFADs use shall include minimum information as following:
- Location (latitude and longitude) of used FADs;
 - FADs Marking;
 - Name of vessel and type of fishing gear;
 - Frequency of harvesting of FADs;
 - Catch by species.
- d. DFAD and/or DFADs beacons replacement policy
- d.1 In case FADs license is expired and not be renewed, the holder of FADs License shall discharge of the deployed of FADs.

- d.2 In case the holder of FADs license does not discharge the deployed FADs as stipulated in para d.1, he or she will be classified as non-eligible person to have new FADs license.
- e. Reporting obligations
 - e.1 Report of FADs deployment shall be submitted to Director General of Capture Fisheries within 14 days after the deployment.
 - e.2 Report of FADs use shall be submitted to Director General of Capture Fisheries every six (6) month.

4. DFAD construction specifications and requirements

- a. DFAD design characteristics (a description)

DFAD component consist of:

 - i. buoy;
 - ii. attractor;
 - iii. rope; and
 - iv. weight.
- b. DFAD markings and identifiers, including DFADs beacons:

DFAD marking composed of:

 - i. Name of owner;
 - ii. Number of fishing permit and fishing vessel authorized to use DFADs.
 - iii. Location (latitude and longitude) of DFADs deployment.
- c. Lighting requirements

4000 watt – 16000 watt.
- d. Radar reflectors

Radar reflector is a piece of flat galvanized steel that could be detected by radar.
- e. Visible distance

DFADs can be deployed with a minimum distance ten (10) nautical miles each other.
- f. Radio buoys (requirement for serial numbers)

No radio buoys requirement regulated.
- g. Satellite transceivers (requirement for serial numbers)

No satellite transceivers requirement regulated

- h. Technical requirement in DFADs use.

It is prohibited to shift of DFADs by vessel or other auxiliary tool which is intending to gather aggregated fish in more than one DFADs.

5. Applicable areas

This plan is applied to Indonesia flagged vessel that are fishing in the following waters:

- a. Indonesia archipelagic waters
- b. Indonesia territorial waters
- c. Indonesia Exclusive Economy Zone
- d. High Seas of Indian Ocean

6. Applicable period for the DFAD–MP

DFAD Management Plan will be implemented during 2015-2017.

7. Means for monitoring and reviewing implementation of the DFAD–MP

- 7.1 Regular monitoring will be undertaken by fisheries observer by fishing vessel or fisheries patrol boat.
- 7.2 DFAD Management Plan will be reviewed every 3 (three) year and will be amended at any time if deemed necessary. The first review will be done in 2017.

8. DFAD logbook

No specific DFAD logbook regulated.

Iran FADs Management Plan

Plan of Iran for Fish Aggregating Devices (FADs) in Purse Seiner Vessels

1 – Current situation of Purse Seine Vessels in Iran

Industrial fishing vessels which are used for tuna fishing are eight purse seine vessels. One of fishing gears used in these vessels like any other purse seiners in high seas and international waters of the Indian Ocean are Fish Aggregating Devices (FADs). Each vessel, averagely install 20-30 FADs at sea and control them via radio buoys. Installation of FADs is according experiments of captain of vessel by climate changes, time and place of installation, sea currents and based on policies of IOTC for member countries.

Installation of FADs and collecting them are according national plans, policies and regulation of Iran besides local and regional regulations (like Tuna Fishing Regulations). It must be noted that industrial fishing vessels which are using purse seine methods in the Oman Sea (EEZ of Islamic republic of Iran) do not use FADs and they only use FADs for international waters fishing activities. They usually fetch missed or lost FADs by correspondence with coastal countries but, vessels owners are not so eager to inform others on how they use FADs.

2 – Program of Iran Fisheries Organization for Management of FADs

Iran Fisheries Organization believes that some of non-target fish species might be caught during fishing activity. Main part of catch in purse seine vessels are from high seas and international waters of the Indian Ocean with the help of FADs and fishing by FADs are much better than other methods used (like free herd, supply vessels and whale ... methods) and on the other hand, due to some technical and non-technical reasons, despite using FADs by purse seiners catch level is lower comparing to other similar countries. Hence, there is no plan to substitute FADs with similar devices. Therefore, Iran is preparing regulations for controlling FADs and extension services to publicize the devices. However, vessel managers and captains are committed (obliged) to report their activities in their improved logbook. In coastal waters and shallow waters of the Oman Sea using FADs are banned, thus there is no conflict with other fishing gears.

3 – FADs Characteristics

FADs used by fishing vessels are from D-FAD. This device is mostly made of bamboo wood or renewable materials in their natural forms. Some buoys are installed on these FADs which have special serial numbers and beside that number, name of vessel has been marked on FADs. These Buoys are traceable via satellite. Dimensions of these FADs are approximately 2*3 and or 3*3 meters. These devices have no reflection on radar instruments and can be seen from 4 mile distance.

4 – Operation Zones

Operation zone for purse seiners is the Oman Sea and international waters of Indian Ocean. Fishing around islands, coastal waters and EEZ of coastal countries should be through paying Royalty to these coastal countries.

5 – Inspection and Control program for Management of FADs

Vessel Monitoring Plan to monitor vessels using FADs can use three methods including VMS, logbook control and onboard inspector visits for these vessels according to a regular timetable. This plan can be tailored for two-year period.

6 –FADs Logbook

Supplying separated data on different log sheets seems to be a hard job for fishing community. Noting the common items between Logbook of Catch and Logbook of FAD, they can be merged in one sheet as attached.

(In last row of the Table, you can see name of person in charge, date of filling the Table besides his signature)

جدول گزارش روزانه عملیات صید کشتی های پرساینر (Purse Seiner vessels logbook)

خروج از/Port: Departure From بندر/ Loch		ورود به/Arrival TO بندر/Port □ لنگرگاه/Loch □		نام و شماره ثبت شناور/ Name&No Vessel		نامخدا/ Master		شماره صفحه / Sheet No	
نام بندر / Name Port :		نام بندر / Name Port :							
تاریخ / Date :		تاریخ / Date :		ساعت / Hour :		ساعت / Hour :			

تاریخ Date	موقعیت تور ریزی (طول و عرض جغرافیایی)- Position	تور ریزی Set		صید تخمینی Estimated catch												صید از طریق این تجهیزات Association				جریان آب Current
		موفق Successful	ناموفق Nill	specify time زمان تور ریزی - 2	شماره مخزن ماهی Well	گیر yellowfin average catch size kg میزان صید kg catch rate	هورر مسقطی sk ipjack average catch size kg میزان صید kg catch rate	چشم درشت bigeye average catch size kg میزان صید kg catch rate	هورر دم دراز longtail average catch size kg میزان صید kg catch rate	زرد کawkaw average catch size kg میزان صید kg catch rate	سایر گونه ها Other (غالب) Species نام گونه name of species average catch size kg میزان صید kg catch rate	گونه های غالب Discards نام گونه name of species average catch size kg میزان صید kg catch rate	کله آزاد Free school	لاگ * log	کشتی پشتیبان supply vessel	بویه beacan	نهنگ shark wale	جهت 5- degree/ direction	سرعت (نات) speed	
تاریخ استقرار:.....موقعیت جغرافیایی:(طول).....عرض.....شماره سریال:(راديو بویه.....گیرنده ماهواره ای.....)بزار غد:(طبیعی مصنوعی)سایر لاگ:(۲*۲، ۳*۳) مواد بکار رفته:(.....)نوع بازید: (استقرار کنترل برداشت تعمیر) نام و نام خانوادگی تکمیل کننده :عنوان شغلی در شناور:تاریخ تکمیل :امضاء :																				
توضیحات :																				

DFAD Management Plan for Japanese tuna purse seine fishing vessels

Fisheries Agency of Japan (FAJ)

1. Objective

This document describes Drifting Fish Aggregating Devices (DFAD) Management Plan to be applied for Japanese tuna purse seine fishing vessels, in order to fulfill paragraphs 2 and 6 of IOTC Resolution 13/08. The objective of the plan is to ensure that the use of DFAD by Japanese tuna purse seine fishing vessels is managed in consistent with the conservation and management measures and data collection requirements of the Indian Ocean Tuna Commission.

2. Scope

(1)Vessel-types and support and tender vessels:

This Management Plan applies to DFAD used by Japanese tuna purse seine fishing vessels during their fishing operation in the Indian Ocean for the period of year 2014 and thereafter unless otherwise decided.

(2)DFAD numbers and/or DFAD's beacon numbers to be deployed:

Each vessel can deploy maximum 150 sets of DFAD.

(3)reporting procedures for DFAD deployment:

Vessel operator records information about deployment of DFADs in the FAD logbook (See attached) and a vessel owner submits it to the Japan Far Seas Purse Seine Fishing Association after each cruise.

(4)incidental bycatch reduction and utilization policy:

The primary objective of this DFAD Management Plan is to reduce captures of non-target species associated with fishing on DFADs.

FAJ and Fisheries Research Agency (FRA) have been carrying out a series of research cruises in order to develop effective and practical methods, and reduce both juvenile bigeye and yellowfin tuna and non-target species catch in DFAD operation.

The research activities have been conducted for following purposes:

- To develop methods separating juvenile yellowfin and bigeye tuna from skipjack schools using intermittent lights;

- To investigate effectiveness of larger mesh size nets;
- To develop simulation models visualizing under-water shapes of purse seine nets; and
- To evaluate new DFAD designs (sheet type) that potentially can avoid entanglements of non-target species such as sharks and sea turtles.

FAJ periodically holds consultation with scientists, industries and other experts to review the development of effective mitigation measures for juvenile bigeye and yellowfin tuna catch, and also to discuss further improvements of the measures.

(5) plans for monitoring and retrieval of lost DFADs:

The location of DFAD is monitored by GPS or radio beacon signals. In the event of loss of DFAD, a fishing vessel operator searches the DFAD using the signals. The loss of DFAD will be recorded on the FAD logbook.

(6) statement or policy on “DFADs ownership”:

Vessel operators monitor the location of DFAD through GPS or radio beacon. Each DFAD is marked with relevant information in order to identify owner.

3. Institutional arrangement of the DFAD Management Plans:

(1) Institutional responsibilities:

A vessel operator is responsible for implementation of this DFAD Management Plans including the FAD logbook control. The Japan Far Seas Purse Seine Association will guide and assist the implementation of this plan. The FAJ provides guidance for proper application of this plan, if necessary, through the Japan Far Seas Purse Seine Fishing Association.

(2) application processes for DFAD and /or DFAD beacons deployment approval:

Although approval is not required for deployment of DFAD and beacons, all deployment is recorded on the FADs logbook.

(3) Obligations of vessel owners and masters in respect of DFAD and /or DFAD beacons deployment and use:

Vessel operators and owners shall comply with requirements stipulated on this Management Plan and IOTC management measures regarding DFAD operation

(4)DFAD and/or DFADs beacons replacement policy:

All replacement will be recorded on the FADs logbook. Old DFAD should be retrieved as practically possible..

(5)Reporting obligation

Fishing operators and/or owners will report use of DFAD through FADs logbook after each cruise to the Japan Far Seas Purse Seine Fishing Association. The Japan Far Seas Purse Seine Fishing Association will submit the logbook to the FAJ.

4. Applicable areas

This Management Plan will be applied to fishing operation in the IOTC convention area. Area/time closures will be according to the IOTC conservation and management measures.

5. Applicable periods for the DFAD-MP

This Management Plan will be applied for the entire period while Japanese purse seiners operate in the IOTC convention area. This plan will be modified if the IOTC management measures are changed.

6. Means for monitoring and reviewing implementation of the DFAD-MP

The Japan Far Seas Purse Seine Fishing Association will review the submitted logbook and will submit it to the FAJ. The FAJ provides guidance to the Japan Far Seas Purse Seine Fishing Association based on the information on the logbook, if necessary.

7. DFAD logbook

The format of FADs logbook is attached.

										FAD 管理日誌(FAD logbook)																																											
住所																																																					
氏名又は名称										船名										総トン数										トン																							
										信号符号										許可番号 まき第										号																							
年	月	日	緯度				経度				ブイ番号	周波数	呼出 番号	呼出 周波数	FAD タイプ (自然物ま たは人工 物)	(1)設置 (2)移動 (3)修理 (4)紛失 (5)操業	備考																																				
Page 1																		Page 3																		Page 5																	
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E																																													
			S					W																																													
			N					E			</																																										

Korea (republic of.) FADs Management Plan (Revised 16.03.16)

The Korean Management Plan for the use of Drifting FADs (DFADs) in the IOTC area of competence

This Management Plan (MP) has been revised in pursuance of the IOTC Resolution 15/08 (Procedures on a Fish Aggregating Devices (FADs) management plan, including a limitation on the number of FADs, more detailed specifications of catch reporting from FAD sets, and the development of improved FAD designs to reduce the incidence of entanglement of non-target species.

1. Objective

This is to ensure that the Korean management plan of the use of DFAD by purse seine vessels is consistent with the conservation and management measures and the data collection and reporting requirements of the Indian Ocean Tuna Commission.

2. Scope

This management plan applies with respect to:

- Vessel-types and support and tender vessels
: Korean flagged purse seine vessels and support vessels
- DFAD numbers and/or DFADs beacon numbers to be deployed
: no more than 550 instrumented buoys active at sea at any one time
- Reporting procedures for DFAD deployment
: Fishing vessels record the deployment of each DFAD in the DFAD logbook (Attachement 1) and report to the National Institute of Fisheries Science (NIFS) generally on a monthly basis or within shorter period, if necessary.
- Incidental bycatch reduction and utilization policy
: All purse seine vessels are encouraged to retain on board and then land all non-target species except fish considered unfit for human consumption. In addition, Korea has a research plan for the development of non-entangling FADs to reduce bycatch, such as sharks, in 2016.
- Consideration of interaction with other gear type
: Collecting information and data
- Plans for monitoring and retrieval of lost DFADs
: Fishermen are encouraged to prevent, as much as possible, loss of DFADs at sea. In the event of a loss or of the impossibility of hauling in a DFAD, operators must record in DFAD logbook its last known date and position. And if fishermen find any FADs lost by other vessels at sea, they are encouraged to retrieve and bring the FADs to Lost and Found at port.

- Statement or policy on “DFAD ownership”
: Each fishing vessel will attach instrumented buoy to every DFAD and fishing vessel name (or callsign) will be marked on the buoys to state the ownership.

3. Institutional arrangements for management of the DFAD Management plans

- Institutional responsibilities
: The captains are responsible for the use of DFAD under the management and supervision of their company and national management plan.
- Application processes for DFAD and /or DFAD beacons deployment approval
: In order to comply with national DFAD management plan, each fishing boat shall record the information in relation to the DFADs deployment in the DFAD logbook and fishing logbook and report to the NIFS.
- Obligations of vessel owners and masters in respect of DFAD and/or DFAD beacons deployment and use
: The fishing companies shall supervise their fishing vessels under the DFADs management plan, and the masters shall be in comply with DFADs management plan and the conservation and management measures related to the use of FADs.
- DFAD and/or DFADs beacons replacement policy
: If deployed DFADs are worn out or needed to be replaced, the captains/fishing masters will replace it and record in the DFAD logbook.
- Reporting obligation
: Each captain/master shall record the information in relation to DFADs activities in the DFAD logbook and report to the NIFS.
- Observer acceptance obligation
: Each captain/master shall be in comply with Regional Observer Scheme of IOTC.

4. DFAD construction specifications and requirements

It is required for the Korean purse seine vessels to submit their DFAD construction specifications to the government before starting their fishing operations. And each captain/master shall record FAD characteristics in the DFAD logbook.

5. Applicable areas

The areas will be applicable for the whole areas while the purse seiner vessels are operating in the IOTC area of competence.

6. Applicable periods for the DFAD-MP

The DFAD-MP will be applicable for the whole periods while the purse seine vessels are operating in the IOTC area of competence.

7. Means for monitoring and reviewing implementation of the DFAD-MP

Each DFAD deployed will be monitored by instrumented buoy, and the masters will record the information in relation to DFADs activities in the DFAD logbook and report to the NIFS.

8. DFAD loglook
See the Attachment 1.

Attachment 1. DFAD logbook

[illegible]

Mauritius FADs Management Plan

Submitted by: Mauritius

Operator: SAPMER/IOSMS (Indian Ocean Ship Management Services)

Purse Seiners: Belle Isle and Belle Rive

1. **Objective:** *To aggregate tuna target species, in the IOTC area of competence.*
2. **Scope:**
 - a. Vessel type: *purse seiner*
 - b. DFAD numbers or number of beacons to be deployed: *200 buoys/vessel/year*
 - c. Reporting procedures: *Through Logbooks (refer to Appendix 1)*
 - d. Incidental by catch reduction and utilization policy: *Non-entangling FADs (refer to Appendix 2)*
 - e. Consideration of interaction with other gears type: *None*
 - f. Monitoring and retrieval of lost DFADs: *Refer to Logbooks (Appendix 1)*
 - g. Statement or policy on DFAD: *use of a limited number of non-entangling FADs*
3. **Institutional arrangement for management of the DFAD Management Plan:**
 - a. Institutional responsibilities: *SAPMER and IOSMS*
 - b. Application processes for DFAD and/or DFAD beacons deployment approval:
Supplier – IOSMS/SAPMER
Rules - IOSMS/SAPMER
Deployment - Master
 - c. DFAD and/or DFADs beacons replacement policy: *maintain 200 buoys per vessel per year*
 - d. Reporting obligations - *Through Logbooks (refer to Appendix 1)*
4. **DFAD construction specifications and requirements**
 - a. DFAD design characteristics (a description): *As per annexed plan (refer to Appendix 2)*
 - b. DFAD markings and identifiers, including DFAD beacons: *DCP identified by serial number*
 - c. Lighting requirements: *flash command*
 - d. Radar reflectors: *visible without radar reflectors*
 - e. Visible distance: *1 NM*
 - f. Radio buoys (requirement for serial numbers): *marine instruments*
MSI XXXXX
M3I XXXXX
M4I XXXXX
 - g. Satellite transceivers (requirement for serial numbers): *IRIDIUM*
5. Applicable areas: *on high seas and EEZ Indian Ocean Coastal State through licenses, excluding closed area as stipulated by IOTC, shipping lanes, away from fishing grounds of the artisanal fishery.*
6. Applicable period for the DFAD-MP: *yearly*
7. Means for monitoring and reviewing implementation of the DFAD-MP: *SAPMER/IOSMS*
8. DFAD Logbook: *refer to logbook (Appendix 1)*

Appendix 1

DEPART / SALIDA / DEPARTURE :		ARRIVEE / LLEGADA / ARRIVAL		PATRON / PATRON / MASTER		NAVIRE / BARCO / VESSEL		FEUILLE HOJA SHEET
PORT / PUERTO / PORT	MAURICE	PORT / PUERTO / PORT	Maurice	TEST		Navire	TEST	
DATE / FECHA / DATE	01/01/2013	DATE / FECHA / DATE	20/01/2013			Pavillon		
HEURE / HORA / HOUR	7:00	HEURE / HORA / HOUR	8:00			Numéro d'immatriculation		
LOCH / CORREDERA / LOCH	0	LOCH / CORREDERA / LOCH	1400	MAREE	EXEMPLE	Port d'immatriculation		
						Signal d'appel international		
						Numéro OMI		1
						Numéro CFS		

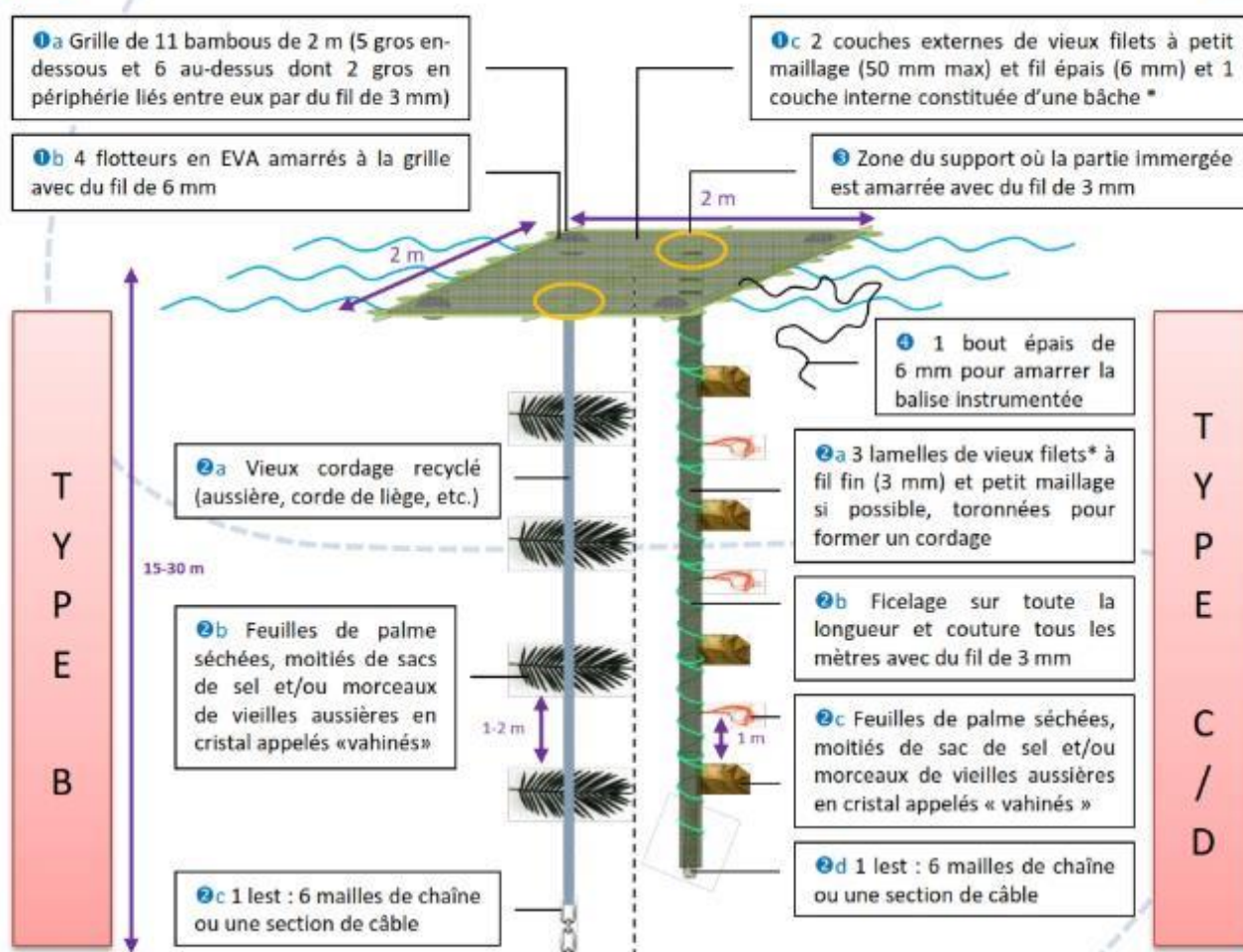
DATE	POSITION (à chaque cadre ou à 30 min)	CALEE LANCE SET		CAPTURE ESTIMÉE (en tonnes) ESTIMACION DE LA CAPTURA (en toneladas) ESTIMATED CATCH (metric tons)										ASSOCIATION ASOCIACION ASSOCIATION				Balise Boyas Buoy	DCP DCP FAD	ZEE ZEE EEZ	COMMENTAIRES COMENTARIOS COMMENTS		VENT VIENTO WIND	
				1	2	3	4	AUTRE ESPÈCE Otro/a Especie		REJETS Predejar le / los nom(s)		Banc. line/ banco/ line/ Free school Banc / Grupo / Grp M (free school/ libre) / A (free school/ libre)	Banc / libre/ banco Banco de alpen / alpen / alpen	Banc / libre/ banco Banco de alpen / alpen / alpen	Banc / libre/ banco Banco de alpen / alpen / alpen	Type :	CRÉER UNE LIGNE PAR ÉVÉNEMENT SUR DCP NATURAL OU ARTIFICIEL						NOM DE LA ZEE	Problèmes divers Prise accessoire Taille du banc Autres associations Autres remarques
FECHA	POSICION (cada lance o en minutos)	RABIL	LISTADO	PATUOD	ALMACORA	OTHER SPECIES give name(s)		DESCARTES dar el / los nombre(s)		DISCARDS give name(s)							MSR	MSE	MHI	MISE A L'EAU DCP ECO	Cher zee indiquer eaux internatio nales			
DATE	POSITION (each set or minutes)	YELLOWFIN	SCORPION	BIGEYE	ALBACORE	give name(s)		give name(s)		give name(s)		Numéro			VISITE AVEC PÊCHE	VISITE SANS PÊCHE	RETRAIT	PERTE / FIN TRANSMISSION BAUSE						
		Taille Taila	Captain Captan	Taille Taila	Captain Captan	Taille Taila	Captain Captan	Taille Taila	Captain Captan	Taille Taila	Captain Captan	Taille Taila	Captain Captan	Taille Taila	Captain Captan				Taille Taila	Captain Captan	Taille Taila	Captain Captan		
		Size Talla	Catch Cacha	Size Talla	Catch Cacha	Size Talla	Catch Cacha	Size Talla	Catch Cacha	Size Talla	Catch Cacha	Size Talla	Catch Cacha	Size Talla	Catch Cacha	Size Talla	Catch Cacha	Size Talla	Catch Cacha					
Une calée par ligne / Une ligne par DCP rencontré (visite / pêche / mise à l'eau, etc)																								
10/01/2013	2°01'N 12°54'W	X	8:00			3,4 kg	60 t									MSI 17024	VISITE AVEC PÊCHE	Eaux internationales	27,5° 135°	5 nds				
10/01/2013	2°21'N 11°20'W		10:00													MSI 17035	MISE A L'EAU DCP ECO	Eaux internationales	28° 135°	5 nds				
10/01/2013	2°35'N 9°5'W		12:00											N	X	MSI 17046	VISITE SANS PÊCHE	Eaux internationales	Ble de bois	27° 135°	4 nds			
10/01/2013	2°20'N 10°55'W		13:00											A	X	MHI 80570	CHANGEMENT DE BAUSE	Eaux internationales	Transfert sur radeau kératin	28° 157°	5 nds			
10/01/2013	2°15'N 9°55'W		14:00												X	D- 22330	RETRAIT	Eaux internationales	Balise décrochée du DCP	28° 155°	4,5 nds			
10/01/2013			15:00													MSI 60870	PERTE / FIN TRANSMISSION BAUSE	Eaux internationales	Balise volée 4°20S - 2°27W					

DCP NON-MAILLANT OCÉAN INDIEN



COMMENT ÉVITER LE MAILLAGE DES ANIMAUX ?

- ✓ Supprimer les battants de filet sur les côtés
- ✓ Tendre au maximum les couches de filet pour supprimer leur « souplesse »
- ✓ Coudre les couches de filet ensemble pour interdire l'accès entre elles.
- ✓ Coudre les couches de filet aux bambous.



COMMENT RENFORCER LA PRISE AUX COURANTS ?

- ✓ Par des « vahinés », des sacs de sel et/ou des feuilles de palme séchées qui permettent d'agrandir la surface de la structure immergée pour jouer le rôle d'ancre flottante (renforcement de la prise aux courants) et le rôle de refuge (augmentation des niches et interstices).



*Vieux filets et bâches remplacés plus tard par des géofilets (ex. fil coco avec mailles 10-20 mm) et/ou des géotextiles (= DCP éco)

Appendix 2b

ANNEXE 3 : PHOTOS DE DCP NON-MAILLANTS

a) DCP non-maillants en mer

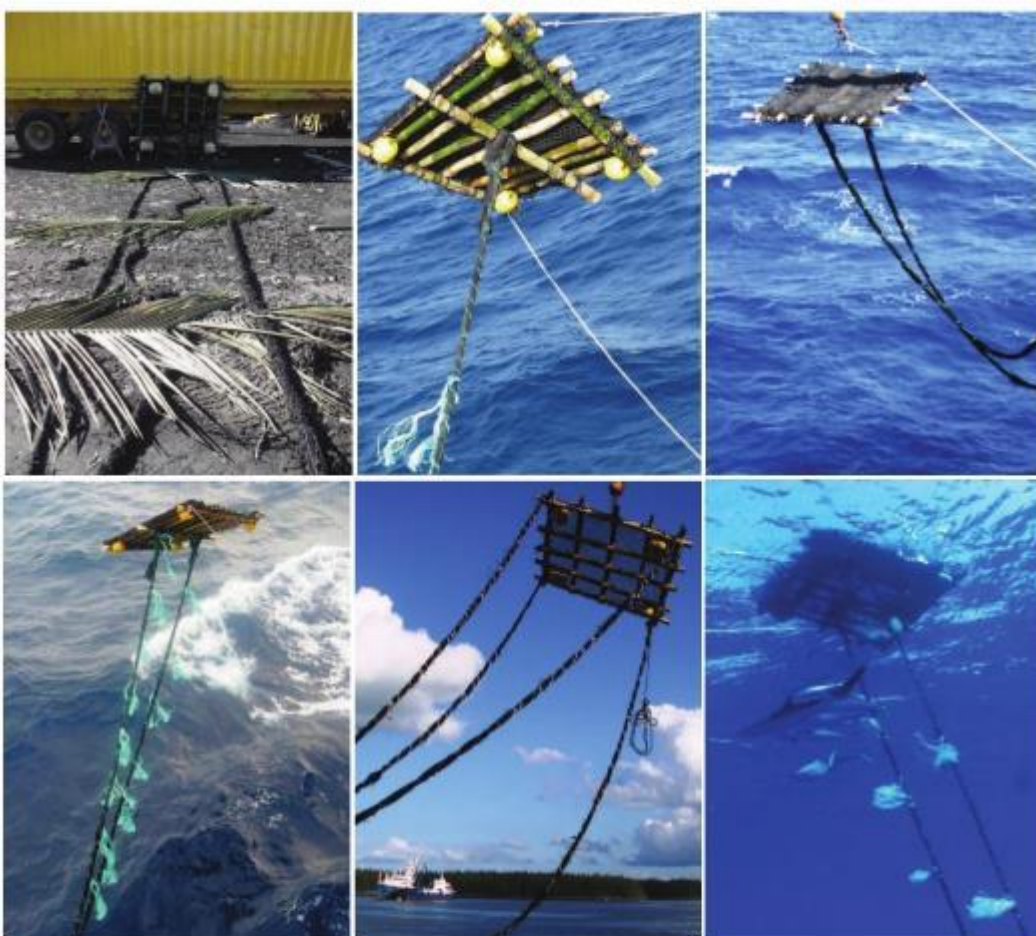


b) DCP non-maillants déployés dans l'océan Indien

Design B



Design C/D



Drifting Fish Aggregation Devices (DFADs) Management Plan for Seychelles fleet fishing for tuna and tuna-like species in the IOTC area of competence

1. Objective

This Management Plan For Drifting Fish Aggregation Devices (DFADs) for Seychelles have as principal aim to provide guidelines for the use of drifting FADS by Seychelles' fleet targeting tuna and tuna-like species in the IOTC area of competence. This Management Plan fulfils Seychelles' obligations as a member of the Indian Ocean Tuna Commission (IOTC) in regards to IOTC's Resolution 13/08 (*Procedures on a Fish Aggregating Devices (FADs) Management Plan*) that requires all IOTCCPCs that use FADs to submit FAD Management Plans for their fleets targeting tuna and tuna-like species in the IOTC area of competence.

2. Scope

The current plan applies to:

- a) Seychelles flagged purse-seiners and
- b) Support (or supply) vessels,
 - i. under the flag of Seychelles, which operate in conjunction with purse-seiners of any flag;
 - ii. of any flag, acting in support of Seychelles flagged purse seiners, provided that they are not covered by a FAD-MPs from their flag states or are not reporting DFAD logbooks to the Seychelles Authority.

Seychelles considers that support (or supply) vessels are an integral part of the purse seine fishing effort and that it is necessary to understand their operations, and the extent to which they contribute to increase the fishing efficiency of the purse seine fleet.

Seychelles vessels currently do not operate anchored FADs, so these are not covered by the current Plan.

3. Definitions

For the purpose of the DFAD- Management Plan, the term beacons is used to define radio buoys, satellite transceiver or any other electronic device used to track and retrieve DFADs.

4. Background

The term FAD stands for "Fish Aggregating Device". There are two main types of FADs: natural and man-made. Natural FADs are naturally occurring floating objects such as logs, branches, debris and large dead floating marine organisms (whales, whale sharks,

manta rays, etc). Man-made FADs are usually bamboo rafts with old nets hanging underneath and can be found either drifting or anchored.

In the open ocean many fish species including tuna, associate with objects floating on the surface, such as logs. This is highly advantageous to purse seine fishing as free swimming tuna tend to aggregate in the proximity of floating objects and remain highly aggregated making those schools more susceptible to capture by tuna purse seiners.

In the mid 1980's, skippers experimented with ways to maximize the potential of floating objects as tools to enhance fishing. Initially, reflectors and radio beacons were attached to logs to improve their detection over distances and fishers eventually started to construct purpose built Drifting Fish Aggregation Devices (DFADs) fitted with electronic buoys to simultaneously boost the number of floating objects in the ocean and further aid their detection. The most recent generation of DFADs are equipped with echo-sounders that transmit daily or hourly estimates of fish biomass beneath the buoy significantly reducing the searching time.

The increasing use of DFADs has improved catch rates thus greatly enhancing the ability of purse seiners to catch tropical tunas, and allowing boat owners to expand the capacity of their fleets in an attempt to exploit more of the resources. Thus, at present about half of the global tuna catches comes from the use of DFADs.

While DFADs are evidently useful fishing tools, their use has been associated with several potential negative ecosystem impacts such as;

- Catch of juvenile tuna (mainly yellowfin and bigeye)
- Higher levels of bycatch of non-targeted, associated and dependent species (NTAD) -such as sharks and marine turtles-, as compared to those obtained when fishing on free-swimming schools.
- Unsustainable exploitation of stocks through increased fishing effort.
- Ecological impact on marine habitat including coral reefs.
- Marine pollution (persistent marine debris)

In 2010 the IOTC adopted Resolution 10/02, which includes provisions for IOTC CPCs having industrial tuna purse seiners that use supply vessels and/or FADs to report information on the total numbers of FADs deployed by quarter and daily activities of supply vessels. However, in recent years the IOTC, recognizing the need to enhancing monitoring of activities on FADs, adopted Resolution 13/08. Resolution 13/08 calls for all IOTC CPCs that use FADs, drifting and/or anchored, to prepare and present FAD Management Plans for their fisheries, using the Guidelines provided in such resolution. Provisions in this resolution also include collection and reporting through FAD logbook.

5. Historical use of DFAD's by the Seychelles Purse seine fleet fishing for tuna and tuna-like species in the Indian Ocean.

There are very limited data on the actual number of DFAD's deployed by the Seychelles purse seine fleet and their supporting supply vessels. The logbook for purse seine vessels only make provisions for the reporting of sets made on DFAD's associated schools including the corresponding catches by species, irrespective of the type of DFAD involved (natural or man-made). Over the period 2004 to 2013 an annual average of 49,185 MT of tuna were reported as being taken on DFAD's associated schools which corresponds to an average of 73% of the total annual reported catch of this fleet. The catch composition of target species consisted on average of 63% skipjack tuna, 29% yellowfin tuna and 8% bigeye tuna.

6. Use of drifting FADS by Seychelles' purse seine fleet targeting tuna and tuna-like species in the IOTC area of competence.

This Management plan (DFAD – MP) will provide guidelines in the following nine areas:

- i. Institutional arrangements for implementation of the DFAD Management Plans
- ii. Deployment of DFAD (including numbers, markings and identifiers, recording of serial numbers of beacons),
- iii. Fishing on DFADs,
- iv. DFAD design and construction specifications,
- v. Obligations of vessel owners and masters in respect of DFAD and DFAD beacons deployment and use,
- vi. Data collection and reporting obligations (including DFAD logbook/ Observer programme),
- vii. Applicable area for the DFAD–MP,
- viii. Applicable period for the DFAD–MP,
- ix. Means for monitoring and reviewing implementation of the DFAD–MP.

6.1 Institutional arrangements for management of the DFAD Management Plan:

The Seychelles Fishing Authority will be the entity responsible for monitoring the implementation of the DFAD – MP, and for taking action in case of infractions.

The responsibility for implementing the DFAD – MP is entrusted with the vessel owners and masters of the Seychelles flagged purse-seiners and supply vessels as defined under clauses 2(a) and 2(b).

6.2 Deployment of DFAD / DFAD beacons (including numbers and procedures)

a. Number of DFAD or DFAD beacons to be deployed

Noting the lack of fine-scale data on DFAD's related fishing activities and the need to regulate FAD fisheries, Seychelles *recognizes* the need for additional measures on FADs, in line with FAO Precautionary Approach to Capture Fisheries.

Seychelles will set an interim limit on the number of DFADs set and drifting at sea at any given time (i.e. equipped with beacon), at 550 FADs per tuna purse seine vessel. Therefore, the total number of DFADs that a fishing company can use will be estimated as the number of tuna purse seiners in operation at any time multiplied by 550, irrespective of whether they receive the support of supply vessels or not.

This measure will be applicable as from 1 January 2016. Following the analysis of data collected under the DFAD – MP, this interim limit could be revised based on advice provided by the IOTC Scientific Committee.

All DFADs set by purse seine and support vessels shall be equipped with electronic devices such as radio buoys, satellite transceiver or any other device, (defined as beacons under section 3), which automatically and continuously indicate their position and allow tracking by the vessel that set the DFAD or its support vessel. Each beacon shall be activated onboard the vessels prior to deployment.

b. Application processes and approval for deployment of DFAD and DFAD beacons

No specific approval will be required prior to the deployment of a DFAD and DFAD beacons.

c. DFAD ownership

DFADs beacons or any other electronic devices used for locating DFAD should be clearly and visibly marked with the name of the fishing company owning the beacon and the name of the fishing vessel that set the device..

d. Recording of serial numbers

The serial numbers of all beacons shall be unique and recorded in the appropriate logbook at the time of deployment of the corresponding DFADs.

e. Reporting procedures for DFAD deployment and encounter

DFAD deployment, as well as all other activities related to the DFAD once it is deployed,

is to be reported in the DFAD logbooks (*see Annex I and II*). Furthermore, whenever a scientific observer is present onboard the vessels the appropriate observer form (*Annex III*) shall also be filled in by the observer. Information to be collected include, type of DFAD deployed or visited, DFAD identification/markings, beacons type and serial number, type of operation undertaken on DFAD.

f. Monitoring and retrieval of lost DFADs

Every single DFAD must be equipped with radio buoys, satellite transceiver or any other tracking device. Vessel masters are encouraged to prevent, as much as possible, loss of DFAD at sea. In the event of a loss or of the impossibility of hauling in a DFADs the master of the vessel must record in the appropriate logbook, the date it was lost and its last known position. Likewise, masters of fishing vessels shall report in the DFAD logbook of any encounter and interaction with DFADs belonging to a third party as per the same requirements applicable to the DFADs they set.

6.3 Fishing on DFADs

a. Mitigation for non-marketable specimens of tropical tunas and other by-catch

Vessels owners and masters shall do their utmost to improve purse seiners' selectivity when fishing on DFADs so as to limit bycatch and discards in particular, harvesting of non-marketable individuals of targeted species (e.g. tunas of very small size), and non-targeted species (with particular attention to sensitive species such as sharks and turtles).

Fishing around any DFAD shall be conducted in accordance with the following IOTC Resolutions:

- Resolution 12/04 – On the conservation of marine turtles,
- Resolution 13/04 – On the conservation of cetaceans,
- Resolution 13/05 – On the conservation of whale shark (*Rhincodon typus*),
- Resolution 05/05 Concerning the conservation of sharks caught in association with fisheries managed by IOTC,
- Resolution 13/06 – On a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries,
- Resolution 12/09 On the conservation of thresher sharks (Family Alopiidae) caught in association with fisheries in the IOTC area of competence, and
- Resolution 13/11 On a ban on discards of bigeye tuna, skipjack tuna, yellowfin tuna, and a recommendation for non-targeted species caught by purse seine vessels in the IOTC area of competence.

All reasonable measures must be undertaken under optimal security conditions for the crew, to ensure that any of these species that are incidentally caught are handled in an

appropriate manner and released alive as quickly as possible to maximize post release survival.

6.4 DFAD design and construction specifications,

a. DFAD design characteristics

The design, construction, operation and maintenance of DFADs will be the responsibility of the vessel owners and masters. As of January 1st 2016, all DFADs deployed should conform to the following design principles to mitigate the entanglement of non-target species:

- The surface structure of the DFAD should not be covered, or should only be covered with non-meshed material.
- If netting is used as a sub-surface component', it should be tied in a strand like manner so as to reduce its surface area.
- Each DFAD deployed shall be equipped with a beacon
- The use of non-meshed materials such as ropes or canvas sheets should be promoted as sub-surface component.
- To reduce the amount of synthetic marine debris, the use of natural or biodegradable materials (such as hessian canvas, hemp ropes, etc.) should be promoted.

More details on DFADs construction specifications and requirements are provided in Annex IV. As of 1st January 2017 all DFADs must be non-entangling DFAD's and as much as possible constructed from natural and or biodegradable materials.

6.5 Obligations of vessel owners and masters in respect of DFAD and DFAD beacons

Vessel owners and masters are responsible for the fulfillment of the obligations under the DFAD – MP, including observance of the limit on DFADs deployed, appropriate markings of DFADs, and completion of the relevant logbooks and submission of the required data.

6.6 Data collection and reporting obligations

The Commission does not currently have detailed catch and effort data on DFADs, such as how long DFADs are left in the water, composition and structure, hence unable to determine how any of those components may affect catch rates of DFADs. This information is essential to developing conservation and management measures in respect to DFADs.

Purse seine logbook (Annex I) shall be completed by the master of the vessel and

submitted to the Seychelles Fishing Authority at the end of each fishing trip.

Supply vessel logbook (Annex II) shall be completed by the master of the supply vessel and submitted to the Seychelles Fishing Authority at each port call of the supply vessel.

Observer form (Annex III) describing characteristic of DFAD's and operations undertaken on them shall be completed by an observer when present onboard the purse seiner or supply vessel.

Relevant information collected in logbooks will be compiled by the Seychelles fishing Authority and reported to the IOTC as per the requirements of IOTC Resolution 10/02. In addition, the Seychelles will share DFAD logbooks data with any flagstate whose purse seiners receive the support of supply vessels flagged in Seychelles.

6.7 Applicable areas

The provisions of this Plan are applicable in all the areas of operation of the vessels, as described in section 2, for as long as they are flagged in Seychelles or support Seychelles flagged purse seiners.

6.8 Applicable period for the DFAD–MP

The provisions of this Management Plan will enter into effect on 1st January 2016. Provisions in this plan will be revised to accommodate any future recommendations from the IOTC, as required.

6.9 Means for monitoring and reviewing implementation of the DFAD–MP

The Seychelles Fishing Authority will be the authority responsible to compile the data needed for a proper monitoring and verification of the implementation of the DFAD – MP, including, but not necessarily limited to, logbook data, VMS data, the Seychelles National Observer Programme, and port inspections of the fishing fleet involved.

REFERENCES

Indian Ocean Tuna Commission (2013)- Resolution 13/08 *Procedures on a Fish Aggregating Devices (FADs) Management Plan*.

Indian Ocean Tuna Commission (2013)- Compendium of Active Conservation and Management Measures for the Indian Ocean Tuna Commission

NOMBRE DEL BARCO

PATRON

DIARIO DE PESCA (I.E.O)

Corredera Comienzo Marea (millas) _____

Corredera Final Marea (millas) _____

PUERTO DE PARTIDA	PORT VICTORIA
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

FECHA DE PARTIDA	HORA (GMT)
------------------	------------

PUERTO DE DESCARGA

FECHA DE LLEGADA	HORA (GMT)
------------------	------------

[illegible]

SALIDA / DEPARTURE		LLEGADA / ARRIVAL		PATRON / PATRON / MASTER		BARCO / VESSEL		HOJA SHEET	
PUERTO / PORT		PUERTO / PORT FECHA / DATE HORA / HOUR CORREDERA / LOCH							
DATE / FECHA									
HORA / HOUR									
CORREDERA / LOCH			VIAJE / TRIP						

[illegible]



Annex III: Scientific Observer Data Collection Programme (Seychelles)

Form D

Version 4.3 Feb. 3013

Monitoring of Drifting FADs

Form D (Drifting FADs) N°:

Date :

Form Route N°:

Route Line N°:

Vessel IOTC N°:

FAD Activities	Tick only one box
1 - Deployed at sea	<input type="checkbox"/>
2 - Visited without fishing	<input type="checkbox"/>
3 - Fished	<input type="checkbox"/>
4 - Recovered without fishing	<input type="checkbox"/>

FAD Operation		
FAD type (T.12)	<input type="text"/>	
Future status (T.13)	<input type="text"/>	
Number of days deployed	<input type="text"/>	
Ownership of the FAD	Unknown	<input type="checkbox"/>
	To the vessels or same company	<input type="checkbox"/>
	To another vessel or different company	<input type="checkbox"/>

Beacon Operation		
	Oper. 1	Oper. 2
Type of activity(T.14)	<input type="text"/>	<input type="text"/>
Type of Beacon (T.15)	<input type="text"/>	<input type="text"/>
Code of beacon	<input type="text"/>	<input type="text"/>
Brand (Make) of Beacon	<input type="text"/>	<input type="text"/>

Name of supply vessel (if associated)

Est. Size of shoal (if	
Tuna species	Est. Weight (tons)
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

Presence of sea turtles, sharks,		
Associated species	Status (T.16)	Number
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>

Remarks :

Data verified (tick): ☐

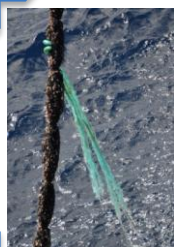
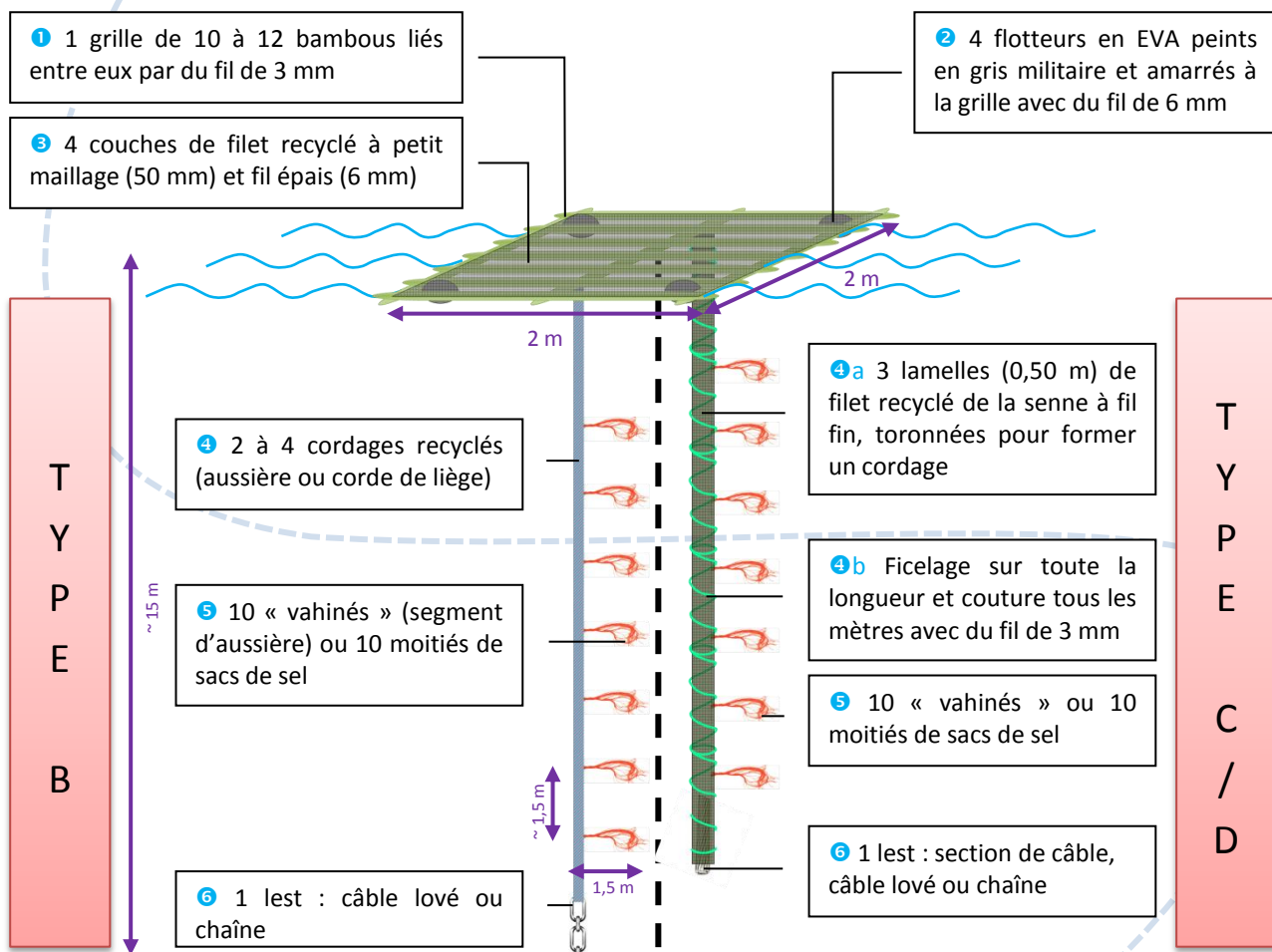


DCP NON-MAILLANT OCÉAN INDIEN



COMMENT ÉVITER LE MAILLAGE DES ANIMAUX ?

- ✓ Supprimer les battants de filet sur les côtés
- ✓ Tendre au maximum les couches de filet pour supprimer le flou.
- ✓ Coudre les couches de filet ensemble pour interdire l'accès entre elles.
- ✓ Coudre les couches de filet aux bambous.



COMMENT RENFORCER LA PRISE AUX COURANTS ?

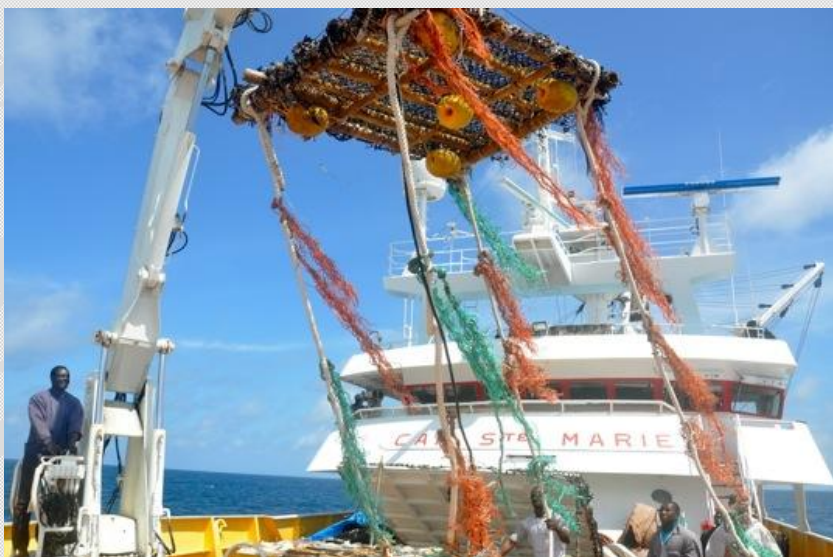
- ✓ Par des « vahinés » ou des sacs de sel qui permettent d'agrandir la surface de la structure immergée pour jouer le rôle d'ancre flottante (renforcement de la prise aux courants) et le rôle de refuge (augmentation des niches et interstices).



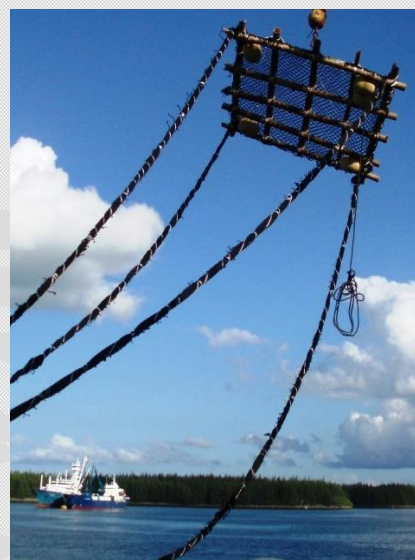


EXEMPLES DE DCP NON-MAILLANT OI

TYPE B



TYPE C/D



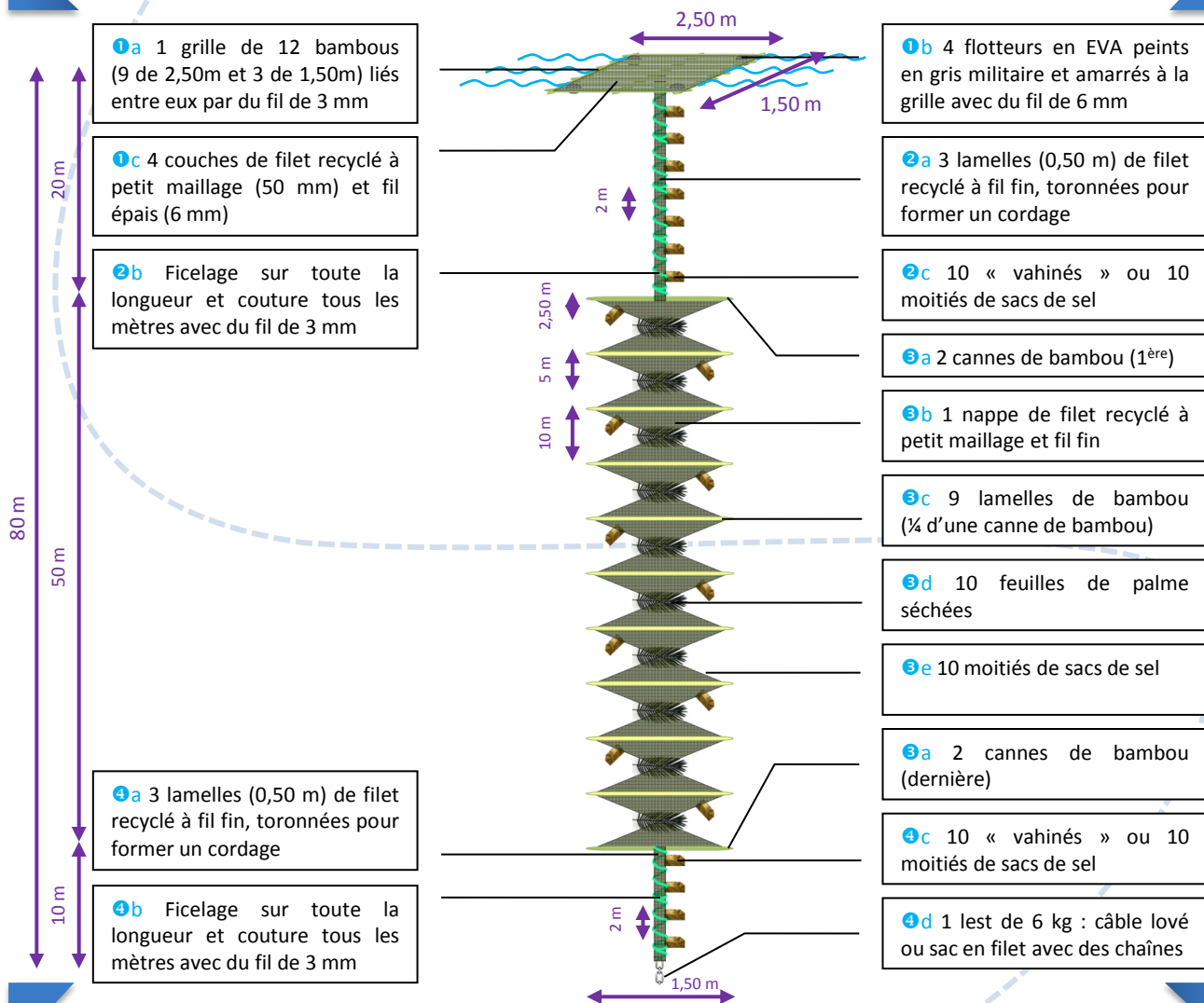


DCP NON-MAILLANT OCÉAN ATLANTIQUE



COMMENT ÉVITER LE MAILLAGE DES ANIMAUX ?

- ✓ Supprimer les battants de filet sur les côtés
- ✓ Tendre au maximum les couches de filet pour supprimer le flou.
- ✓ Coudre les couches de filet ensemble pour interdire l'accès entre elles.
- ✓ Coudre les couches de filet aux bambous.



COMMENT RENFORCER LA PRISE AUX COURANTS ?

- ✓ Par un panneau jouant le rôle d'ancre flottante (courant de sub surface)
- ✓ Par des « vahinés » ou des sacs de sel qui permettent d'agrandir la surface de la structure immergée pour jouer le rôle d'ancre flottante (renforcement de la prise aux courants) et le rôle de refuge (augmentation des niches et interstices).

