

## UPDATE ON THE IMPLEMENTATION OF THE IOTC REGIONAL OBSERVER SCHEME

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### PURPOSE

To inform the WPEB14 of the status of implementation and reporting to the IOTC Secretariat of the Regional Observer Scheme (ROS) set out by Resolution 11/04 *on a Regional Observer Scheme* at the 15<sup>th</sup> Session of the Commission in 2011.

### BACKGROUND

Fisheries observer data is important for fisheries management, providing an independent source of detailed, high quality information on fishing activities and catches at a sufficient level of resolution to be used for analyses such as the standardisation of catch rates and analysis of bycatch mitigation measures. At the 13<sup>th</sup> Session of the Commission (S13), the Commission adopted Resolution 09/04 *on a Regional Observer Scheme*, which was superseded in 2010 by Resolution 10/04, and again in 2011 by Resolution 11/04. The main objective of the IOTC Regional Observer Scheme is to *'collect verified catch data and other scientific data related to the fisheries for tuna and tuna-like species in the IOTC area of competence'* [Res 11/04, para. 1].

Resolution 11/04 *On a Regional Observer Scheme* makes provision for the development and implementation of national observer schemes among the IOTC CPCs starting in July 2010 and covering *"at least 5 % of the number of operations/sets for each gear type by the fleet of each CPC while fishing in the IOTC Area of competence of 24 meters overall length and over, and under 24 meters if they fish outside their EEZs shall be covered by this observer scheme. For vessels under 24 meters if they fish outside their EEZ, the above mentioned coverage should be achieved progressively by January 2013"*.

The Resolution also states that *"the number of the artisanal fishing vessels landings shall also be monitored at the landing place by field samplers"* and that *"the indicative level of the coverage of the artisanal fishing vessels should progressively increase towards 5% of the total levels of vessel activity (i.e. total number of vessel trips or total number of vessels active)"*. There are currently no established guidelines for the collection of data from artisanal vessels fishing within their national EEZ so this remains an area for further development.

A number of national observer programmes have now been established for industrial fleets across the Indian Ocean and these are used to collect scientific fisheries data by onboard observers, according to specific research requirements specified by each of the coordinating organisations. Data are collected and reported at the regional level to the IOTC Secretariat as part of the mandate of the ROS and are summarised in this paper.

### UPDATE ON CURRENT STATUS OF IMPLEMENTATION AND REPORTING

#### *Implementation of the observer scheme*

As of 28<sup>th</sup> August 2018, fifteen CPCs (Australia, China (including Taiwan,China), Comoros, EU (France<sup>2</sup>, Spain, Portugal and UK), Indonesia, Japan, Kenya, Rep. of Korea, Madagascar, Maldives, Mauritius, Mozambique, Seychelles, South Africa and Thailand) have submitted a list of observers and have been allocated an IOTC observer registration number. A total of 375 observers are currently registered as active.

As of 28<sup>th</sup> August 2018, a total of 1268 trips have been reported to the IOTC Secretariat by Australia, China (including Taiwan,China), EU(France, Italy, Portugal, Spain and the UK), France OT, Indonesia, Japan, Kenya, Rep. of Korea, Madagascar, the Maldives, Mauritius, Mozambique, Seychelles, South Africa, Sri Lanka and Tanzania.

Appendix A provides a summary of the status of implementation of the ROS by all IOTC CPCs. Appendix B and Appendix C provide an estimation of the level of effort covered by observers between 2010 and 2017 for industrial longline and purse seine vessels (data updated as of 28<sup>th</sup> August 2018). Reported scientific observer coverage for the artisanal fleets is currently zero.

#### *Reporting in electronic format*

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<sup>2</sup> Including Mayotte due to its status as a French outermost region since January 2014

At the SC20 in 2017, there was a recommendation for all observer data to be submitted in electronic format:

(para. 115) "*Resolution 11/04 On a Regional Observer Scheme requests the submission of a report after each trip but the SC **RECOMMENDED** that on the next revision of the Resolution, this should be amended to request the submission of data in an electronic format suitable for automated data extraction (including historic data) with a given deadline so that information from multiple trips can be provided*".

An increasing number of CPCs are now submitting data electronically, including Australia, EU, France, EU, Spain, EU, UK, China (partial), Indonesia, Japan, Kenya, Maldives, Mozambique and Mauritius (partial) (Appendix A).

## A PILOT PROJECT FOR THE ROS

Since its origination in 2009, national implementation of the Regional Observer Scheme remains very low among IOTC CPCs. Where observer programmes have been established, these are wide ranging and highly variable in the type and quality of information collected and the reporting of data to IOTC standards remains poor and so the data that are submitted and stored regionally are currently of little value.

In recognition of these issues and in a positive step towards addressing the problems and seeking solutions, the IOTC adopted Resolution 16/04 *On the implementation of a pilot project in view of promoting the Regional Observer Scheme of IOTC* and following this a pilot project has been developed. This was discussed and further developed at the WPEB, WPDCS<sup>3</sup> and SC<sup>4</sup> in 2016, circulated to all Members for comment in March 2017 and was approved by the Commission in May 2017<sup>5</sup>.

The project outlines a comprehensive plan as part of a long-term, holistic strategy for supporting the implementation of the Regional Observer Scheme in the IOTC area of competence. It aims to tackle each of the key issues that currently prevent the collection and analysis of high quality data to contribute to stock assessment and management advice through the development of new technologies, tools, standards and processes. The overall strategic framework is centred around five key components:

1. Observer training programme and minimum standards
2. Electronic reporting
3. Observer database development and historic data collation
4. Electronic monitoring system
5. Observation in-port

A critical component in each of the workstreams is the piloting phase and Resolution 16/04 provides a framework for trialling these innovations by drawing together the outputs from the various work streams and operationalising them in selected voluntary CPCs.

### *Outcomes of SC20 relevant to the ROS*

The SC noted paper IOTC-2017-SC20-07 that provides an update on the status of implementation and reporting to the IOTC Secretariat set out by Resolution 11/04 *on a Regional Observer Scheme* (ROS), and Resolution 16/04 *On the implementation of a pilot project in view of promoting the Regional Observer Scheme of IOTC* (provided in [Appendix XXXIII](#)).

The SC acknowledged the financial support of the EU for the implementation of Resolution 16/04 *On the implementation of a Pilot project in view of promoting the Regional observer scheme of IOTC*, which is expected to deliver long-lasting improvements in the data collection and reporting of scientific observer data to the IOTC Secretariat.

The SC noted that there are no specific data collection standards for electronic monitoring systems, in terms of minimum coverage levels and recalled that the Commission has specifically requested the development of minimum standards for EMS through Resolution 16/04 and the need for this to be part of the Pilot Project.

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<sup>3</sup> IOTC-2016-WPDCS-22: <http://www.iotc.org/documents/pilot-project-iotc-regional-observer-scheme>

<sup>4</sup> IOTC-2016-SC19-14: <http://iotc.org/documents/pilot-project-iotc-regional-observer-scheme-0>

<sup>5</sup> IOTC-2017-S21-10: <http://www.iotc.org/documents/pilot-project-iotc-regional-observer-scheme-1>

The SC therefore **RECOMMENDED** that the EMS standards presented for purse seine fisheries (IOTC-2016-SC19-15) are adopted and **REQUESTED** that draft standards are similarly proposed for the longline fleets by CPCs currently trialling and implementing EMS on these vessels and that draft standards are also developed for gillnet fleets through the ROS Pilot Project.

Noting the development of a Steering Committee for the ROS Pilot Project and the few nominations received to-date (one CPC and one NGO), the SC encouraged interested parties submit their nominations to the Secretariat as soon as possible.

The SC **RECOMMENDED** that a data exchange be implemented between existing software formats used for the collection of observer data by CPCs (e.g., *ObServe*), and the IOTC Regional Observer Database, to facilitate the transfer of historical observer data to the IOTC database for future dissemination and analysis.

The SC noted that EMS are intended to complement human observer programs and also collect other useful information, and encouraged that different – but mutually compatible EMS systems – conform to harmonized standards in terms of installation, data collection and reporting, and **REQUESTED** that purse seine fleets or CPCs wishing to voluntarily implement EMS in purse seiners follow the guidelines described in document IOTC-2017-WPDCS13-26 and IOTC-2016-SC19-15.

The SC noted that the feasibility and range of data collected by Electronic Monitoring Systems varies according to type of fishing gear, and **REQUESTED** that the IOTC Secretariat, in collaboration with CPCs, develop standards for data collection and reporting applicable to different gear types.

Resolution 11/04 On a Regional Observer Scheme requests the submission of a report after each trip but the SC **RECOMMENDED** that on the next revision of the Resolution, this should be amended to request the submission of data in an electronic format suitable for automated data extraction (including historic data) with a given deadline so that information from multiple trips can be provided.

### ***Outcomes of S22 relevant to the ROS***

The Commission **AGREED** to defer IOTC-2018-S22-PropD and PropJ *On a Regional Observer Scheme*. The proponents of these proposals attempted to merge the two proposals; however, they agreed more work needed to be done to reach a consensus and indicated that a revised proposal will be submitted to the next session of the Commission.

### ***ROS Pilot Project: progress update***

#### ***1. Observer training programme and minimum standards***

A vast array of observer initiatives, with different training curricula, data collection methods and procedures has been developed across the Indian Ocean by a range of organisations, both prior to and since the implementation of Resolution 11/04. As a result, an assortment of data of varying quality is being collected and reported, with many inconsistencies and gaps, and overall a lack of standardisation in the procedures employed by national observer schemes and of conformity with IOTC mandatory data requirements.

#### ***Minimum standards for the ROS***

The issues associated with this variety of standards, programmes and lack of coordination have already been identified in some areas such as the southwest Indian Ocean region and resulted in increasing number of requests being addressed to the Secretariat for clarification of standards and for formal accreditation or recognition that national or sub-regional programmes are adhering to IOTC standards. However, no formal mechanism was in place through which to do this or a concrete and auditable set of standards against which programmes could be assessed.

Funds were obtained and a consultancy developed for an expert to comprehensively review and finalise the ‘interim’ data collection and reporting requirements and set out the minimum standard for the scheme in a clear and concise format. A full project report has been developed including a revised set of data fields and programme standard. An expert workshop has been organised to review these standards and will be taking place in Seychelles from 24-28

September 2018. The final set of standard recommended by this expert group will be presented to the WPDCS for review and to the SC21 for approval.

### *ROS training package*

A project proposal has been developed as an application for funding for a project to develop a complete training package for the IOTC ROS. This will be based on the finalised standards and include training materials for observer coordinators as well as observers. The newly developed tools and materials will be implemented in six countries (Sri Lanka, I.R.Iran, Tanzania, Indonesia, Pakistan and Mauritius). The IOTC Executive Secretary is in the process of securing high level commitment for the support of this project each country. The project will be advertised openly through a call for tenders on the IOTC website as soon as the funding has been confirmed.

### *2. Electronic reporting*

The electronic reporting interface has been successfully finalized and tested: it is provided as a standalone, multi-platform application that does not require Internet connectivity to work, although it now includes direct communication mechanisms to retrieve vessel information from the IOTC RAV (“*Record of Authorised Vessels*”) as well as the IOTC list of accredited observers. It is also directly linked to the main IOTC Statistics database so as to constantly synchronize all needed reference data in a seamless way.

The e-reporting interface implements all the requirements detailed by the “*IOTC Regional Observer Scheme user manual*” for all considered fisheries (Longline, Gillnet, Pole-and-Line and Purse Seine) and for both data collection and data reporting requirements (see: [www.iotc.org/sites/default/files/documents/science/IOTC-2015-ROS\\_11\\_04\\_Observer\\_Manual\\_v1.2.pdf](http://www.iotc.org/sites/default/files/documents/science/IOTC-2015-ROS_11_04_Observer_Manual_v1.2.pdf)).

Following completion of the interface, training workshops have been delivered in Sri Lanka and Indonesia, who have also agreed to begin piloting of the software and submit future reports using the new e-reporting tools. Training in additional countries (e.g., Mauritius and Tanzania) is also planned for 2018/early 2019.

### *3. Observer database development and historic data collation*

The *e-reporting interface* (see above) mainly serves as a tool to support data collection on the field: all captured information is expected to be submitted to a national focal point that will incorporate observer data within a *National Database* (also supplied as a standalone and multi-platform application). The main goal of the National Database – besides establishing a central repository for national observer data – is also to submit information to the *Regional Database*, hosted by IOTC and expected to contain only data marked as “*mandatory for reporting*”.

The National Database tool has been finalized and tested, whereas the Regional Database – although already finalized – is undergoing further enhancements to increase its integration with the other IOTC statistical systems.

Additionally, the Regional Database is in the process of being populated with legacy information provided in the past at different level of detail and through different electronic / non-electronic means by member countries.

Currently, it includes observer data from various fleets and years, covering a total of 11133 sets for 845 trips recorded between 2005 and 2017. The processed information consists of trip reports provided in the ICCAT ST09 format (for both European longliners and purse seiners), Japanese trip reports in a custom electronic format, and various purse seiners trip reports originally provided as Word / PDF documents and digitized with the support of a consultant funded by SIOTI<sup>6</sup>.

A breakdown of all currently available observer data in the Regional Database is as follows (data as of 4<sup>th</sup> September 2018):

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<sup>6</sup> The Sustainable Indian Ocean Tuna Initiative (SIOTI) has been jointly established by key governments in the region, major tuna processors, producer organisations and their fishing vessels, with the support of WWF. This FIP is a multi-stakeholder effort, and its goal is to support improvement in the management of tuna fisheries in the Indian Ocean so that in the future, consumers can be assured that the purse-seine tuna they purchase has been harvested sustainably.

Fleet	Gear	Num. trips
EU.ESP	PS	16
EU.FRA	LL	492
EU.FRA	PS	266
JPN	LL	25
KOR*	PS	6
MUS*	PS	17
SYC*	PS	23
Total		845

Number of available observer trips by fleet and gear  
(Items marked with \* were entered in the ROS Regional Database with support from SIOTI)

Year	Number of trips	
	PS	LL
2017	60	61
2016	85	50
2015	77	96
2014	49	88
2013	11	85
2012	7	85
2011	3	42
2010	0	6
2009	3	4
2008	13	0
2007	11	0
2006	8	0
2005	1	0
Total	328	517
	845	

Number of available observer trips by year and gear.

Year	Number of sets	
	PS	LL
2017	1300	377
2016	1865	385
2015	1521	825
2014	991	1128
2013	206	475
2012	156	489
2011	95	219
2010	0	54
2009	137	41
2008	307	0
2007	370	0
2006	168	0
2005	24	0
Total	7140	3993
	11133	

Number of available observed sets by year and gear.



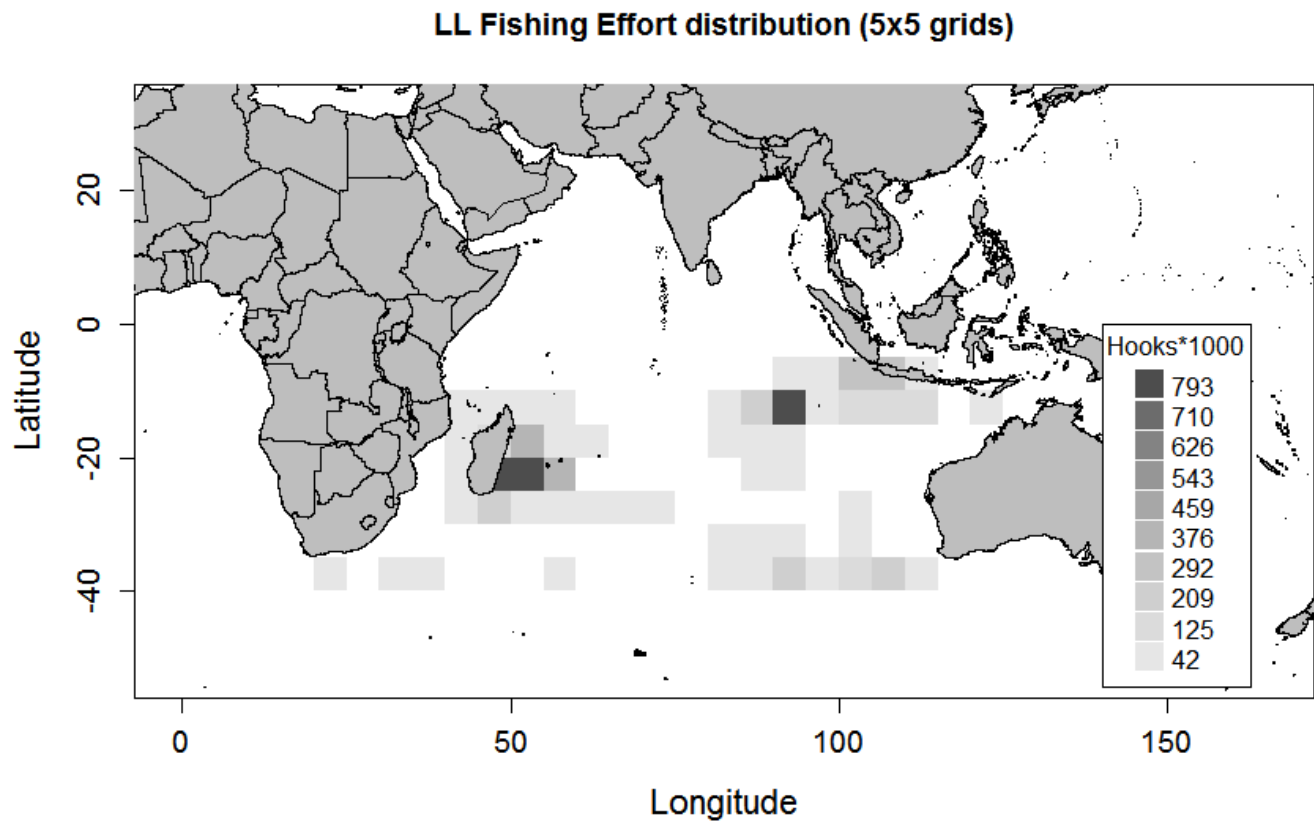


Figure 1. Distribution (5 x 5) of observed fishing effort reported for longline fleets (total number of hooks observed between 2009 and 2017).

**PS Fishing Effort distribution (5x5 grids)**

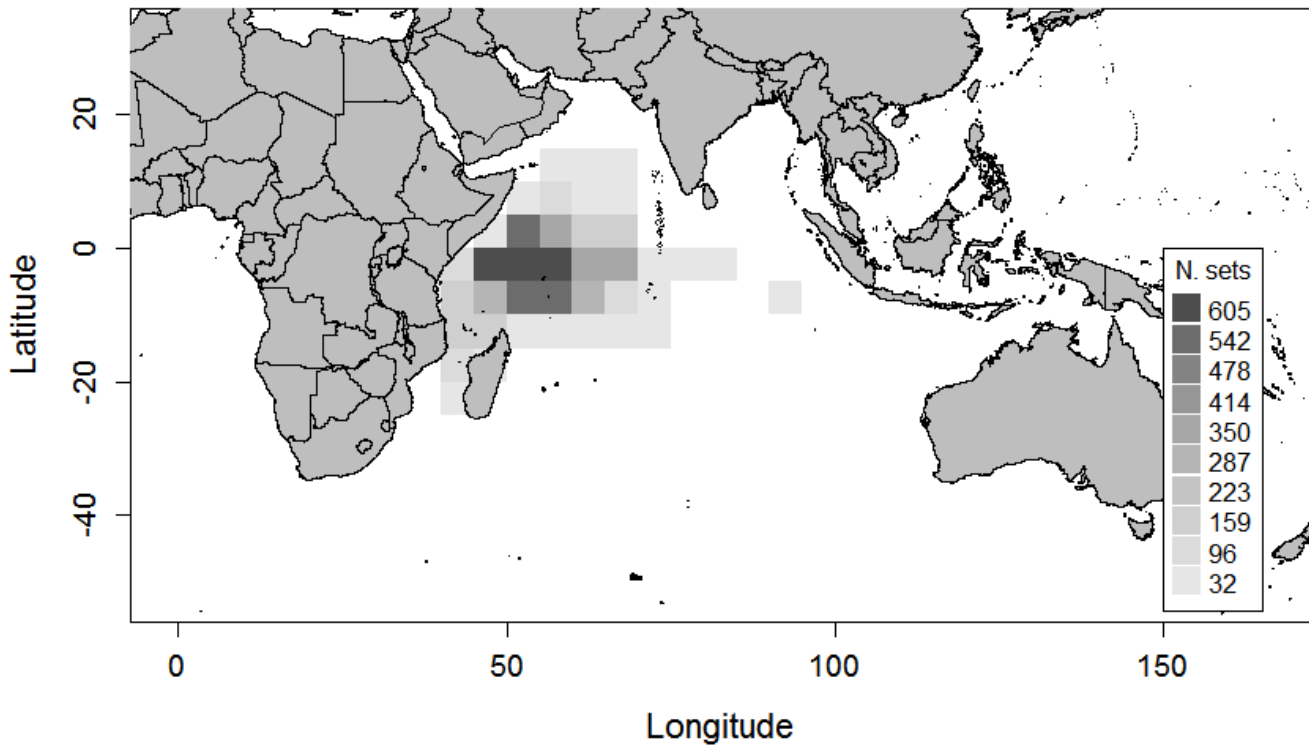


Figure 2. Distribution (5 x 5) of observed fishing effort reported for purse seine fleets (total number of sets observed between 2005 and 2017).

In the medium-to-long term, the Regional Database is expected to be populated with *live* observer data collected through the e-reporting interface and managed – at national level – through dedicated National Database instances (thus increasing both the level of compliance and the technical capacity for participating flag states).

Furthermore, with the goal of incorporating as much historical information as possible and account for comprehensive data exchange between CPCs and the ROS Regional Database, the ROS tools are being extended with facilities to allow the import of observer data collected through third-party, well established data collection platforms such as ObServe and the SWIOFP database. This task is currently carried on with the support of an external consultant and is scheduled for completion by February 2019.

#### 4. *Electronic monitoring system*

This activity aims at improving the quality of data collection and coverage of fisheries where there are practical difficulties placing regional observers on-board vessels (e.g., due to safety issues, lack of space, logistics, etc.), particularly in the case of the smaller-scale fisheries under 24m LOA.

During 2017 the IOTC Secretariat conducted field visits to Pakistan, Sri Lanka, and I.R. Iran to assess the logistical practicalities of implementing EMS onboard coastal gillnet (and gillnet-longline) vessels. A proposal was subsequently developed, in collaboration with the Sri Lanka Ministry of Fisheries and Aquatic Resources Development (MFARD) to trial EMS on-board around 6 coastal longline/gillnet vessels (between 15m – 24 m LOA). Funding have been confirmed, and the IOTC Secretariat is part-way through procurement of the EMS equipment, with delivery and installation planned for 2018 Q4.

#### 5. *Observation in-port*

There is currently no funding available for this project component and as such it has not yet been fully developed.

### ***ROS Steering Committee***

Following calls by the Scientific Committee and Commission for nominations for the ROS Pilot Project Steering Committee, a group of experts and representatives of the main fleets has been agreed. This Committee will provide higher level oversight and direction to enable efficient progress and continuation of project activities during the intersessional periods. It will be involved in the development of core project activities, particularly at the initiation stage by providing guidance on project workstreams as they are developed (e.g. new consultancies, workshop agendas and major areas of work). It will review progress reports prepared by the Secretariat and provide guidance on all areas of activity, including any modifications/additions that may be required to progress an area of work further to improve the overall project success. To save resources and maximise efficiency, the Committee will take the format of a predominantly remote-based board who will meet electronically with the occasional ad hoc meeting in the margins of the IOTC meetings.

### ***IOTC Species ID guides***

**Table 1.** Summary of priority languages and species groups for translation and printing as identified by the SC16 and SC17 (1=high). Green = translation and printing complete. Yellow = in progress.

	1. Tuna & like	2. Billfish	3. Turtles	4. Sharks and rays	5. Seabirds
<b>Persian</b>	2	1	1	1	1
<b>Arabic</b>	2	2	2	2	2
<b>Urdu</b>	4				
<b>Bahasa Indonesian</b>	1	3	5	5	5
<b>Swahili</b>		4			
<b>Spanish</b>		5	3	3	3
<b>Portuguese</b>		6	4	4	4
<b>Thai</b>		7			
<b>Sinhala</b>	3	8			
<b>Tamil</b>		8			
<b>Bahasa Malaysia</b>	1				
<b>Hindi</b>	3				



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**Progress to date:**

- Translation and printing of IOTC species ID guides into Persian has already been completed for tuna, sharks, billfish and turtles and these are now available on the IOTC website<sup>7</sup> (IOTC, IFO and WWF-Pakistan)
- Translation and printing of IOTC species ID guides into Arabic has been completed for tuna and tuna-like species and translation of the others is currently underway (IOTC and WWF-Pakistan)
- Translation and printing of tuna, billfish, turtles and shark ID guides into Urdu is complete (WWF-Pakistan)
- Translation and printing of tuna and billfish ID guides into Bahasa Indonesian is complete (OFCE)
- Translation of turtle, shark and seabird ID guides into Bahasa Indonesian and is complete, typesetting has been finalised and cards are ready to print (DGCF and IOTC)
- Translation of turtle ID guides into Spanish is complete and cards are ready for printing (IOSEA & IOTC)
- Translation of tuna and tuna-like species ID guides into Hindi is complete and cards have been type set for printing (CMFRI and IOTC)
- Translation of tuna and tuna-like species ID guides into Malaysian is complete and card are ready for printing (IOTC)
- Translation of tuna and tuna-like species ID guides into Sinhala and Tamil has been completed and cards have been printed (NARA, DFAR and FAO)
- Translation of all IOTC species ID guides into Portuguese has been completed and cards are ready for typesetting (IIP and IPMA)
- Translation and printing of all IOTC species ID guides into Maldivian is underway (Ministry of Fisheries and Agriculture, Maldives)

While a number of guides are now ready for printing and funding has been obtained for these, two administrative hurdles have arisen which have delayed progress. One is the agreement with the illustrators which is taking some time to resolve and the second is the need for all future publications (including language translations) to proceed through the 12-step FAO approval process which has also caused sever delays with some cards taking >8 months to progress through the system. Nevertheless, the Secretariat is seeking solutions to these issues and, once resolved, progress should be rapid.

***Cetacean ID guides***

An Indian Ocean cetacean ID guide has now been developed with inputs from an expert group of WPEB scientists. This has been translated into ten languages as requested by the WPEB13 (Arabic, French, Hindi, Indonesian, Persian, Sinhalese, Spanish, Swahili, Tamil and Urdu) which are currently undergoing typesetting. The guides will be published on the IOTC website as soon as they have reached the end of the 12-step FAO publications approval process and the Marine Mammal Commission has provided funding for the printing of these guides.

**APPENDICES**

- Appendix A:** Update on the implementation of the IOTC regional observer scheme
- Appendix B:** Estimated observer coverage for longline vessels
- Appendix C:** Estimated observer coverage for purse seine vessels

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<sup>7</sup> [www.iotc.org/science/species-identification-cards](http://www.iotc.org/science/species-identification-cards)

**APPENDIX A**  
**UPDATE ON THE IMPLEMENTATION OF THE IOTC REGIONAL OBSERVER SCHEME**

CPCs	Vessels on active list (2017)				List of registered observers submitted	Number of observer reports provided							
	LL	PS	GN	BB		2010	2011	2012	2013	2014	2015	2016	2017
<b>MEMBERS</b>													
Australia	3	7		1	YES: 21	2(O)	1(O)	3(O)	No	2(O) + 4(E)	11(E)	28(E)	No
China	81				YES: 8	1(O)	No	1(O)	1(O)	2(O)	1(O)	4(O)	4(O)
–Taiwan,China	314				YES: 54	No	No	1(O)	19(O)	18(O)	26(O)	18(O)	12(O)
Comoros					YES: 7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Eritrea	No information received				N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
European Union	17	12			YES: EU,France: 64	FRA 6(O)	FRA 12(O)	FRA 17 (O)	FRA 89(E)	FRA 94(E)	FRA 109(E)	FRA 106(E)	FRA 119(E)
		1			No: EU, Italy	N/A	N/A	N/A	N/A	N/A	ITA 6(O)	ITA 4(O)	No
	5				YES: EU,Portugal: 5	No	PRT 1(O)	PRT 1(O)	PRT 1(O)	PRT 1(O)	PRT 1(O)	PRT 1(O)	PRT 1(E)
	13	14			YES: EU,Spain : 9	No	No	No	ESP 1(O)	ESP 2(O)	ESP 23(E)	ESP 15(E)	ESP 19(E)
	2				YES: EU,UK 1	No	No	No	No	No	No	No	GBR 2(E)
France (OT)					N/A	No	9(O)	7(O)	7(O)	NA	NA	NA	NA
Guinea					N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA	NA
India					No	No	No	No	No	No	No	No	No
Indonesia	216	30			YES:9	No	No	No	No	5(E)	No	7(E)	No
Iran, Isl. Rep. of		3	1232		No	No	No	No	No	No	No	No	No

Japan	39	2			YES: 19	pending	pending	pending	pending	pending	pending	pending	pending
Kenya	1				YES: 5	No	N/A	N/A	N/A	N/A	N/A	1(E)	No
Korea, Rep. of	15	3			YES: 40	2(O)	No	2(O)	3(O)	3(O)	4(O)	11(O)	4(O)
Madagascar	7				YES: 7	No	No	18(O)	7+1(O)	2+5(O)	No	No	No
Malaysia	19				No	No	No	No	No	No	No	No	No
Maldives	44			356	YES: 4	No	No	No	No	No	No	No	No
Mauritius	5	2			YES: 8	No	No	No	No	No	5(O)	8(O+E)	4(O)
Mozambique	2				YES: 11	No	No	1(O)	N/A	No	7(E)	3(E)	No
Oman	1				No	No	No	No	No	No	No	No	No
Pakistan					No	No	No	No	No	No	No	No	No
Philippines	2				No	No	No	No	No	No	N/A	N/A	No
Seychelles	58	13			YES: 78	No	No	No	No	6(O)	46(O)	47(O)	4(O)
Sierra Leone	No information received				N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Somalia	No information received				N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
South Africa	14			3	YES: 25	pending	pending	pending	pending	pending	pending	pending	pending

Sri Lanka	2		1372		No	No	No	No	No	2(O)	2(O)	No	2(O)
Sudan	No information received				N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tanzania, United Rep.of					No	No	No	No	No	No	No	1(O)	No
Thailand		1			YES: 18	No	No	No	No	No	No	No	No
United Kingdom (OT)					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Yemen	No information received				No	No	No	No	No	No	No	No	No
<b>COOPERATING NON-CONTRACTING PARTIES</b>													
Bangladesh					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Liberia					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Senegal					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Year = year in which the observed trip began (E:Electronic, O:Other)

Reports from Madagascar include observers onboard foreign vessels

Totals for Japan and South Africa will be provided once agreement has been reached about the Joint Venture Agreement vessels

**APPENDIX B: ESTIMATED OBSERVER COVERAGE FOR LONGLINE VESSELS**

MEMBERS	Total effort (no.hooks)							Observed effort (no. hooks)							Coverage rate							
	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017	
Australia	359,832	672,398	609,995	449,387	430,015	429,288	532,396	6232	89490	0	41581	28729	49875	0	1.73%	13.31%	0.00%	9.25%	6.68%	11.62%	0.00%	
China	4,136,710	11,295,050	23,439,470	19,212,540	26,616,190	24,107,147	33,070,839	0	185742	216640	178413	105201	1206739	1584934	0.00%	1.64%	0.92%	0.93%	0.40%	5.01%	4.79%	
-Taiwan,China	182,770,834	170,633,711	195,560,569	185,485,353	167,958,929	205,030,919	206,426,248	0	121675	4344678	4004870	3650886	3461035	2301589	0.00%	0.07%	2.22%	2.16%	2.17%	1.69%	1.11%	
Comoros																						
Eritrea																						
EU - France	3,769,250	3,367,941	4,042,077	3,573,448	3,533,544	3,710,089	3,067,200	257830	630313	619619	516645	527459	566024	0	6.84%	18.72%	15.33%	14.46%	14.93%	15.26%	0.00%	
EU - Portugal***	903,600	685,206	1,558,000	1,496,715	1,398,400	1,673,150	1,624,100	140317	73685	127580	90894	156536	152385	128201	15.53%	10.75%	8.19%	6.07%	11.19%	9.11%	7.89%	
EU - Spain	3,758,516	4,673,785	6,262,822	6,262,823	6,262,824	6,262,825	6,262,826	0	0	0	224900	0	0	0	0.00%	0.00%	0.00%	3.59%	0.00%	0.00%	0.00%	
EU - UK	92,300	71,400	55,000	84,700	388,300	271,700	500,300								0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
France(OT)	93,718	120,000	120,000												0.00%	0.00%	0.00%					
Guinea																						
India	85,406,677	63,791,723	66,716,403	60,553,908	17,558,762	24,363,545	17,772,131								0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Indonesia	143,316,878	205,786,515	197,588,017	201,070,860	201,468,158	273,516,396	270,531,213	0	0	0	195,780	0	808,600	0	0.00%	0.00%	0.00%	0.10%	0.00%	0.30%	0.00%	
Iran, Isl. Rep. of																						
Japan*	28,854,054	31,460,928	29,125,098	31,780,765	28,954,672	27,002,829	31,703,028															
Kenya	0	0	0	0	0	0	0	0	0	0	0	0	67240	0								
Korea, Rep. of	5,862,681	4,350,708	5,337,464	6,740,247	6,739,605	5,044,105	6,540,506	0	282656	546927	213225	313662	377864	0	0.00%	6.50%	10.25%	3.16%	4.65%	7.49%	0.00%	
Madagascar**	374,307	348,653	326,494	355,138	357,897	330,541	178,890	0	21582	62400	0	0	0	0	0.00%	6.19%	19.11%	0.00%	0.00%	0.00%	0.00%	
Malaysia	13,175,632	4,008,683	4,220,794	3,588,653	5,017,243	6,232,414	8,774,959								0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Maldives			3,054,590	3,040,716	678,824	2,254,552	1,957,257															
Mauritius	252,480	182,300	150,560	105,120	195,850	1,214,910	2,750,380								0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Mozambique	383,323	383,323		7,177	240,031	134,330	262,110	0	1100	0		42715	29600	0	0.00%	0.29%		0.00%	17.80%	22.04%	0.00%	
Oman, Sultanate of	16,042,822	6,366,785	2,608,008	1,465,331	552,649	393,258	341,402								0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Pakistan																						
Philippines	16,042,822	6,366,785	2,608,008	1,465,331	552,649	393,258	341,402								0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Seychelles	3,080,822	3,400,912	3,876,173	21,366,998	22,778,433	35,608,822	35,466,910								0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Sierra Leone																						
Somalia																						
Sri Lanka		112,187,187	140,186,312	145,165,259	50,385,870	35,216,695	23,252,938	0	0	0	550	46430	0	36294					0.00%	0.00%	0.16%	
South Africa*	1,219,015	1,176,125	959,285	565,705	661,378	616,518	0															
Sudan																						
Tanzania, United Rep. of	2,893,111	4,313,604	3,468,197	3,681,606	1,648,649	2,112,744	0	0	0	0	0	0	757	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%		
Thailand	1,041,600	1,061,363	784,881	1,821,217	1,121,073	0	0								0.00%	0.00%	0.00%	0.00%	0.00%			
United Kingdom																						
Yemen																						
COOPERATING NON CONTRACTING PARTIES																						
Bangladesh																						
Liberia																						
Senegal																						
Other	7,854,251	10,832,417	5,005,660	9,093,754	9,822,626	7,034,619	0													0.00%	0.00%	
<b>Total</b>	<b>521,685,235</b>	<b>647,537,503</b>	<b>697,663,875</b>	<b>708,432,751</b>	<b>555,322,572</b>	<b>662,954,654</b>	<b>651,357,035</b>	<b>404,379</b>	<b>1,406,243</b>	<b>5,917,844</b>	<b>6,018,311</b>	<b>5,423,071</b>	<b>7,271,572</b>	<b>4,602,471</b>	<b>0.08%</b>	<b>0.22%</b>	<b>0.85%</b>	<b>0.85%</b>	<b>0.98%</b>	<b>1.10%</b>	<b>0.71%</b>	

\*Coverage for Japan and South Africa will be estimated once agreement has been reached about the Joint Venture Agreement vessels

\*\*Observed effort for Madagascar has been estimated from the number of fishing days. Coverage for EU,Spain (2014) was submitted by Madagascar

\*\*\*2012 and 2013 total effort are estimates provided by Portugal which are to be updated

**Key:** TOTAL EFFORT (#HOOKS): Total number of hooks set by longliners, by fishing fleet and year, including:

- Total effort available (green font)
- Total effort not available: total effort estimated using the nominal catches available and sampled effort or catch rates from other fleets or year periods (red font)

## APPENDIX C: ESTIMATED OBSERVER COVERAGE FOR PURSE SEINE VESSELS

MEMBERS	Total effort (no. fishing days)							Observed effort (no. fishing days)							Coverage rate							
	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017	
Australia	130	148	133	113	148	141	48								0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
China																						
–Taiwan,China																						
Comoros																						
Eritrea																						
EU - France	1947	1795	2115	3467	3168	3152	3091	108	237	193	600	683	772	0.00%	6.02%	11.21%	5.57%	18.94%	21.67%	24.98%		
EU - Portugal																						
EU - Spain	3555	3684	3899	4238	3838	3933	3242	0	48	86	7	344	0	0.00%	0.00%	1.23%	2.03%	0.18%	8.75%	0.00%		
France (OT)	1167	1257	1276	0	0	0	0	252	188	171	0	0	0	0.00%	20.04%	14.74%						
EU - UK																						
EU - Italy					284							210	147							73.94%	84.00%	
Guinea																						
India																						
Indonesia																						
Iran, Isl. Rep. of	139	168	172	179	164	137	74							0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Japan	95	72	36	35	86	86	47							0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Kenya																						
Korea, Rep. of	0	98	369	539	460	760	565	0	0	33	45	35	232	121		0.00%		6.12%	9.78%	4.60%	41.06%	
Madagascar										(14)	(118)											
Malaysia																						
Maldives																						
Mauritius	0	0	27	264	304	332	213				0	111	148	44			0.00%	0.00%	36.53%	33.41%	20.63%	
Mozambique																						
Oman, Sultanate of																						
Pakistan																						
Philippines																						
Seychelles	2166	1969	1670	1947	3012	4087	3269	0	0	0	271	1404	1489	111	0.00%	0.00%	0.00%	13.92%	46.61%	36.43%	3.40%	
Sierra Leone																						
Somalia																						
South Africa																						
Sri Lanka			64								12						0.00%					
Sudan																						
Tanzania, United Rep. of																						
Thailand						6	11													0.00%	0.00%	
United Kingdom																						
Yemen																						
<b>COOPERATING NON CONTRACTING PARTIES</b>																						
Bangladesh																						
Liberia																						
Senegal																						
Other																						
<b>Total</b>	<b>9,199</b>	<b>9,192</b>	<b>9,761</b>	<b>10,782</b>	<b>11,463</b>	<b>12,635</b>	<b>10,561</b>	<b>0</b>	<b>360</b>	<b>506</b>	<b>778</b>	<b>2,367</b>	<b>3,043</b>	<b>1,048</b>	<b>0.00%</b>	<b>3.92%</b>	<b>5.18%</b>	<b>7.22%</b>	<b>20.65%</b>	<b>24.08%</b>	<b>9.92%</b>	

\* Brackets indicate observers on foreign vessels (Observer data provided by Madagascar for EU,ESP,EU,FRA and SYC)

**Key:** TOTAL EFFORT (#FDAYS): Total number of days fished by tuna purse seiners, by fishing fleet and year, including:

- Total effort available (green font)
- Total effort not available: total effort estimated using the nominal catches available and sampled effort or catch rates from other fleets or year periods (red font)