UPDATE ON THE IMPLEMENTATION OF THE IOTC REGIONAL OBSERVER SCHEME

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Purpose

To inform the WPEB16 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 15th 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 13th Session of the Commission (S13), the Commission adopted Resolution 09/04 *on a Regional Observer Scheme*, which was superseded in 2010 by Resolution 10/04, and again in 2011 by Resolution 11/04.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 26th August 2020, fifteen CPCs (Australia, China (including Taiwan,China), Comoros, EU (France[2], 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 **419** observers are currently registered as active.

At the same day, data for a total of **2176** trips have been reported to the IOTC Secretariat (in different formats) by Australia, China (including Taiwan,China), EU (France, Italy, Portugal, Spain and the UK), France OT, Indonesia, Japan,

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[2] Including Mayotte due to its status as a French outermost region since January 2014

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 between 2010 and 2019 by all IOTC CPCs. **Appendix B** and **Appendix C** provide an estimation of the level of effort covered by observers between 2012 and 2019 for industrial longline and purse seine vessels (data updated as of 26th August 2020).

Reported scientific observer coverage for the artisanal fleets is currently zero.

Reporting in electronic format

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, Mauritius and Sri Lanka (see also Appendix A) although not all the formats adopted for data submission are suitable for automated and accurate extraction of the information to be stored in the ROS regional database.

Furthermore, several important data fields marked as *for reporting purposes* are regularly missing from these submissions (e.g., estimated catch by species at set level for some of the PS fleets) although known to be available to the data providers and in addition, a potential misunderstanding on the meaning of "*optional / mandatory for reporting*" (see the ROS data fields specification) was encountered with some CPCs thus preventing the submission of important data fields (e.g. weight measurements of caught / retained individuals) that were instead available in earlier reports.

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[3] and SC[4] in 2016, circulated to all Members for comment in March 2017 and was approved by the Commission in May 2017[5].

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 on five key components:

1. Observer training programme and minimum standards
2. Electronic reporting
3. Observer database development and historic data collation

[3] IOTC-2016-WPDCS-22: http://www.iotc.org/documents/pilot-project-iotc-regional-observer-scheme
[4] IOTC-2016-SC19-14: http://iotc.org/documents/pilot-project-iotc-regional-observer-scheme-0
[5] IOTC-2017-S21-10: http://www.iotc.org/documents/pilot-project-iotc-regional-observer-scheme-1

4. Electronic monitoring system
5. Observation in-port

A critical component in each of the work streams 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 SC22 relevant to the ROS

The SC **NOTED** that Kenya submitted observer data for 2018 and **ACKNOWLEDGED** that the level of observer coverage for the Kenyan longline fleet is expected to increase further as a result of Kenya's participation in the ROS Pilot Project training programme.

The SC was informed that, due to a lack of national staff, Malaysia is not currently able to fully implement the ROS requirements and therefore cannot participate in the ROS Pilot Project. The SC **ACKNOWLEDGED** that results on the improvements in data collection introduced by installing EMS equipment onboard (CCTV cameras) will be presented at the next SC meeting. The SC **NOTED** that e-logbooks and EMS implemented in Malaysia since 2017 should be useful tools to properly record these interactions, and these initiatives should result in improved species breakdown of catches for sharks and rays in the future.

The SC also **ACKNOWLEDGED** that Mozambique will be one of the six pilot countries to actively participate to the ROS Pilot Project training programme.

The SC **NOTED** that information on bycatch from FAD fisheries is only partially available for the major industrial fleets but that it can be extracted from regular ROS data submissions.

The SC **NOTED** that the tables presented in Appendix VII of the WPEB report which provide information on the status of the ROS may no longer be fully up-to-date. The SC **ENCOURAGED** all CPCs that have submitted ROS data to the IOTC Secretariat to verify that the information contained within corresponds to what available at national level.

The SC **NOTED** paper IOTC–2019–SC22–07 which provided 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) including the coverage estimated for both the longline and purse seine large scale fisheries from concerned CPCs, and how these compare to the expected minimum coverage level.

The SC **ENCOURAGED** CPCs to validate the information provided in appendices A, B and C of paper IOTC-2019-SC22-07, and confirm that it correctly reflects the status of implementation of the ROS at the national level, and to liaise with the IOTC Secretariat should any discrepancy be identified.

The SC **ACKNOWLEDGED** that estimation of ROS coverage for the purse seine fleets is adversely impacted by the lack of uniformity in reporting effort data to the IOTC Secretariat, and **AGREED** that this information, which is particularly useful to assess the performance of Resolution 11/04, should be further standardized. As such, the SC **RECOMMENDED** that all purse seine fleets reporting effort as fishing hours or fishing days begin to submit this information as 'number of sets' instead, in particular when fulfilling the reporting requirements of Resolution 15/02.

The SC **SUPPORTED** the utilization of the ROS electronic tools for data collection and reporting, **NOTING** the effort made by the Secretariat in support of their adoption also by countries not directly participating to the implementation of the ROS training programme.

The SC **NOTED** that the ROS pilot project is planned to be initiated in six member countries, but that only four members had confirmed their participation prior to the SC22. The SC **WELCOMED** the confirmation by Mozambique and the offer by Maldives and Pakistan to join the project.

Outcomes of S23 relevant to the ROS[6]

IOTC–2019–S23–PropJ On a regional observer scheme. There was no consensus regarding key elements of this proposal such as the level of observer coverage. However, there was support for other aspects of the proposal, particularly electronic monitoring, and the proponents were encouraged to continue discussing and revising the text for future presentation to the Commission.

Consideration of the IOTC Regional Observer Scheme Draft Standards

(Para 118) The Commission **NOTED** document IOTC-2019-S23-10_Rev1 containing draft standards for an IOTC Regional Observer Scheme.

(Para 119) The Commission **NOTED** that several CPCs had provided the Secretariat with comments which were used to develop a revised document, although some CPCs expressed their concern that not all their comments had been taken into consideration.

(Para 120) The Commission **RECOGNISED** the need to have standards for the IOTC observer scheme, but that the standards for similar schemes being implemented by other tuna RFMOs should also be acceptable to IOTC. The Commission **AGREED** that the standards required for vessels operating under the Western Central Pacific Fisheries Commission (WCPFC) Regional Observer Programme meet IOTC standards, and therefore those CPCs whose observer programs have been already accredited by WCPFC are exempted from the application of the IOTC standards.

(Para 121) The Commission **ENDORSED** the IOTC Regional Observer Scheme (ROS) standards in principle in order for the Secretariat to implement the ROS, on the understanding that further comments can be made, and that the standards will be reviewed based on these comments and other feedback made during the implementation phase.

ROS Pilot Project: progress update

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.

During 2018, funds were obtained and a consultancy was developed for an expert to comprehensively review the *ad-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 was developed that includes a revised set of data fields and programme standard, and an expert consultation workshop – involving a working group of selected experts from each of the main fleets (longline, purse seine, pole and line, gillnet and handline) from the eastern and western Indian Ocean as well as from other oceans – took place in Seychelles from 24-28 September 2018.

[6] Due to the insurgence of the CoViD pandemic, the S24 - that was scheduled to be held in May 2020 – had to be postponed to November 2020, which means that the outcomes of its previous session (S23) still apply at the time this document has been finalized

The workshop specific objectives focused on the revision of proposed ROS standards, data collection fields and reporting requirements, with participants that were invited to review the relevance and practical applicability of existing and proposed standards, data collection fields and reporting requirements.

The final set of standards recommended by this expert group was then presented to the WPDCS14 for review and to the SC21 for approval, and eventually triggered a number of significant updates on the already developed ROS e-tools, that are in the process of being finalized.

ROS training package

In 2019, a project to develop a complete training package for the IOTC ROS has been awarded to CapMarine: this is based on the finalised standards and include training materials for observer coordinators as well as observers, both on-line (e-learning tools) and on paper.

The newly developed tools and materials will be implemented in six counties (Sri Lanka, Tanzania, Kenya, Indonesia, Maldives and Mozambique[7]) and the IOTC Executive Secretary has secured high level commitment for the support of this project in each country.

As of today, a first round of visits has been performed by the Service Provider in Sri Lanka, Tanzania and Kenya: for what concerns Kenya, a second site visit including comprehensive training on all aspects of the ROS programme and written tests to assess the competence of the trainees, was also delivered in February 2020 and the IOTC Secretariat is awaiting confirmation from the Kenyan Observer Programme Coordination Team (OPCT) about the details of the trainees that successfully passed the tests and have been officially designated as Scientific Observers ready for deployment onboard.

Due to the insurgence of the CoViD pandemic and the consequent health risks and travel restrictions implemented at national levels, the project was temporarily suspended for reasons of *force majeure*, as was the deployment of ROS scientific observers in the IOTC area of competence.

Electronic data collection and reporting

The ROS e-collection tool has been updated in 2019 and 2020 to reflect the changes in data collection and reporting requirements emerging from the *ROS expert consultation workshop* held in Victoria, Seychelles at the end of September 2018 and endorsed by the SC21.

The revised interface is currently undergoing testing on the field: it still is provided as a standalone, multi-platform application that does not require Internet connectivity to work, although it supports direct communication mechanisms to retrieve vessel information from the IOTC RAV ("*Record of Authorised Vessels*") and is linked to the main IOTC Statistics database to constantly and seamlessly synchronize all reference data.

The ROS e-collection and national database require that end-users authenticate against a list of currently accredited IOTC observers and ROS focal points, respectively: for this reason, a formal workflow should be established so that CPCs can provide updates to their list of active observers and focal points and see this reflected in real time within the set of ROS credentials available to the IOTC Secretariat.

Training workshops specifically targeting the previous data collection and reporting requirements, including the usage of the ROS e-tools, were successfully delivered to Sri Lanka and Indonesia during late 2017 and 2018: both countries have started trialling the software and agreed about submitting ROS data using the e-tools in the future.

As of today, Sri Lanka has successfully managed to provide a number of LL trip reports compiled through the old version of the ROS e-collection tool and more reports are expected to come during 2020, while Indonesia is still submitting ROS information using the *ad-interim* ROS data collection templates – that are still designed on the basis

[7] Maldives and Mozambique are replacing two of the countries originally interested in being part of the training programme (I.R. Iran and Malaysia). As of today, though, formal arrangements for the continuation of the project at national level have yet to be confirmed by both Maldives and Mozambique.

of the previous reporting requirements (pre-workshop) and therefore cannot be properly incorporated in the ROS database.

Additional training, this time specifically focused on the adoption of the revised data collection and reporting requirements, was also delivered to Mauritius in April 2019 with the commitment – from the country – of using the ROS e-tools for future data submissions.

Furthermore, as part of the original schedule for the delivery of the ROS training package to the six selected CPCs, specific training on the usage of the ROS e-tools was provided to Kenya (Q1 2020): again, the insurgence of the CoViD pandemic has prevented similar training to be delivered to other target countries so far as it was originally scheduled.

The delivery of the ROS training packages is expected to resume as soon as travel restrictions to the target countries will be lifted, as will the specific training on the ROS e-tools.

Observer database development and historic data collation

The ROS *e-collection tool* mainly serves as a tool to support data collection on the field: all captured information has to be submitted to a national focal point that will in turn incorporate all observer data within a ROS *national database* (also supplied as a standalone and multi-platform application). The main goal of the ROS national database – besides establishing a central repository for national observer data – is also to submit information to the ROS *regional database*, hosted by IOTC and specifically designed to accommodate all data marked as "*mandatory / optional for reporting*" (according to the revised definitions following the ROS expert consultation workshop).

The ROS national database and the ROS regional database have both been finalised: the regional database is now integrated with the IOTC statistical systems and contains a collation of all ROS data submitted so far in a convenient (from a data extraction and analysis perspective) electronic format – including (but not limited to) the information entered through the various version of the ROS e-collection tool.

Currently, the ROS regional database stores observer data reported by a number of fleets during different time periods, covering a total of 26175 sets for 1492 trips recorded between 2005 and 2019 (see **Tables 1.a-c** and **Figures 1.a-b**).

The processed information consists of trip reports provided in the ICCAT ST09 format (for both European longliners / purse seiners and Seychellois purse seiners), trip reports in a custom electronic format (Japan), ROS trip reports entered through the ROS e-collection tool (Sri Lanka) and various purse seiners trip reports (for Rep. of Korea, Mauritius and Seychelles) originally provided as Word / PDF documents and digitized with the support of a consultant funded by SIOTI[8].

The data currently available in the IOTC ROS regional database covers 68.5% of all ROS trip data provided to the Secretariat so far (coverage increased from the 63.4% calculated at the last WPEB).

[8] 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.

A breakdown of all currently available observer data in the ROS regional database (with data as of 26th August 2020) is as follows (**Table 1.a-c**):

Fleet	Gear	Num. trips
EU.ESP	PS	94
EU.FRA	LL	589
EU.FRA	PS	374
JPN	LL	51
KOR*	PS	6
LKA	LL	7
MUS*	PS	17
SYC*	PS	354
Total		**1492**

Table 1.a: Number of available observer trips by fleet and gear in the ROS database (* includes data entered with support from SIOTI)

Year	Number of trips	
	PS	LL
2019	138	55
2018	181	50
2017	153	61
2016	144	59
2015	122	98
2014	50	87
2013	11	90
2012	7	95
2011	3	42
2010	0	6
2009	3	4
2008	13	0
2007	11	0
2006	8	0
2005	1	0
Total	**845**	**647**
	14923	

Table 1.b: Number of available observer trips by year and gear in the ROS database

Year	Number of sets	
	PS	LL
2019	3557	506
2018	4224	355
2017	3336	377
2016	3616	896
2015	2496	917
2014	981	1283
2013	206	896
2012	156	958
2011	95	219
2010	0	54
2009	137	41
2008	307	0
2007	370	0
2006	168	0
2005	24	0
Total	**19673**	**6502**
	26175	

Table 1.c: Number of available observed sets by year and gear in the ROS database

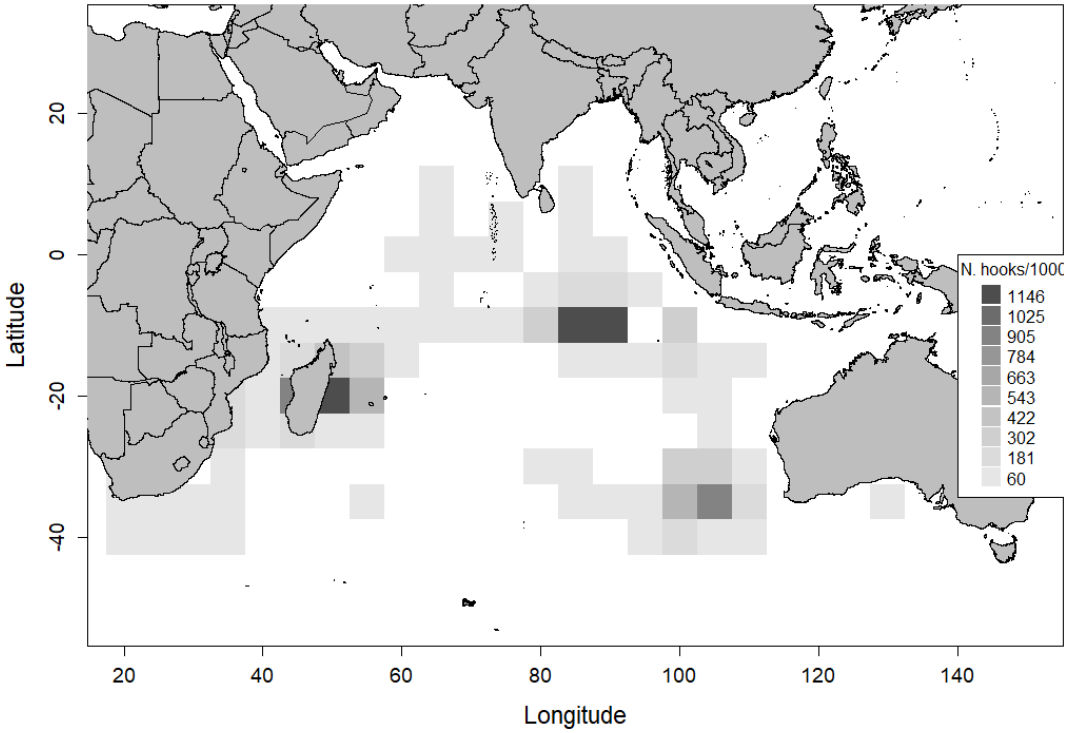

Figure 1.a: Distribution (5 x 5 degrees grids) of observed fishing effort reported for longline fleets (total number of hooks observed between 2009 and 2019).

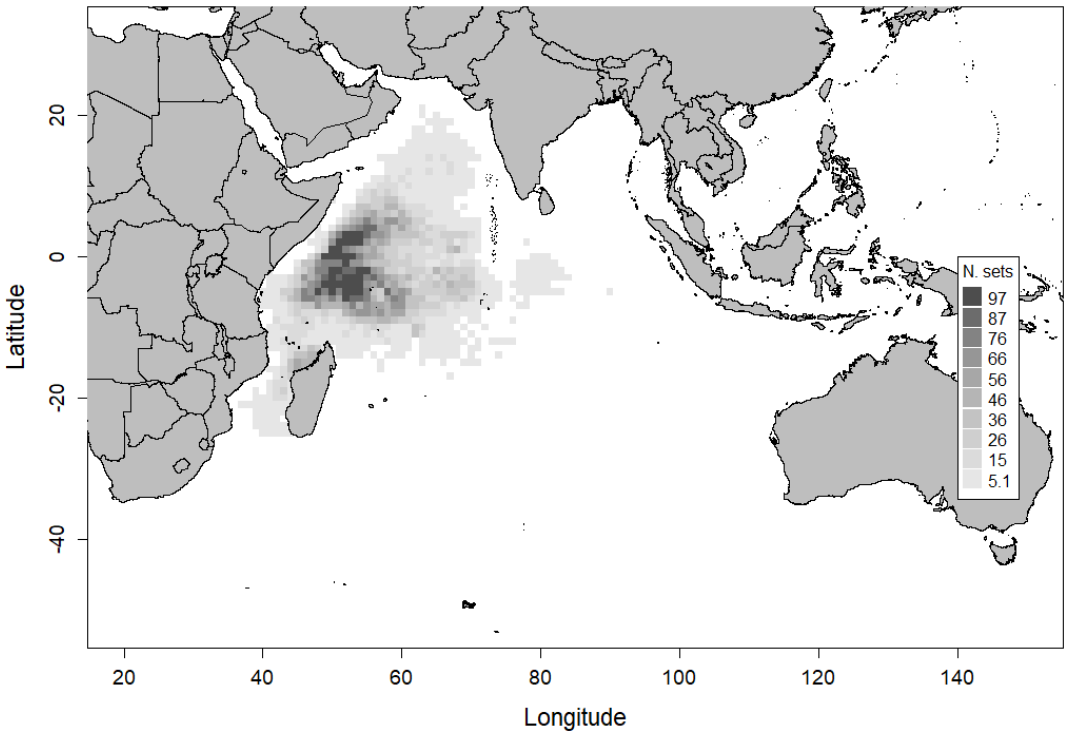

Figure 1.b: Distribution (1 x 1 degrees grids) of observed fishing effort reported for purse seine fleets (total number of sets observed between 2005 and 2019).

Once in full operation, the ROS regional database will be regularly and automatically populated with *live* observer data collected through the ROS e-collection tool and managed through dedicated ROS national database instances deployed at country level, increasing the level of compliance and the technical capacity of all participating developing flag states.

Furthermore, to incorporate as much historical information as possible and account for comprehensive data exchange between CPCs and the ROS regional database, the ROS data exchange protocol is in the process of being extended with facilities to allow the import of observer data collected through third-party, well established data collection platforms such as *ObServe* (EU and Seychelles PS and LL fleets) and the SWIOFP database (IOC countries).

This task is currently ongoing, with increased support from the IOTC Secretariat, and is expected to be completed by Q2 2021.

Since the WPEB15 (2019) the IOTC Secretariat has begun to regularly disseminate aggregated ROS data as these become available to the ROS regional database. Additionally, a set of preliminary online query interfaces is available at the following URLs:

- http://ros-browser.iotc.org/v2/efforts/
- http://ros-browser.iotc.org/v2/catches/
- http://ros-browser.iotc.org/v2/coverage/

Data extracted from the ROS regional database is still considered to be preliminary and subject to changes in structure and content without prior notice: the scientific community should ask explicit consent from the IOTC Secretariat before publicly disseminating any study or analysis based on this information.

Electronic monitoring system

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

Since 2017, the IOTC Secretariat conducted field visits to I.R. Iran, Pakistan and Sri Lanka, to assess the logistical practicalities of implementing EMS onboard their 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 six coastal longline/gillnet vessels (between 15 – 24m LOA): funding for this activity has been confirmed, procurement of the EMS equipment has been completed and the equipment has been installed on 4 of the vessels originally identified by the Sri Lankan authorities.

A first round of test trips was performed with the equipment fully deployed onboard: this helped stakeholders to identify some important technical issues (e.g., interference with radio communication equipment, high current drain from the main vessel batteries etc.) which have been sorted out by the technology provider. Equipment to support the work of "*dry observers*" (desktop computers, their training material etc.) was also purchased and deployed on site.

The insurgence of the CoViD pandemic has introduced unexpected delays in the finalization of the procurement and deployment processes for this task, which was put on temporary halt for reasons of *force majeure*: furthermore, a field mission to Sri Lanka – originally expected to be undertaken in Q2 2020 by the IOTC Secretariat in collaboration with the consortium responsible for the actual installation of the EMS hardware and the training of designated observers – had to be postponed until further notice.

This mission is crucial to the completion of this workstream, as it was meant to ensure, among other things, that the information collected onboard could be satisfactorily submitted to the IOTC Secretariat in full accordance with the requirements of the ROS data exchange protocols.

Finally, in April 2020 a *Letter of Agreement* was signed between FAO of the UN and the International Seafood Sustainability Foundation (ISSF) for the provision of services related to "*improvements of data-limited methods for*

assessing Indian Ocean neritic tuna species". Integral part of this LoA and the expected services to be provisioned is the development of Electronic Monitoring Systems (EMS) minimum standards, including specifications and procedures for the implementation of EMS for IOTC fisheries, as well as an evaluation of EMS capabilities to collect IOTC ROS minimum standards data fields.

The project focuses on EMS standards for purse seiners and longliners (and small-scale fisheries, if possible) that would help standardize EMS implementation (e.g. number and position of cameras, installation, software requirements etc.) as well as data collection, usage, revision and ownership.

A final report describing the minimum standards to be presented to the IOTC Working Party on Data Collection and Statistics (WPDCS) and Scientific Committee (SC) in 2020, based on the comments of the WPTT and IOTC Secretariat, for consideration of adoption and recommendation to the Commission.

Observation in-port

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

IOTC Species ID guides

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

Table 2. 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; entries in **boldface** represent printed guides not available at the last WPEB.

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[9] (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 and these are now available on the IOTC website (WWF-Pakistan)
- Translation and printing of tuna, billfish and turtles ID guides into Bahasa Indonesian is complete and these are now available on the IOTC website (OFCF)
- Translation of sharks and seabirds ID guides into Bahasa Indonesian and is complete, typesetting has been finalised and cards are ready to print (DGCF and IOTC)
- Translation of turtles ID guides into Spanish is complete and available on the IOTC website (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)

[9] https://www.iotc.org/science/species-identification-cards

- 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, the major administrative hurdle which has delayed further progress 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 cetaceans 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. Several translations of the guide are now published on the IOTC website, and the Marine Mammal Commission has provided funding for the printing.

Progress to date

- English (**published**, **printed** and available on the IOTC website)
- French (**published**, **printed** and available on the IOTC website)
- Spanish (**published**, **printed** and available on the IOTC website)
- Indonesian (**published**, **printed** and available on the IOTC website)
- Sinhala (revisions taking place)
- Persian (translations have been completed and the guide is being prepared for printing)
- Urdu (revisions taking place)
- Swahili (revisions taking place)
- Hindi (revisions taking place)

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

Appendix A: Update on the implementation of the IOTC Regional Observer Scheme

CPCs		Vessels on active list (2019)					Accredited observers		Number of observer reports provided																						Totals
		LL	PS	GN	BB	Tot	Number	Last update	2010		2011		2012		2013		2014		2015		2016		2017		2018		2019				
									O	E	O	E	O	E	O	E	O	E	O	E	O	E	O	E	O	E	O	E		
MEMBERS																															
Australia		3	7		1	11	21		2		1		3				2	4		11		28									51
China	CHN	88				88	4	2020-06	1				1		1		2		1		4		4		5		4				23
	TWN, CHN	260				260	54						1		19		18		26		18		20		21		24				147
Comoros						0	7		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A				N/A
Eritrea		No information received																													0
European Union	FRA	18	12			30	64		6		10	45	16	92	10	92	23	116	24	135		111		121		110		105			1016
	ITA		1			1			N/A		N/A		N/A		N/A		N/A		6		4				10						20
	PRT	3				3	6	2019-10			1		1		1		1		1		1			1		1		1			9
	ESP	11	15			26	9								1		2			24		15	17		3	37		42			141
	GBR	2				2	3	2019-09																2		2					4
France (OT)						0	N/A	N/A			9		7		7		N/A		N/A		N/A		N/A		N/A		N/A				23
Guinea						0	N/A	N/A	N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A				N/A
India						0																					N/A				0
Indonesia		242	73			315	9											5				7		4		5					21
Iran, Isl. Rep. of			5	1207		1212																					N/A				0
Japan		45	1			46	24	2020-01		8		11		10		6		14		12		9		9		11					90
Kenya						0	5				N/A		N/A		N/A		N/A		N/A			1			6		4				11
Korea, Rep. of		10	2			12	40		2				2		3		3		4		11		4		3						32
Madagascar		5				5	7						5		7		7		5												24
Malaysia		17				17																									0

CPCs	Vessels on active list (2019)					Accredited observers		Number of observer reports provided																				Totals
	LL	PS	GN	BB	Tot	Number	Last update	2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		
								O	E	O	E	O	E	O	E	O	E	O	E	O	E	O	E	O	E	O	E	
MEMBERS																												
Maldives	28			365	393	4																	1		2		53	56
Mauritius	12	3			15	5	2019-04											5		8		4		9		9		35
Mozambique	4				4	11						1		N/A					7		3		2				13
Oman					0																			N/A		N/A		0
Pakistan					0																							0
Philippines					0													N/A		N/A		N/A		N/A		N/A		0
Seychelles	79	15			94	78											7		66		63		91		83		44	354
Sierra Leone	No information received																											0
Somalia	No information received																											0
South Africa	16			1	17	33	2019-08			12		10		13		10		16		5		8				18		92
Sri Lanka	633		549		1182	23										2		2		2					4		3	13
Sudan	No information received																											0
Tanzania, United Rep.of	1				1															1		N/A		N/A		N/A		1
Thailand					0	12	2019-10																	N/A		N/A		0
United Kingdom (OT)					0	N/A	N/A	N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A
Yemen	No information received																											0
COOPERATING NON-CONTRACTING PARTIES																												
Bangladesh					0	N/A	N/A	N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A
Liberia					0	N/A	N/A	N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A
Senegal					0	N/A	N/A	N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A
																												2176

- **Year** = year in which considered observed trip began with the vessel sailing from its origin port
- **Number of observer reports provided: E**: number of trips reported in a structured electronic format, **O**: number of trips reported in other formats, including non-structured electronic ones)

❖ Reports from Madagascar include observers onboard foreign vessels

❖ Reporting status for Japan and South Africa is in the process of being updated following the provisions of Resolution 19/07 (superseding Resolution 18/10) and regarding vessels chartering in the IOTC area

	Not applicable (N/A) or information not received
	Data provided according to standards
	Data only partially provided according to standards
	Data not provided

Appendix B: Estimated observer coverage for longline vessels

	Total effort (no.hooks)							Observed effort (no. hooks)							Coverage rate							Average (last 5 years)	
MEMBERS	2013	2014	2015	2016	2017	2018	2019	2013	2014	2015	2016	2017	2018	2019	2013	2014	2015	2016	2017	2018	2019	Effort	Coverage
Australia****	609,995	449,387	430,015	429,288	532,396	411,101	373,810		41,581	28,729	49,875	62,126	54,010		0.00%	9.25%	6.68%	11.62%	11.67%	13.14%	0.00%	435,322	8.62%
China	23,439,470	19,212,540	26,616,190	24,107,147	33,070,839	32,987,773	26,380,951	216,640	178,413	105,201	1,206,739	1,584,934	1,681,983	1,814,426	0.92%	0.93%	0.40%	5.01%	4.79%	5.10%	6.88%	28,632,580	4.43%
–Taiwan,China	195,560,569	185,485,353	167,958,356	205,030,919	206,353,760	191,283,729	196,268,155	4,344,678	4,004,870	3,650,886	3,461,035	6,412,309	7,959,058	3,924,121	2.22%	2.16%	2.17%	1.69%	3.11%	4.16%	2.00%	193,378,984	2.63%
Comoros																						---	---
Eritrea																						---	---
EU - France	4,042,077	3,573,448	3,533,544	3,710,089	3,067,200	3,321,759	4,046,121	619,619	516,645	519,661	566,024	534,686	369,011	497,672	15.33%	14.46%	14.71%	15.26%	17.43%	11.11%	12.30%	3,535,742	14.16%
EU - Portugal***	1,558,000	1,496,715	1,398,400	1,673,150	1,624,100	895,800	810,000	127,580	90,894	156,536	152,385	128,201	138,245	139,600	8.19%	6.07%	11.19%	9.11%	7.89%	15.43%	17.23%	1,280,290	12.17%
EU - Spain	6,262,822	6,107,814	4,508,559	4,427,429	3,579,479	2,821,579	2,992,243		224,900			401,116	137,877		0.00%	3.68%	0.00%	0.00%	11.21%	4.89%	0.00%	3,665,858	3.22%
EU - UK	55,000	84,700	388,300	271,700	500,300	498,100	621,600					38,688	45,437						7.73%	9.12%		456,000	8.43%
France(OT)	120,000														0.00%							---	---
Guinea																						---	---
India	66,716,403	60,553,908	17,558,762	24,363,545	25,744,139	42,168,908	35,077,541								0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	28,982,579	0.00%
Indonesia	150,798,219	95,497,053	100,472,150	50,792,198	47,765,407	45,953,210	51,208,307		195,780		808,600	228,970	251,891		0.00%	0.21%	0.00%	1.59%	0.48%	0.55%	0.00%	59,238,254	0.52%
Iran, Isl. Rep. of																						---	---
Japan*	29,125,098	31,780,765	28,954,672	27,038,829	23,344,427	22,201,649	20,075,617	1,387,765	2,773,266	1,092,583	1,659,250	1,438,042	1,781,695		4.76%	8.73%	3.77%	6.14%	6.16%	8.03%	0.00%	24,323,039	4.82%
Kenya					578,587						67,240		68,807	2,400								578,587	---
Korea, Rep. of	5,428,935	5,998,722	7,364,599	5,862,099	6,462,887	6,052,850	5,899,410	546,927	213,225	313,662	377,864	251,355	214,244		10.07%	3.55%	4.26%	6.45%	3.89%	3.54%	0.00%	6,328,369	3.63%
Madagascar**	326,494	355,138	357,897	330,541	178,890	141,917	154,281	62,400		5,300					19.11%	0.00%	1.48%	0.00%	0.00%	0.00%	0.00%	232,705	0.30%
Malaysia	4,220,794	3,588,653	5,017,243	6,232,414	8,852,314	10,147,579	9,587,211								0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7,967,352	0.00%
Maldives	3,054,590	3,040,716	678,824	2,254,552	1,106,976	609,598	119,962								0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	953,982	0.00%
Mauritius	150,560	105,120	195,850	763,618	1,653,981	1,445,477	1,553,466						39,200		0.00%	0.00%	0.00%	0.00%	0.00%	2.71%	0.00%	1,122,478	0.54%
Mozambique		7,177	267,387	230,296	265,808	202,281	202,281			42,715	29,600	24,354				0.00%	15.97%	12.85%	9.16%	0.00%	0.00%	233,611	7.60%
Oman, Sultanate of	2,608,008	1,465,331	552,649	393,258	678,821										0.00%	0.00%	0.00%	0.00%	0.00%			541,576	0.00%
Pakistan																						---	---
Philippines	3,759,626	2,016,101													0.00%	0.00%						---	---
Seychelles	3,876,173	21,366,998	22,778,433	35,608,822	38,476,480	39,867,357	38,059,267								0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	34,958,072	0.00%
Sierra Leone																						---	---
Somalia																						---	---
Sri Lanka	145,102,396	50,364,051	35,201,444	23,242,869	40,213,911	50,759,577	67,787,598		550	46,430		36,294	200,282	148,740	0.00%	0.00%	0.13%	0.00%	0.09%	0.39%	0.22%	43,441,080	0.17%
South Africa*	959,285	565,705	661,378	616,518	1,284,160	1,325,446	1,355,677		17,895	70,258	5,340	27,554		81,112	0.00%	3.16%	10.62%	0.87%	2.15%	0.00%	5.98%	1,048,636	3.92%
Sudan																						---	---
Tanzania, United Rep.of	3,468,197	3,681,606	1,648,649	2,112,744							757				0.00%	0.00%	0.00%	0.04%				1,880,696	0.02%
Thailand	784,881	1,821,217	1,121,073												0.00%	0.00%	0.00%					1,121,073	0.00%
United Kingdom																						---	---
Yemen																						---	---
COOPERATING NON CONTRACTING PARTIES																							
Bangladesh																						---	---
Liberia																						---	---
Senegal																						---	---
Other	5,005,660	9,093,754	9,822,626	7,034,619											0.00%	0.00%	0.00%	0.00%				8,650,333	0.00%
Total	657,033,250	507,711,970	437,487,001	426,526,644	445,334,863	453,095,691	462,573,496	7,305,609	8,809,472	6,583,414	8,936,162	11,720,082	13,493,193	7,159,524	1.11%	1.74%	1.50%	2.10%	2.63%	2.98%	1.55%	445,003,539	2.15%

* Coverage for JPN and ZAF is in the process of being re-estimated, following the provisions of Resolution 19/07 (superseding Resolution 18/10) and regarding vessels chartering in the IOTC area
** Observed effort for MDG (2012-2014) has been estimated from the number of fishing days. Coverage for EU,ESP (2014) was submitted by MDG
*** 2012 and 2013 total effort are estimates provided by EU,PRT which are to be updated
**** Data collected through EMS

Total effort: Total number of hooks set by longliners, by fishing fleet and year, including:

- **AVAILABLE** effort (green font): total effort extracted from the yearly submissions of catch-and-effort data for the fleet
- **NOT AVAILABLE** effort (red font): total effort estimated using the nominal catches available and sampled effort or catch rates from other fleets or year periods

Appendix C: Estimated observer coverage for purse seine vessels

	Total effort (no. fishing days)							Observed effort (no. fishing days)							Coverage rate							Average (last 5 years)	
MEMBERS	2013	2014	2015	2016	2017	2018	2019	2013	2014	2015	2016	2017	2018	2019	2013	2014	2015	2016	2017	2018	2019	Effort	Coverage
Australia***	133	90	119	84	69	115	125								0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	102	0.00%
China																						---	---
--Taiwan,China																						---	---
Comoros																						---	---
Eritrea																						---	---
EU - France*	2115	3467	3168	3152	2943	3233	2692	145	584	664	744	792	810	705	6.86%	16.84%	20.96%	23.60%	26.91%	25.05%	26.19%	3,038	24.54%
EU - Italy *****			284	252	395	542				210	147	42	339				74.02%	58.39%	10.64%	62.58%		368	51.41%
EU - Portugal																						---	---
EU - Spain	3899	4238	3838	3933	3242	3433	3397	48	86	7	344		591	694	1.23%	2.03%	0.18%	8.75%	0.00%	17.21%	20.43%	3,569	9.31%
EU - UK																						---	---
France(OT)	1276	0	0	0	0	0	0	171							13.40%							0	---
Guinea																						---	---
India																						---	---
Indonesia																						---	---
Iran, Isl. Rep. of	172	143	131	110	114	81	67								0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	101	0.00%
Japan	36	28	69	69	79	43	4								0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	53	0.00%
Kenya																						---	---
Korea, Rep. of	369	539	460	608	452	433	381	33	45	35	232	121			8.93%	8.34%	7.61%	38.14%	26.77%	0.00%	0.00%	467	14.50%
Madagascar**								(14)	(118)													---	---
Malaysia																						---	---
Maldives																						---	---
Mauritius	27	211	243	266	326	347	246			111	148	44	67	95	0.00%	0.00%	45.66%	55.68%	13.49%	19.32%	38.68%	285	34.57%
Mozambique																						---	---
Oman, Sultanate of																						---	---
Pakistan																						---	---
Philippines					4														0.00%			4	0.00%
Seychelles	1670	1947	3012	4087	3269	2787	2923	0	110	997	1102	1431	1218	682	0.00%	5.65%	33.10%	26.96%	43.77%	43.71%	23.34%	3,216	34.18%
Sierra Leone																						---	---
Somalia																						---	---
South Africa																						---	---
Sri Lanka	64								12						0.00%							---	---
Sudan																						---	---
Tanzania, United Rep.of																						---	---
Thailand				6	11													0.00%	0.00%			9	0.00%
United Kingdom																						---	---
Yemen																						---	---
COOPERATING NON CONTRACTING PARTIES																							
Bangladesh																						---	---
Liberia																						---	---
Senegal																						---	---
Other																						---	---
Total	9,761	10,664	11,323	12,567	10,904	11,014	9,835	397	837	2,024	2,717	2,430	3,025	2,176	4.07%	7.85%	17.88%	21.62%	22.29%	27.46%	22.13%	11,294	19.42%

* Total number of fishing days for EU,FRA unavailable for 2019, estimated using NC in combination with previous year CPUE.
** Brackets indicate observers on foreign vessels (observer data provided by MDG for EU,ESP, EU,FRA and SYC)
*** The AUS purse seine fleet targets Southern bluefin tuna and submits observer data to CCSBT
**** No C-E data officially provided by EU,ITA for 2018, although observer data was received. Efforts from 2017 were temporarily used for 2018.

Total effort: total number of days fished by tuna purse seiners, by fishing fleet and year, including:

- **AVAILABLE** effort (green font): total effort extracted from the yearly submissions of catch-and-effort data for the fleet
- **NOT AVAILABLE** effort (red font): total effort estimated using the nominal catches available and sampled effort or catch rates from other fleets or year periods