

FISH AGGREGATING DEVICE MANAGEMENT PLAN FOR VESSELS FLAGGED IN CURAÇAO

1. Background

According to the fisheries management policies that Curaçao has been traditionally carrying out in order to assure the sustainable management of the fishing resources in general; also considering that the control of fishing effort is a necessary issue in the ICCAT area; and with the aim to guarantee the sustainability of the target and bycatch populations of species related to tuna fisheries, the following Fish Aggregating Device¹ Management Plan is hereby established.

2. Objectives

- To provide a scientific basis for the approval of measures that guarantee the rational use of FADs in the tuna fisheries of the Atlantic Ocean.
- To widen the technical knowledge of these devices and of their eventual positive or negative impact on the ecosystems.
- To develop joint information exchange schemes between operators, scientists and Administrations to facilitate the communication of any progress made in this field and the implications it could have.
- To improve the knowledge on the composition of species and sizes to be found in the sets made on FADs.

3. Application field

This Management Plan applies to the tuna purse seiner vessels licensed to fish in the Atlantic Ocean.

4. Definitions

Fish Aggregating Device (FAD). Floating objects, either natural or man-made, which gather some species underneath, thus making those species more accessible to their search and subsequent catch by fishing vessels.

FAD types:

- Anchored FADs: those that are artificially fixed to the bottom of the sea preventing them from drifting; these include the support vessels anchored at an underwater mountain.
- Drifting object with a net: those non anchored FADs composed of either a continuous panel or one in the shape of a grill, which is associated to a hanging piece of net or rope, which serves as a sail under the sea.
- Drifting object without hanging materials: those non anchored FADs composed of either a continuous panel, or one in the shape of a grill.
- Natural FADs: any floating object found at sea, such as vegetable waste, dead animals or debris of human origin used as a FAD.
- Other drifting FADs: any FAD that differs from the above-mentioned.

Activities related to FADs:

- Deployment: The activity that involves the deployment of any given FAD at sea.
- Checking: The fishing activity that involves the monitoring of the previously deployed FADs to carry out maintenance tasks or verify the fish gathering underneath the device.
- Set: The fishing operating to catch the fish schools associated to a FAD.
- Collection: The fishing activity that involves the recovery of a FAD from the sea.

Buoy types:

GPS buoy: A buoy equipped with a GPS system.

Radio buoy: A buoy equipped with a radio system.

Visual buoy: A buoy equipped with no electronic system, only identifiable at sight.

Oceanographic buoys: buoys used for oceanographic research.

¹ Hereinafter referred to as FADs.

5. Identification of FADs

Each FAD to be deployed must be previously assigned a sequence of characters that will identify it. That sequence must be maintained during its lifetime.

Operators might select the identification system they prefer, provided that the sequence assigned remains individual and unique for each FAD.

Depending on the results obtained by the application of the present Plan, this Administration could, if needed be, establish common and compulsory marking system for all the FADs used by the fleet flagged in Curaçao.

6. Register and communication of FAD related information

6.1. Inventory

As an initial measure, by December the 31st, 2012 all operators must deliver to the Directorate of Economic Affairs a list of the operative FADs used by the fleet before that date.

The list must include the information requested in Annex I for each FAD.

The list must be updated at least on a quarterly basis.

The objective of this inventory is to provide all possible information on the characteristics of the FADs in use. It also aims to provide the scientific community with an analysis of the logbook entries derived from the individual identification of each FAD.

6.2. Specific Activity Registry

Operators must keep a Registry that includes all activities related with FADs.

The information to be incorporated in this registry is included in Annex II.

In the event of using a natural FAD, operators must also register this information, assuming by “deployment” the assignment of a buoy and as “collection” its removal. If this FAD is intended to be of further use, its information must be included in the inventory already mentioned in the previous chapter. Whenever a fishing or auxiliary boat carries out any given activity which is related to a FAD that originally did not belong to that ship, all information regarding this activity must still be registered. In these cases, the box that contains the identification of the FAD must be filled with the word “external”, along with a visible character sequence that leads to the identification of the FAD.

Lastly, for each activity carried out on a FAD, all events related to by catch must be recorded, including the following data: species, number of individuals and number of individuals which were set free alive.

This Registry of Activity must be delivered to the competent Authorities at least on a quarterly basis.

6.3. Logbook entries

Apart from the specific record mentioned in the previous section, Masters must continue to record in the logbook the following information related to the activity over FADs:

- Set on FADs: position, date, identification and results must be indicated.
- As stated in the previous point, all the sets made on FADs not originally belonging to the fishing vessel, as well as set made on natural FADs which are to be included in the inventory, must be duly recorded in the logbook.
- Catches associated to marine mammals, whale sharks, underwater mountains, or any element that could contribute to gather fish (such as dead animals, concentration of random materials, etc.) have to be recorded as well. The aim is to provide the most complete possible information about the set made, including position, date and result of the set.

7. FAD monitoring

The vessels must, to the extent possible, keep the monitoring information for each FAD that carries a satellite buoy. Such information must be linked to the ID number assigned to that particular FAD.

8. Measures to avoid the loss of FADs

The operators of the vessels must avoid as much as possible the loss of FADs at sea.

In case of loss or impossibility to recover any given FAD (i.e. those that fall in areas or periods closed for the fishing) operators must record in the Specific Activity Registry its last known position and date.

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

The use of the most selective methods to avoid the catch of juvenile and associated species will be encouraged. These might include, among others, size-sorting grids incorporated in the purse seine nets.

Along with that, the use of acoustic systems (such as echo sounders) will also be encouraged. They should help to avoid the catch of non target species or sizes, allowing their identification before the set is made.

Research related to mechanisms that provide an alternative to net pieces hanging below the FADs will be promoted. These systems should avoid the entangling of marine species, especially turtles, by using different materials or smaller nets, in order to minimize their negative impact.

10. Specific closures on FAD fisheries. ICCAT Recommendation 11-01

During the FAD closure period established by ICCAT (REC 11-01), fishing activities, or those in support of them, which are related to bigeye and yellowfin tuna, and are also associated with floating objects (including FADs), are forbidden, as follows:

- a) From January the 1st to February the 28th every year and,
- b) In the area defined below:

Northern limit: African coast

Southern limit: Parallel 10° South latitude

Western limit: Meridian 5° West longitude

Eastern limit: Meridian 5° East longitude

The prohibition includes:

- the deployment of any floating object, with or without buoys
- Fishing around, under or in association with artificial objects, including vessels
- Fishing around, under or in association with natural objects, and
- Towing floating objects located inside the area to a position outside it.

11. Control and monitoring measures

The relevant authorities could carry out documentary inspections regarding the provisions specified in the present plan. They might request, if needed be, the data referred to in the sixth paragraph.

The Directorate of Economic Affairs will be the responsible for processing and monitoring the information supplied by the operators. This Authority shall be entitled to prepare the monitoring reports of the present plan and also to propose the measures it may see fit in order to improve the overall performance of the system.

12. Measures for the confidentiality of the data supplied by the operators

The information supplied by the operators will always be treated confidentially. Its use will be strictly limited to scientific ends, or those of control, if necessary. The Directorate of Economic Affairs assumes that this information will not be made public beyond the above-mentioned limits, at least without the express consent of the shipowners.

**MANAGEMENT PLAN FOR FISH AGGREGATING DEVICES (FADS) IN THE
TUNA FISHERY IN GHANA**



February 2015

**ENDORSEMENT OF THE MANAGEMENT PLAN FOR FADS IN THE TUNA
FISHERY IN GHANA**

Implementation of this management plan for FADS used in the Tuna fishery in Ghana has been approved by the Head Delegate for Ghana in consultation with the Ministry of Fisheries and Aquaculture Development and the Fisheries Commission.

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Executive Summary

The use of Fish Aggregating devices (FADs) in the tuna fishery in the Atlantic Ocean has been found to be of utmost importance because of its apparent aggregation of numerous juvenile tuna species which are caught whilst fishing especially with pursing gears.. The lack of integrated strategies to mitigate the biological interactions and environmental issues of this device and also the financial cost of possible changes in the fishery have all culminated to a major concern for ICCAT and national fisheries authorities.

Under the auspices of ICCAT, various interventions on the impact of FADs on the fishery (Recomm11-01; 14-01) has led to a more pragmatic approach at gathering more information on FADs to take a firm decision (with all key players both scientists, managers and other stakeholders in the industry) to find an amicable solution to the use of these devices. Ghana as a contracting party has taken some initial steps to quantify the numbers and types of FADs being used in her fishery and also willing to contribute to minimizing the destructive nature of FADs to ensure the sustainability of the resources.

This plan seeks to consolidate efforts by ICCAT to gain a complete knowledge on the status and use of FADs in the entire Atlantic regions aimed at mitigating adverse effects on the tuna resources most especially the juvenile Bigeye species.

1 INTRODUCTION

Floating objects have been used for the past decades to enhance the capacity of fishermen to catch more fish. Fishermen place these natural or artificial objects at the surface or at particular depths within the ocean floor to attract fish with ease. Increasingly more and more FADs of different shapes and sizes are now being used and synchronised to electronic beacons to locate their geographic positions.

Since the 1990s purse seine FAD fishing for tropical tunas has rapidly expanded and fleets in Ghana also fish extensively on FADs. Purse seine fishing in general, and especially in FAD fishing, has experienced a large number of innovations that have made fishing more effective over time.

While FADs attract species of interest to the tuna fleets, they also attract non-targeted endangered marine species, such as seabirds, sharks and turtles.

Developing methods to mitigate the impact of FAD fishing on non-targeted, by-catch, is an active area of research to which most Regional fisheries Management Organisational (RFMO's) have taken the initiative.

Table 1 shows landings of the principal tuna species (mt)

	YELLOWFIN	BIGEYE	SKIPJACK	TOTAL
1987	4159	124	26576	30859
1988	2770	52	29936	32758
1989	2883	16	23154	26053
1990	7710	98	29499	37307
1991	6629	138	28249	35016
1992	6254	96	21336	27686
1993	10647	3	22639	33289
1994	7394	291	23863	31548
1995	7119	4	22923	30046
1996	12242	615	24285	37142
1997	23250	28	39205	62483
1998	19291	3921	41998	65210
1999	28282	3680	51284	83246
2000	15910	1651	34986	52547
2001	29303	2357	56418	88078
2002	20311	2034	38934	61279
2003	19030	4816	32766	56612
2004	15138	6944	33600	55682
2005	19833	2333	54322	76488
2006	14549	1540	42789	58878
2007	15107	5748	46415	67270
2008	14250	9269	37387	60906
2009	18355	10554	36064	64973
2010	12511	6768	53812	73091
2011	14500	4122	56500	75122
2012	9113	3455	57284	69852
2013	13167	2786	46257	62210

2.0 PURPOSE OF THE MANAGEMENT PLAN

Managing FADs in the tuna industry in Ghana has been found to be essential in that it is known to attract a lot of juvenile fish and although the fishing method has been criticized for its negative impact on the fish stocks it still remains the quickest means of capturing fish. This non-selective nature of the device attracts almost everything within its radius or path and it's of major concern. It is in this light that various management regimes have been propounded to help curb the negative effect of fishing on FADs.

The use of Fishing aggregating devices (FADs) in the capture of tunas especially juvenile species have been of concern to both scientist and fishers at large. ICCAT in 2015 will provide to all contracting parties to ICCAT, FAD logbooks to monitor their use at sea, type, deployment strategies and numbers for its management in the short to medium term.

Various ICCAT recommendations have been put forward aimed at rebuilding low stocks of especially the bigeye tuna caught off FADs. During the 2012 SCRS meeting a review of the contents for a management plan was discussed during which six (6) countries including Ghana submitted FAD management plans during the meeting, however only three (3) included the required number of FAD to be deployed by each vessel. The Committee recommended that the Commission review the nature of its requirements regarding the monitoring of the FADs set forth in [Rec. 11-01] (paragraphs 18-19 and Annexes 1 and 2 of the Recommendation). Recommendation 14-01 explicitly deals with conservation of tropical tunas including FADs.

3.0 ICCAT MEASURES AND RECOMMENDATIONS ASSOCIATED WITH THE USE OF FADS

Recommendation 14-01 seeks to

- put measures in place to reduce the harvest of juvenile tunas in the Gulf of Guinea contribute to the long-term sustainability of the stocks;
- adopt monitoring and control measures to ensure and improve conservation and management measures bases on scientific and best available information on stocks;

- implement a Multi-annual Management and Conservation Program for the period 2012-2015 where capacity limitations are applied to the bigeye tuna caught by vessels over 20m with catch limits for some CPC's who have overharvested their quota
- Review capacity and harvest control regimes for CPC's including Ghana to be allowed to change capacity limits allocated and approved by the commission based on a comprehensive plan submitted;
- Improve upon the database on catch and fishing activities including identification of FADs , their positions recorded also in logbooks for the purposes of gathering information for scientific purposes;
- Introduce an Area/Time closure in relation with the protection of juveniles where prohibition on the use of FADs is forbidden;
- ***Introduce FAD Management Plans*** the content of which should guide the SCRS to plan and manage the use of Fads globally;

4.0 OBJECTIVE OF PLAN

The overall objective of this plan is to ensure that :

- fishery resources harvested by the tuna fleet within waters under the jurisdiction of the Republic of Ghana are exploited within biologically acceptable levels and regenerate at rates dependent on the population dynamics and life history characteristics of the species being exploited and the rate of extraction by harvest, and
- to provide a foundation for management of the fishery to move towards a more integrated management framework of shared responsibilities between the Fisheries Administration and other stakeholders of the sector,

In this regard and the immediate objective of the plan is to come up with :

- the right number of FADs and type of FAD to be deployed in the fishery based on science;
- Design specific characteristics of FADs to mitigate bycatch and reduce entanglement of other endangered species and
- Introduce markings and identifiers for better navigation and maneuvering of vessels to avoid any adverse impacts on the fishery;

The above information is currently being sought by all CPC fishery on FADS (Recommendation 14-01) which will give the SCRS the sound baseline information for a collective management of the use of FADS in the Atlantic Ocean.

4.1 KEY POLICY DRIVERS

The FAD management plan is consistent with the relevant requirements of the ICCAT convention; Fisheries Act (Act 625) of 2002, the Fisheries Regulations (LI 1968) of 2010; the FAO Code of Conduct for Responsible Fisheries, Ecosystem Approach to Fisheries, Ecological Sustainable Development, the Plan of Implementation of the World Summit on Sustainable Development 2002, the precautionary approach, the Convention on Biological Diversity, and other appropriate instruments.

5.0 DESCRIPTION OF TYPE AND USE OF FADs

In Ghana over 80% of FAD are constructed from natural objects such as bamboo strips and palm fronds entangled with old netting and attached to a radio beacon. These drifting devices are left at sea for between 3-4 months and usually retrieved after and reset with fresh palm fronds. Over 40% of drifting FAD in Ghana either get lost or decay beyond repair. From computations as per company it was realized that each company constructs and deploys different numbers of FADS each month at sea. Types of Fad are typically the same and each Bamboo Fad generally has the same dimensions of 5m x 2m on average costing between USD200-300. Each radio beacon cost around USD500 hence a complete typical FAD in Ghana cost USD700-800.

Statistics gathered from the companies indicate that typically each vessel deploys a minimum of 200

FADs and a maximum of 350 FADS per quarter. It is this envisaged that with 37 vessels will deploy a maximum of 12,950 FADs every 3-4 months. Assuming that they are able to operate their vessels effectively it will be prudent to say they will eventually deploy 12950x3 (38,850 FADs per year). There is currently one (1) support vessel in Ghana and belonging to one (1) company having 6 vessels and its likely this vessel can deploy and retrieve FADS much more readily than the others. Modern technology indicate that FADS/ beacons can be monitored via a specialized electronic Monitoring System however this technology is not used in Ghana but the possibility exist in the near future for 2 companies.

Data from FAD fishing activities are monitored via Satellite (Zunibal) and recorded in a log sheet showing typically the mode of fishing. FAD logbooks as enshrined in Rec.14-01 should come into effect on 2015 to be provided for by ICCAT. All incidental catches and mitigation measures are being put in place with observer programmes and instructions from reputable organizations such as ISSF who yearly from 2012 have been training Captains and officers onboard on measures to minimize bycatch and incidental catches of endangered species. Consideration of the use of devices to minimize entanglement or exclude other species from being caught are in the process with assistance and training by experts from ISSF. Some of these conditionalities are prerequisite for companies to enable them export their products safely to 3rd party countries.

Currently in Ghana there is no clear policy on FAD ownership however each company / vessel has unique identifiers and serial codes to distinguish between each of them.

6.0 INSTITUTIONAL ARRANGEMENTS

This management plan has been developed in an inclusive, interactive and participatory manner. The process included consultations with representatives of the key stakeholders of the sector. The primary groups from which representatives will be drawn are from the Ministry of Fisheries and Aquaculture Development and Ghana Tuna Association. At the international level a representative from the industry (GTA) and the Fisheries Ministry/ commission may constitute a team to interact at any international forum on FADs.

Based on the review at the international level i.e. ICCAT and the outcomes, the GTA will agreed on the objectives, scope and other elements to be included in the plan for its effective implementation and monitoring.

The implementation of the FAD management plan is a joint responsibility of the Ministry of Fisheries and Aquaculture Development, and the Ghana Tuna Association, the resource users and other stakeholders of the fisheries sector. However, in keeping with its mandate, the Secretariat of the Fisheries Commission will regulate, promote, support and guide the implementation of the plan, through broad consultative processes with other stakeholders.

The Minister in-charge of Fisheries and Aquaculture Development will charge the Head delegate of Ghana/ICCAT to ensure the effective and harmonious implementation of the plan in line with International./Government directives. Each year, an Action Plan of priority actions to be undertaken will be developed based on outcomes from FAD workshops held under the auspices of ICCAT with agreed set targets etc. The annual action plan would also contain a “Communication Strategy” to ensure that all those implementing the plan possess the same information base, interpret it in the same way, and that the results of the management plan are widely disseminated.

7.0 REPORTING OBLIGATIONS

Based on a FAD logbook to be provided by ICCAT to be effective from 2015 it is envisaged that the obligations of vessel owners and masters in respect of reporting FAD deployment and its use would be adequately documented in the said logbook (see table 2 below) to among others:

- contribute to the conservation and sustainable management of the bigeye and yellowfin tuna fisheries;

- address the lack of reliable data collection mechanisms, particularly in bigeye and yellowfin tuna fisheries carried on in association with objects that could affect fish aggregation, including Fish Aggregating Devices (FADs) ;
- adopt data collection and transmission mechanisms to allow improvement of the monitoring and the scientific assessment of the related fisheries and associated stocks;

Under Recommendation 14-01 CPCs shall ensure that all purse-seine and bait-boat fishing vessels and all support vessels (including supply vessels) flying their flag, when fishing in association with fish aggregating devices (FADs), including objects that could affect fish aggregation, shall collect and report the following information and data in a FAD-logbook:

- a) the date of deployment of FADs,
- b) Any visit on FADs;
- c) For each visit on a FAD, whether followed or not by a set, the,
 - i. position,
 - ii. date,
 - iii. FAD identifier (i.e., FAD Marking or beacon ID or any information allowing to identify the owner)
 - iv. FAD type (anchored FAD, drifting natural FAD, drifting artificial FAD),
 - v. FAD design characteristics (dimension and material of the floating part and of the underwater hanging structure),
 - vi. type of the visit (deployment, hauling, retrieving, loss, intervention on electronic equipment).
- d) If the visit is followed by a set, the results of the set in terms of catch and by-catch, whether retained or discarded dead or alive.

In establishing the FAD-logbook, CPCs may use the reporting formats laid down to ensure that the requisite data is collected.

Format 1

<i>FAD Identifier</i>		<i>FAD and electronic equipment types</i>		<i>FAD Design characteristics</i>				<i>Observation</i>
<i>FAD Marking</i>	<i>Associated beacon ID</i>	<i>FAD Type</i>	<i>Type of the associated beacon and/or electronic devices</i>	<i>FAD floating part</i>		<i>FAD underwater hanging structure</i>		
				<i>Dimensions</i>	<i>Materials</i>	<i>Dimensions</i>	<i>Materials</i>	
(1)	(1)	(2)	(3)	(4)	(5)	(4)	(6)	(7)
...
...

- (1) If FAD marking and associated beacon ID are absent or unreadable, mention it and provide all available information which may help to identify the owner of the FAD
- (2) Anchored FAD, drifting natural FAD or drifting artificial FAD
- (3) e.g., GPS, sounder, etc. If no electronic device is associated to the FAD, note this absence of equipment
- (4) e.g., width, length, high, depth, mesh sizes, etc.
- (5) Mention the material of the structure and of the cover and if biodegradable.
- (6) e.g. nets, ropes, palms, etc... and mention the entangling and/or biodegradable features of the material.
- (7) Lighting specifications, radar reflectors and visible distances shall be reported in this section.

<i>FAD marking</i>	<i>Beacon ID</i>	<i>FAD type</i>	<i>Type of visit</i>	<i>Date</i>	<i>Time</i>	<i>Position</i>		<i>Estimated catches</i>			<i>By-catch</i>			<i>Observations</i>	
						<i>Latitude</i>	<i>Longitude</i>	<i>SKJ</i>	<i>YFT</i>	<i>BET</i>	<i>Taxonomic group</i>	<i>Estimated catches</i>	<i>Unit</i>		<i>specimen released alive</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(7)	(8)	(8)	(8)	(9)	(10)	(11)	(12)	(13)
...
...

(1) If FAD marking and associated beacon ID are absent or unreadable, report it in this section.

(3) Anchored FAD, drifting natural FAD or drifting artificial FAD.

(4) *i.e.*, deployment, hauling, retrieving, changing the beacon, loss and mention if the visit has been followed by a set.

(5) dd/mm/yy

(6) hh:mm

(7) °N/S/mm/dd or °E/W/mm/dd.

(8) Estimated catches expressed in metric tons

(9) Use a line per taxonomic group.

(10) Estimated catches expressed in weight or in number.

(11) Unit used.

(12) Expressed as number of specimen

(13) If no FAD marking neither associated beacon ID is available, report in this section all available information which may help to describe the FAD and to identify the owner of the FAD.

8.0 OBSERVER OBLIGATIONS

Specifically, observers would be deployed on all surface fleets using FADs to monitor their activities and to be able to complete the thorough filling out of forms as depicted in formats 1 and 2 above. Among other obligations of the observer will be to:

- sample catches by set noting carefully how many sets were on FADs;
- determine catch and species composition on Fads and without FADs;
- determine geographical distribution of the species caught off FADs;
- estimate quantities of catch on board including by-catch and discard off FADs and
- any other duties deemed necessary to obtain more information such as listing of Radio buoys and FAD construction specificities as formats 1 and format 2 require

9.0 MONITORING, EVALUATION AND REVIEW OF THE MANAGEMENT PLAN

The monitoring and evaluation (M&E) plan of the project is based on the key indicators detailed in the management plan. The overall achievement of the plan will be measured through a combination of measures/indicators which will lead to the sustainable exploitation of the fishery through: limited FAD use per type and size, per vessel; closed seasons (moratorium), and to a lesser extent awareness campaigns, education and training in more responsible fishing practices.

This FAD management plan reflects current understanding of the fishery and the resources exploited. It will be improved with advancements in knowledge and management of the fishery through obtaining and analyzing sound data on the fishery. Reviews of the Management Plan are the responsibility of the SCRS and to be implemented by the Ministry of Fisheries and Aquaculture Development and passed through the GTA and other stakeholders for their consideration and endorsement. However, no major departure from the stated management arrangements for a given period will occur unless directed by SCRS and the ICCAT commission at their regular meetings.

Reports from data collection mechanisms will be channeled to the SCRS through the Executive Secretary of ICCAT by the Head delegate (Ghana) at stipulated times as the SCRS/ commission may determine.

10.0 MANAGEMENT AND OPERATIONAL OBJECTIVES

The management and operational objectives of this Fisheries Management plan are as follows:

Management Objectives:

Management Objective 1: Reduce the impact of FAD fishing on juvenile Bigeye and Yellowfin in the Tuna fishery

Operational Objectives:

- 1.1 Enforce the appropriate numbers and sizes of FADS to be used by each vessel;
- 1.2 Establish seasonal and area closure of the fishery
- 1.3 Reinforce VMS monitoring systems

Management Objective 2 : Improve governance of the FAD fishery

Operational Objectives

- 2.1 Limit access to the use of FADs
- 2.2 Reduce conflict in the fishery

Management Objective 3: Address adverse environmental impacts on the FAD fishery

- 3.1 Create awareness on the impact of deforestation of woodlots and water bodies;

MANAGEMENT MEASURES AND PERFORMANCE INDICATORS

The management measures in the logframe Table 3 are directed at the entire fishery. In general, the range of strategies provides the necessary scope and flexibility required to manage the fishery and its impacts on fish stocks and the broader ecosystem, within a natural but dynamic environment.

The extent to which the FAD management plan is achieving the range of established management objectives will be assessed using a combination of performance indicators, designed to measure the performance of the fishery and the overall condition of the environment and livelihood of the fishers.

Table 3 LOG-FRAME FOR THE FAD MANAGEMENT PLAN

Management Objective 1: Reduce the impact of FAD fishing on juvenile mortality of especially the Bigeye species						
Issue	Operational Objectives	Management measures	Indicators	Target/Limit Reference Points	Means of verification	Responsibility/Time Frame
1	Reduce over-exploitation of juvenile fish	Enforce the appropriate numbers and sizes of FADS to be used by each vessel thru studies	No of FADs approved by the ICCAT Commission	50% reduction over a 5 year period	Observer/VMS reports	SCRS and National Scientists
		Establish seasonal and area closure of the fishery.	<i>Closed seasons and areas established</i>	Within January-February each year	Observer /VMS reports	SCRS and National Scientists
		Reinforce VMS monitoring systems	<i>Monitoring systems strengthened</i>	<i>All year round</i>	VMS reports	<i>National scientists</i>

Management Objective 2: Improve governance of the FAD fishery						
Issue	Operational Objectives	Management measures	Indicators	Target/Limit Reference Points	Means of verification	Responsibility/Time Frame
2	Limit access to the use of FADs	<i>Replacement policy enacted</i>	<i>Static or reduced numbers of vessels using</i>	<i>No increase in FAD numbers over a period</i>	<i>Survey conducted</i>	<i>National scientists</i>

			<i>FADs</i>			
3	Reduce conflict in the fishery	<p>Initiate resolution mechanisms</p> <p><i>Strengthen capacity within management institutions</i></p> <p><i>Strengthen capacity among fisher groups</i></p>	<p><i>No of mechanisms established</i></p> <p><i>More trained personnel</i></p>	<i>Reduced levels of conflicts by 50% in 5 years</i>	<i>Annual reports</i>	<i>ICCAT/ National scientists</i>

Management Objective 3: Address adverse environmental impacts on the FAD fishery						
Issue	Operational Objectives	Management measures	Indicators	Target/Limit Reference Points	Means of verification	Responsibility/Time Frame
4	Create awareness on the impact of deforestation of woodlots and water bodies;	<ul style="list-style-type: none"> <i>Facilitate training in alternative approaches such as recycling artificial objects</i> 	<ul style="list-style-type: none"> <i>Decrease in levels of harvesting bamboo strips</i> 	<i>Reduction of 20% over 5 year period thru studies</i>	<i>Reports</i>	<i>National scientists</i>

ANNEX 1

14-01 RECOMMENDATION BY ICCAT ON A MULTI-ANNUAL CONSERVATION AND MANAGEMENT PROGRAM FOR BIGEYE AND YELLOWFIN TUNAS

CONSIDERING that the adoption of a multi-annual program for the medium-term will contribute to the conservation and sustainable management of the bigeye and yellowfin tuna fishery;

EXPRESSING GRAVE CONCERN about the difficulties encountered by the Standing Committee on Research and Statistics (SCRS) in investigating the state of the stock of bigeye and yellowfin tunas from the Convention area because of the lack of reliable data collection mechanisms by some CPCs;

IN VIEW THEREFORE OF THE NEED to closely monitor the fishing activities by fishing vessels;

AWARE of the considerable efforts that have already been carried out by CPCs involved in these fisheries;

RECOGNIZING the contribution that a reduction in the harvest of juvenile tunas in the Gulf of Guinea can

contribute to the long-term sustainability of the stocks;

NOTING that the SCRS does not have the data necessary to fully evaluate options for area/time closures and to propose precise relevant recommendations;

RECOGNIZING that a pilot implementation of an area/time closure will contribute to the collection of such necessary data, and will favour the reduction of the catches of juvenile bigeye and yellowfin tunas;

RECOGNIZING also that timely reporting of catch will assist greatly in the monitoring of the fisheries;

RECOGNIZING the necessity to adopt monitoring and control measures to ensure the respect of conservation and management measures and to improve the scientific assessment of those stocks is necessary;

THE INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS (ICCAT) RECOMMENDS THAT:

Multi-annual Management and Conservation Program

1. Contracting Parties and Cooperating non-Contracting Parties, Entities or Fishing Entities (CPCs) whose vessels fish bigeye and/or yellowfin tunas in the Convention area shall implement a Multi-annual Management and Conservation Program for the period 2012-2015.

Capacity limitation for bigeye tuna

2. A capacity limitation shall be applied for the duration of the Multi-annual Program, in accordance with the following provisions:

a) The capacity limitation shall apply to vessels 20 meters length overall (LOA) or greater fishing bigeye tuna in the Convention area.

b) CPCs which have been allocated a catch limit in accordance with paragraph 11 shall each year:

i) Adjust their fishing effort so as to be commensurate with their available fishing possibilities

ii) Be restricted to the number of their vessels notified to ICCAT in 2005 as fishing for bigeye tuna.

However, the maximum number of longline and purse seine vessels shall each year be subject to the following limits:

CPC Longliners Purse seiners

China 45 -

EU 269 34

Ghana - 13

Japan 245 -

Panama - 3

Philippines 11 -

Korea 14 -

Chinese Taipei 75 -

c) Ghana shall be allowed to change the number of its vessels by gear type within its capacity limits communicated to ICCAT in 2005, on the basis of two bait boats for one purse seine vessel. Such change must be approved by the Commission. To that end, Ghana shall notify a comprehensive and detailed capacity management plan to the Commission at least 90 days before the Annual meeting. The approval is notably subject to the assessment by the SCRS of the potential impact of such a plan on the level of catches.

d) The capacity limitation shall not apply to CPCs whose annual catch of bigeye tuna in the Convention area in 1999, as provided to the SCRS in 2000, is less than 2,100 t.

Specific authorization to fish for bigeye and/or yellowfin tunas

3. CPCs shall issue specific authorizations to vessels 20 meters LOA or greater flying their flag allowed to fish bigeye and/or yellowfin tunas in the Convention area, and to vessels flying their flag used for any kind of support to this fishing activity (hereafter referred to as "authorized vessels").

ICCAT Record of authorized bigeye and yellowfin vessels

4. CPCs shall by 1 July each year notify the list of authorized vessels to the Executive Secretary in an electronic form and in accordance with the format set in the Guidelines for Submitting Data and Information Required by ICCAT.

5. The Commission shall establish and maintain an ICCAT record of authorized bigeye and yellowfin vessels.

Fishing vessels 20 meters LOA or greater not entered into this record are deemed not to be authorized to fish, retain on board, tranship, transport, transfer, process or land bigeye and/or yellowfin tunas from the Convention area.

6. CPCs shall without delay notify the Executive Secretary of any addition to, deletion from and/or modifications of the initial list at any time such change occurs.

For CPCs for which a capacity limitation applies in accordance with paragraph 2b) vessels fishing bigeye and/or yellowfin tunas in the Convention area may be replaced only by vessels of equivalent capacity or lesser. After the establishment of the initial ICCAT list, the retroactive listing of vessels shall not be allowed.

7. The Executive Secretary shall without delay post the record of authorized vessels on the ICCAT website.

Vessels actively fishing bigeye and/or yellowfin tunas in a given year

8. Each CPC shall by 1 July each year notify to the Executive Secretary the list of authorized vessels flying their flag which have fished bigeye and/or yellowfin tunas in the Convention area in the previous calendar year.

The Executive Secretary shall report each year these lists of vessels to the Compliance Committee.

9. The provisions of paragraphs 3 to 8 do not apply to recreational vessels.

Catch limits for bigeye tuna

10. The annual Total Allowable Catch (TAC) for 2012 and subsequent years of the Multi-annual Program is 85,000 t for bigeye tuna. The following shall apply:

a) If the total of catches exceeds the TAC in a given year, the excess amount shall be paid back by CPCs to which a catch limit has been granted for the species concerned. Excess quantities shall be deducted the following year on a *prorata* basis from the adjusted quotas/catch limits of the CPC concerned, as per paragraphs 14 and 15.

b) The TAC and catch limits for 2012 and subsequent years of the Multi-annual Program shall be adjusted based on the latest scientific assessment available. Whatever the outcome, the relative shares used to establish the annual catch limits for the CPCs appearing in paragraph 11 shall remain unchanged.

11. The following catch limits shall be applied for 2012 and subsequent years of the Multi-annual Program to the following CPCs:

CPC Annual catch limits for the period 2012-2015 (t)

China 5,572

European Union 22,667

Ghana 4,722

Japan 23,611

Panama 3,306

Philippines 1,983

Korea 1,983

Chinese Taipei 15,583

12. Catch limits shall not apply to CPCs whose annual catch of bigeye tuna in the Convention area in 1999, as provided to the SCRS in 2000, is less than 2,100 t. However, the following shall apply:

a) CPCs which are not developing coastal States shall endeavour to maintain their annual catch less than 2,100 t;

b) if the catch of bigeye tuna of any developing coastal CPC not listed in paragraph 11 above exceeds 3,500 t for any one year, a catch limit shall be established for that developing CPC for the following years. In such a case, the relevant CPC shall adjust its fishing effort so as to be commensurate with their available fishing possibilities

Transfers

13. The following annual transfer of bigeye tuna shall be authorized in 2012-2015:

a) from Japan to China: 3000 t

b) from Japan to Ghana: 70 t

c) from China to Ghana: 70 t

d) from Chinese Taipei to Ghana: 70 t

e) from Korea to Ghana: 20 t.

Underage or overage of catch

14. Underage or overage of an annual catch limit for CPCs listed in paragraph 11 for bigeye tuna may be added/to or shall be deducted from the annual catch limit as

follows:

Year of catch Adjustment Year

2011 2012 and/or 2013

2012 2013 and/or 2014

2013 2014 and/or 2015

2014 2015 and/or 2016

2015 2016 and/or 2017

However, a) The maximum overage that a CPC may transfer in any given year shall not exceed 30% of its annual initial catch limit;

b) For Ghana, the overage catch of bigeye tuna in the period 2006 to 2010 shall be repaid by reducing the catch limit of Ghana for bigeye tuna by a yearly amount of 337 t for the period 2012 to 2021.

15. Notwithstanding paragraph 14, if any CPC exceeds its catch limit during any two consecutive management periods, the Commission will recommend appropriate measures, which may include, but are not limited to, reduction in the catch limit equal to a minimum of 125% of the excess harvest, and, if necessary, trade restrictive measures. Any trade measures under this paragraph will be import restrictions on the subject species and consistent with each CPC's international obligations. The trade measures will be of such duration and under such conditions as the Commission may determine.

TAC for yellowfin tuna

16. The annual TAC for 2012 and subsequent years of the Multi-annual program is 110,000 t for yellowfin tuna and shall remain in place until changed based on scientific advice. If the total catch in any year exceeds the TAC for yellowfin tuna, the Commission shall review the relevant conservation and management measures in place.

Recording of catch and fishing activities

17. Each CPC shall ensure that its vessels 20 meters LOA or greater fishing bigeye and/or yellowfin tunas in the Convention area record their catch in accordance with the requirements set out in **Annex 1** and in the

Recommendation by ICCAT Concerning the Recording of Catch by Fishing Vessels in the ICCAT

Convention Area [Rec. 03-13].

18. CPCs shall ensure that purse seine and bait boat vessels flying their flag, when fishing in association with objects that could affect fish aggregation, including fish aggregating devices (FADs), shall identify in a logbook:

a) Any deployment and retrieval of FAD, and

b) The position, date, identification of the aggregating device and results of the set.

19. CPCs shall ensure that the logbooks referred to in paragraph 17 are promptly collected and the information made available to the SCRS.

Area/Time closure in relation with the protection of juveniles

20. Fishing for, or supported activities to fish for bigeye and yellowfin tunas in association with objects that could affect fish aggregation, including FADs, shall be prohibited:

a) From 1 January to 28 February each year, and

b) In the area delineated as follows:

Northern limit African coast

Southern limit Parallel 10° South latitude

Western limit Meridian 5° West longitude

Eastern limit Meridian 5° East longitude

21. The prohibition referred to in paragraph 20 includes:

- launching any floating objects, with or without buoys;
- fishing around, under, or in association with artificial objects, including vessels;
- fishing around, under, or in association with natural objects;
- towing floating objects from inside to outside the area.

22. The efficacy of the area/time closure referred to in paragraph 20 for the reduction of catches of juvenile bigeye and yellowfin tunas shall be evaluated by the SCRS in 2014 or until such a time as the SCRS has adequate information to provide detailed advice on any alternate area/time closure.

23. Each CPC fishing in the geographical area of the area/time closure shall:

- a) Take appropriate action against vessels flying their flag that do not comply with the area/time closure referred to in paragraph 20,
- b) Submit an annual report on their implementation of the area/time closure to the Executive Secretary, who shall report to the Compliance Committee at each Annual meeting.

FAD Management Plans

24. By 1 July of each year, CPCs with purse seine and baitboat vessels fishing for bigeye and yellowfin tunas in association with objects that could affect fish aggregation, including FADs, shall submit to the Executive Secretary Management Plans for the use of such aggregating devices by vessels flying their flag, following the Guidelines for Preparation for FAD Management Plans suggested in **Annex 2**.

25. The Executive Secretary shall report the content of these Management Plans to SCRS and to the Compliance Committee for review at each annual meeting.

VMS

26. If the VMS satellite tracking device of a vessel referred to in paragraph 3 stops functioning or has a technical failure when the vessel is inside the area/time closure referred to in paragraph 20, the flag State shall require the vessel to exit the area without delay. The fishing vessel shall not be authorized to enter the area again without the satellite tracking device having been repaired or replaced.

ICCAT Regional Observer Program

27. The ICCAT Regional Observer Program in **Annex 3** shall be established in 2013 to ensure observer coverage of 100% of all surface fishing vessels 20 meters LOA or greater fishing bigeye and/or yellowfin tunas in the area/time closure referred to in paragraph 20.

Identification IUU activity

28. The Executive Secretary shall without delay verify that any vessel identified or reported in the context of this Multi-annual Program is on the ICCAT record of authorized vessels and not out of compliance with the provisions of paragraphs 20 and 21. If a possible violation is detected, the Executive Secretary shall, without delay, notify the flag CPC. The flag CPC shall immediately investigate the situation and, if the vessel is fishing in relation with objects that could affect fish aggregation, including

FADs, request the vessel to stop fishing and, if necessary, leave the area without delay. The flag CPC shall without delay report to the Executive Secretary the results of its investigation and the corresponding measures taken.

29. The Executive Secretary shall report to the Compliance Committee at each Annual meeting on any issue related to identification of unauthorized vessels, the implementation of the VMS, the Regional observer provisions and the results of the relevant investigation made by the flag CPCs concerned.

30. The Executive Secretary shall propose to include any vessels identified in accordance with paragraph 28, or vessels for which the flag CPC has not carried out the required investigation in accordance with paragraph 29, on the provisional IUU list.

Port Sampling Plan

31. The Commission requests the SCRS to develop, by 2012, a Port Sampling Plan aimed at collecting fishery data for bigeye, yellowfin, and skipjack tunas that are caught in the geographical area of the area/time closure referred to in paragraphs 20.

32. Beginning in 2013, the port sampling program referred to paragraph 31 shall be implemented in landing or transshipment ports. Data and information collected from this sampling program shall be reported to ICCAT each year beginning in 2014, describing, at a minimum, the following by country of landing and quarter: species composition, landings by species, length composition, and weights. Biological samples suitable for determining life history should be collected as practicable.

General provisions

33. This Recommendation replaces [Rec. 93-04], [Rec. 98-03], [Rec. 04-01], [Res. 05-03], [Rec. 08-01], [Rec. 09-01] and [Rec. 10-01].

Annex 1

Requirements for Catch Recording

Minimum specification for paper or electronic logbooks:

1. The logbook must be numbered by sheets.
2. The logbook must be filled in every day (midnight) or before port arrival
3. One copy of the sheets must remain attached to the logbook
4. Logbooks must be kept on board to cover a period of one- trip operation.

Minimum standard information for logbooks:

1. Master name and address
2. Dates and ports of departure, Dates and ports of arrival
3. Vessel name, registry number, ICCAT number and IMO number (if available).
4. Fishing gear:
 - a) Type FAO code
 - b) Dimension (length, mesh size, number of hooks ...)
5. Operations at sea with one line (minimum) per day of trip, providing:
 - a) Activity (fishing, steaming...)

- b) Position: Exact daily positions (in degree and minutes), recorded for each fishing operation or at noon when no fishing has been conducted during this day.
- c) Record of catches:
- 6. Species identification:
 - a) By FAO code
 - b) Round (RWT) weight in t per set
 - c) Fishing mode (FAD, free school, etc.)
- 7. Master signature
- 8. ICCAT Regional Observer signature, if applicable
- 9. Means of weight measure: estimation, weighing on board and counting.
- 10. The logbook is kept in equivalent live weight of fish and mentions the conversion factors used in the evaluation.

Minimum information in case of landing, transshipments:

- 1. Dates and port of landing /transshipments
- 2. Products: number of fish and quantity in kg
- 3. Signature of the Master or Vessel Agent

Annex 2

Guidelines for Preparation of FAD Management Plans

The FAD Management Plan for a CPC purse seine fleet must include at least:

- a) Number of FAD to be deployed per purse seine and per FAD type
 - b) FAD design characteristics (a description)
 - c) FAD markings and identifiers
- and could include:
- 1. Objective of the FAD Management Plan
 - 2. Description
 - a) Vessel-types and support and tender vessels,
 - b) FAD types: AFAD = anchored; DFAD = drifting
 - c) Reporting procedures for AFAD and DFAD deployment,
 - d) Catch reporting from FAD sets (consistent with the Commission's Standards for the Provision of Operational Catch and Effort Data),
 - e) Minimum distance between AFADs,
 - f) Incidental by-catch reduction and utilization policy,
 - g) Consideration of interaction with other gear types,
 - h) Statement or policy on "FAD ownership"
 - 3. Institutional arrangements
 - a) Institutional responsibilities for the FAD Management plan,
 - b) Application processes for FAD deployment approval,
 - c) Obligations of vessel owners and masters in respect of FAD deployment and use,
 - d) FAD replacement policy,
 - e) Reporting obligations,
 - f) Observer acceptance obligations,
 - g) Conflict resolution policy in respect of FADs.
 - 4. FAD construction specifications and requirements
 - a) Lighting requirements,

- b) Radar reflectors,
 - c) Visible distance,
 - d) Radio buoys (requirement for serial numbers),
 - e) Satellite transceivers (requirement for serial numbers).
5. Applicable areas
- a) Details of any closed areas or periods e.g. territorial waters, shipping lanes, proximity to artisanal fisheries, etc.
6. Applicable period for the FAD Management Plan
7. Means for monitoring and reviewing implementation of the FAD Management Plan
8. Means for reporting to the Executive Secretary

Annex 3

ICCAT Regional Observer Program

1. Each CPC shall require its fishing vessels involved in the bigeye and/or yellowfin tunas fisheries in the area and during the area/time closure referred to in paragraph 20 of this Recommendation to carry an ICCAT observer.
2. By 1 November each year, CPCs shall notify to the ICCAT Executive Secretariat a list of its observers.
3. The Secretariat of the Commission shall appoint the observers before 15 November each year, and shall place them on board the fishing vessels flying the flag of Contracting Parties and of non-Contracting Cooperating Parties, Entities or Fishing Entities that implement the ICCAT observer program. An ICCAT observer card shall be issued for each observer.
4. The Secretariat shall issue a contract listing the rights and duties of the observer and the master of the vessel. This contract shall be signed by both parties involved.
5. The Secretariat shall establish an ICCAT observer program manual.

Designation of the observers

6. The designated observers shall have the following qualifications to accomplish their tasks:
 - Sufficient experience to identify species and fishing gear;
 - Satisfactory knowledge of the ICCAT conservation and management measures assessed by a certificate provided by the CPCs and based on ICCAT training guidelines;
 - The ability to observe and record accurately;
 - A satisfactory knowledge of the language of the flag of the vessel observed.