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position on
FAD management



LDRAC position on FAD management



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Madrid, June 2012

Dear reader,

One of the mayor achievements from the 2002 CFP reform was the creation of the Regional Advisory Councils. The aim was to involve deeply the EU stakeholders in the implementation and elaboration of the Common Fisheries Policy.

The LDRAC main function is to advise the European Institutions on the external dimension of the CFP, in particular shall advise on questions concerning Fisheries Agreements with third countries and relations with the Regional Fisheries Management Organisations (RFMOs) of which the EU is a signatory or a partner or in whose waters the Community fleet operates

Currently, we are almost sixty associations at EU level, and twelve Member States are officially involved in our works´ (Denmark, Estonia, France, Germany, Ireland, Italia, Lithuania, Netherlands, Poland, Portugal, Spain and United Kingdom).

This recommendation is an example about how we work; it is a consensus among the different interest we have within the RAC, Industry, NGOs, Trade Unions, Processors, Women network, etc.

The functioning of the RAC has been very variable the first five years of life, but I am very proud to say that with this kind of recommendation we are in the right direction.

Yours sincerely,



Mr Antonio Cabral
Chair of the LDRAC

A handwritten signature in black ink, appearing to read 'Antonio Cabral'. The signature is written in a cursive style and is positioned below the typed name 'Yours sincerely,'.



Advice of the LDRAC on a management scheme of the use of FAD and by catch mitigation by tuna purse-seine fisheries (by WG 1)

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Recalling the Agreement for the implementation of the provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the conservation and management of straddling fish stocks and highly migratory fish stocks;

Further recalling the FAO International Plan of action for the Management of Fishing Capacity;

Considering the situation of excess fishing capacity in certain tropical tuna fisheries and continued expansion of global tuna fisheries in important fishing areas;

Considering that FADs use is an important

parameter in terms of purse seiners capacity and the need for it to be assessed to be included in capacity management plans and overall fisheries management;

Considering that some tropical tuna stocks are globally in a relatively healthy situation but that uncertainties exist about the situation of the stocks and that the level of exploitation in all oceans must be carefully monitored for all tuna fleets;

Considering that the use of FADs is global and represents a substantial proportion of the tropical tuna purse-seine catch, making up roughly 63% of the global catch, and that precise data on their effects

on the ecosystem must be collected and submitted to RFMOs;

Considering that other fisheries such as Pole and line and other purse seine local fisheries have significantly increased the use of anchored floating objects in recent years, with little information of their effects on the ecosystem;

Considering that regulation by certain RFMOs of purse-seine fishing on FADs must be improved and that further regulation of the use of FADs – as in the Indian Ocean where FAD management plans are being discussed – must be based, as for any other gear, on the best scientific knowledge and recommendations, implementing the precautionary and ecosystem-based approaches and include binding capacity management schemes;

Considering that, currently, none of the management measures recommended by the RFMOs



prohibits the use of FADs in the purse-seine fisheries and that the most common form of management in FAD fisheries has been temporary closures of FAD fishing currently being enforced in all oceans;

Acknowledging the proactive role of European operators who were the first adopting voluntary a time/area closure on FADs fishing the Atlantic and Indian Ocean in 1997 and the scientific research that has been developed at the industry initiative with the National scientific bodies (AZTI, IEO and IRD) since 2005;

Considering that, although the figure of by-catch of non-tuna species in terms of percentage of the overall catch in FAD fisheries is relatively small compared to other gears, the potential effects of FADs on non-tuna species, on tuna stock productivity, behaviour and biology and on the pelagic ecosystem need still more research and monitoring;

Mindful, however, that the absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures;

Considering the EU purse-seine fleet's commitment to the sustainability of the fishery and the EU stakeholders' (industry and scientists) proactive role launching several research initiatives in order to mitigate adverse effects of FADs and explore solutions to improve the sustainability of the fishery as a whole;

Noting that more accurate monitoring of FAD fishing has been implemented at national level in France and Spain (since 2010).



The LDRAC agrees that tropical tuna FAD fishing should be better managed for all fleets and gives the advice that such management should consist in adopting an international FAD management plan at the level of the RFMOs that would require:

1. Collecting on a continuous basis and submitting in timely manner to relevant RFMOs FAD-related data in order to accurately evaluate and closely monitor the use of FADs, the precise tuna catch-at-size by species composition, by-catch rate for each of the fisheries involved and their potential effect on tuna stocks, dependent and associated species and the pelagic ecosystem (such data should encompass the number of FADs per vessel and/or vessel groups and their technical characteristics, set type, the amounts of by-catch kept on board, of discards and of animals released alive, as well as the information allowing to quantify the use of FADs);
2. Assessing accurately the effects of FADs and of their utilisation on tuna resources, on tuna behaviour and associated and dependent species and on the pelagic ecosystem, including the increase of fishing capacity and efficiency;
3. Improving management procedures to accurately monitor the number, type and use of FADs deployed or equipped with buoys by any vessel;
4. Developing technical measures to mitigate all possible negative effects of purse-seine fishing on FADs on the ecosystems, and the catches of juvenile tunas;

5. Fishermen to adopt tools and/or strategies to reduce as much as possible, even eliminate when possible, incidental entanglement of animals in their FADs and incidental by-catch of non target species;

The LDRAC supports the development of an EU policy for a sustainable exploitation of tropical tuna by purse seiners using FADs, in light of the best scientific advices and implementing the precautionary and ecosystem-based approaches, that would:

- Provide a regulatory framework for FAD management plans developed by member States, the compilation of by-catch mitigation measures in addition to those adopted in the RFMOs, the use of FADs designed to eliminate as much as possible or even eradicate the entanglement of turtles and sharks and any other best practices proved to be adapted to the purse-seine fleet.
- Provide for the evaluation of the use of FADs in relation to fishing capacity and effort. In terms of overall marine ecosystem impact of FADs use, its potential efficiency and fishing effort increase must be accurately assessed and managed as any other fishing capacity and effort parameter, through adjustments schemes by RFMOs on a fishery per fishery basis.
- This global policy should be promoted by the EU across all tuna RFMOs (IATTC, ICCAT, IOTC, AND WCPFC) to be implemented by all tuna purse-seine fleets fishing for tropical tunas



Furthermore, the LDRAC has collected the annexed documentation to document the feasibility and the support by the sector of such a global sustainable FAD fishing policy.

Annex 1: Description of the MADE program	
	Dagorn L, 2011. An update of the EU MADE project. IOTC-2011-WPEB07-52
Annex 2a, 2b, 2c, 2d, 2e: Description of the current actions led by EU fleets on a voluntary basis	
	OPAGAC/ANABAC. Code of good practices on sustainable fishing with FADs for the Spanish Purse Seine fleet.
	ANABAC FAD projects
	OPAGAC FAD projects
	Rapport d'avancement ORTHONGEL sur le CAT « DCP éco »
	Rapport d'avancement ORTHONGEL sur le CAT « Requins »
Annex 3: RFMOs FAD fishing current regulations register	



An update of the EU MADE Project

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Numerous and various data have been collected by the project in the Indian Ocean: Biological samples of sharks, PAT and Mini PAT tagging of pelagic sharks, acoustic tagging of tuna, sharks and other by-catch species at FADs, observers data, knowledge from fishers. These data are currently being analyzed in order to investigate the potential of spatial (using results on the spatial dynamics of sharks for instance) and technical measures (e.g. ecological FADs, best practices onboard vessels, use of artificial bait, best vertical distribution of hooks, etc.) for both purse seine and longline vessels. The project will organize an international symposium in late 2012 to review progress in the world on this topic.

An overview of the project

The MADE (Mitigating adverse ecological impacts of open ocean fisheries) project, funded by the European Commission (DG Research), gathers 13 institutions from 8 different countries (France, Spain, Portugal, Italy, Greece, Belgium, Brazil, Seychelles). It is coordinated by IRD (France) from the Seychelles

office. The primary objective of the project is to propose measures to mitigate adverse impacts of fisheries targeting large pelagic fish in the open ocean: purse seiners (using FADs) and longliners. The project specifically aims at:

- investigating spatial and technical management measures to reduce the by-catch of pelagic sharks and juvenile swordfish by pelagic longliners
- investigating spatial and technical management measures to reduce the by-catch of pelagic sharks and other species using FADs
- assessing the effects of FADs on the behavior and ecology of pelagic fish

If the project is conducting researches on three different oceans (Atlantic, Indian, Mediterranean Sea), this document will mainly present an update of data and results that are of interests for the Indian Ocean. The project has almost completed all field activities and has already started data analyses. The project ends in December 2012.

Spatial measures

Sharks represent one of the major targets of the project: silky, oceanic white tip and blue sharks. For all these species, there is a general need to improve the fundamental knowledge on their biology and behavior, a pre-requisite to develop science-based measures for conservation and management.

Most of investigations concerning potential spatial management measures in the Indian Ocean focus on sharks. The full investigation of such measures will combine results from biological analysis, tagging and observers data.



Annex 1



Biology of pelagic sharks

Biological samples of blue sharks and silky sharks were collected in the western Indian Ocean and in the Atlantic Ocean. Biological samples are analyzed to estimate the growth curves of both species, to investigate the diet of silky sharks caught by purse seiners under FADs, and to analyze the isotopic niches of both species from signatures in $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ of muscle tissues.

Behavior of pelagic sharks

Eight small juvenile silky sharks (88-109 cm TL) were tagged after being caught around FADs, eight larger sharks (154-285 cm TL) were tagged after being caught by commercial longliners (2 malfunctioning tags), and 20 sharks (86-235 cm TL) were tagged onboard purse seiners to study their post-release survival (2 non reporting tags) (see Poisson et al. 2011). Those tagging provided a total of 1168 days at liberty. Nine blue sharks were tagged after being

caught by commercial longliners, with a total of 349 days at liberty (1 non reporting tag, 1 still at sea). Two oceanic white tip sharks were tagged after being caught by commercial longliners (1 non reporting tag), and one after being caught around a FAD, for a total of 119 days at liberty.

Areas with high rates of catch of silky sharks

Observers data (from French and Spanish fleets) have been analyzed to investigate the areas with high by-catch of silky sharks in the tuna purse seine fishery. Details are provided in Amandè et al. (2011) - IOTC-2011-WPEB07-29.

Technical measures for longliners

Ecological Based Artificial Bait (EBAB)

The objective of the EBAB is to make use of scrap and offal of capture and provide new utilization of fish transformation, reducing the impacts of longliners on the ecosystem by reducing the catch of bait. A secondary objective is to reduce by catch through size selectivity, and potentially, through deterrent systems inserted in the bait.

A prototype has been developed and patented by the INPI (Institut National de la Propriété Intellectuelle, France). While no catch was observed during the first tests performed in La Réunion (10-day fishing trip), several attacks on the EBAB were observed, confirming attraction of fish to the bait. More field tests are planned in the coming months.

Experimental longline fishing

A total of 62 instrumented longline sets (with hook timers and time depth recorders) were done around La Réunion (along with 74 sets done in the Atlantic

Ocean and Mediterranean Sea) to obtain data on the depths of capture of various species. These data, combined with information on the vertical behavior of sharks from electronic tagging, will be analyzed to investigate optimal vertical distribution of hooks so to minimize by-catch of some vulnerable species (e.g. some pelagic shark species).

Technical measures for purse seiners

Ecological FADs

After providing guidelines for ecological FADs (Franco et al. 2009), first in situ tests were done in collaboration with other projects in order to test the efficacy of different designs of ecological FADs to attract tuna while avoiding incidental capture of turtles and sharks. Two different approaches were adopted:

- 43 ecoFADs (biodegradable materials) deployed in the Atlantic Ocean (joint project 'EcoFAD' funded

by ANABAC), with SATLINK echosounder buoys to assess the efficacy of such FADs (estimates of tuna biomass) every day.

- 600 ecoFADs (non-biodegradable materials) deployed in the Indian Ocean (joint project 'Contrat Avenir' funded by the French organization ORTHONGEL): data from 51 ecoFADs that were fished on.

Using echosounder buoys to provide information on the presence or abundance of by-catch around FADs

Fishers' Echo-sonder buoys were identified as a potential tool for remote discrimination of by-catch. First results are described in Lopez et al. (2011) IOTC-2011-WPEB07-54.

Reducing mortality of sharks induced by purse seine fishing on FADs

Scientists participated to two regular fishing trips





onboard French purse seiners in the Indian Ocean and one fishing trip in the Atlantic Ocean onboard a Spanish purse seiner. Data on conditions and mortality rates of captured sharks were collected during each cruise. Fishing strategy, procedures, and conditions faced by sharks and rays documented from the above cruises and from interviews with fishers. During cruises in the Indian Ocean, first tagging of released sharks has started, in collaboration with another project funded by the French fleet organization ORTHONGEL (Contrat Avenir). Tags were contributed both by MADE and the ORTHONGEL project. Results are presented in Poisson et al. (2011) - IOTC-2011-WPEB07-28.

Experiments were conducted around the Seychelles (during a scientific cruise co-funded by the ISSF By-catch project) to test if sharks can be attracted away from FADs before setting. Shark attraction experiments were conducted on 5 different FADs. The scientific protocol consisted of (i) assessing the numbers of sharks around the FAD at the start of the experiment (snorkeling), (ii) using a small tender to drift slowly away from the FAD with a bag full of fish chum (bait), (iii) assessing the number of sharks attracted and maximum distance of attraction using

underwater GoPro cameras and a handheld GPS. Each experiment was terminated when either the tender reached a distance of 500 m from the FAD or when no more sharks were observed for several minutes.

FAD	Number of sharks at start	Number of sharks attracted	Maximum distance (metros)
1	9	3	500
2	2	1	120
3	3	2	80
4	2	1	80
5	2	2	250

Table X: Results of the shark attraction experiment around the Seychelles

This pilot study provided key information:

- sharks can be attracted hundreds of meters away from FADs by simply towing a bag of bait away from the FAD
- reactions of sharks varied greatly between the experiments ranging from almost no reaction to attraction up to 500 m. It appears that many factors could be responsible for the success of the attraction: if the FAD was fished a few days before (probably affecting the natural behavior of sharks), the size of the multispecies fish aggregation, feeding motivation, etc. The small dataset does not allow conclusions to be drawn on the respective effects of each parameter. The shark attraction experiment showed that sharks can be attracted

using a bag of bait, but that the FAD always remains a very strong attraction stimulus. From this new knowledge, we recommend that future experiments be conducted on sharks that have already been encircled by the purse seine net. This protocol will involve placing a bag full of chum on top of the FAD, then towing the FAD out of the net and assessing the number of sharks that could be released.

Draft list of potential measures to mitigate impacts of open ocean fisheries

On the basis of the results obtained so far, and through a participatory approach to trigger a group discussion, a list of potential mitigation measures was drafted by the group. It is important to note that these potential measures were only listed, and not evaluated yet.

Proposed measures concerned the monitoring of fishing activities (e.g. FADs for purse seiners), the control of fishing efforts (e.g. numbers of hooks per sets, numbers of sets, numbers of FADs or FAD sets, etc.), the development of economic incentives or market-driven measures (e.g. use of non-sensitive by-catch species, regulate price of undersized target fish, promote eco labeling, etc.), the improvement of fishing practices such as methods to release by-catch or use of particular gears (e.g. promote the use of ecological FADs, ban lightsticks or wire leaders for longliners, promote the use of artificial baits, etc.). These measures will be investigated until the end of the project. The project will organize an international symposium in late 2012 to review progress in the world on this topic.



Good Practices for responsible purse seine tuna fishing

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Annex 2a

The good practices listed below, are intended to improve the maneuvers of the purse seine tuna fishing performed in oceans across the World and reflects the practices carried out by the fleet of OPAGAC / AGAC and ANABAC-OPTUC to improve the selectivity of the tuna purse seine fishery, aiming to exercise a responsible fishing that keeps to a minimum the impact of fishing onto the marine ecosystem, permitting a sustainable management.

The results of the experiments and research carried out by the OPAGAC/AGAC and ANABAC /OPTUC ship owners in collaboration with Fundación AZTI and Spanish Oceanographic Institute (IEO) since 2005



had produced a series of technical solutions that will be applied to improve tuna purse seine selectivity through:

1. The design of a FAD to prevent the entanglement of associated species (mainly turtles and sharks).
2. The development of techniques to release associated species.

The preoccupation of the Spanish Administration for the responsible management of purse seine fishing was translated, and after several years of work in collaboration with scientists and the ship owners, in the application of a FAD Management Plan through the introduction of the FAD logbook (see enclosed) on board all Spanish purse seine vessels since October 2010; that will constitute the basis for a rational management of purse sein fishing and as model for its application in all fisheries of the World, introducing it as model in the different RFMOs.

Design of non entangling FADs

The alternative design of FADs used at the different scientific experiments, had provided as a result, FAD Technical characteristics that minimize impact on non-target species, especially turtles and sharks. The results set the basis for the progressive replacement of the FADs used by the fleet of OPAGAC / AGAC and ANABACOPTUC for new models meeting the basic characteristics experinced, understanding that these features will mean a minimum standard to be used, not impeding that each company develops and implements designs and materials that further minimize the impact on non-target species and

the marine environment. The replacement will begin immediately for the entire fleet of OPAGAC / AGAC and ANABAC-OPTUC and is expected to be completed by the end of 2012.

Fad set components: mandatory materials and characteristics.

GRILL

It was agreed that the grill that ensures the set's floatability, must be uncovered (not lined) or in case it is, the material must not be meshy (burlap or dense tissue) or mesh with a limited maximum opening of 3 cm (1 1/4 inches) as approved in IATTC for dolphin-safe fisheries, and commonly known as Dolphin mesh or Medina panel.

TAILS OF THE FAD

Anything hanging from the grid should avoid entanglement and be manufactured with loose rope ends, light mesh nets with maximum openings of 3 cm or old tuna fishing nets but rolled up in "sausage" shapes wrapped up with mesh of fine mesh.

Bycatch release maneuvers

SHARKS

Bycatch of sharks, although non-significant at a global level compared to other fishing gears, can be reduced with the application of appropriate release protocols.

Baiting maneuver: this technique takes advantage of the movements usually performed on an associated set, when the speedboat removes the floating device before closing the set. Sharks can be drawn out of the set using bait to make them follow the trail of blood, avoiding catching them inside the purse.

In case any other shark turns out during the boarding of the catch, all of them must be released as quickly and carefully as possible, avoiding to hurt the animal while keeping all necessary measures for preserving the crew's safety while freeing these potentially dangerous animals. At the same time it was discarded of freeing sharks that will occur on board using poles or ropes, to avoid hurting this animals using those devices.

Once the animal is released, the crew will check whether it behaves normally and record the



operation in the logbook. In case any unusual behavior is perceived, it will also be noted in the logbook.

TURTLES

Following the recommendations existing in the four RFMOs concerning this group of marine animals¹, the crews have been trying by all means to release every turtle entangled in the current floating devices or nets upon the closing of the set, since the release is impossible before this point. Avoiding by all means their passing through the power block, the net's encircling maneuver is immediately stopped once an entangled turtle is noticed. All specimens that can be located within the set are freed avoiding hurting them, and in case this might happen they are treated before being released with the utmost care. With these practices mortality of sea turtles in the purse seine fleet of OPAGAC / AGAC and ANABAC-OPTUC is practically zero.

Once the animal is released, the crew will check whether it behaves normally and record the operation in the logbook. In case any unusual behavior is perceived, it will also be noted in the logbook.

MANTA RAYS AND SKATES

While incidental catch of these animals in FAD sets is practically nonexistent, a very simple protocol is established for their release in case it happens. Consisting in trying to scoop them out of the set with the dip net used to load the catch onboard, even if it means the loss of a certain amount of catch (2-3 tons) or else some other kind of cradle-type device to avoid any possible damage.

Once the animal is released, the crew will check whether it behaves normally and record the operation in the logbook. In case any unusual behavior is perceived, it will also be noted in the logbook.

WHALE SHARKS

Concerning whale sharks there we are aware about the great difficulty of their release, concluding that the maneuver currently applied is the most appropriate and the only practical thing to do once a whale shark is caught. The specific protocol is as follows:

The crews should take all possible measures to avoid, by all means, mortality of whale sharks. If a whale shark is found encircled in the set, the net should be carefully pulled up to confine it in a small area of the bag. At this time, depending on the circumstances of the sea as well as the animal's behavior and always





preserving the safety of the crew, the following measures might be taken:

A) When the whale shark floats on the surface

A.1.- The crew must carefully pull the net to approach the whale shark to the nearest corkline. The net should always be pulled from the animal's tail side and below the ventral side, trying to make the fish slide towards the corkline.

A.2.- If it is a small-sized shark (less than 2m long) it can be directly scooped out and released using the dip net.

A.3.- Free the corkline to facilitate the exit of the whale shark, sinking the corkline.

A.4.- Wait for the whale shark to swim out of the net by its own means.

A.5.- Collection of the catch will only take place once the shark is freed from the net.

B) When the whale shark does not appear on the surface

The loading of the catch can be carried on until the shark appears on the surface. At that time the loading shall be suspended and procedure explained in

Section A) above should be followed.

C) When the whale shark pushes the net with his head before lowering the corkline.

There are occasions on which the shark pushes the net attempting to escape, before the corkline can be brought down and it becomes difficult to push it back in order to lower the corkline. In this case the corkline should be lowered from the ship using poles or rods so the animal can free its head over the corkline.

D) In case the shark is trapped in the bag with the head towards the stern of the boat

The operation to try to free the animal over the corkline becomes more difficult, therefore a more effective maneuver, once the shark is in the bag, will be to locate the net's joint nearest to the head of the animal, proceeding to cut a couple of fathoms of the seam of the joint providing a window for the shark to get out lowering the drapes a bit until sinking that window.

Regardless of the circumstances and the actions undertaken, after the animal's release the crew will check whether it behaves normally and record the operation in the logbook. In case any unusual behavior is perceived, it will also be noted in the logbook.

REVIEW COMMITTEE

In order to improve this code of good practices, a Review Committee is constituted, counting with the appropriate scientific advice that will convene annually in order to ensure its implementation, update it and incorporate continuous improvements that might be recommended by scientific advisors.



ANABAC's projects on sustainability and Tropical Tuna Fishing best practices

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Over the last years there has been a growing concern about the potential adverse effects on the sustainability of marine resources and ecosystems of the use of drifting fish aggregating devices –DFADs– in the tropical tuna fisheries. Tuna-RFMOs, as well as an increasing number of scientists, politicians, fishermen and conservationists are focusing and requesting actions to avoid these potential adverse impacts.

The Spanish purse seine vessel owners association ANABAC has shared the concern for sustainability and responsible fishing and started working on how to improve DFADs to make them as sustainable as possible in the first years of the XXI century. This document shows which the steps made by ANANBAC are so far to tackle the subject; from the first project in 2003 to the ones that are currently ongoing.

Tortu-FAD.

This 5 year project, starting in 2003 and finalizing in 2007, gave the chance to carry out 850 days of scientific campaign in the Atlantic and Indian oceans, where 650 fishing operations were monitored.

The goals were to gather accurate data on turtle by-catch and mortality in tropical tuna purse seine fisheries, to survey the DFADs in view to seeking interaction with turtles and to quantify the turtle by-catch and/or mortality rates.

The results of the project revealed that no turtle was sighted in more than half of the campaigns and 88% of the individuals could have been set free alive and in good condition in the Atlantic and 95% in the Indian Ocean.

It demonstrated that turtle by-catch and mortality are small in purse seine fisheries –103 catches in 5 years–.

SELECTUN

In the years 2009 and 2010 ANABAC's fleet undertook to investigate and optimize a technique and methodology to improve the remote acoustic



Annex 2b

information on the composition of fish aggregations by using autonomous instrumented buoys used by fishermen. This information has helped to understand the different acoustic signals provided by the instrumental buoys in order to improve the acoustic selectivity and, hence, the identification of the species composition of the fish school; which in turn will improve the fishery selectivity targeting to mono-specific schools of skipjack or schools containing large yellowfin tunas.

As a result of the research, the best specifications for the tool –echo-sounder buoys– to remotely discriminate by-catch at DFADs were obtained.

MADE - Mitigating adverse ecological impacts of open ocean fisheries (EU 7FP Project). <http://www.made-project.eu/>

The primary objective of this 4 year project —2008-2012— launched by the EU is to propose measures to mitigate adverse impacts of fisheries targeting large pelagic fish in the open ocean through appropriate knowledge on the biology and ecology of species, and of the fisheries.

ANABAC is member of the Fishery committee and participates, among other things, incorporating resources for sea trials.

GAP 1 - Bridging the GAP between Science and Stakeholders (EU 7FP Project). Phase 1

The first phase of this European project –2008-2009– focused on the need for fisheries stakeholders, scientists and policy makers to work together more effectively to approach the challenges of sustainable fisheries management. GAP aims at incorporating the

knowledge and skills of fishermen into research that provides the scientific advice to policy makers.

ANABAC was paired with the scientific foundation AZTI were paired together.

Main output of the project was the development of a research case study called Conservation and management issues of tuna fisheries around FADs to be implemented in the ongoing European project –GAP2–.



GAP 2 - Integration of evidence-based knowledge and its application to science and management of fisheries and marine environment.

<http://www.gap2.eu/case-studies/case-study-7/>

In a four year period from 2011 to 2015, the French organizations IRD and ORTHONGEL, together with AZTI and ANABAC, are jointly collaborating in the case study called Conservation and management issues of tuna fisheries around FADs.

The aim of the case study is to define the best FAD-fishing practices and appropriate management measures that should be taken to ensure a sustainable fishery. Scientists and stakeholders – skippers and fleet owners–, in association, will address research and management issues, for sustainable and responsible fishing.

The particularity of this case study is that fishers are involved from data gathering to data analysis and decision-making, as experts of the pelagic ecosystems.

Eco-FAD.

Aimed at investigating and developing in real conditions prototypes of ecological DFADs that avoid incidental by-catch by entangling sea turtles and sharks, a total of 45 Eco-FADs, equipped with echo-sounder buoys and made out of biodegradable materials, have been deployed in the Atlantic Ocean.

By the end of 2012, the final goal is to design an Eco-FAD that aggregates fish efficiently so that the fleet can substitute the traditional FADs.



Two different prototypes were tested in 2010 and 2011 and a third deployment has been made in 2012.

These Eco-FADs have been tracked remotely and scientists from AZTI are handling the data of the amount of fish aggregated by each Eco-FAD.

The catches eventually made on these Eco-FADs are going to be observed by AZTI scientists.



Summary of OPAGAC's research actions

SELAC (2004): Project on new FAD designs to avoid entanglement of by-catch species, mainly sea turtles and acoustic selectivity in the Spanish purse seine fishery in the Indian Ocean

As early as 8 years ago, Opagac pioneered with this pilot action, aiming to improve selectivity through the use of acoustic and electronic means as well as test a series of alternative FAD designs to avoid negative impact on turtle populations.

This Pilot Project executed by the company Albacora and monitored by the Instituto Español de Oceanografía (IEO) took place in the Indian Ocean.

For ten months two purse seine vessels and two auxiliary vessels operated on new FAD designs to avoid entanglement of by catch species, mainly sea turtles, and acoustic selectivity.

The objective of the Pilot Project was to improve selectivity and bycatch incidence of the purse seine fishing on FADs where the impact on stocks of the most sensitive species (bigeye and yellowfin) and on

the ecosystem (bycatches) could pose certain concern.

Several prototypes (22) of artificial floating objects and their performance were analysed in search for a compromise between avoiding entanglement with the minimal loss on aggregation capability for target species.

Acoustic data was collected using up-to-date devices (sonar and scientific echosounders) and subsequently analysed to establish criteria that could provide information for an eventual reduction of juvenile catch of tropical tunas (yellowfin, and essentially, bigeye), based on possible acoustic selectivity.

Results have been very preliminary, although promising in both the objectives of reducing entanglement and the use of acoustic means with selectivity purposes.



Annex 2c

ABYSS (2008): “Analysis of potential relationship between Depth of Purse Seine nets and increased catchability of juvenile bigeye”

The main objective of the project ABYSS was the study of the possible relationship between juvenile bigeye catch and depth of the purse seine. In the event such a relationship was to be found, specific management measures could be devised to mitigate catch on juvenile bigeye.

Data was collected on the effective depth of the purse seine during previous observer trips, but up to date the possible relationship of increased catches of bigeye in relation with the depth of the net was never investigated.

The hypothesis to be tested was that greater depths of net, implied a higher proportion of bigeye in the catch, based on a possible stratification of the species in the water column under floating objects.

This project took place on board OPAGAC associated vessels in the three oceans, Atlantic, Indian and Pacific, for a period of 12 months between 2008-2009, and was designed and coordinated by the Spanish IEO.

Depth sensors were installed in the net, and measurements were taken during the entire deployment of the net on every set and recorded for future analysis assessment of every set's catch composition.

Final results showed no significant positive relationship between depth of the net and increased catchability of bigeye, thus implying lack of particular bathymetric stratification of the species.



SELAC : “Acoustic selectivity” - In development

Originally planned to have started in 2007, it was delayed on several occasions due to lack of funding. It continues to be a prospect for a future pilot action that will take the results already obtained during AP CERCO in the Indian Ocean, for a more improved and more specifically targeted purpose on achieving a greater level of selectivity by the use of acoustic means.

SELAC is projected to take place in the Pacific Ocean involving two Spanish flagged OPAGAC purse seiners. Portable Scientific Echosounder SIMRAD EY-60 with 38, 120 and 200 Khz transducers will be employed to characterize the acoustic footprint of the tuna aggregations prior to setting.

OBJECTIVES

- Obtain the individual echoes to discriminate by species and sizes of tunas under FADs.
- Being able to determine species, biomass and size of tunas concentrated under FADs.
- Behavioral study of tunas under FADs.

Final target of the entire project would be to acquire detailed and sufficient knowledge on the acoustic signature of each of the tropical species and sizes, to enable a detailed knowledge of the tuna aggregations prior to setting.

This knowledge of catch composition and sizes would provide valuable information and allow decision-making in situations where the average size of the tuna is too small.

Also, it could be employed on the improvement of buoy designs, being capable of informing vessels on the sizes and composition of the catch around the FAD, saving fuel, reducing carbon foot print and potentially allowing to avoid undesirable sets.

TUNA-BAI “Buoy Abundance Index”: In development

This ambitious initiative tries to respond to a common issue in every RFMO, data scarcity and non reliable indexes of abundance, up to date, uniquely

based in fishery data for what concerns highly migratory species.

Solid management should be based on a solid knowledge of the status of the resource, for that reason index of abundance are a keystone in any stock assessment.

Finding a reliable index of abundance has been often problematic for tropical tuna species, mainly due to the fact the distribution of CPUE (catch per unit of effort) of the subject species is often not representative of the actual stock distribution, incomplete or scarce, in any of the cases the result is that data lacks reliability for assessment purposes.

The aim of this project is to utilize the entire web of FADs deployed by the fleet and use the data provided by the buoys on these FADs. This data could provide periodic snapshots (even several per day) of tropical tunas biomass around FADs, throughout the entire geographical distribution of the network of FADs. In addition to that, acoustic characterization of species achieved on previous research could also be used for further refinement of these indexes.

FADs would serve as a window to look into the pelagic ecosystem evolution, providing a direct measurement on abundance and species distribution and behavior.

Preliminary drafts for this projects have already been discussed and there is already an important pool of data available for processing that could be used right away. This project will tentatively be the result of a joint collaboration among OPAGAC, ANABAC, ISSF, IEO and AZTI.



Progress report of the Orthongel Tuna Contract for the Future “eco-FAD”

References:

- EFF file identification number 33245
- Orthongel-IRD partnership convention number 2010/02

Starting from the results of the EU MADE project, this TCF has been launched in order to modify the FADs of the French fleet in a way that would eradicate the entanglement of turtles and sharks (although the incidental mortality linked with this entanglement is estimated to be only around a few dozens of animals per year). The modified FADs was to be called “eco-FAD” meaning “turtle & shark friendly” or “non-entangling FAD”.

The first step consisted in identifying the possible technical solutions. It was based on the results of the MADE program and ended with the elaboration of a document describing the different designs of eco-FAD. This document was distributed to all the captains of the fleet.

During the second step (completed in the Indian Ocean and in progress in the Atlantic Ocean), the vessels have been testing different types of “eco-FAD” first built following instructions given by an project manager recruited by Orthongel. Liberty was given to

the crews to modify the proposed designs as long as the result was non-entangling. 3 designs were finally selected by them, which are the following:

1) THE TWISTED NET DESIGN (53% OF THE SEEDED ECO-FADS)

This FAD is composed of:

- A raft made of 8 to 10 2 meters-long bamboo canes attached with cork floats. The raft is covered by 2-4 layers of thick black small-mesh netting tightly sewn together and heavily strained to prevent animals from getting between the netting. Tests have also been conducted with a cover made of a black cotton cloth.

- A single (sometime double) twisted net hanging from under the middle of the raft and weighted by a piece of chain or cable at its bottom end. The net is twisted into a sausage shape, sewn or tied every meter to reduce the likelihood of entanglement. To increase the drift



Annex 2d

of the submerged structure (which serves as a sea anchor), salt bags and/or small sections of recycled ropes are attached to the net.

The advantage of this design is that it can be realized with the FADs already used. The transformation of the FAD takes less than one hour and does only increase slightly the cost of the FAD.

2) THE 4-ROPES DESIGN (3% OF THE SEEDED ECO-FADS)

This FAD is composed of:

- A raft made of 8 to 10 2 meters-long bamboo

canes attached with cork floats. The raft is covered by 2-4 layers of thick black small-mesh netting tightly sewn together and heavily strained to prevent animals from getting between the netting. Tests have also been conducted with a cover made of a black cotton cloth.

- 4 recycled ropes weighted by a piece of chain or cable at their bottom end and attached to each corner of the raft. To increase the drift of the submerged structure (which serves as a sea anchor), salt bags and/or small sections of recycled ropes are attached to the ropes.



3) THE 4-NET STRIPS DESIGN (40% OF THE SEEDED ECO-FADS)

This FAD is composed of:

- A raft made of 8 to 10 2 meters-long bamboo canes attached with cork floats. The raft is covered by 2-4 layers of thick black small-mesh netting tightly sewn together and heavily strained to prevent animals from getting between the netting. Tests have also been conducted with a cover made of a black cotton cloth.

- 4 strips of net weighted by a piece of chain or cable at their bottom end and attached to each corner of the raft. Each strip is twisted into a sausage shape and sewn or tied every meter to reduce the likelihood of entanglement. To increase the drift of the submerged structure (which serves as a sea anchor), salt bags and/or small sections of recycled ropes are attached to the ropes.

As the end of 2011, 51 sets have been reported around 45 ecoFADs (6 were visited twice). In 80% of these sets, the catch realized have been equal or greater to 10 t. The average catch under ecoFAD was of 25t per set, which is comparable to the average catch under classical FADs.

This Tuna Contract for the Future has benefited from a public financial assistance for collective actions under the FEP program. At its end, the financial involvement of the sector should then be of about 41%. This program is realized in close cooperation with IRD and is led by an Orthongel project manager based in the Seychelles and supervised by IRD.

The progress of the program was however unfortunately disturbed by the persistence of piracy in the Indian Ocean and the initial period of one year for the program was extended to two years.



Progress report of the Orthongel Tuna Contract for the Future “Sharks”

References:

- EFF file identification number 33246
- Orthongel-IRD partnership convention number 2010/03

This program aims to provide fishermen’s training and equipment onboard the French tuna purse seiners to release sharks in good health in order to significantly reduce or eliminate the incidental mortality of sharks. Training will be realized with the support of public funding.

The first step is based on the results of the MADE program and specific embarkation of scientists which mission was to identify, on one hand, the tools and potential developments of the ships to release sharks in the best survival conditions possible, and, on the other hand, the operative protocols that will allow to perform such good practices under the best possible conditions for sailors (safety) and sharks (survival).

Since December 2010, 18 crewmen (mainly skippers) were interviewed about their experiences, observations, opinions and ideas about the catch and release of pelagic sharks, rays and whale sharks. At the end of these talks, protocols and devices ideas have been proposed to the boards. Information on onboard equipments was also collected allowing to identify the best solutions for each type of vessels.

Furthermore, the embarkation of scientists on board seiners identified different protocols/solutions to release sharks under the best conditions for survival and safety, such as:

- Using a square piece of net to manipulate manta rays and large sharks and release them at sea;
- For a safe manipulation by hand of small sharks (on the deck or on the sorting belt), the sailor must

first held the head of the shark by grasping the animal behind the gill slits or by the dorsal fin;

- The system of sorting belt and discard belt could be improved to facilitate the release of sharks and rays.



Annex 2e

To date, two campaigns were conducted (in conjunction with the program MADE). These shipments have allowed to:

- estimate the current survival of sharks (before the training of the crews): of 136 sharks caught accidentally (mostly of silky sharks), 53 were released alive (39%) of them, 21 were tagged before being released ; at least 14 were still alive after ten days (67%);
- describe the different operations involved in the capture of sharks: the chance of survival decreasing with time and depending on the number of manipulations, it is important to

intervene as quickly as possible during the capture process while ensuring the safety of crew; for large individuals, manipulations usually happen on the bridge and may take several minutes (2-4) involving three to four sailors; for small individuals, they are generally released through the discard belt;

- describe the technique currently adopted to free the whale sharks.

These experiments have resulted in a publication (Survival rate of Silky sharks (*Carcharhinus falciformis*) incidentally caught onboard French tropical purse seiners, Poisson F., Vernet AL, Filmalter J., Dagorn



L. and M. Goujon) considered very interesting and promising by many scientists.

In a second step, a training course, a manual of best practices, descriptive sheets and posters should be prepared and disseminated to all ships of the two oceans in order to sensitize the crew to the problem of reducing the bycatch mortality of sharks and to generalize the respect of the adopted good practices.

Given the scientific observations already made, gestures and simple techniques could be quickly implemented without special constraints for crews. Training sessions will be organized on each ship in the fleet to ensure that procedures have been well understood. These trainings will be organized by the scientific experts possibly accompanied by crewmen with experience in these release operations.

During a third step, the embarkation of scientists on board purse seiners is planned in order to validate

the adopted procedures for the release of sharks and improve them if necessary. During these campaigns, it is also planned to tag released sharks with pop-up tags to assess their survival rates and to perform blood sampling to assess the health status of sharks released (some blood parameters allow to assess the stress suffered by the released animal and thus to get an idea of its long-term survival).

This Tuna Contract for the Future has benefited from a public financial assistance for collective actions under the FEP program. At its end, the financial involvement of the sector should then be of about 53%. This program is realized in close cooperation with IRD and is led by an Orthongel project manager based in the Seychelles and supervised by IRD.

The progress of the program was however unfortunately disturbed by the persistence of piracy in the Indian Ocean and the initial period of one year for the program was extended to two years.





**Management measures in place for FADs,
Purse seine and Tropical tunas fisheries in
the different RFMO's**

ICCAT

- Recommendation 04-01 by ICCAT on a multi-year conservation and management program for bigeye tuna Ammended by Recs. 09-01,10-01,06-01.
- BET-Total allowable catch for 2010 is set at 85,000 t for Contracting Parties and Cooperating non-Contracting Parties, Entities or Fishing Entities.
- Limits on numbers of fishing vessels less than the average of 1991 and 1992.

- Specific limits of number of purse seine boats; Panama
- Rec 11-01 No FAD fishing January 1st to February 28th in the area encompassed by 10°s-African Coast 5°N and 5° W-5°E.
- YFT- Effective fishing effort not to exceed 1992 level [Rec. 93-04].



Annex 3



LDRAC POSITION ON FAD MANAGEMENT

IOTC

- Resolution 10/01 for the conservation and management of tropical tunas stocks in the IOTC area of competence (Time-Area Closure 0° - 10° North 40° and 60° East – November)
- Recommendation 10/13 on the implementation of a ban on discards of skipjack tuna, yellowfin tuna, bigeye tuna and non targeted species caught by purse seiners
- Biot MPA closed to all fishing since 2011
- Glorious MPA since 2011

- Maldivas EEZ closed for foreign fleets.
- Somalia EEZ closed to all access since 2008.

IATTC

- 100% observer coverage for Purse Seine fleet.
- Ban on discards
- Resolution C-09-01 on a Multiannual Management program for Tropical Tunas in the Eastern Pacific
- Time Area Closure (Corralito) 96° to 110 W and 4°N to 3°S from September 29th to October 29th.
- Total 2 month full stop on Purse seine fishing.

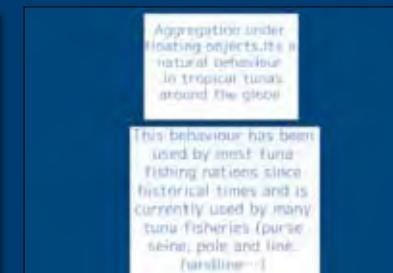
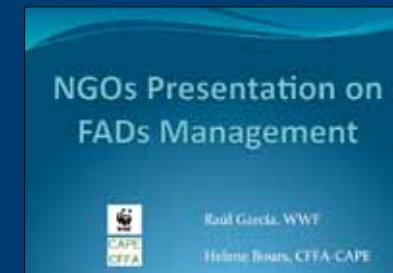
WCPFC

- 100% observer coverage for Purse Seine fleet.
- Ban on discards.
- 3 months FAD closure CCM 2008-01.
- Western high seas closed to fishing.
- Phoenix Islands MPA.

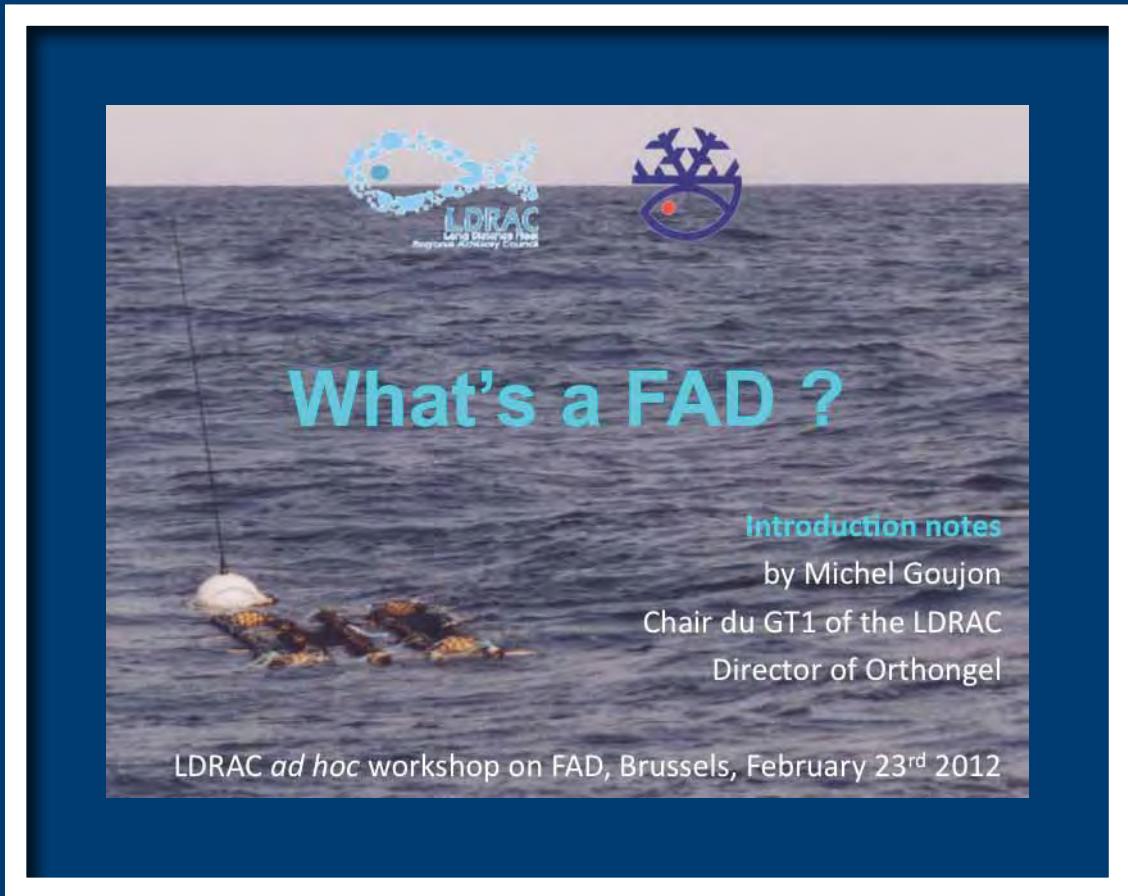


Full texts of the Recommendations are available in the websites of the RFMOs:
<http://www.iccat.int/>
<http://www.iotc.org/>
<http://www.wcpfc.int/>
<http://www.iattc.org/>

Presentations workshop



MICHEL GOUJON - CHAIRMAN WG1



MICHEL GOUJON



MICHEL GOUJON

What's a FAD: types of FAD

- Lost/discarded human-made objects:
 - Objects built and released at sea to aggregate fish

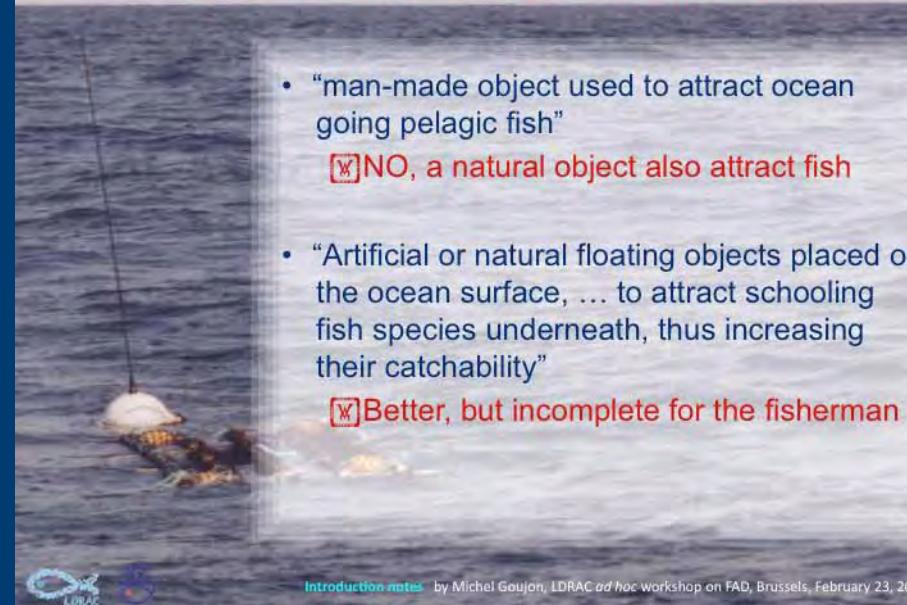


LDRAC

MICHEL GOUJON

What's a FAD: definition

- “man-made object used to attract ocean going pelagic fish”
 - NO, a natural object also attract fish
- “Artificial or natural floating objects placed on the ocean surface, ... to attract schooling fish species underneath, thus increasing their catchability”
 - Better, but incomplete for the fisherman



Introduction notes by Michel Goujon, LDRAC ad hoc workshop on FAD, Brussels, February 23, 2012

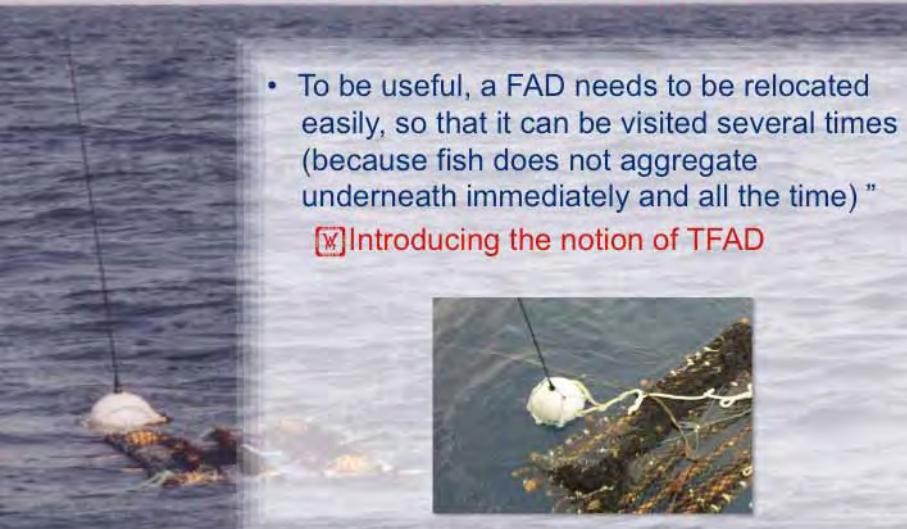


MICHEL GOUJON

What's a FAD: definition

- To be useful, a FAD needs to be relocated easily, so that it can be visited several times (because fish does not aggregate underneath immediately and all the time) ”

Introducing the notion of TFAD



Introduction notes by Michel Goujon, LDRAC ad hoc workshop on FAD, Brussels, February 23, 2012

MICHEL GOUJON

What's a TFAD: definition

- “Artificial or natural floating objects released at sea by fishermen with a beacon (and therefore tracked) to attract schooling fish species underneath, thus increasing their catchability”



Introduction notes by Michel Goujon, LDRAC ad hoc workshop on FAD, Brussels, February 23, 2012



HILARIO MURUA - AZTI TECNALIA

Overview of global of tropical tuna fisheries - Purse Seine and FAD Fisheries

Hilario Murua
Chair of IOTC WPTT

azti tecnalia

6-12 1

HILARIO MURUA

azti
Tropical Tunas: (SKJ, BET, YFT) by SPECIES

Tropical Tuna Catches by species

Catches (tonnes)

Year

2000-2010

56% 12% 33%

Bigeye Yellowfin Skipjack

© AZTI-Tecnalia

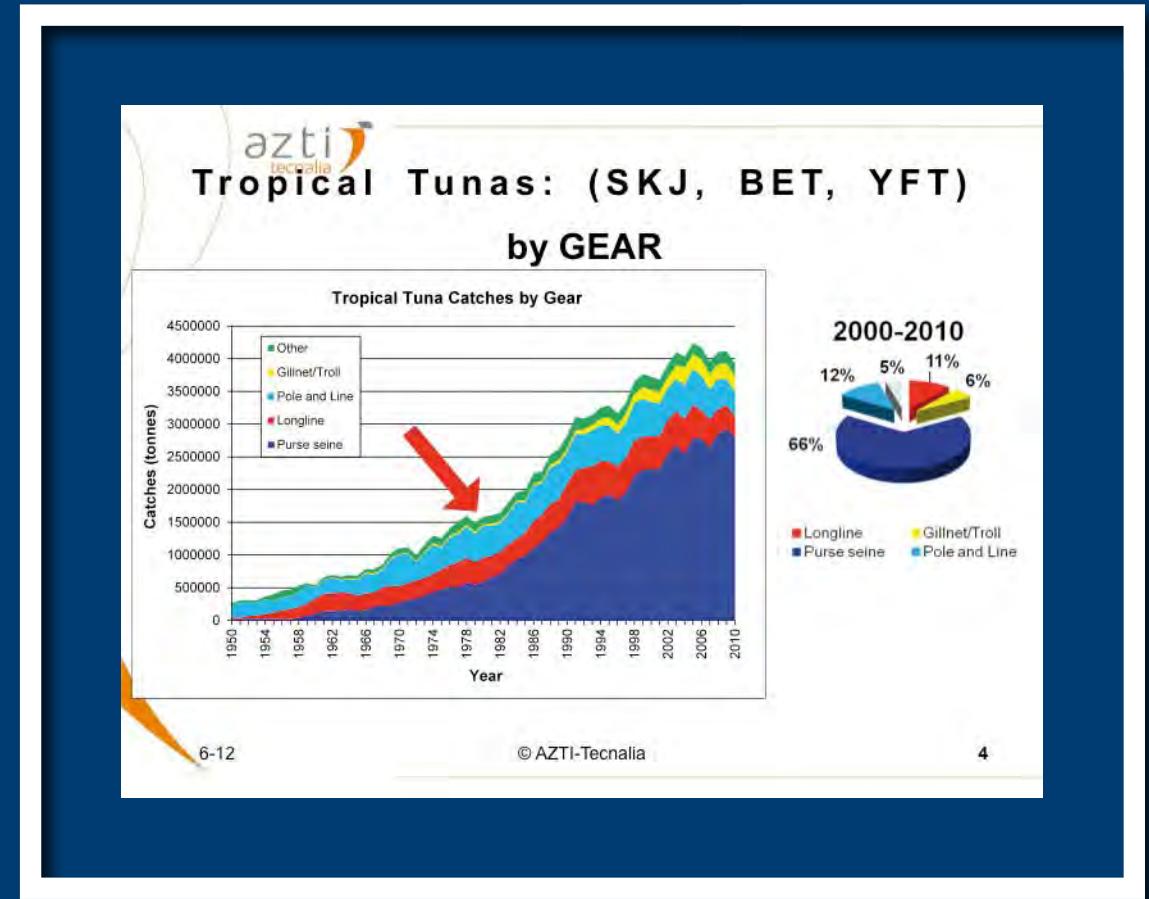
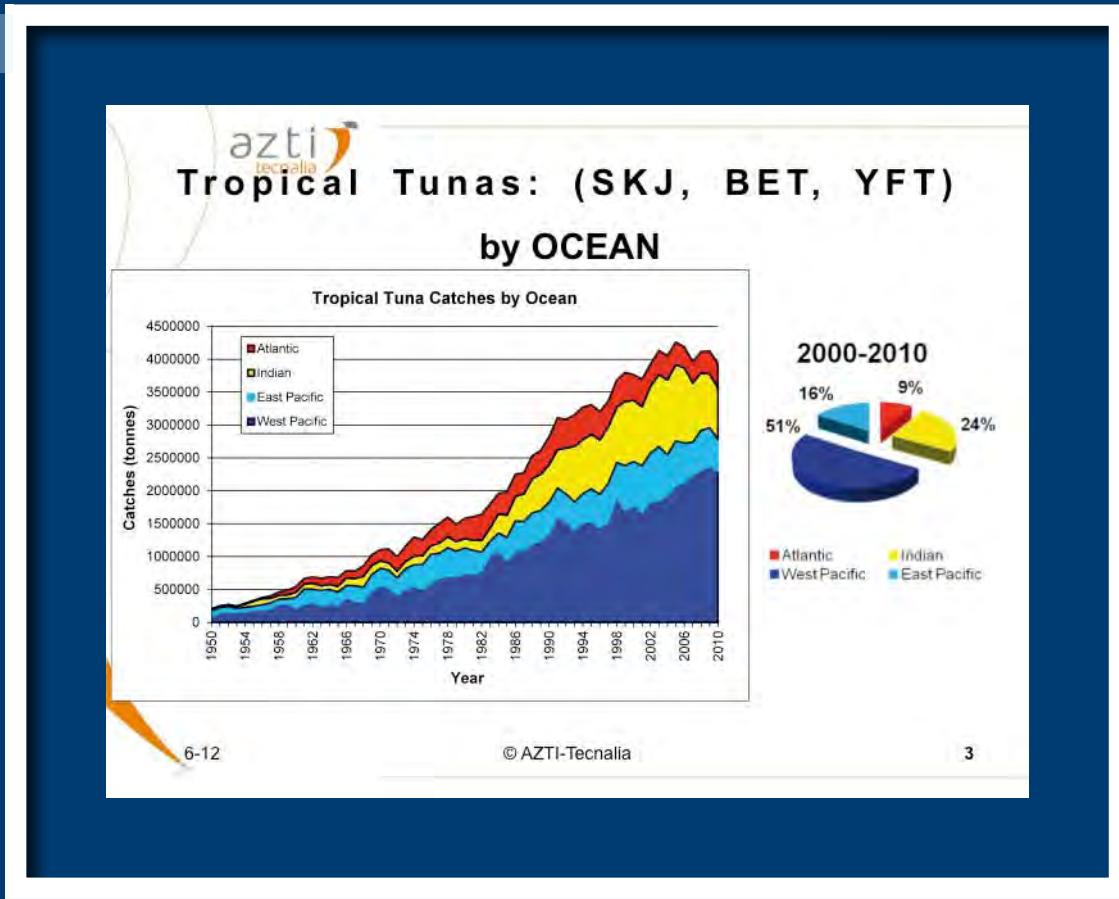
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HILARIO MURUA

HILARIO MURUA

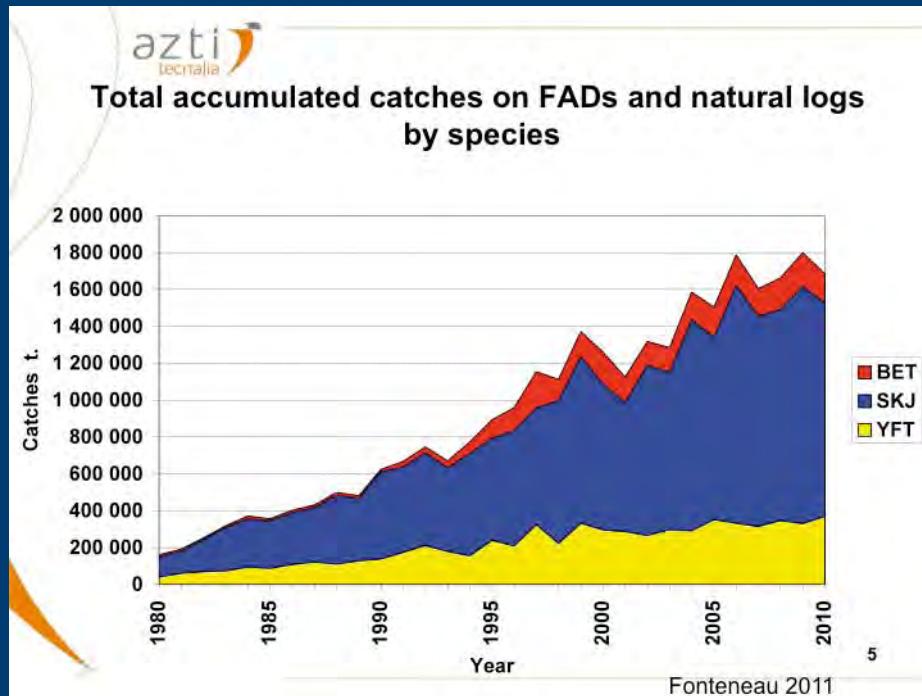


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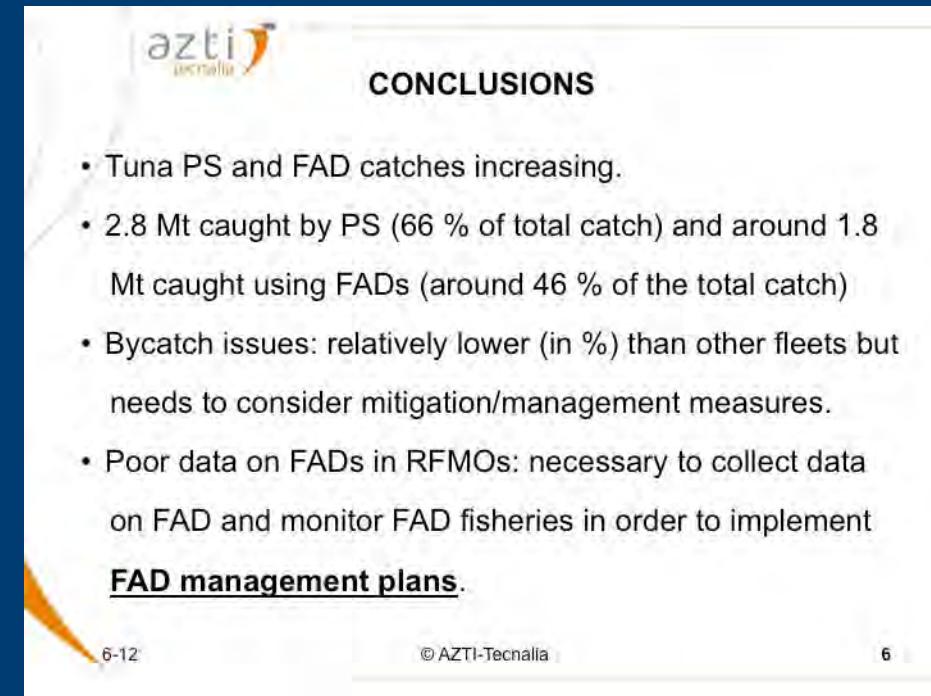
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HILARIO MURUA



HILARIO MURUA



3

DANIEL GAERTNER - IRD



Workshop FADs

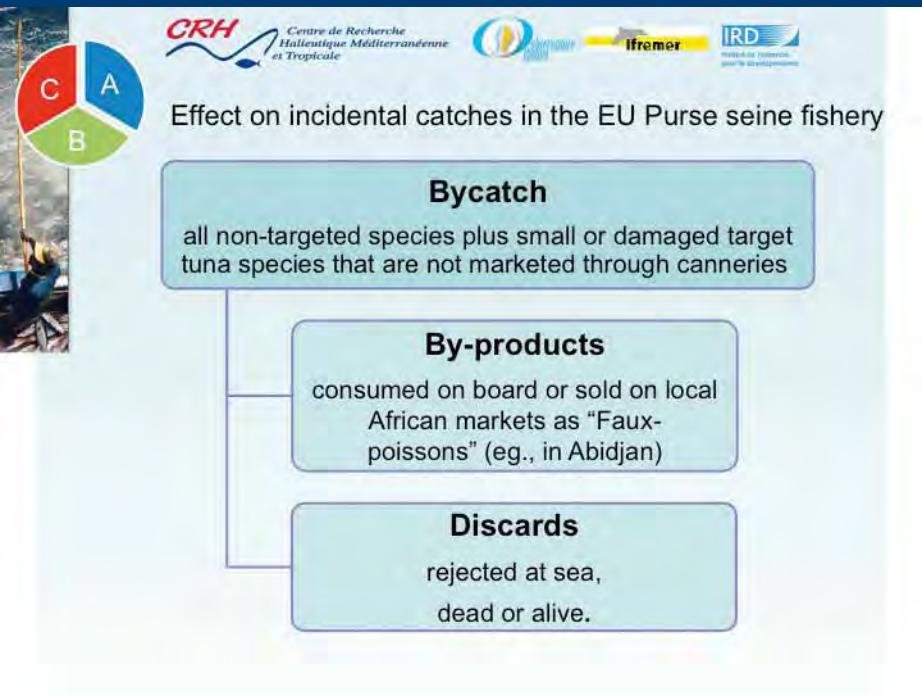
Consequences of the FADs utilization:

- A) Effect on incidental captures,
- B) Indirect effect on tuna populations (concept of ecological trap)
- C) Effect on fishing effort (calculation, fishing grounds)

*Highly migratory stocks and relevant regional fisheries management organizations (Long Distance Fleet Regional Advisory Council)
23rd of February 2012, Brussels*

Daniel Gaertner (IRD) daniel.gaertner@ird.fr
UMR EME, CRH BP 171, Sete 34203, Cedex France

DANIEL GAERTNER



Effect on incidental catches in the EU Purse seine fishery

Bycatch
all non-targeted species plus small or damaged target tuna species that are not marketed through canneries

By-products
consumed on board or sold on local African markets as "Faux-poissons" (eg., in Abidjan)

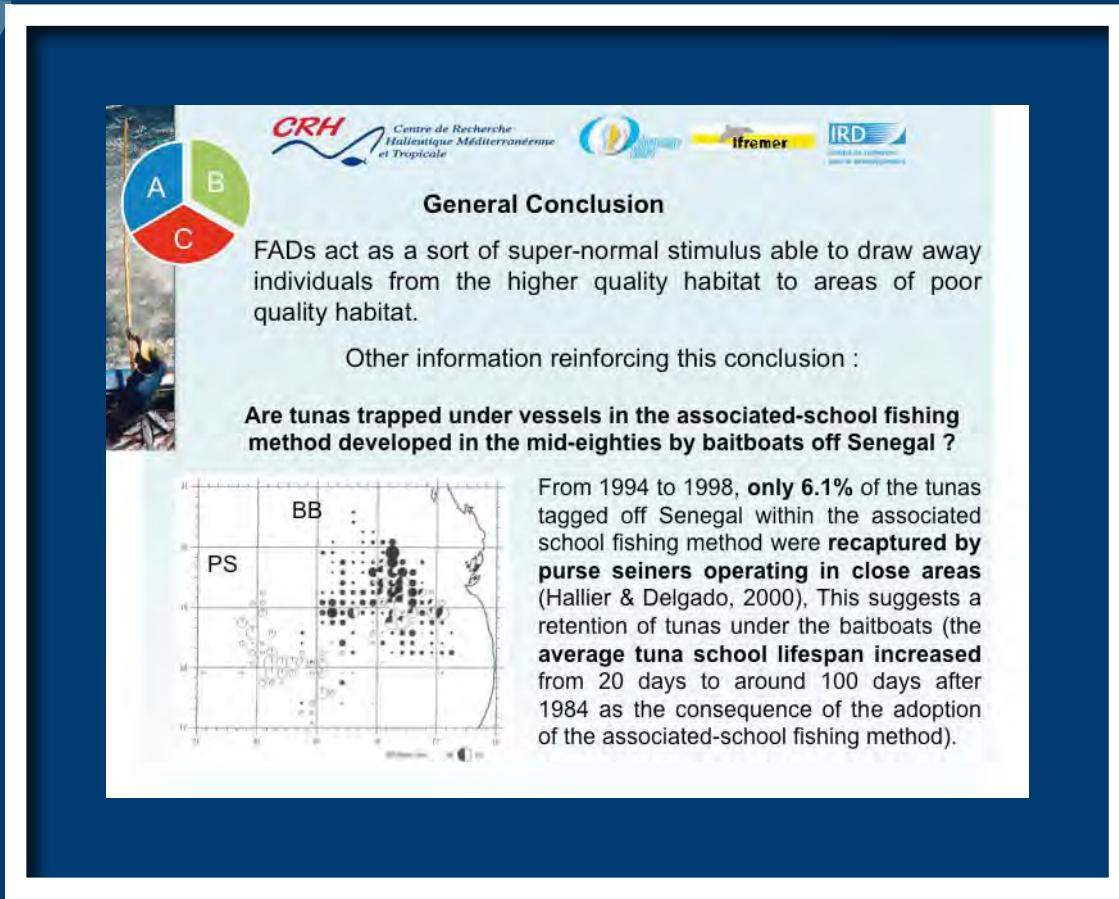
Discards
rejected at sea, dead or alive.



3

DANIEL GAERTNER

DANIEL GAERTNER

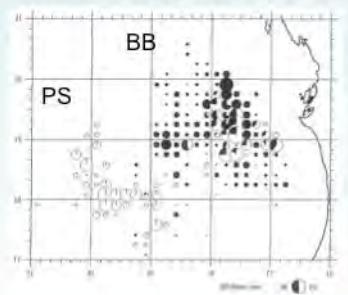


General Conclusion

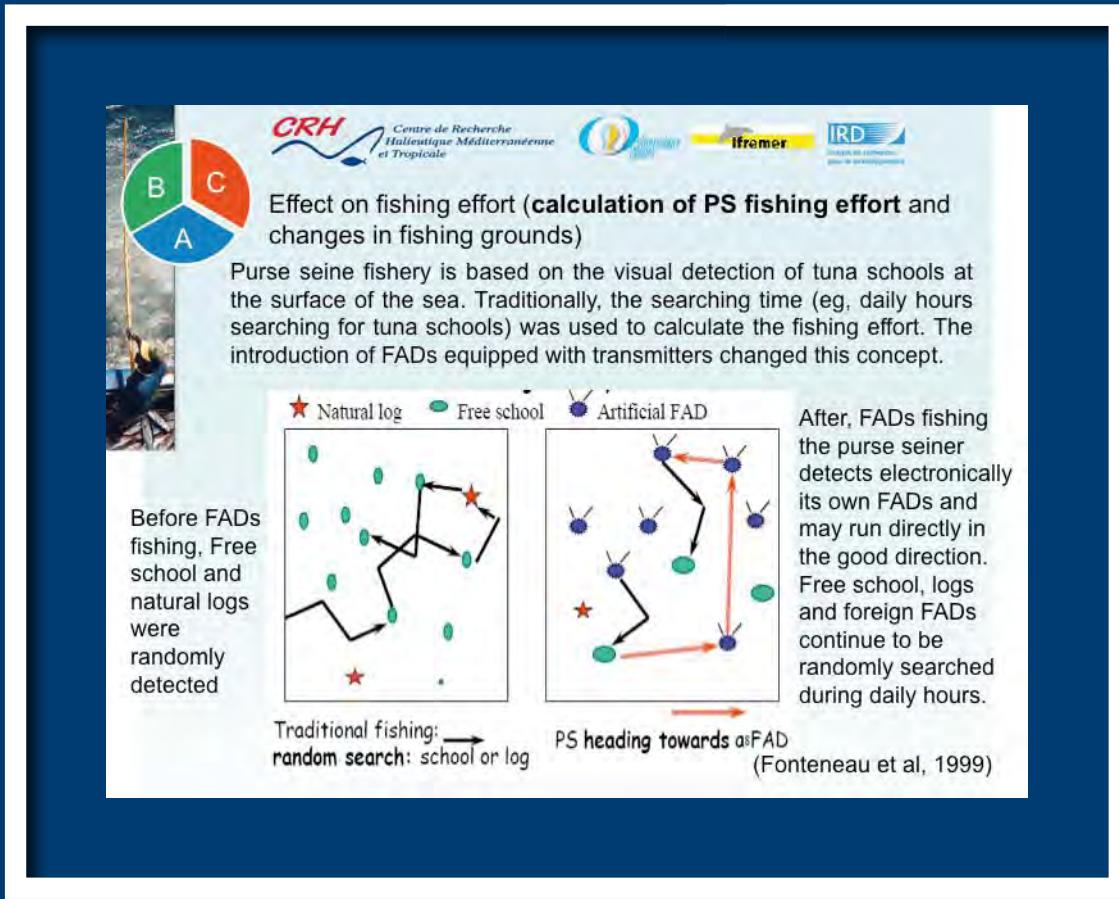
FADs act as a sort of super-normal stimulus able to draw away individuals from the higher quality habitat to areas of poor quality habitat.

Other information reinforcing this conclusion :

Are tunas trapped under vessels in the associated-school fishing method developed in the mid-eighties by baitboats off Senegal ?

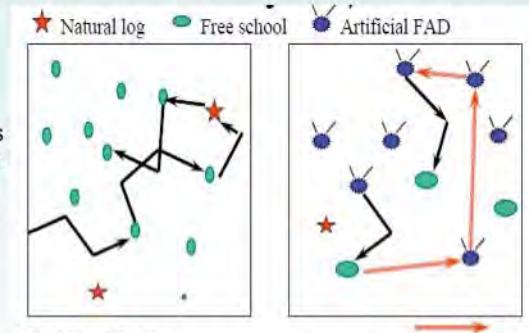


From 1994 to 1998, **only 6.1%** of the tunas tagged off Senegal within the associated school fishing method were **recaptured by purse seiners operating in close areas** (Hallier & Delgado, 2000). This suggests a retention of tunas under the baitboats (the **average tuna school lifespan increased** from 20 days to around 100 days after 1984 as the consequence of the adoption of the associated-school fishing method).



Effect on fishing effort (calculation of PS fishing effort and changes in fishing grounds)

Purse seine fishery is based on the visual detection of tuna schools at the surface of the sea. Traditionally, the searching time (eg, daily hours searching for tuna schools) was used to calculate the fishing effort. The introduction of FADs equipped with transmitters changed this concept.



Before FADs fishing, Free school and natural logs were randomly detected

After, FADs fishing the purse seiner detects electronically its own FADs and may run directly in the good direction. Free school, logs and foreign FADs continue to be randomly searched during daily hours.

Traditional fishing: random search: school or log

PS heading towards an FAD (Fonteneau et al, 1999)



3

DANIEL GAERTNER

DANIEL GAERTNER

In the Atlantic: seasonality does matter !

Natural logs vs FADs

- Natural logs
- FADs

French PS logbooks, 2005-2011; Source: Observatoire thonier (IRD UMR EME)

The next challenge for PS fisheries: How to manage FADs fishing within an ecosystem approach ?

- Controlling **quantitatively** (number) and **qualitatively** (when and where) the use of FADs
- Testing **mobile time and area closures** according to specific objectives (eg protection for juveniles of tunas and/or endangered species)
- Limiting **unnecessary discards** and using by-catch as **by-products**
- Targeting a **better** selectivity rather than focusing on **more** selectivity

Thanks for your attention



4
NGOs PRESENTATION

**NGOs Presentation on
FADs Management**

 Raúl García, WWF

 Helene Bours, CFFA-CAPE

LDRAC Workshop on FAD, Brussels, February 23rd 2012

NGOs PRESENTATION

FADs Management

INTRODUCTION

- Use of FADs in tropical tuna fisheries keeps increasing globally
- Represents a substantial proportion of the tropical tuna purse-seine catch, making up roughly 63% of the global catch
- Data on their impacts on the marine ecosystems are still poor and they further exacerbate existing uncertainties exist about the status of tropical tuna stocks

4
NGOs PRESENTATION

FADs Management

INTRODUCTION

- FADs = important parameter which greatly enhances fishing capacity,
- 1999 FAO International Plan of Action on the Management of Capacity called for the adoption of capacity management plans by 2005 and “immediate actions for major transboundary, straddling, highly migratory and high seas fisheries requiring urgent measures”

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NGOs PRESENTATION

FADs Management

FADs IMPACTS

- Increase pressure on target species and makes assessment of fishing effort and stock trends difficult
- Increase catches of juvenile tunas, non-targeted tunas and other species (mainly sharks, rays, turtles and other marine life)
- Causes significant changes to migratory patterns, increase displacement rates, etc., (ecological trap)
- Population assessment of tuna more difficult due to those ecological changes.

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4
NGOs PRESENTATION

FADs Management

MANAGEMENT MEASURES NEEDED

- FADs impact on fishing efficiency and effort must be accurately assessed
- Precise data on their effects on target species, dependent and associated species and marine ecosystems must be urgently collected and submitted to RFMOs and made available to the relevant scientific committees.
- 1999 FAO Technical Consultation on the Measurement of Fishing Capacity describes major capacity characteristics by gear type

NGOs PRESENTATION

FADs Management

MANAGEMENT MEASURES NEEDED

- For purse seines: Time searching, use of fish aggregating or fish-finding aids such as FADs, planes and sonar, average sets per trip, vessel GRT or GT or other volumetric measure, kW, fish hold capacity
- Regulation of purse-seine fishing on FADs by EU and RFMOs is insufficient
- Must follow best scientific knowledge and implement the precautionary and ecosystem-based approaches
- Binding capacity and effort adjustments schemes must be adopted by EU and RFMOs

5

INDUSTRY PRESENTATION



INDUSTRY PRESENTATION

Aggregation under floating objects, its a natural behaviour in tropical tunas around the globe

This behaviour has been used by most tuna fishing nations since historical times and is currently used by many tuna fisheries (purse seine, pole and line, handline...)



5

INDUSTRY PRESENTATION

Catches of juvenile tropical tunas

But..there are some side effects that can be improved...

But..catching many juveniles might not be such a huge benefit, since tropical tuna natural mortality is very high TLE

Natural Mortality Reduction

INDUSTRY PRESENTATION

Bycatch and interaction with sensitive species

but.. in reality.. bycatch on Purse Seine fisheries is among the lowest of all the industrial fisheries (+/- 3%)!!



6

EUROPEAN COMMISSION

The situation of FADs in the frame of the RFMOs and UN

Workshop FADs – LDRAC (23rd February 2012)

EUROPEAN COMMISSION

FISHERIES

European Commission

Facts on FADs

- Total FADs actively monitored in oceans: +50,000
- Eastern Pacific Ocean (EPO): 9,813 (2008)
- Western and Central Pacific Ocean (WCPO): 20,859 (2008)
- Indian Ocean : 2,100 (2008)
- Total by-catch from the use of FADs amounts to over 180,000 tons every year (2007)
- Source: PEW

European Commission
Marine Affairs
and Fisheries

Slide



6 EUROPEAN COMMISSION

FISHERIES



Main issues with FADs in RFMOs

- Capture of juveniles, non-targeted tunas and by-catch (sharks, rays, turtles and other marine life)
- Ecological trap (alter natural distribution patterns, habitat associations, migrations...)
- Increased difficulty of properly assessing status of individual tuna populations
- Contributes to increased pressure on the stocks
- RFMOs with FAD management measures: ICCAT, IATTC, IOTC, WCPEC



European Commission
Marine Affairs
and Fisheries

Slide

EUROPEAN COMMISSION

FISHERIES



United Nations framework

- No references to FADs in **UNCLOS** nor **UNFSA**
- **FAO Code of Conduct** : article 8.11.3 *"States should, within the framework of coastal area management plans, establish management systems for artificial reefs and fish aggregation devices. Such management systems should require approval for the construction and deployment of such reefs and devices and should take into account the interests of fishers, including artisanal and subsistence fishers"*



European Commission
Marine Affairs
and Fisheries

Slide

6

EUROPEAN COMMISSION

EUROPEAN COMMISSION

FISHERIES



UNGA Sustainable Fisheries Resolution

- Mexico's proposal in 2010 on FADs, requesting States to number, monitor and retrieve FADs (not agreed)
- In 2011, Mexico re-tabled the proposal and after long discussions a text was agreed, which reads:
- *"Calls upon States, either individually, collectively or through regional management organizations and arrangements, to further study, develop and adopt effective management measures, taking into account the best available scientific information on fishing methods, including fish aggregating devices, to minimize by-catch";*



Slide

FISHERIES



Trade-offs

- **Prohibition of the use of FADs:** may reduce fishing effort over the short term but may also cause fishermen to start using alternative methods
- **Moratorium:** time-area moratoria alone are unlikely to prove sufficient effects to manage FAD fisheries (full compliance is needed, moratoria are less effective in oceans with no clear seasonal pattern in fishing with FADs)
- **Alternative FAD design:** loss of target catch, insufficient tests, cost
- **Marking FADs:** observer coverage needed
- **First starting point for the EU :** FADs management Plans



Slide



7

SPANISH ADMINISTRATION

MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE.
SECRETARÍA GENERAL DE PESCA.

**MANAGEMENT NATIONAL PLAN FOR FISH
AGGREGATING DEVICES (FADs)**

GENERAL SECRETARIAT FOR FISHERIES
MINISTRY OF AGRICULTURE, FOOD AND
ENVIRONMENT.

23rd February 2012

SPANISH ADMINISTRATION

MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE.
SECRETARÍA GENERAL DE PESCA.

1. Need to produce a Plan.
2. Production of the Plan.
3. Structure of the Plan.
4. Future.



SPANISH MANAGEMENT PLAN



MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE.
SECRETARÍA GENERAL DEL MAR

1. NEED TO PRODUCE A PLAN.

- The **evolution** of this type of devices: from simple wooden sticks to the current technological development.
- Its **use has grew up** considerably, due to its high productivity. At the same time, the degree of uncertainty has also increased.
- **The Spanish Administration** as well as the Fisheries sector affected by, have the commitment to lead at international level the management of the FADs.
- To do so, the first step is: to improve the knowledge on this type of fishing gear as a tool to mitigate the possible adverse effects, and look for its improvement.

SPANISH MANAGEMENT PLAN



MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE.
SECRETARÍA GENERAL DEL MAR

2. PRODUCTION OF THE PLAN:

- Administration, represented by the General Scretariat for Fisheries and the Spanish Oceanographic Institute
- Sector: represented by the two Associations that gather all the Spanish tuna purse seiners: ANABAC and OPAGAC.
- The Plan leaves open the possibility to include other scientific organizations, if is decided so.

SPANISH ADMINISTRATION



MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE.
SECRETARÍA GENERAL DEL MAR

3. STRUCTURE OF THE PLAN:

- 3.1. Basis and background of this Plan.
- 3.2. Objectives
- 3.3. Scope of application.
- 3.4. Definitions.
- 3.5. Identification of FADs.
- 3.6. Register and information-sharing regarding FADs.
- 3.7. Monitoring FADs.
- 3.8. Measures to prevent loss of FADs.
- 3.9. Measures to mitigate the catch of juvenile tuna and non-target species.
- 3.10. Specific closures on fishing with FADs.
- 3.11. Measures to monitor and follow up the present Plan
- 3.12. Confidentiality measures for the information provided by operators.
- 3.13. Amendments to the present Plan.

SPANISH ADMINISTRATION



MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE.
SECRETARÍA GENERAL DE PESCA

4. FUTURE

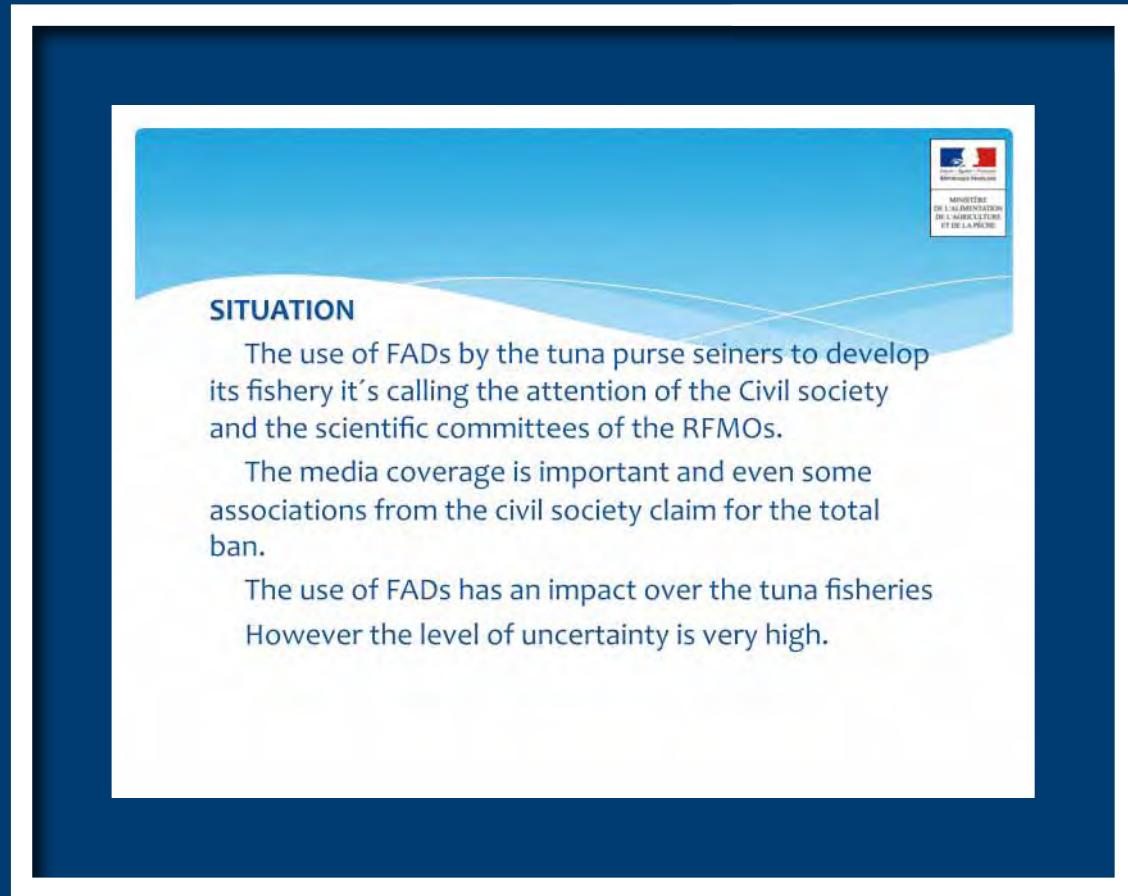
- Timing of the Plan: adoption in October 2010; first implementation campaign in 2011. First outcomes: along 2012
- These results will be used to propose measures for the amendment of the plan, as well as to provide support to all the proposals that it would like to implement;
- Among them, measures aimed to reduce the by-catch of non-target species.
- To update the Plan to include the legislation produced by the RFMOs as well as by the EC.
- The Plan has been taken as a model: introduced in the WCPFC. Currently no RFMO is implementing any plan similar to this one.
- Joint success.

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FRENCH ADMINISTRATION



FRENCH ADMINISTRATION



8

FRENCH ADMINISTRATION

HOW TO MANAGE THIS TOOL

It is necessary to establish the reference framework for the management.

Industry has to be involve, and run their own initiatives. The French sector is committed to the improvement of the knowledge and fully engaged with a sustainable management of the tuna fisheries as a whole.

In France, Administration, Industry and scientists, (mainly IRD), are working together in the same direction.



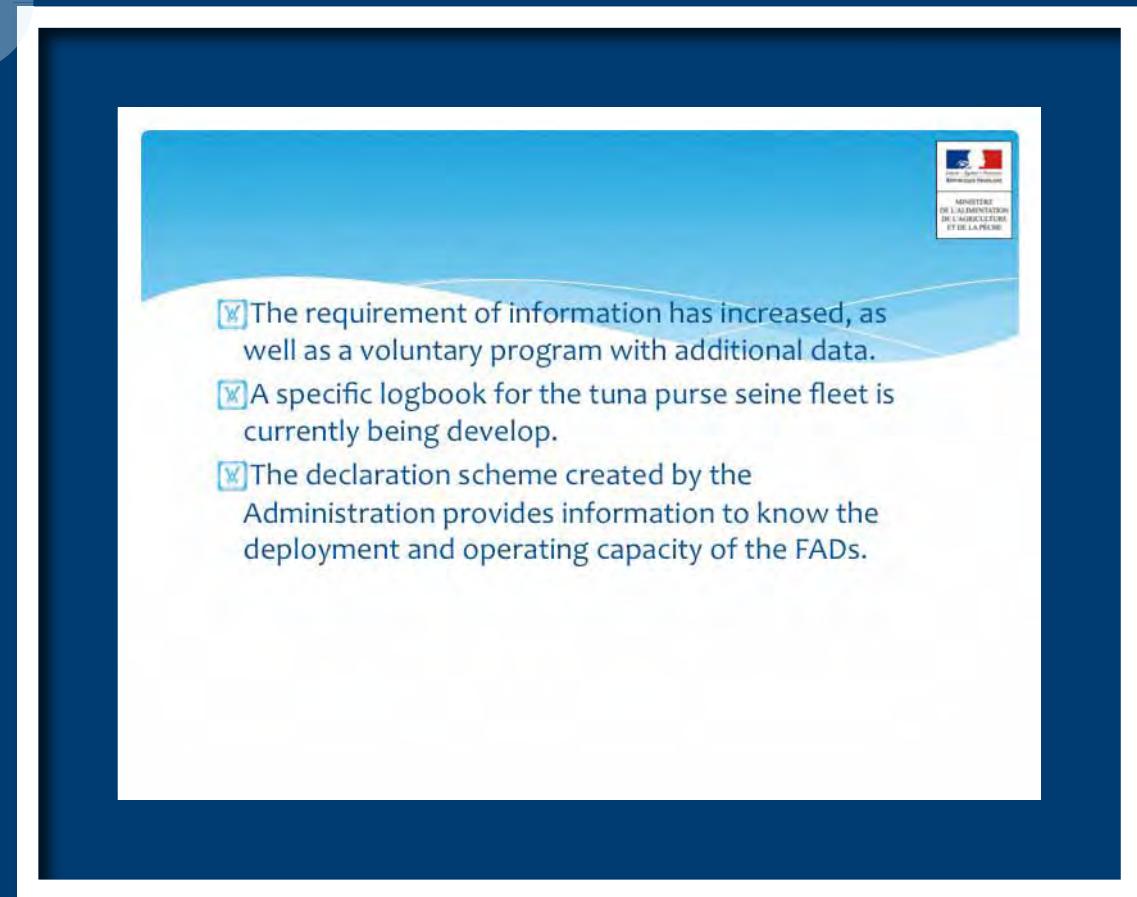
FRENCH ADMINISTRATION

- ☑ A project to make ecological FADs, designed to mitigate by-catches, is currently in place.
- ☑ Most of the FADs used by the French fleet are satellite buoys, and the information provided by them is very important, however it is in place another project to manage the non-satellite FADs.
- ☑ Another elements are also being implemented, aimed to improve the knowledge of the fishing activity, the data collection required is more exhaustive, because there is a need to know better the impact of FADs.



8

FRENCH ADMINISTRATION



- ☑ The requirement of information has increased, as well as a voluntary program with additional data.
- ☑ A specific logbook for the tuna purse seine fleet is currently being develop.
- ☑ The declaration scheme created by the Administration provides information to know the deployment and operating capacity of the FADs.

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FRENCH ADMINISTRATION



MANAGEMENT PLAN

France is currently working on the elaboration of a specific management plan for FADs.

The French industry is very proactive in the management, and it is taking measures by its own initiative aimed to develop the fishery in a sustainable way.

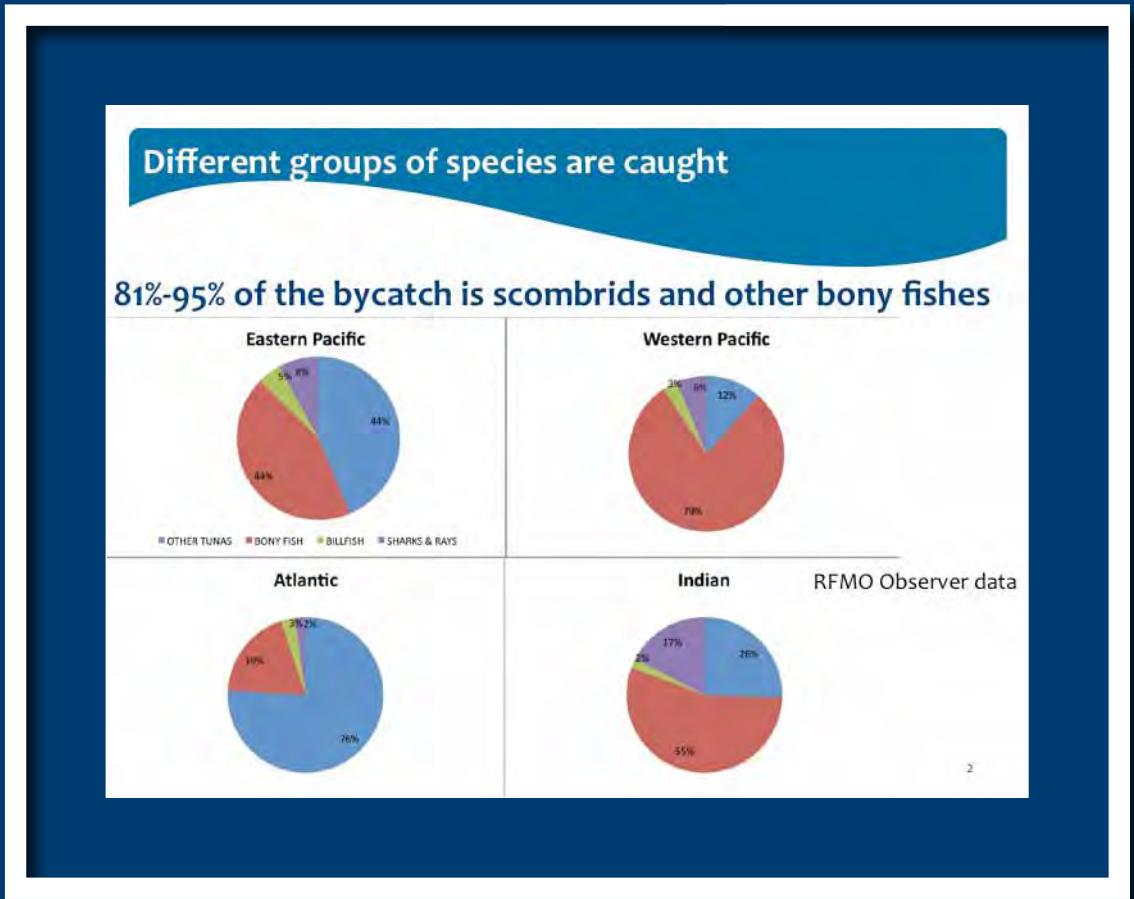
97



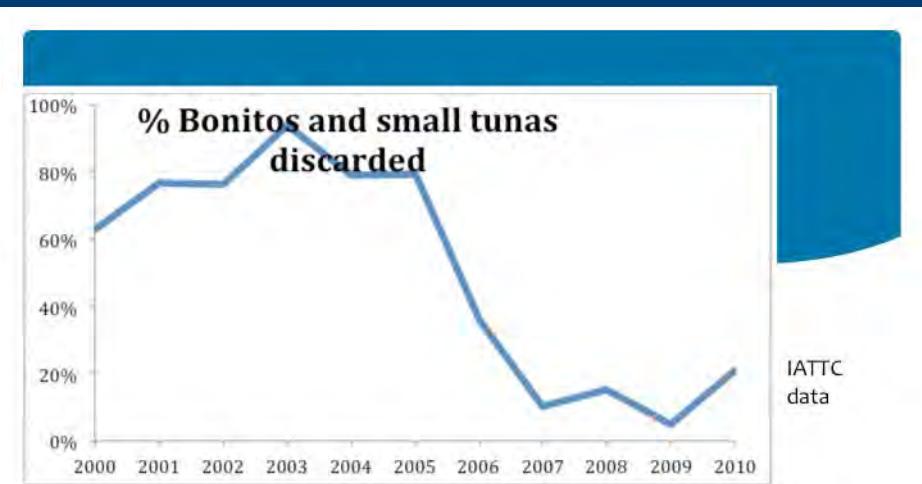
VICTOR RESTREPO - ISSF



VICTOR RESTREPO



VICTOR RESTREPO

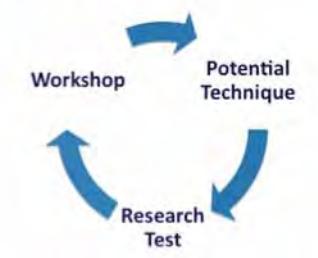


**Eliminating discards would address 80% to 95% of the FAD bycatch (in terms of weight).
- How? Needs more work**

VICTOR RESTREPO

Bycatch Mitigation Research

- Scientific Steering Committee
- Skippers' Workshops
- At-sea Research



VICTOR RESTREPO

Concluding Remarks

Are FADs bad?

They have Pros and Cons, like every gear

1.2 million t SKJ caught on objects

Replace by P&L? FS? Unlikely

Can FAD bycatch be reduced?

Yes. But there are different issues:

Other tunas and fishes: Find uses for them

Small BET and YFT: Requires research

Turtles: Minor issue

Sharks: Requires research



INTERNATIONAL SEAFOOD SUSTAINABILITY FOUNDATION

VICTOR RESTREPO

Concluding Remarks

Do FADs need to be regulated?

- All fishing methods need to be regulated (monitored and managed)
- Need to inform the stock assessment
- FAD logbooks are a must
- FAD usage data need to go to RFMO SCs
- Don't forget anchored FADs



INTERNATIONAL SEAFOOD SUSTAINABILITY FOUNDATION



LIST OF ASSOCIATIONS LDRAC GENERAL ASSEMBLY

The LDRAC is an Advisory Council of the European Union, created by Council Decision of 19th July 2004 (2004/585/EC), and became operational in May 2007 by means of the Commission Decision of 29th March 2007, (2007/206/EC).

Its main task is to advise the European Commission on issues regarding the Fisheries Agreements with Third Countries, relations with Regional Fisheries Organizations, RFMOs, in international waters where the Community fleet operates, as well as International Trade and Markets on Fisheries products.

This is carried out through five working groups, (WG 1 - Highly Migratory Stocks and Relevant RFMOs; WG 2 - RFMOs and Agreements in North Atlantic; WG 3 - Rest of RFMOs and high seas waters not covered by RFMOs; WG 4 - Bilateral Relations with Third Countries; and WG 5 - Horizontal matters), where the draft recommendations are prepared and later on submitted to the Executive Committee for its approval, and after that, is sent to the European institutions (Commission, Parliament, Member States, ...).

The LDRAC is formed by 58 Associations from 12 Member States of the European Union, that are also Members of the RAC, Denmark, Germany, Estonia, Spain, France, Ireland, Italy, Lithuania, Netherlands, Poland, Portugal and United Kingdom.

LDRAC POSITION ON FAD MANAGEMENT

	Name of the Organization	Member State	Category
2/3 GROUP: Fishing Associations, Processing Industry, Trade Unions and others			
1	AABPM	Spain	Fishing sector
2	ADAPI	Portugal	Fishing sector
3	AEEG	Spain	Fishing sector
4	AGARBA	Spain	Fishing sector
5	ALIF	Portugal	Fishing sector
6	AMAP	Portugal	Fishing sector
7	ANABAC-OPTUC	Spain	Fishing sector
8	ANACEF	Spain	Fishing sector
9	ANAMAR	Spain	Fishing sector
10	ANAMER	Spain	Fishing sector
11	ANAPA	Spain	Fishing sector
12	ANASOL	Spain	Fishing sector
13	ANAVAR	Spain	Fishing sector
14	ARBAC	Spain	Fishing sector
15	ARPOAN	Spain	Fishing sector
16	CAPA	Portugal	Fishing sector
17	CEPPT	Spain	Fishing sector
18	CNPMEM	France	Fishing sector
19	CRPMEM La Réunion	France	Fishing sector
20	DHV	Germany	Fishing sector
21	DPFTA	Netherlands	Fishing sector
22	DPPO	Denmark	Fishing sector
23	ELDFU	Estonia	Fishing sector
24	LFPA	Lithuania	Fishing sector
25	FEABP	Spain	Fishing sector
26	FEDERPESCA	Italy	Fishing sector
27	FEOPE	Spain	Fishing sector
28	KFO	Ireland	Fishing sector
29	NAPO	Poland	Fishing sector
30	NFFO	UK	Fishing sector
31	ONAPE	Spain	Fishing sector

LDRAC POSITION ON FAD MANAGEMENT

	Name of the Organization	Member State	Category
2/3 GROUP: Fishing Associations, Processing Industry, Trade Unions and others			
32	OPAGAC	Spain	Fishing sector
33	OPP-07-LUGO	Spain	Fishing sector
34	ORPAGU	Spain	Fishing sector
35	ORTHONGEL	France	Fishing sector
36	P/R Ocean Tiger	Denmark	Fishing sector
37	SFF	UK	Fishing sector
38	SPFA	UK	Fishing sector
39	UAPF	France	Fishing sector
40	VIANAPESCA	Portugal	Fishing sector
41	AETINAPE	Spain	Skippers Association
42	AICPE/CEP	EU	Processing Industry
43	ANFACO	Spain	Processing Industry
44	ETF	EU	Trade Union
45	FEICOPESCA	Spain	Processing Industry
46	FIAC	France	Processing Industry
47	INTERATUN	EU	Processing Industry

	1/3 GROUP: Other Interest		
48	APROAR	Spain	NGO
49	CEPMRR	Spain	Anglers
50	CFFA/CAPE	Belgium	NGO
51	CPD	France	NGO
52	DSLIV	Denmark	NGO
53	EAA	EU	Anglers
54	EBCD	EU	NGO
55	OCEANA	EU	NGO
56	SAR	Belgium	NGO
57	SSNC	Sweden	NGO
58	WWF	EU	NGO

This publication **is not a scientific one**; its objective is just to disseminate a recommendation produced by the LDRAC regarding the management of the FADs in the tuna fisheries, as example of stakeholder's initiative.

On 23rd February, was held in Brussels a workshop on FADs organized by the LDRAC, and in this publication it can be found the presentations prepared by the speakers. The above mentioned recommendation is the result of discussions and subsequent reflections.

For this reason, it is necessary to give a special thanks to all the speakers, as well as the participants and the associations that form the Long Distance RAC.

Also, we would like to emphasize that all the photographs are courtesy of the Spanish Institute of Oceanography.

The LDRAC Secretariat is responsible for the elaboration this publication.





