

## REVIEW OF PURSE SEINE LOGBOOKS USED IN THE ICCAT AREA AND RECOMMENDATIONS FOR A HARMONISED FORM

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### SUMMARY

*Logbooks for industrial fisheries are key in collecting valuable data for scientific, stock assessment and management purposes. ICCAT Recommendations [03-13], [11-01] and [14-01] require the use of Logbooks for data collection on fishing activities and establish minimum data requirements for the purse seine fleet. However, no ICCAT recommendation for a particular logbook template currently exists. The objective of this study is to review logbook models in use by the various Atlantic tropical purse seine fleets and compare them against ICCAT's minimum data requirements. In particular most recent ones listed in Rec. [14-01]. Considering that the existence of a common ICCAT logbook template could, among other benefits, improve the accuracy and uniformity of data, the findings of this review will serve to recommend a logbook to be used by the ICCAT tropical tuna purse seine fleet.*

### RÉSUMÉ

*Les carnets de pêche pour les pêcheries industrielles sont essentiels pour collecter des données utiles à des fins scientifiques, d'évaluation et de gestion des stocks. Aux termes des Recommandations [03-13], [11-01] et [14-01] de l'ICCAT, la collecte des données sur les activités de pêche doit se faire au moyen des carnets de pêche et des exigences minimum en matière de données doivent être établies pour la flottille de senneurs. Or, il n'existe aucune recommandation de l'ICCAT qui spécifie un format particulier pour les carnets de pêche. Cette étude a pour objectif de passer en revue les divers modèles de carnet de pêche utilisés par les différentes flottilles de senneurs tropicaux dans l'Atlantique et de les comparer avec les exigences minimum en matière de données de l'ICCAT, et surtout les plus récentes qui sont répertoriées dans la Rec. 14-01. Étant donné que l'existence d'un modèle commun de carnet de pêche de l'ICCAT pourrait, entre autres avantages, améliorer la précision et l'uniformité des données, les conclusions de cet examen serviront à recommander un carnet de pêche qui sera utilisé par la flottille de senneurs thoniers tropicaux de l'ICCAT.*

### RESUMEN

*Los cuadernos de pesca para las pesquerías industriales son clave para recopilar datos valiosos con fines científicos, de evaluación de stock o de ordenación. Las Recomendaciones 03-13, 11-01 y 14-01 de ICCAT requieren el uso de cuadernos de pesca para recopilar datos sobre las actividades pesqueras y establecen requisitos mínimos en cuanto a datos para la flota de cerco. Sin embargo, no existe actualmente una recomendación de ICCAT sobre una plantilla para un cuaderno de pesca en particular. El objetivo de este estudio es examinar los modelos de cuaderno de pesca que usan las diversas flotas de cerco tropical del Atlántico y compararlos con los requisitos mínimos en cuanto a datos de ICCAT, en particular, con los más recientes incluidos en la Rec. [14-01]. Considerando que la existencia de una plantilla de cuaderno de pesca común para ICCAT podría, entre otras cosas, mejorar la precisión y uniformidad de los datos, las conclusiones de esta revisión servirán para recomendar un cuaderno de pesca a utilizar por las flotas de cerco de túnidos tropicales de ICCAT.*

### KEYWORDS

*Logbooks, Purse seining*

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## 1. Introduction

Management of fisheries depends very largely on availability of data from fishing activities. For the International Commission for the Conservation of Atlantic Tuna (ICCAT), management and research activities are primarily based on fishery-dependent data, collected by logbooks and port sampling. The most basic type of data to be collected is Task I, nominal catches by species, time and area, flag and gear, followed by Task II, catch and effort, size and species composition. An exception to Task II is that information regarding sizes and species composition is estimated through port sampling programs, the rest of the information (e.g. effort) is obtained through on board logbooks. In recent years, the required information for ICCAT fisheries management and scientific research is increasing and becoming more intricate as fishing operations evolve and become more complex. This is particularly the case with the purse seine fisheries, the subject of this review.

Therefore, it is fundamental that data logbooks can capture all the pieces of information considered relevant for fisheries management and scientific research efficiently and accurately. The ICCAT Manual describes in detail what type of data logbooks should collect. Additionally, ICCAT has a number of resolutions (below) providing for mandatory minimum data collection schemes, and the type of information to be recorded. A number of national and gear logbooks are provided as examples in the manual, but no standard ICCAT model of logbook has been adopted to-date.

- Recommendation 2003-13 concerning the recording of catch by fishing vessels in the ICCAT convention area.
- Recommendation 2011-01 on an ICCAT multi-annual conservation and management program for bigeye and yellowfin tunas.
- Recommendation 2013-01 amending recommendation 2011-01.
- Recommendation 2014-01 on an ICCAT multi-annual conservation and management program for tropical tunas.

A detailed list of data requirements according to the ICCAT Manual, and minimum catch recording requirements for logbooks, including Fish Aggregation Devices (FAD) data, are listed in **Appendix 2**.

A review of the variety of catch and effort and FAD logbook templates in use across the different tropical tuna purse seine fleets that operate in the Atlantic Ocean reveals that, with the exception of some details, they successfully capture the key information as required by ICCAT. However, a standardised logbook would be advantageous, providing consistence and coherence on the data being collected and ensure that all minimum requirements for the purse seine fleet are met in a harmonised format, as suggested in Rec. [14-01].

The objective of this paper is to provide an overview to what extent current logbooks gather ICCAT required information, in particular for most recent ones related to FADs, and to promote discussion of the adoption of an appropriate format for a harmonised ICCAT tropical tuna purse seine logbook.

## 2. Methodology

### *Logbook collection*

Logbooks used by each of the different Purse seine fleets operating under ICCAT were collected for comparison, including FAD activity logbooks and supply vessel logbooks when available.

The forms for comparison were collected directly through fleet companies and representatives to ensure that current versions in use were employed for this study. Also, copies of logbook templates were collected through the Spanish Institute of Oceanography (IEO), the French vessel owner association Orthongel and the Venezuelan Institute of Oceanography (IOV).

Purse seine fleets for which logbooks forms were collected comprise the following flags: Belize, Cape Verde, Curaçao, El Salvador, France, Ghana, Guatemala, Ivory Coast, Korea, Senegal and Spain.

### *Logbook review*

ICCAT minimum data requirements under review are provided by the following Recommendations: ICCAT Rec. [03-13] provides that vessels above 24 meters shall keep a bound or electronic logbook, to collect information according to the ICCAT Manual. In addition to that, Rec. [11-01] sets out specific catch recording requirements for Logbooks. Lastly Rec. [14-01] requires that purse seine and supply vessels collect and report fishing activities in association with fish aggregating devices (FADs). Reference will only be made to Rec. [14-01] as it summarizes all requirements under review.

Logbooks are organised in two types, *catch and effort logbooks* and *FAD logbooks* which are reviewed separately in this paper and compared against respective minimum data requirements.

*Catch and effort recording* logbooks are represented for comparison in **Table 1** with their respective data fields grouped by *trip specific, set specific, catch and miscellaneous data*. The presence/absence of each data field is noted, including comments and a list of available entries per field or drop down menus when they exist.

**Table 2** compares *catch and effort logbooks* against ICCAT minimum data requirements as listed per Rec. [14-01].

**Table 3** compares FAD data being collected by *FAD logbooks* and against requirements of Rec. [14-01]. Data fields are grouped by *deployment/loss, visit and setting data*.

Based on these comparisons, a template for a common purse seine logbook that captures all data as per ICCAT minimum requirements, ensuring to incorporate all data is proposed in **Appendix 1**.

## **3. Results and discussion**

### **Overview of available catch and effort logbook templates**

The same logbook format, with slight variations, appears to be utilized by a number of fleets. The Spanish logbook format, developed by the IEO, is currently employed by purse seine fleets of Curaçao, Panama, Cape Verde, El Salvador and Senegal. This occurs most likely for simplicity, as these fleets are either operated and/or owned by Spanish companies which apply similar management schemes as for Spanish vessels. It also appears that at least 2 variations of the Spanish IEO logbook exist in use, one of them incorporating discards, with no other substantial differences.

- The Cape Verde and Guatemala logbooks have their own formats, although they seem to be modified versions of the Spanish logbook. They are considered independently.
- The French logbook format is also used by the Belize and Ivory Coast fleets.
- The Ghana logbook appears to have been developed or updated as part of the activities of the ICCAT/Japan Data Improvement Project (JDIP), which was completed in 2009 (Wazawa and Suzuki, 2010).
- The Korean logbook model uses the same format for Indian and Pacific oceans.
- The Venezuelan logbook, although having a similar format than the others, includes data fields for activities in association with baitboats.

A number of logbooks are used in excel formats, containing dropdown menus. Such is the case for French, Spanish (one of the versions available) and Cape Verde forms. The rest appear to be plain Excel templates either to be filled directly in a computer or printed and completed in hand writing.

Spain and France, as per EU regulations, have electronic logbooks in place. These gather the same information as their respective logbooks, plus supplemental elements of interest for EU and National administrations. A template with minimum data requirements is mandatory for implementation of EU Member States.

## **Review of catch and effort logbooks**

### ***Trip specific data***

This category includes elements that remain unchanged during the course of a given fishing trip such as dates and places of departure and arrival, vessel and gear details. After review, it appears that two elements required by ICCAT Rec. [14-01] are not being captured by the majority of logbooks:

- *gear information* (FAO type and dimensions), collected only in the Korean and Ghana logbooks.
- *vessel information* (registry numbers, ICCAT and IMO). Only France, Korea and Guatemala logbooks collect this information partially and they all miss ICCAT registry numbers. Cape Verde does not include IMO.

### ***Other findings:***

- *vessel data* is completed using different elements depending on the logbook, but none of them captures all the elements listed in Rec. [14-01].
- *log readings* (mileage at beginning/end of trip), is included in some logbooks.
- Ghana logbook seems to miss a substantial number of elements on this section. It appears that the first page of the logbook contains these data fields although no copy was available to the authors neither was it confirmed that it is being completed by skippers.

### ***Set-specific data***

This category collects all the data elements that characterize each fishing operation, such as date, time and position by operation, status and type of operation. All logbooks appear to comply with ICCAT requirements on this type of information.

### ***Other findings:***

- slight differences are found among logbooks. Data elements such as *start/end time* and *success/nil* for each set exist in some logbooks. This data is potentially useful for effort estimation.
- *vessel activity and status*. This important information is gathered in all logbooks with various degrees of detail and terminology. In a number of cases it is recorded at masters discretion under "*comments*".

### **Catch recording**

Catches are adequately captured by all the logbooks, by species, in tonnes per set and with a variety of size categories.

### ***Other findings:***

- although it is not an explicit ICCAT logbook requirement, some collect information on discards. For the Korean fleet, a specific bycatch logbook is being completed together with the main and FAD logbooks.
- information on the wells and how catch is distributed is also present in some logbooks. Although this is mainly for use of the vessel, it can also be useful to trace catches from a particular operation when sampling.

### **Miscellaneous data**

Includes general data on weather conditions (temperature, wind, visibility) and fields for comments. Although useful for scientific purposes, none of this data is being required by ICCAT.

### ***Other findings:***

- "*Comments*" field is included in this section. For the revised logbooks it was being completed with information on status, type of set or association among others.

## **Compliance of catch and effort logbook data against ICCAT requirements by Rec. [14-01]**

Comparison of logbooks information against ICCAT minimum catch and fishing data requirements shows that only trip specific elements fail to be adequately captured by most of the forms. Vessel information, in particular vessel and ICCAT registry numbers and IMO, are either missing completely or not fully in compliance as required. It is worth to note that catch and effort, and set specific information is being effectively collected in all the reviewed logbooks.

### **Overview of available FAD logbook templates**

Only two FAD specific activity logbooks have been found to be in use, Spanish and Korean FAD logbooks. FAD related activities on the French vessels is collected in the catch Logbook where extra fields have been included for this purpose. In the Spanish and French electronic logbooks, data entry is organised using drop-down menus with fixed options while the Korean logbook must be completed, although pre fixed activity codes are indicated.

According to Spanish companies, for vessels operating under other flags in the Atlantic, FAD related activity data is being collected using the Spanish FAD logbook. However, it has not been confirmed whether these data are being reported to ICCAT. Similarly, there is no information as to whether Korean associated fleets utilize the Korean FAD logbook.

For the rest of fleets, no FAD related activities appear being recorded in the catch logbook nor a specific FAD activities logbook were found.

### **Review of FAD logbooks**

#### ***Deployment and loss***

Information on FAD deployments and loss, position and ID are collected on this section. Spanish and Korean logbook capture all mandatory information of this type while French logbook does not collect information on FAD markings as required.

***Other findings:*** Collecting buoy or FAD markings, or both still unclear. Buoys might have a manufacturer's ID, but no common standard exists for FADs. Some fleets interpretation is that buoys indicate the ownership of a FAD and define any floating object as such. However as it has been recently recommended during the Ad Hoc ICCAT Working Group on FADs, both buoys and FADs need to be marked and the information collected and reported. Discussion on the issue by the Commission is required before deciding how this information should be collected and reported.

#### ***Design and materials***

Data on this section details the materials and type and design of the FAD including if it has a non entangling design. Description must be provided for the surface as well as the submerged part of the FAD, as this might be related with FAD by-catch and interaction with species of sharks and turtles. French logbook does not detail information on FAD design at deployment. Korean logbooks provide only partial information of this kind, omitting to describe the underwater part of the FAD.

***Other findings:*** Providing detailed description is only practical during deployment of FADs. For encountered FADs it might be difficult to obtain a description of materials and design and a more precise way of proceeding for this case should be considered.

#### **Visit**

This type of data is successfully captured by the three models. The Spanish version includes extra activities, such as "*at port recovery*"; the French version includes "*buoy non transmitting*" (it is not clear if this would be equivalent to "*loss*").

## Catch

Catch related to FAD activities is successfully captured by the three models. In the case of the Korean fleet, a dedicated bycatch logbook is used to register discards and bycatch information. The French logbook does not provide explicit field to indicate fate for bycatch species.

**Other findings:** Loose underwater FAD netting can be cause of bycatch (Filmlalter *et al.*, 2013). This type of entanglement bycatch is not included as part of the collected data.

## **FAD activities by supply vessels**

Following Rec. [14-01], supply vessels must collect information on any FAD related activities they provide support.

A number of supply vessels from various flags are known to operate in the ICCAT area, but only the Spanish supply vessel logbook appears to exist. It is also not certain if supply FAD related activities are reported by vessels from other flags. Although a specific supply vessel logbook exists for Spanish vessels, data on FAD related activities as per Rec.14-01 is completed through the same FAD logbook used on purse seiners.

Since the Spanish FAD logbook already includes all of the information that the supply vessel logbook is meant to collect, it is not reviewed further here (a template of the Spanish supply vessel logbook is included among the recollected logbooks, **Appendix 3**).

## **4. Conclusions and recommendations for an ICCAT harmonized Logbook**

The review finds that logbooks utilized by ICCAT purse seine fleets are mostly in conformity with ICCAT Manual requirements and recommendations and with the requirements of Rec. [14-01]. Current forms in use would require minimal modifications, in most cases, to gather the entire set of data required by ICCAT in terms of catch and effort, fishing activities and FAD related data.

It is noted that terminology and definition of events and activities is not uniform across the different forms. Also, data elements are often categorized or grouped differently (e.g. status, activity, set type). Other data elements require further development and clarification to be adequately captured (e.g. FAD markings, non entangling design, biodegradable FADs).

It should be ensured that current data collection schemes take into account vessel, gear and discards information. In regards to FAD data, detailed description and materials of deployed and encountered FADs, including underwater parts should be collected. In addition to that, it must be ensured that FAD markings are being registered for each deployment or encounter. However, it remains unclear if this is feasible until a particular FAD marking scheme is agreed by ICCAT.

The logbook data collection schemes reviewed in this paper appear to be largely appropriate. We note that FAD-related information from many purse seine fleets are not being reported to the ICCAT Secretariat as required under Rec. [14-01] (De Bruyn, 2015). We do not know if the data are in fact being collected but not being reported (to national authorities and/or the Secretariat). In this paper, we focused on whether or not the logbook forms are adequate to meet the requirements. A study of compliance with reporting requirements is beyond the scope of this paper.

Results indicate that, with some exceptions, catch and effort data is being appropriately collected. However, the latest requirements on FAD activities (Rec. [14-01]) are substantial and can be complex. Integrating these supplementary data elements and activities into existing data collection schemes can also be difficult and onerous for skippers. This process would benefit from the existence of a harmonized data collection format which has also been one of the recommendation of the 2015 ICCAT Ad Hoc Working Group on FADs:

*“Promote the harmonization of FAD nomenclature, and data reporting as to facilitate data sharing across Oceans “*

The existence of a ready to use, harmonized logbook format, such as the one proposed in **Appendix 1**, would also be beneficial for fleets not having yet developed a logbook collecting the latest requirements on FAD data.

## **Recommendations for a harmonised ICCAT logbook**

The following elements were found to be missing or incomplete and should be included in any harmonized format, together with the rest of current minimum data requirements.

### ***Minimum catch recording***

- All vessel information should be provided, including registry number, IMO and ICCAT numbers,
- Gear information. Minimum catch recording requirements should be included, with length, width, depth and mesh size.
- Discards information should be included. For some fleets this is estimated based in observer data, although no observer coverage is provided for all fleets.

### ***FAD data***

- Detailed descriptions and materials should be provided for each deployed FAD, as well as for any encountered FAD.
- FAD markings should be registered or ID provided to any new FAD deployed or encountered, with addition to the buoy ID.

### ***Supplementary data elements estimated of potential interest to be included***

- Log reading. Potentially useful for effort standardisation.
- Start/end times for each set. Success/nil for each set. Potentially useful for effort standardisation.
- Distribution of wells. Potentially useful for sampling purposes.
- Vessel activity and status. These data is often recorded under “comments”. It should have a dedicated data field and specific nomenclature should be agreed for the various activities and status.
- Bycatch of non target species. Given their importance on FAD fisheries, it would be desirable to collect as much information as possible, including any potential mitigation measures in application.
- Supply vessels. Same version of FAD logbook used on purse seiners could be easily adapted for supply vessels. Also, purse seiners should identify any supply vessel from which they are being assisted and each activity must be noted referencing the corresponding supply vessel when applicable.

### ***General recommendations***

Any format for consideration must seek simplicity and integration, avoiding to pose an excessive burden to be completed. A single logbook integrating catch and FAD activity data within a single template would be desirable if possible.

In order to minimize data errors and homogenize nomenclature, drop down menus (when possible), or fixed coded entries are desirable for completing fields with multiple possibilities. Suggestions and directions should be provided in the template. Such options must be subject to discussion and adoption. Any common template should allow completion in electronic or paper format at choice.

Specific entry fields should exist for every variable, particularly for minimum requirements, and avoid to be noted under generic fields such as “*comments*” or “*remarks*”.

Given their important role in FAD fisheries, it must be ensured that minimum data requirements for supply vessels are met, either by means of a dedicated logbook or by completing the same FAD logbooks as per purse seiners.

**Appendix 1** presents a "strawman" harmonized logbook that results from this study. It is recommended that the SCRS and the ad hoc Working Group on FADs take this into consideration in making its recommendations to the Commission.

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**Table 1.** Review of available catch and effort logbooks. Cells with “Y”, “N” and “P”, account respectively for recorded, non-recorded or partially-recorded data element. List of available entries per field, drop down menus, or suggested entries are included when available.

Data group		Spain / Senegal / Panama / Curaçao / El Salvador	France	Belice / Ivory coast	Korea	Ghana	Venezuela	Guatemala	Cape Verde
Trip Specific	Vessel name	Y	Y	Y	Y	Y	Y	Y	Y
	Master/captain	Y	Y	Y	Y	N	Y	Y	Y
	Port of departure	Y	Y	Y	Y	N	Y	Y	Y
	Port of arrival (unload)	Y	Y	Y	Y	N	Y	Y	Y
	Date/hour of departure	Y	Y	Y	Y	N	Y	Y	Y
	Date/hour of arrival	Y	Y	Y	Y	N	Y	Y	Y
	Loch start/end	Y	Y	N	N	N	N	Y	N
	Gear details	N	N	N	Y	N	N	N	N
	Vessel data	P (Depends on version)	Flag, register #, Port of register, Int call sign, Imo	N	Total tonnage Total horsepower IMO Fishing permit Number of crew Fishing gear details Supply vessel name/register Helicopter y/n	N	N	N	Name of vessel Reg. N° Shipowner Address GRT Capacity
	Set Specific	Date	Y	Y	Y	Y	Y	Y	Y
Time		Y	Y	Y	Y	Y	Y	Y	N
Set#		Y	Y	Y	Y	Y	Y	Y	Y
Start/end		N	N	N	Y	Y	Y	N	N
Successful		Y	Y	Y	N	Y	Y	N	Y
Position		Y	Y	Y	Y	Y	Y	Y	Y
Zee		N	Y	N	N	N	N	N	Y
Status / Activity		Indicated in "comments"	Indicated in "comments"	Indicated in "comments"	Fishing, searching, transit, breakdown, bad weather, in port, cleaning set	Indicated at each position entry	Indicated in "comments"	Indicated in "comments"	Departing, searching, breakdown, transit, to port, in port
Fad #		Dedicated logbook	Y	N	Dedicated logbook	N	N	N	N
Set type		Y	Y	Indicated in "comments"	Unassociated, feeding on bait, drifting log/debris/dead animal, drifting fad/payao	Y	Fish on surface, free school, natural object, birds, whale shark, BB association	Indicated in "comments"	FAD, natural object, FS SKJ, FS YFT, sonar, seamount, supply, whale shark, whale
Catches	Yft	Catch, avg weight	Catch, avg weight, size (min,max)	Y	Catch <9kg / >9kg	Catch, categories	Catch, avg weight	Catch, category	Catch
	Skj	"	"	Y	Catch	Catch	Catch, avg weight	"	"
	Bet	"	"	Y	Catch <9kg / >9kg	Catch, categories	N	"	"
	Alb	N	"	N	Catch	N	N	N	"
	Oth	Y	Y	Y	Dedicated logbook		Y	Spp, catch, category	Y
	Discards	P (Depends on version)	Y	Y	Size of fish Damaged fish Full vessel Other	Y	N	N	N
Misc	Well #	Y	Y	Y	N	Y	Y	Y	N
	Remarks / Comments	Y	Y	Steaming, searching, problems, log type, bycatch, school size, other assoc	N	Name of supply, bycatch school size	Stop, searching, breakdown, freezing, etc	Y	N
	Zee	N	Y	N	N	N	N	N	N
	Wind	N	Y	N	N	N	Y	N	N
	Current	N	N	N	N	N	N	N	N
Water t°	Y	Y	Y	Y	Y	Y	Y	N	

**Table 2.** Catch and effort logbooks against current ICCAT minimum requirements as per Rec [14-01]. Cells with “Y”, “N” and “P” account respectively for recorded, non recorded or partially recorded data element.

ICCAT Catch and effort minimum data requirements Rec [11-01]		Spain (Senegal, Panama, Curaçao, El Salvador)	France	Belice / Ivory Coast	Korea	Ghana	Venezuela	Guatemala	Cape Verde
Trip Specific	Master	Y	Y	Y	Y	N	Y	Y	Y
	Date and ports of departure and arrival	Y	Y	Y	Y	N	Y	Y	Y
	Vessel name , registry, lccat and IMO numbers when available	N (registry numbers)	P (missing ICCAT number)	N (registry numbers)	Y	N (registry numbers)	N (registry numbers)	N (registry numbers )	P (missing ICCAT number)
	Fishing gear details	N	N	N	Y	N	N	N	N
Set Specific	Operations at sea, providing: activity, position at noon or per set, catches	Y	Y	Y	Y	Y	Y	Y	Y
	Fishing mode	Y	Y	Y	Y	Y	Y	Y	Y
Catches	Species ID and RWT per set	Y	Y	Y	Y	Y	Y	Y	Y
	Means of weight	Catch estimation	Catch estimation	Catch estimation	Catch estimation	Catch estimation	Catch estimation	Catch estimation	Catch estimation
	Conversion factors if applicable	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**Table 3.** Comparison among existing FAD data collection schemes and ICCAT requirements as per Rec [14-01]. Cells with “Y”, “N” and “P” account respectively for recorded, non recorded or partially recorded data element.

FAD data required to be collected as per ICCAT Rec. [14-01]		Spain FAD logbook	France logbook	Korea FAD logbook
<b>FAD activity data</b>	<b>Deployment / Loss</b>	Y	Deploy Eco-FAD	Y
	Position	Y	Y	Y
	Type of buoy	GPS, satellite, Satellite+ecosounder	Y	Y
	ID	Y	P (Only beacon ID)	Y
	<b>Design</b>			
	Floating part	Payao/Raft (Pvc, metal, plastic),non covered raft or covered with non entangling material, natural	N (no information is collected on FAD desing or material)	Y
	Dimensions	Y		Y
	Materials – Surface	Bamboo,PVC/plastic, metallic,floaters, fishing net,antifouling net		Y
	Materials – Underwater	Mesh size.Nylon, free nets, "sausage" type, palm leaves, ropes		N
	Dimensions	Y		N
	Entangling (Y/N)	Y		N
	<b>Visit</b>			
	Position	Y	Y	Y
	Date	Y	Y	Y
	ID	Y	Y	Y
	Haul Retrieve Manipulate Electronic equip	Visit, retrieval, replacement, buoy to natural object, loss, collected in port	Replacement, retrieval, fishing, visit no fishing, buoy stop transmitting	Hauling , retrieving, loss, intervention on electronic equipment, observation-please specify
	Position and Date	Y	Y	Y
	<b>If set</b>			
	Catch	Y	Y	Y
	Bycatch	Y	Y	Y
	Discard (fate)	Y	P (fate not indicated)	Y

Appendix 1

RECOMMENDED HARMONIZED LOGBOOK FOR THE ICCAT TROPICAL PURSE SEINE FLEET

DEPART / SALIDA / DEPARTURE :		ARRIVAL				MASTER		OBSERVER		VESSEL DATA						SHEET #								
PORT	0	PORT		Y						Name Registry n° IMO n° ICCAT n° Int. Call sign Supply vessel														
DATE	#NOMBRE?	DATE / FECHA / DATE		Y																				
HOOR	0:00	HOOR		ent, retrieval, fishing, visit no fishing, buoy stop tr		Trip		Trip : 0																
LOCH	0	LOCH		0																				
DATE	POSITION+EEZ (each set or noon)	SET		ESTIMATED CATCH (metric tons)										ASSOCIATION TYPE (insert code)	Buoy ID	FAD		Description & Materials		MITIGATION MEASURES (Codes)	COMMENTS	T <sup>2</sup> /Wind/knots		
		SUCCESSFUL	NIL	START/END	1		2		3		4		OTHER SPECIES			DISCARDS give name(s)	BYCATCH (insert code)	ACTIVITY (insert code)	MARKING				SURFACE (code)	DIMENSIONS
					YELLOWFIN		SKIPIACK		BIGEYE		ALBACORE												UNDERWATER (code)	DIMENSIONS
					YFT+10		YFT-10		SKJ		BET												ALB	
Size	Catch	Catch	Size	Catch	Size	Catch	Size	Catch	Size	Catch	Name	Size	Catch	Group	Nº	Fate								
One set per line / One line per FAD activity (deployment/ visit / set /, etc) – Use extra lines to account for other species / discards within a set when needed																								
<b>Assoc. Code:</b> Free Sch - 1 Object- 2 Buoy- 3 Supply-4 Whale shark-5 Mammal- 6		<b>FAD Codes:</b> Deployment- 1 Intervention on buoy- 2 Recovered in Port- 3 Set -4 Check -5 Removal -6 Haul -7 Loss -8				<b>Bycatch Codes:</b> Turtle- 1 Shark- 2 Whale shark- 3 Billfishes- 4, Rays- 5 Mammals- 6				<b>Mitigation measures:</b> Underwater structure check- 1 Whale shark safe release- 2 Shark safe release- 3 Turtle deentanglement- 4 Rays safe release- 5														

## INFORMATION TO BE GATHERED BY LOGBOOKS ACCORDING TO ICCAT MANUAL

### Per fishing trip:

- Identification of vessel, captain, owner.
- Details of vessel including type, flag nationality, gross registered tonnage, power of engines (preferably as transmitted to the propeller shaft, i.e. excluding power used for generators, refrigeration, winches, etc.); length (specifying whether length overall or registered length); capacity for fish; number of fishing crew and the times of any shifts worked (in case catch processing differs between them).
- Date, time, and port of departure and arrival including for stops during the trip.
- Time lost due to breakdowns, poor weather, or other interruptions.
- Details of any trans-shipments or landings of fish made during the trip.
- Specifications of fish finding equipment available on board;
- Generalised details of fishing gear, i.e. excluding modifications made from set to set. For nets, this would include mesh sizes (specifying whether knot to knot, or stretched mesh measurement), twine type and construction, and preferably a net plan. For long-lining the general details would include the total number of hooks, number of hooks between floats, hook type, and a general diagram of the dimensions of the longline.
- Generalised details of fishing techniques including shooting and hauling operations, typical fishing depths, immersion times, weather limitations on fishing.
- The target species for the trip, plus policies used by the crew to decide whether to discard or keep fish of different species, e.g. minimum landing sizes.
- The names of fish species that will be identified in the catch log if caught, and of those that are likely to be mixed up because they are difficult to separate or because the market does not require separation. [Vernacular names are sometimes confused (e.g. bonito for skipjack) so species' identities should be checked and translated to Latin names for the logbook records archived by the fishery authority. See section 4.2.5.]
- Methods used to estimate quantities of fish retained (and discarded if possible).

### Daily:

- Date, noon position, position of fishing, activities, the times spent steaming, scouting for fish, and fishing, amount of fishing effort employed, and catch by species.

### Per set:

- Gear deployed (if it changes from set to set). Details given should be sufficient to calculate a useful measure of effective fishing effort for each set.
- Positions and times of shooting and hauling, plus way-points if the vessel did not travel directly between the two.
- Damage sustained by gear during fishing.
- Weather and sea state. Oceanographic variables by arrangement with the fishery authority, depending on the sensors available for use.
- The retained quantities of each species, and mix of species, as numbers or weights.
- And, if available, estimates of the discarded quantities of each species and mix.

### At the end of each trip:

- Total time in stated units (e.g. hours, working days, 24-hr periods, etc.) spent looking for and catching fish.
- The total quantity landed as registered by a commercial scale, preferably separately for each species and mix of species.

### *Minimum catch recording requirements set up by Rec [14-01]*

#### 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

***Recording of catch and FAD fishing activities as per Rec [14-01]***

Each CPC shall ensure that its vessels 20 meters LOA or greater fishing bigeye and/or yellowfin and/or skipjack 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].

CPCs shall ensure that all purse seine and baitboat fishing vessels and all support vessels (including supply vessels) flying their flag, and/or authorized by CPCs to fish in areas under their jurisdiction, when fishing in association with fish aggregating devices (FADs), including objects that could affect fish aggregation, shall collect and report, for each deployment of a FAD, each visit on a FAD, whether followed or not by a set, or each loss of a FAD, the following information and data:

- a) Deployment of any FAD
  - i. Position
  - ii. Date
  - iii. FAD type (anchored FAD, drifting artificial FAD)
  - iv. FAD identifier (i.e., FAD Marking or beacon ID, type of buoy – e.g. simple buoy or associated with echosounder)
  - v. FAD design characteristics (dimension and material of the floating part and of the underwater hanging structure and the entangling or non-entangling feature of the underwater hanging structure)
- b) Visit on any FAD
  - i. Type of the visit (hauling, retrieving, intervention on electronic equipment)
  - ii. Position
  - iii. Date
  - iv. FAD type (anchored FAD, drifting natural FAD, drifting artificial FAD)
  - v. FAD identifier (i.e., FAD Marking or beacon ID or any information allowing to identify the owner)

vi. 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. If the visit is not followed by a set, note the reason (e.g. not enough fish, fish too small, etc.)

c) Loss of any FAD

- i. Last registered position
- ii. Date of the last registered position
- iii. FAD identifier (i.e., FAD Marking or beacon ID)