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Report of the expert review workshop on standards for the IOTC Regional Observer Scheme

Compiled by Teresa Athayde[1] and IOTC Secretariat[2]. Reviewed by the ROS Steering Committee[3]

Mahé, Seychelles 24 – 28 September 2018

BACKGROUND

Fisheries observer data is important for fisheries management, as it provides a source of detailed information on fishing activities that is independent from logbooks. At a sufficient level of resolution it can be used for analyses such as the standardisation of catch rates and analysis of bycatch mitigation measures. In 2011, during the 15th Session of the Indian Ocean Tuna Commission (IOTC), a Regional Observer Scheme (ROS) was introduced 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[4] through the implementation of national programmes.

Preliminary standards introduced

In 2010, the IOTC Scientific Committee reviewed and endorsed an Observer Manual[5], including a set of guidelines, standards and supporting information for observer data collection, reporting and training, an Observer Trip Report template[6] containing the minimum reporting requirements and data forms containing minimum data collection requirements. These were approved, in provisional form, by the Commission in 2011 where it was noted[7]:

> "*Minimum data requirements were adopted as well as an observer report template that will be reviewed and revised as necessary".*

Resolution 11/04 on the ROS was adopted at this meeting and similarly provided a means for the observer scheme to begin, while the development of standards and more comprehensive training tools were to be ongoing. Paragraph 15 of this Resolution states:

> *"The elements of the Observer Scheme, notably those regarding its coverage, are subject to review and revision, as appropriate, for application in 2012 and subsequent years. Basing on the experience of other Tuna RFMOs, the IOTC Scientific Committee will elaborate an observer working manual, a template to be used for reporting (including minimum data fields) and a training program".*

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[4] IOTC. (2011). *Resolution 11/04 On a Regional Observer Scheme.* Res.11/04
[5] IOTC-2010-SC11-R
[6] IOTC-2018-SC12-R
[7] IOTC-2011-S15-R

Based on this mandate many national observer programmes were initiated under the scheme, and programmes that were already underway began reporting to the IOTC. Nevertheless, there were a number of issues arising from the data received by the IOTC Secretariat through the trip report template which were discussed in detail in 2014 at the WPEB [8] and WPDSC. This included issues with the resolution of data (e.g. effort reported for an entire trip), new requests arising from the Commission and SC, areas of redundancy and duplication as well as misunderstanding of data field descriptions and lack of categorisation/coding resulting in inconsistent data entries. A key issue was also the format of data reporting which was pdf or word documents unsuitable for transferring to IOTC database. This resulted in a request from the SC in 2013 for the reporting format to be made available in an excel template to facilitate data transfer.

Interim standards adopted

In 2014, the Scientific Committee adopted[9] a set of changes to the data reporting requirements:

> *"the SC **NOTED** the revisions to the observer reporting templates proposed by the WPEB10 and the WPDCS10 to improve the quality of the data submissions for scientific purposes such as stock assessments and other such scientific work as requested by the IOTC Scientific Committee".*

Further

> "***NOTING** that improving the quality of data submissions is a process that evolves and develops over time, the SC **ADOPTED** the revised observer templates as interim reporting templates for immediate use by CPCs where ready and for preliminary use by CPCs where further time is required for review. The SC **AGREED** that the IOTC Secretariat will make these templates available in 2015 and update the guidance in the manual accordingly. Following implementation in interim format, the SC **AGREED** that these will be reviewed and modified further as appropriate in 2015".*

The revised reporting templates (in excel format), updated version of the manual and data collection forms were made available on the IOTC website[10]. Since then, the quality of reporting has improved substantially, notably the reporting of set level information, and coverage levels have also increased[11]. The interim reporting requirements have been implemented for four years, however, to fulfil the request of the SC to review and, where appropriate, revise the standards further so they may be finalised, a dedicated workstream was set up as part of the ROS Pilot Project[12].

Review and finalisation of standards

A vast array of observer initiatives, with different training curricula, data collection methods and procedures have been developed across the Indian Ocean by a range of organisations. As a result, an assortment of data of varying quality are 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.

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

[8] IOTC–2014–WPEB10–08 Rev_1 Update on the implementation of the IOTC Regional Observer Scheme

[9] Based on the request of the Commission to elaborate these minimum data fields, noting that only the Commission can adopt binding requirements or take decisions and that the role of the SC is to provide advice to the Commission.

[10] www.iotc.org/science/regional-observer-scheme-science

[11] IOTC-2017-SC20-07

[12] Resolution 16/04 *On the implementation of a Pilot Project in view of Promoting the Regional Observer Scheme of IOTC*

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, there are currently no formal mechanism in place through which to do this or a concrete and auditable set of standards against which programmes can be assessed.

The ROS manual is currently a large document, comprising a range of materials which includes a substantial amount of background information, some training tools and materials, some guidance information and some standards. The aim of the current project is to disentangle and further develop the standards and guidance into discrete components to improve the clarity, usability and completeness of the materials.

EXPERT REVIEW

To address the issues associated with the varying quality and type of data collected and reported by national observer programmes operating under the ROS, a final, clear and complete set of minimum standards needs to be developed. This will promote the harmonisation of observer schemes, standardisation of data and promote a minimum level of scientific rigor across all fleets. An independent consultant was hired in January 2018 to review the standards of the ROS, propose amendments as necessary, and submit a final version for review.

The main outputs of this task were:

- Standards and guidelines for the ROS (for national programmes to be certified as ROS compliant)
- Final set of mandatory data reporting requirements
- Final set of data collection fields and 'suggested' data fields

Following this consultancy, an expert technical workshop was held from 24 - 28 September 2018 to review the standards for the IOTC Regional Observer Scheme in light of the consultant's recommendations. This was intended to be a small, dedicated working group of selected experts in order to be able to complete the extensive review within the week scheduled for the meeting. Expertise were sought from each of the main gear types (longline, purse seine, pole and line and gillnet) with representation from a number of the fleets across the Indian Ocean. Input from beyond the Indian Ocean was also obtained through the participation of experts from other tRFMOs and oceans. Participants with a range of observer programme-related expertise were also sought. This ranged from those with practical experience working onboard vessels as observers themselves, those involved in the logistical day-to-day management of observers and observer programmes, those involved in training and debriefing as well as those responsible for auditing observer programmes. Database managers familiar with manipulating and processing the data were invited as well as scientists involved in analysing the datasets. The objective was to have adequate representation from these different areas of work within each group to ensure that the priority data demands of scientists were balanced by the practical realities of what is feasible onboard a vessel. The final list of attendees who were able to participate is provided in Annex 1.

Participants were provided with a detailed report produced by the consultant comprising a thorough review of the interim standards with proposed amendments set out for discussion. This was distributed one month ahead of the workshop to provide the opportunity for a detailed review in advance. Experts who were unable to attend the workshop in person were also provided with an opportunity to comment on the report.

During the workshop, experts were divided into five small working groups and given specific material to review based on their specific knowledge and experience. A chair and a rapporteur were nominated for each group at the start of the workshop to assist with the group functioning, to maintain progress and focus as well as to be able to record the main discussion points in order to document the rationale for the changes proposed. Groups were asked to work through each data field in turn keeping in mind a set of key requirements, including whether the item was necessary, relevant, feasible, adequate, complete and clear. Groups were also asked to assess whether the information was necessary for reporting to IOTC and therefore to be considered as mandatory for

reporting. A further question was whether the item was to be part of the data to be collected by national programmes (mandatory for collection), or should be designated as 'suggested' for collection. For the group working on the overall programme standards, they were similarly asked to keep in mind the same key considerations, while also ensuring they were clear enough to be auditable.

DISCUSSION

The overall aim of the workshop was to provide a comprehensive review of the standards and to establish consensus on a set of proposed revisions in a summary document for the WPDCS to review. The full set of proposed programme standards and guidelines are provided in Annex II and the proposed amendments to the mandatory data fields for reporting are provided in Annex III. The proposed set of revisions to the data collection fields and suggested data collection fields are provided in paper IOTC-2018-WPDCS14-INF03. While the full set of amendments has been documented for WPDCS, there are a number of key considerations that arose during the workshop that are highlighted here for discussion.

Reporting requirement categories

Data collection fields listed in IOTC ROS observer manual are categorised as 'mandatory for reporting', 'mandatory for collection' and 'recommended (or suggested) for collection'. However, during the Expert Workshop, it was noted that the use of a hierarchical system to categorise data collection field reporting requirements has multiple shortcomings:

1. Impedes the reporting of desirable information to the Commission as this information is collected under 'suggested' data fields (e.g. data collected for specific research purposes);
2. Potentially results in the downgrading of data fields to 'suggested collection' for any existing data field that cannot be collected in a systematic way, to avoid compliance issues for CPCs (e.g. data on gear interactions[13] as recommended by the SC[14]).
3. Potentially results in the downgrading of data fields to 'suggested collection' where information is considered as unreliable.
4. Potential for confusion regarding the different requirements.

While the IOTC has two distinct data *collection* (Res. 15/01) and data *reporting* requirements (Res. 15/02) for the main datasets, given the issues described above it may be appropriate to pursue an alternative approach for the ROS data. A simple solution would be to recommend the Commission adopts only mandatory reporting data fields.

Given that the main purpose of having a set of data collection fields appears to be the use of these in the initiation of observer schemes, the data collection fields agreed by the Expert Workshop would be made available and CPCs could use these where needed. However, data collection fields that are not mandatory for reporting would be excluded from the proposed auditing process and would simply be a supporting tool.

For data fields which are of regional scientific interest but are not collected on a routine basis, these could remain as mandatory for reporting but with the acknowledgement that these will not always be collected (e.g. "to be collected where possible"). This would enable the reporting of this information where it exists while avoiding any potential compliance issues when observer programmes have not collected the information.

[13] Consistent with Resolutions 13/04; 13/05; 12/04; 12/06; 12/09.
[14] SC16.24 (para. 53), SC14.27 (para. 85), SC14.48 (para. 143)

Consistency across gear types

Due to time constraints and the large volume of material to cover, the workshop functioned primarily as independent groups based on gear type (longline, purse seine, pole and line, gillnet and programme standards). Therefore, while the proposed modifications are highly specific and relevant for each fishery, there are some minor inconsistencies among gear types, data fields and with SC and Commission requests and recommendations which the WPDCS is invited to consider and review. These include:

1) Catch and effort

   a) Information on "Time net pursed" for purse-seine fisheries is presently collected but not reported following the recommendations of the expert group (Table 1). While these data fields may be less important for the calculation of CPUE in these fisheries as the standardisation process is arguably more complex, the WPDCS may consider to flag this data field as 'mandatory for reporting' for consistency with other gear types and given that 'fishing set duration' was used as a covariate in a recent standardisation for yellowfin tuna[15].

Table 1. Effort data collection fields and reporting requirement

Data fields	Mandatory for reporting (Y/N)			
	LL	PS	PL	GLL
Set/event start date	**Y**	**Y**	**Y**	**Y**
Set/event start time ('Time start fishing' for PS and PL)	**Y**	**Y**	**Y**	**Y**
Set/event start position	**Y**	**Y**	**Y**	**Y**
End setting time	**Y**	**N**	**NA**	**Y**
End setting date	**Y**	**NA**	**NA**	**Y**
End setting position	**N**	**NA**	**NA**	**N**
Start Hauling Date	**Y**	**NA**	**NA**	**Y**
Start Hauling Time (Time end fishing for PL / Time net pursed for PS)	**Y**	**N→Y**	**Y**	**Y**
Start Hauling Position	**Y**	**NA**	**NA**	**Y**

NA = Not Applicable

   b) A second weight measurement ('Weight 2') is not presently required for the gillnet fisheries (Table 3), however, given that fish are processed on-board gillnet vessels, the insertion of this data field should be considered.

   c) There are also some inconsistencies between the data field reported within a gear type, e.g., for pole and line and gillnet fisheries weight is to be reported, but the weight code is not (Table 2). Given that the weight is meaningless without the accompanying code explaining what type/metric of weight has been measured (round or processed such as head-off) they should either both be reported or neither.

Table 2. Catch data collection fields and reporting requirement

Data field	Mandatory for reporting (Y/N)				
	LL	PS	PL (tuna & tuna-like)	PL (Bait)	GLL

[15]Katara et la., 2018. Standardisation of yellowfin tuna CPUE for the EU purse seine fleet operating in the Indian Ocean. IOTC–2018–WPTT20–36

Species	**Y**	**Y**	**Y**	**Y**	**Y**
Fate	**Y**	**Y**	**Y**	**Y**	**Y**
Number	**NA**	**Y**	**Y**	**NA**	**Y**
Weight tool	**Y**	**Y**	**Y**	**Y**	**Y**
Weight code	**N**	**Y**	**N → Y**	**NA**	**N → Y**
Weight 1	**N**	**Y**	**Y**	**Y**	**Y**
Weight 2	**N**	**NA**	**NA**	**NA**	**NA→N**

NA = Not Applicable

d) Data fields related to fishing mode (date, time, position of tuna school sightings, school sighting cue, and school type) are presently proposed for collection but not for reporting (Table 3). The WPDCS is invited to consider to highlight listed data fields for reportingto ensure that information on catch and effort data aggregated by fishing mode (free/associated school) and drifting or anchored artificial FADs is reported (consistent with Resolution 18/08). This will also allow the disaggregation of data on mitigation measures and gear interactions by school association and school type (consistent with information of interest to the Commission as expressed in Resolutions 13/04, 13/05[16]; and Resolutions 12/04[17] and 12/06[18] respectively) (suggestions in Table 3 below) as well as information on the use of artificial lights to attract fish (consistent with Resolution 16/07).

Table 3. Purse-seine and pole and line (tuna & tuna like) daily activity data collection fields and reporting requirement [19]

Data field	Mandatory for reporting (Y/N)		Commission expression of interest in the information			
	PS	PL	Res 18/08	Res 16/07	Res 13/04 Res 13/05	Res 12/04 Res 12/06
Date	**N → Y**	**N → Y**	**Y**			**Y**
Time	**N → Y**	**N → Y**				**Y**
Position	**N → Y**	**N → Y**	**Y**		**Y**	**Y**
Activity code	**N → Y**	**N → Y**	**Y**			**Y**
School sighting cue	**N → Y**	**N → Y**	**Y**		**Y**	**Y**
School type	**N → Y**	**N → Y**				**Y**
School detection	**N → Y**	**N → Y**				
Object ID	**N → Y**	**N → Y**	**Y**			
Buoy ID	**N → Y**	**N → Y**	**Y**			
Buoys equipped with artificial lights	**N → Y**	**N → Y**		**Y**		
FAD design	**N → Y**	**N → Y**	**Y**			**Y**

2) Mitigation measures

[16] Resolutions 13/04 and 13/05 para. 7 "CPCs shall report the information and data collected under paragraph 3(b) and paragraph 4, through logbooks, or when an observer is onboard through observer programs."

[17] Resolution 12/04 para. 3 "CPCs shall collect (including through logbooks and observer programs) and provide to the IOTC Secretariat (…) all data on their vessels' interactions with marine turtles."

[18] Resolution 12/06 para. 1 "CPCs shall record data on seabird incidental bycatch by species, notably through scientific observers in accordance with Resolution 11/04 and report these (…)".

[19] Recommended level of reporting in Table 3 if from the Expert Working Group and the ROS Steering Committee

a) While a number of data fields on mitigation measures already exist for longline fisheries, a set of data fields for the collection of mitigation measures from the purse-seine and the gillnet fisheries has been developed. The WPDCS is invited to consider and review the proposed data fields and respective reporting requirement in light of the information on mitigation measures of interest to the Commission (suggestions in Table 4 and 5 below).

   i) Cetacean and whale shark sightings during purse-seine setting is specifically requested by the Commission (Resolutions 13/04 and 13/05[20]);

   ii) The use of FADs designed to reduce the incidence of entanglement (Resolutions 13/04, 13/05[21] and 12/04[22]);

   iii) The use of mitigation devices with gillnet fisheries (Resolution 12/04 para. 10a).

b) The WPDCS is also invited to consider the insertion of a new data field, 'Steps taken to ensure safe release' concerning "cetaceans and whale sharks sightings during purse-seine setting" (Table 5), given IOTC requirements regarding cetaceans/whale sharks[23] .

Table 4. Data collection fields and reporting requirement on mitigation measures for the gillnet fisheries

Data fields	**Mandatory for reporting (Y/N)**
Mitigation measures (Y/N)	**Y**
Mitigation device	**N → Y**
Data fields	**Purse-seine fisheries**
Cetaceans and whale sharks sightings during purse-seine setting	
Sighting occurred before setting (Y/N)	**N → Y**
Caught inside the net (Y/N)	**N → Y**
Brought on-board (Y/N).	**N → Y**
Species	**N → Y**
N° of individuals sighted per spp	**N → Y**
Steps taken to ensure safe release	**Y**
The use of FADs designed to reduce the incidence of entanglement	
Raft materials	**N → Y**
Tail materials	**N → Y**

[20] Resolutions 13/04 and 13/05 para. 7 "CPCs shall report the information and data collected under paragraph 3(b) and paragraph 4, through logbooks, or when an observer is onboard through observer programs..".".

[21] Resolution 13/04, 13/05 para. 5. "CPCs shall adopt Fish Aggregating Device designs that reduce the incidence of entanglement, according to Annex III of Resolution 13/08 [superseded by Resolution 15/08, then by Resolution 17/08 then 18/08] (or any subsequent revision)."

[22] Resolution 12/04 para. 10a) "Where appropriate undertake research trials of circle hooks, use of whole finfish for bait, alternative FAD designs, alternative handling techniques, gillnet design and fishing practices and other mitigation methods which may improve the mitigation of adverse effects on marine turtles…"

[23] Resolutions 13/04 and 13/05, para.3b "… .v. the steps taken to ensure safe release; …".

Table 5. Data collection fields and reporting requirement on mitigation measures for the purse seine fisheries

Data fields	Mandatory for reporting (Y/N)
Cetaceans and whale sharks sightings during purse-seine setting	
Sighting occurred before setting (Y/N)	**N → Y**
Caught inside the net (Y/N)	**N → Y**
Brought on-board (Y/N).	**N → Y**
Species	**N → Y**
N° of individuals sighted per spp	**N → Y**
Steps taken to ensure safe release	**Y**
The use of FADs designed to reduce the incidence of entanglement	
Raft materials	**N → Y**
Tail materials	**N → Y**

3) Interaction details (Table 6)

a) It was concluded that it is simply not feasible for an observer to collect information on interactions (interaction with the gear hook, bait, leader type and de-hooker/line cutter) for all bycatch and release details (hauling method, specimen brought on-board and condition) for every single discard. Furthermore, it was noted that it would be important to collect such information for certain IOTC species, e.g. billfish (that are not always considered bycatch). Therefore, it was suggested that this information should only be collected for a list of species considered of special interest (SSI) for the IOTC. This list should include all Protected, Endangered and Threatened species (PETs), billfish species (all/specific), shark/ray species (all/specific), and any other species deemed of special interest (e.g. bycatch species which are thought to be heavily impacted by IOTC fisheries). The WPDCS is invited to develop such a list and a suggested first draft is available in Annex IV.

b) The WPDCS is invited to consider and review a minor inconsistency with IOTC SC recommendations that escaped consultant/experts' perusal during the time-limited workshop. Consultant/workshop experts proposed that 'Condition (for discards)' should only be collected for SSI as defined by the IOTC. However, the SC indirectly noted the need for the collection of information on the condition of discards both at capture and at release to help to evaluate benefits of retention bans for the populations of non-target species. Information on 'condition' is currently only collected at the point of release.

c) Information on Interaction details is presently collected but not reported (except for DF 'gear interaction' and 'condition at capture'. The WPDCS may consider flagging the remaining DFs as 'mandatory for reporting' if and when collected.

Table 6. Data collection fields and reporting requirement on interaction details

Data collection field	Mandatory for reporting (Y/N)				
	LL	**PS**	**PL (Tuna)**	**PL (Bait)**	**GLL**
Hook type	**N→Y**	**NA**	**NA**	**NA**	**NA**
Bait	**N→Y**	**NA**	**NA**	**NA**	**NA**
Leader type	**N→Y**[24]	**NA**	**NA**	**NA**	**NA**

[24] SC14.36 (para. 100) "Noting that the use of monofilament leaders may allow sharks to escape by biting through the line (removing the hook), in contrast to wire leaders which are not prone to bite-off‟ the SC RECOMMENDED that, where possible for fleets that have not already prohibited the use of wire leaders, the number of bite-off‟ per leader type is added to the longline hauling information recorded by the observer".

Gear interaction	**Y**	**Y**	**Y**	**Y**	**Y**
De-hooker/line cutter	**N→Y**	**NA**	**N**	**NA**	**NA**
Brought on-board (Y/N)	**N→Y**	**N→Y**	**N→Y**	**N→Y**	**N→Y**
Hauling method	**N→Y**	**N→Y**	**N→Y**	**N→Y**	**N→Y**
Condition (at capture and release)[25]	**Y**	**Y**	**Y**	**Y**	**Y**
Ressuscitation	**N→Y**	**N→Y**	**N→Y**	**N→Y**	**N→Y**

NA = Not Applicable

Codes

As part of this review, the full suite of code lists were also revised where appropriate. Nevertheless, given that many code lists require ongoing modifications and amendments it would be pertinent for CPCs to submit new codes to the IOTC Secretariat as and when they arise so that the regional database can be updated on an ongoing basis.

Sampling methods

As part of this review, data fields requesting the description of sampling methods were revised where appropriate. The WPDCS is invited to consider and review proposed data field definitions and associated tables and to note that changes brought to these data fields will allow for the standardizing of sampling methods accordingly to IOTC Observer Manual v.1.2. and for the collection of information on non-text format via the use of standard code tables.

Maturity scales

It is proposed that standardised maturity scales for the staging of elasmobranchs, tuna and billfish species are developed (e.g. as per other tRFMOs), to allow for the collection of this information in non-text format via the use of standard code tables.

SUGGESTED RECOMMENDATIONS FOR THE SCIENTIFIC COMMITTEE

The WPDCS **RECOMMENDED** that the revised data fields for mandatory reporting and programme standards are adopted by the Commission°.

The WPDCS **RECOMMENDED** that funding is allocated for the auditing of national programmes to be certified as ROS 'recognised' or 'accredited'.

The WPDSC **RECOMMENDED** that the SC updates the ROS materials with the revised data collection fields and develops these into forms for use as a capacity building tool for CPCs to use where needed.

The WPDSC **RECOMMENDED** that the SC considers and endorses the list of species considered of special interest (SSI) as defined by WPDCS14.

[25] SC17 Para. 41 "...Assess the species-specific percentage of discards that is captured dead versus alive, as well as the post-release mortality of species that are discarded alive, in order to estimate what will be the added fishing mortality to the populations, based on the best current information".

ANNEX 1. LIST OF PARTICIPANTS

Name	Organisation	Role/expertise	Group	Contact
Tom Nishida	Fisheries Research Agency, Japan	• Data analysis, stock assessment • IOTC ex SC Chair and at previous ROS technical group	Longline	aco20320@par.odn.ne.jp
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Bram Setyadji	Research Institute for Tuna Fisheries, Indonesia	• Practical onboard observer experience • IOTC scientist, data analysis	Longline	bram.setyadji@gmail.com
Victor Ngcongo	CapFish/CapMarine Observer Provider for South Africa and for IOTC and ICCAT ROP for transhipments	• At-sea observer experience • Briefing and debriefing of observers • Observer coordinator	Longline/ pole and line/ standards	victor@capfish.co.za
Ross Wanless	BirdLife South Africa's Seabird Conservation Programme	• Seabirds and fisheries impacts • Seabird mitigation measures • WPEB vice-Chair	Longline/Pole and line/ gillnet /standards	ross.wanless@birdlife.org.za
Suraj Chandrakuamara	Department for Fisheries and Agricultural Research, Sri Lanka	• Observer programme management and deployment • At-sea experience as observer	Longline/ gillnet	ksckdumidi@gmail.com
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James Geehan	Fisheries Officer (Statistician), IOTC	• Data collection and sampling frameworks of fishery capture statistics	Pole and line / gillnet	james.geehan@fao.org
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Moazzam Khan	WWF-Pakistan	• Observer programme management • Gillnet data analysis	Gillnet	mmoazzamkhan@gmail.com
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ANNEX II. PROGRAMME STANDARDS AND GUIDELINES

Proposed Standards for the IOTC Regional Observer Scheme (ROS)

Two different font colours were used to differentiate minimum standards already approved by the Commission and its SC (**in black**), and proposed recommendations still to be submitted to the SC for consideration by the Commission, (**in red**).

Item Description	**Standard Required**
Observer Coverage Proportion of observed effort to total effort as defined in Resolution 11/04 *On a Regional Observer Scheme* (or any subsequent superseding Resolution).	Observer coverage required is, at a minimum that specified in Resolution 11/04 *On a Regional Observer Scheme* (or any subsequent superseding Resolution). **ROS expectation on observer coverage** CPCs are to meet the minimum level of coverage is met and that the coverage is representative of the entire fleet so that there will be minimal bias in results from the extrapolation of observer data. CPCs should ensure that coverage is stratified across gear type, vessel size (≥24m and <24m), target species, area and season. There should also be adequate observer representation across all individual vessels over the long term. If the minimum level of coverage is not met by a flag CPC, any other CPC may, subject to the consent of the flag CPC who has not met its coverage, place an observer to fulfil required tasks until that flag CPC provides a replacement or the target coverage level is met. *This standard does not preclude the right of the coastal state to mandate the deployment of a national observer on vessels operating within their EEZ, regardless of the presence of an observer from another CPC.* CPCs shall provide to the Executive Secretary and the Scientific Committee annually a report of the number of vessels monitored and the coverage achieved by gear type. IOTC Res. 11/04
Item Description Authorisation process Method by which National Observer Programmes will be assessed against IOTC requirements to obtain authorisation to become part of the ROS.	**Standard Required** On request by the CPC, the Secretariat will audit and authorise National Observer Programmes to provide observer services under the IOTC ROS. IOTC Res11/04 and IOTC ROS OM **ROS expectation on the Authorisation process** CPCs will supply the Secretariat with a list of their approved Observer Providers (national institutes and/or independent service providers) and CPCs will assist the Secretariat with the Authorisation process. The Secretariat will establish a schedule of auditing to ensure programmes meet current requirements. CPCs using international observers onboard vessels will provide the Secretariat with a MoU established for the provision of observer services.

	National Observer Programmes will be audited and authorised by the Secretariat according to the *ROS Minimum Standards and Guidelines* as adopted by the Commission. IOTC ROS Observer Manual (v 1.2), page 39, Para 3.
Item Description **Programme performance** Assurance that best practices are met and that standards are maintained after authorisation and continue to reflect ROS requirements.	**Standard Required** CPCs have ongoing mechanisms to assess the performance of Observer Providers against agreed performance standards. **ROS expectation on the Programme performance** Observer Providers will be audited by the IOTC Secretariat against the performance criteria in the *Standards for the IOTC ROS* as the principal mechanism for assessing ongoing Observer Programme performance. Programmes will be subject to periodic review and evaluation based on a pre-agreed schedule with the CPC. The IOTC Secretariat will use this information to advise the CPC of its programme's participation within the ROS.
Item description **IOTC Observer registration** Procedure used to demonstrate that observers meet IOTC agreed requirements.	**Standard Required** CPCs may not deploy unregistered persons in a ROS Observer capacity. All registered observers will meet ROS expectations on IOTC observer registration. IOTC Res. 11/04; *IOTC-2010-WROS-R; IOTC ROS Observer Manual v1.2.* ROS expectation on IOTC Observer registration 1. Registration The Secretariat will oversee the observer registration process. Following the submission of a request for observer registration, the Secretariat will allocate observers with an individual IOTC registration code that must be included on observer data submitted to the Secretariat. Registration will be limited to a time period determined by the validity of the observer's documentation. 2. De-registration[26] Should any of the observer's documentation expire and no renewal obtained the CPC should inform the Secretariat to deregister the observer. 3. Re-registration Any observer who has been de-registered due to the lack of valid documentation can be re-registered by meeting the requirements in item 1.

[26] Note that certain documents such as the Certificate of Medical Fitness and the Basic Safety Training Certificate are to be regularly renewed. Observer provider should provide the Secretariat with the renewed documents on a dully manner to avoid observer decertification.

	Observer Providers should keep a record of documentation required to attest observers meet agreed requirements, including: • Evidence of proficiency in literacy and numeric competency (holder of a Secondary School Certificate or equivalent) • Valid passport • Valid Certificate of Medical Fitness[27] (STCW or equivalent) issued by an authorised medical practitioner[28] . • Valid STCW Basic Safety Training Certificate (or equivalent)[29] • Certificate of successful completion of a Basic Observer Training Course based on IOTC training guidelines and curriculum. • Document signed by the observer accepting the code of conduct. IOTC ROS Observer Manual v1.2.
Item description **Code of conduct** Set of guiding principles relating to accepted behaviour and standards of conduct while working as an Observer.	**Standard Required** CPCs will ensure that all registered observers sign a document agreeing to conform to a Code of Conduct approved by the Commission. CPCs will address any alleged breaches reported. IOTC ROS Observer Manual v1.2. **ROS expectation on the Code of Conduct** Compliance with the Code of Conduct shall be monitored by the Observer Provider and CPCs are responsible for ensuring reported breaches are investigated. • Based on the results of the investigation, the Observer Provider will make recommendations on any action to be taken. • The recommended action by the Observer Provider should be reported to the CPC who shall subsequently report to the Secretariat. • If an observer is removed following the investigation carried out by the Observer Provider, the observer must also be officially de-registered with the IOTC Secretariat. • The investigation will be conducted in a fair manner for all parties and include an appeal process.

[27] Seafarers (observers included) are required to undergo medical examinations to reduce risks to other crew members and for the safe operation of the ship, as well as to safeguard their personal health and safety **Source spécifiée non valide.**. Medical certificates shall remain valid for a maximum period of two years unless the seafarer is under the age of 18, in which case the maximum period of validity shall be one year.

[28] The competent authority should maintain a list of recognized medical practitioners to conduct medical examinations of seafarers and issue medical certificates (STCW Code, section A-I/9, paragraph 4). See https://www.classnk.or.jp/hp/pdf/activities/statutory/mlc/flag/sgp/sc_no_13_of_2013annex_a.pdf .

[29] To comply with "international safety standards for merchant seaman and fishermen" to embark on-board any commercial fishing vessel, observers are required to undertake a number of STCW certified courses, which are valid for five years.

Item Description	Standard Required
Observer trainer Individual responsible for the delivery of a/multiple observer training component(s).	CPCs will follow agreed regional standards for Observer Trainers.
	ROS expectation on Observer trainers
	Trainers may be internal to CPC National Observer Programmes or may be specialists brought in from other programmes, organisations or supplied by training providers. Trainer skills, qualifications and experience should meet agreed regional standards. These can be found under the Guidelines for IOTC ROS.

Item	Standard Required
Observer training policy Provides a foundation for ensuring standardised training which is of sufficient quality, comprehensive and kept up-to-date.	CPCs will ensure that training entities meet ROS expectation on the Observer training policy.
	ROS expectation on the Observer training policy
	Education/ Entrance Qualifications for entry to observer training should meet IOTC minimum pre-requisites for the accreditation of observers. **Training** As a minimum, the IOTC Basic Observer Training curriculum (see Guidelines for IOTC ROS) should be used to ensure that observers have acquired required skills by the end of the training course. Class sizes should be kept to manageable levels (5 trainees per trainer). *Training courses should be updated on a regular basis to ensure they remain consistent with the current decisions of the Commission.* **Assessment** To successfully complete the Basic Observer Training course candidates should be subject to a competency based assessment and meet or exceed ROS minimum competency standards (listed under the Guidelines for IOTC ROS). **Certification** Observers that meet ROS minimum competency standards will be certified by the Observer Provider as fully trained in one or all of the gear types below and issued an individual training certificate inclusive of candidate assessment results per training module. a) Purse seine b) Longline c) Pole and Line d) Gillnet **Venues** Training should be conducted in suitable training facilities with appropriate equipment. Marine colleges are favourable venues for observer training but are not essential. Access to fishing harbours, fishing vessels or fish landing sites are advantageous where possible. **Review and validation**

	The Secretariat can request a CPC to submit the records for review, including: • list of trainers and CVs • list of observer candidates and CVs • training curriculum and methodologies • implemented daily training schedule (per subject and lecture type) • list of training materials (manuals, syllabus, sample lesson plans, quizzes, PPT presentations and other relevant material) • details on assessments tools (exercises, practical tasks, written and/or oral assessment, and results) • training manual Observer Providers should keep a copy of all documentation for a minimum of 5 years for review and validation purposes.
Item **Observer competency** Capacity to meet and maintain observer competency standards.	**Standard Required** CPCs will ensure that Observer Providers have mechanisms to assess the performance of observers against agreed competency standards. **ROS expectation on Observer competency** Observer Providers shall routinely evaluate observer performance against agreed competency standards (listed under the Guidelines for IOTC ROS) by meeting the minimum standards for debriefing, adherence to the Code of Conduct, health requirements etc. IOTC Res 11/04; IOTC Res 16/04; IOTC Res 15/01; IOTC-Res 15/02
Item Description Observer deployment and at-sea coordination The carrying out of functions required to embark / disembark observers, to establish and maintain communications with the observers and to provide them with all possible assistance during the deployment period.	**Standard Required** CPCs shall use existing deployment and coordination procedures in place for their programmes. CPCs will develop these procedures based on the details below and make them available for review by the Commission. IOTC Res 11/04 **ROS expectation on observer deployment and coordination** It is the responsibility of the CPC to deploy observers on its flagged fleet, or to provide consent to another CPC (via the establishing of a MoU) to place observers to fulfil required tasks until a replacement is provided. It is the responsibility of CPCs to ensure the Observer Provider has the necessary legal, administrative, safety (including at-sea and on land insurance) and financial means to provide observer services and the experienced/trained personnel to carry out observer deployment and coordination functions listed under ROS guidelines. IOTC Res 11/04 and IOTC Res16/04

Item Description	Standard Required
Observer Coordinator(s) Person(s) that coordinates observer operations, manages data collection and transmission, assures quality of information through debriefing and serves as the contact point for observer issues.	The CPC nominated Observer Provider/s will provide the IOTC Secretariat with the contact details of their Observer Coordinator/s. **ROS expectation on Observer coordination training** The Observer Coordinator shall be appropriately qualified, experienced in observer coordination matters or been trained to accomplish necessary functions based on ROS Observer Coordinator training standards, listed under the Guidelines for IOTC ROS. The Observer Coordinator should be directly involved in day-to-day observer operations and authorised by the CPC to communicate with the IOTC Secretariat.
Item Description	**Standard Required**
Observer briefing and debriefing Briefing of an observer is a specially arranged session with the observer and provider briefing personnel. Briefing is to ensure that the observer understand clearly the roles and duties that he/she are expected to carry out on a vessel before a trip. Debriefing of an observer, is a specially arranged session with the observer and the provider debriefing personnel to ensure that the data and information collected by an observer is checked for discrepancies and can be corrected before the information is used for analysis. It is also a period when the observer can report critical incidents for further attention.	CPCs shall ensure that Observer Providers will implement a system for briefing and debriefing of observers. **ROS expectation on the briefing and de-briefing of observers** Observer Providers shall implement a system for briefing and debriefing of observers that follows a consistent format and include ROS agreed standard briefing/debriefing procedures, detailed in Guidelines for the IOTC ROS. Observer Providers shall: • Ensure that briefing is conducted prior to deployment and that debriefing is conducted as soon as possible within a pre-agreed timeframe following the end of each observer trip, after the observer leaves the vessel. • Ensure that rigorous briefing/de-briefing is carried out, covering observer data and reports as well as health and wellbeing. • Ensure that briefing and debriefing is conducted by a person that has at-sea experience as an observer (preferably with the relevant gear type), understands how observer data is used by scientific personnel, recognises common errors made by observers and presents strong interpersonal communication skills. • Where possible, allow briefers/debriefers to undertake training programmes designed to educate them in the techniques of interviewing observers and of debriefing observer collected information and material.
Item Description	**Standard Required**
Equipment and materials Includes all essential items that observers will require to meet their	CPCs shall ensure that Observers are provided with appropriate equipment, including safety equipment to carry out their duties on board a vessel in a competent and safe manner.

vessel and to carry out their duties on board a vessel in a competent and safe manner.	**ROS expectation on the equipment and materials of Observers**
	Observers will not board vessels until they have been fully equipped. The Observer Provider will be responsible for ensuring that equipment issued is in appropriate working order, the observer shall ensure equipment issued is well maintained and report all loss, failures or breakages of gear. A standard checklist of Equipment and Materials to be provided to observers, appropriate for the gear and climate, is detailed under the Guidelines for IOTC ROS.
Item Description Manuals and data collection forms Manual is defined as publications that serve to provide observers with information to assist with the roles and duties they are expected to carry out, including instruction on the filling of data collection forms, prescribed data formats, units and codes. Data collection forms are paper and/or electronic forms that an observer will be required to complete while carrying out its duties.	**Standard Required** CPCs may have and use their respective Observer Manual/ Guidelines/ Data collection forms. CPC data collection forms must include *inter alia* minimum data field requirements as adopted by the Commission. CPCs may use the Observer Manual/ Guidelines/ Data collection forms developed by the Scientific Committee* and adopted by the Commission.
	ROS expectation on manuals and data collection forms
	Observer Manuals may include a number of publications or formats that an observer will use for guidance when carrying out duties on an observer trip. Manuals will be relevant to, and will contain Commission current requirements and information for the use by the observers of CPCs national and regional programmes. Manuals should include observer operations guides, species ID guides, gear type & electronic guides, guides on reporting and handling species of special interest. Guidelines on collecting, security and handling of data collected by the observer including, biological samples, tag collection, photo, videos, digital images and any other form of data collection. General operational guides and data collection guidelines *Note: [Standard] Observer Manual/ Guidelines/ Data collection forms developed by the Scientific Committee are available in electronic format on the IOTC Website (http://www.iotc.org/science/regional-observer-scheme-science).
Item Description IOTC CMMs IOTC Secretariat publishes a "Compendium of active CMMs for the IOTC", available in electronic format on the IOTC Website (http://www.iotc.org/cmms). The	**Standard Required** Observer Providers shall ensure that observers fully understand the content of IOTC CMMs of relevance to the observer scheme, especially in relation to their roles and tasks in data collection and reporting.
	ROS expectation on IOTC CMMs

compendium is updated annually and is to be given to observers before deployment.	Observer providers will develop a mechanism to keep observers informed about IOTC CMMs of relevance to the ROS and corresponding requirements. This mechanism should include *inter alia*: • The issue of an updated compendium of IOTC CMMs to all observers on an annual basis. • The conducting of refresher training to routinely inform observers of amendments to CMMs[30]. • The inclusion of new amendments to CMMs to observer briefing/debriefing to ensure that observers fully understand their content especially in relation to their roles and tasks in monitoring the CMMs under the ROS. • *The allocation of a current copy of IOTC CMMs to observers before their deployment.*
Item Description Observer communications Access and routine use of devices to contact the Observer Provider as well as training in the use of these communications devices and equipment.	**Standard Required** CPCs will ensure that Observer Providers have a schedule for observers to routinely communicate any required information appropriately while deployed and that Observer Providers will train observers in the use of communications devices. **ROS expectation on observer communications** Observer Providers shall: • Establish a routine communication protocol with deployed observers including, but not restricted to, receiving observer deployment [embarkation] and weekly status reports; • Ensure that observers are familiar with reporting protocols before boarding a vessel; • Inform the vessel that they must allow the observer to have access to communications and should assist when required; • Ensure access to approved two-way communication devices and train observers in their use. [Potentially prohibitively costly; for discussion by WPDCS]
Item Description Safety-at-sea Procedures established to guarantee that observers are deployed on safe/seaworthy vessels, and that at-sea observer emergencies and reports on issues of safety (including instances of harassment, intimidation, or	**Standard Required** CPCs will ensure that all programmes have a Vessel safety check form containing a list of minimum safety requirements in line with those of the Commission (see Guidelines for the IOTC ROS). CPCs will ensure that an "Emergency Action Plan" (EAP) is in place to accommodate any reported observer emergency and that it is included in any MoU established for the deployment of observers in the context of the IOTC ROS. IOTC ROS OM v1.2.

[30] i.e. CMMs full texts or extracts of CMMs that can be of interest to the observer work.

assault) are immediately and effectively handled.	**ROS expectation on Safety-at-sea**
	Vessel Safety Check (VSC) is conducted before each boarding and vessel safety conditions surveyed against the list of minimum safety requirements. A VSC form is filled out by observer/observer provider to ensure that vessel safety conditions meet minimum safety requirements and that there is adequate safety equipment to cater for the extra observer on board. Observers have the right to refuse the boarding if the VSC highlights that the vessel does not comply with expected standards or if they consider a particular vessel to be un-safe. An EAP is in place to accommodate any reported observer emergency and it's explained to observers and fully understood before observers depart on their trip. The EAP includes, as a minimum, the following agreed safety-at-sea standard procedures, detailed under Guidelines for IOTC-ROS. • **Communications protocol and appropriate contact information:** A communications protocol is established; designated personnel are assigned responsibility for maintaining a device capable of receiving a signal from the independent two-way satellite communication devices allocated to deployed observers. • **Follow up responses:** A procedure to initiate contact with the observer, the vessel, and, if necessary, the appropriate enforcement authority of Flag CPC and relevant Coastal CPC's is established. • **Remedial action:** Appropriated procedures for addressing issues related to the safety of observers including violations against observers are established. These must include clear actions that must be taken in the event of various emergencies • **Completing the EAP protocols:** Appropriated measures for addressing violations made against observers are established. Incidents involving observer reporting of Interference Harassment, Intimidation must be resolved through a legal or nationally recognized procedure. • **Reporting to the IOTC:** A procedure to report on incidents involving observers to the Secretariat is established.
Item Description Insurance and Liability Observer health, safety and liability insurance.	**Standard Required**
	CPCs will ensure that Observer Providers make available to observers health, safety and liability insurance before observers embark on an ROS observer trip.
	ROS expectation on Insurance and Liability for observers
	Observer Providers will have in place a system to ensure that: • National or regional health and safety insurance is available

	for all observers. • Observers are insured at all times during their employment. This includes insurance onboard a vessel, travel to and from the vessel, and other areas of observer employment i.e. "waiting time" etc. • Observers have regular health checks, covered by the provider, to confirm they are fit to carry out work on a vessel that could be at sea for long periods. By arrangement, observers may be included as part of the vessel crew list in order to benefit from vessel P&I insurance cover while on-board, under the following conditions: • Holder of a valid Certificate of Medical Fitness (STCW); • Holder of an in-date Certificate for Survival Techniques and Occupational Health and Safety at Sea (STCW); Nonetheless the observer programme will still need to provide for observer insurance when traveling to and from the vessel, "waiting time" etc.
Item Description Dispute settlement Dispute occurs when two or more parties disagree over matters involving the roles and tasks of the observer, operations of the vessel, or any other issue involving the observer and a second party onboard the vessel. Dispute settlement is conducted via the implementation of procedures to prevent the escalation of conflict, through mediation, facilitation, conciliation, and training. Disputes resolution may require the appointment of an appropriately-composed expert or technical panel.	**Standard Required** CPCs will ensure that there will be a dispute resolution mechanism in place for resolving conflicts at-sea, and if not, one will be developed. **ROS expectation on Dispute Settlements** The programme will have in place the following: • procedures for timely reporting of report disputes for both the observer and the vessel; • mechanisms to enable the process to start as soon as possible following the event, e.g., this should take place remotely if they are at sea; • consultations process allowing all parties to make statements; • process to determine a resolution of the problem through mediation, facilitation and conciliation; • process to appoint an independent expert or technical panel if required to resolve the dispute.
Item Data fields Minimum data fields for reporting approved by the IOTC.	**Standard Required** CPCs will ensure that the IOTC ROS minimum data fields for reporting are collected submitted to the Secretariat. IOTC Res 11/04 and IOTC ROS Observer Manual v.1.2 **ROS expectation on data fields** Programmes may continue to use their own data collection forms as long as they include IOTC ROS minimum data reporting fields required by the Commission. Observers will report ROS minimum data reporting fields using IOTC standard codes.

	*Note: [Standard] Standard data collection fields and forms developed by the Scientific Committee available in electronic format on the IOTC Website can be used as a supporting tool (http://www.iotc.org/science/regional-observer-scheme-science),
Item Description Data management, processing and reporting and quality control Data management, processing, and reporting and quality control requirements approved by the IOTC.	**Standard Required** CPCs shall ensure that: 1. Data will be checked for inconsistencies, quality and accuracy prior to reporting to the IOTC Secretariat. 2. Data will be submitted in an agreed electronic data reporting format to the IOTC Secretariat, using IOTC standard codes and units. 3. Data will be submitted to the IOTC Secretariat according to the time frame specified in Resolution 11/04, or any superseding Resolution. 4. Data will also be submitted to the authorities of the Coastal States of the EEZs in which the vessel fished according to the time frame specified in Resolution 11/04, or any superseding Resolution. 5. Data confidentiality requirements outlined in Resolution 12/02, *Data Confidentiality Policy and Procedures*, shall apply to all ROS data. IOTC Res 11/04; IOTC ROS Observer Manual v.1.2; IOTC Res 16/04. IOTC 12/02]
	ROS expectation on data management, processing, reporting and quality control
	Minimum standard data approved by the IOTC for collection on ROS trips will be submitted to the Secretariat according to the time frame specified in Resolution 11/04, or any superseding Resolution. Data will be reported to the IOTC Secretariat in a standardised electronic format, i.e., using: i. IOTC ROS National Databases, to automatically submit data marked as *"mandatory for reporting"* for ROS data collected through the IOTC electronic data collection and management interface (for CPCs adopting the IOTC ROS electronic tools); ii. An IOTC-endorsed reporting format (either XLS or CSV based) currently under standardisation[31] Flag CPCs and respective authorised Observer Providers should cooperate to ensure timely access to ROS data and provision of

[31] *The IOTC Secretariat is developing – in collaboration with the involved national institutions – the required automated exchange mechanisms for all CPCs with well-established observer data collection framework and systems already in place (e.g. ObServe / SWIOFP) in order to minimize the effort required to submit ROS information that is already collected and managed in a standardized way.*

	the ROS data to the Secretariat and the Coastal State authorities in which fishing has occurred.

Note that these guidelines are not binding. Suggested guidelines are to be used by CPCs as a guide when developing or improving NOSs / SOSs.

A. IOTC minimum pre-requisites for the registration of Observes under the IOTC ROS:

1. Minimum age of 21 years
2. Physically capable of carrying out observer duties attested by a valid Certificate of Medical Fitness (STCW or equivalent) issued by an authorised medical practitioner.
3. Clear police record. History of strong socially acceptable ethical standards in the areas of honesty and public behaviour.
4. Evidence of proficiency in literacy and numeric competency in the languages of the national project (holder of a Secondary School Certificate or equivalent)
5. Valid passport
6. Valid STCW Basic Safety Training Certificate (or equivalent)
7. Certificate of successful completion of a Basic Observer Training Course based on IOTC training guidelines and curriculum.
8. Acceptance of the code of conduct.

B. Observer trainer minimum standards

Trainer skills, qualifications and experience should meet agreed minimum regional standards, as follows.

1. Skills
   - able to communicate training messages in clear and straight forward manner
   - capacity to communicate in the language of the students
   - technical expertise in their area of training high personal credibility and integrity
2. Qualifications
   - a good understanding of the fishery and the management of that fishery,
   - level of education similar or higher than the level of education required to access training (i.e. secondary school certificate)
   - it is desirable that the trainer has a vocational training qualification
3. Desirable experience

   Observer Trainers that have experienced conditions at sea as an observer, have a good understanding of the fishery, have undergone a series of training programmes designed to educate persons in the training of observers or Trainers with an extended experience in the training of observers and debriefing should be given preference.

C. Basic observer training curriculum

Three different font colours were used to differentiate training modules and curriculum already approved by the Commission and its SC (**in black**), from training modules and/or curriculum proposed for consideration (**in grey**). **In pink,** modules and/or curricula to be considered for removal from current BOT curricula.

1. Safety			
Module	**Curriculum**	**Assessment criteria**	
1.1. Personal Safety and Social Responsibilities (STCWcompliant or equivalent); **COMPULSORY** IOTC ROS OM v1.2, page 140.	1.1.1. Comply with Emergency Procedures	– The incidents that may result in an emergency are listed. – Typical emergency response on fishing vessels is described. – The information available on a vessel muster list is stated. – The emergency muster and abandon ship signals are stated and the actions to be taken explained. – The correct use of personal safety equipment is explained. – The value of regular and meaningful on board emergency training is discussed. – The initial safety actions that should be taken on joining a new vessel are listed – The meaning of basic IMO safety symbols is stated.	
	1.1.2. Knowledge and observation of safe working practices	– The importance of following safe work practices at all times is discussed. – Potential hazards associated with the vessel working environment are identified. – The need for personal protective clothing is understood. – The proper use of safety equipment for the protection of hearing, head, hands, feet, eyes and respiratory system is described. – The content and purpose of material safety data sheets is outlined. – Precautions and procedures required for entering enclosed spaces on a vessel are described.	
	1.1.3. Contribute to effective human relationships on board ship	– The importance of maintaining good human and working relationships aboard ship is discussed. – Social responsibilities on board ship are listed. – Individual rights and obligations with respect to the vessel work place are discussed. – The dangers associated with drug and alcohol abuse at sea are described. – The basic principles for conflict resolution are understood.	
	1.1.4. Contribute to effective communications on	– The principles of, and barriers to, effective communication between individuals and teams within the ship is discussed.	

	board ship	– The importance of the team effect onboard; the adverse effect poor human relations can have on shipboard safety and efficiency is explained.	
	1.1.5. Understand and take necessary actions to control fatigue	– Effects of tiredness and extended periods of work are identified and options to mitigate sleep shortage are proposed.	
	1.1.6. Take precautions prevent pollution to marine environment	– The effects and impacts of operational or accidental pollution to the marine environment are explained. – Basic procedures to prevent pollution are described. – Regulations that cover pollution (MARPOL etc.) are discussed.	
1.2. Personal Survival Techniques (STCW compliant or equivalent) **COMPULSORY FOR ALL GEARS** IOTC ROS OM v1.2, page 141.	1.2.1. Emergency Situations	– The incidents that may result in an emergency are listed. – The emergency muster and abandon ship signals are stated and the actions to be taken explained. – The importance of water tight doors and escape routes explained. – The value of regular and meaningful on board emergency training is discussed.	
	1.2.2. Basic emergency actions	– Able to explain and describe (with diagrams if applicable) or practically demonstrate a knowledge of the procedures to be followed by the crew of a vessel in a man overboard situation. – Able to explain and describe and/or practically demonstrate a knowledge of o The characteristics of a life jacket o Correct stowage of a lifejacket o The correct method of putting on a life jacket and how to enter the water wearing a life jacket – Able to explain and describe and/or practically demonstrate a knowledge of: o The characteristics of a life buoy o Correct stowage of a life buoy o Buoyant line and self-igniting light that can be attached to a life buoy o The correct use of a life buoy in an emergency – Able to explain and describe and/or practically demonstrate a knowledge of: o The characteristics of an immersion suite o Correct stowage of an immersion suite o The correct method of putting on an immersion suite and how to care and store immersion suite	
	1.2.3. Abandon ship and sea	– Able to explain and describe and/or practically demonstrate a knowledge	

	survival techniques	of ○ The important parts of a life raft ○ Correct stowage of a life raft ○ The workings of a hydrostatic release unit – Able to explain and describe and/or practically demonstrate a knowledge of ○ Crew preparations to abandon the boat ○ The procedures to launch a life raft ○ The procedures to board a life raft ○ The procedures to right a life raft – Able to explain and describe and/or practically demonstrate a knowledge of the procedures that should be adopted in ○ Rescuing someone with the use of the rescue quoit ○ First entering the life raft ○ Enhancing survival in the life raft ○ Main dangers to cope with in sea survival are listed – Able to explain and describe and/or practically demonstrate a knowledge of ○ What hypothermia is and its symptoms ○ How to protect against hypothermia ○ How to treat hypothermia ○ Minimising loss of body heat in the water – Explain and describe and/or demonstrate how to ○ Correct use of 3 common pyrotechnics ○ Identify the correct pyrotechnic for use according to the situation described – Able to explain and describe eight internationally recognised distress signals (to include at least one from each group – sight, sound, pyrotechnics, radio)	
	1.2.4. Emergency Radio Equipment	– Able to explain and describe basic principles of 121.5 and 406 EPIRBs – Practically demonstrate how to correctly operate 121.5 and 406 EPIRBs – Identify the actions required when an EPIRB is activated accidentally – Practically demonstrate how to correctly operate a radio VHF and HF and send a distress message.	

1.3. Observer Health and Safety practices onboard a vessel **COMPULSORY FOR ALL GEARS** Covers for Module: "Observer Health & Safety practices (In-house training) - *Supports formal certified survival training*". IOTC ROS OM v1.2, page 141.	1.3.1. Health issues that can be experienced onboard and personal first aid	– Procedures and practices to maintain work and personal hygiene at all times are explained. – Effects of tiredness and extended periods of work are identified and options to mitigate sleep shortage are proposed. – Challenges in cultural interactions in the work place are identified and strategies to mitigate are proposed. – Basic health issues that can be experienced onboard are identified and solutions proposed.	
	1.3.2. Safe working practices onboard a vessel engaged in active fishing.	– The importance of following safe work practices at all times is discussed. – Potential hazards associated with a vessel engaged in active fishing are identified. – The need for personal protective clothing is understood and tits proper use for the protection of hearing, head, hands, feet, eyes and respiratory system is described. – Precautions and procedures required for entering enclosed spaces on a vessel are described. – The need for the use of safety gear when working on deck is described and the gear detailed. – The importance of having a working knowledge of the safety equipment found onboard a vessel is explained.	
	1.3.3. Safety protocols (including pre-safety inspections and at-sea transfers), emergency communication and contact information;	– The importance and procedure to undertake a pre-sea safety inspections and vessel safety tour is explained. – The importance of regular communications is understood and procedures to follow in case of an emergency communication are expounded. – Procedures to follow and potential dangers that may be encountered during personnel transfers from one vessel to another are described.	
2. Electronics			
Module	**Curriculum**	**Assessment criteria**	
2.1. Basic notions on navigation, navigation equipment and electronic fishing aids	2.1.1. Navigation and positioning (including latitude/longitude; course and speed)	– Use and understand latitude and longitude to correctly plot a position on a chart – Position is obtained from a GPS or chart plotter and transferred to a chart correctly. – Vessel heading is obtained from a GPS, chart plotter or compass (gyro or magnetic) and transferred correctly on to a chart using the compass rose and a parallel ruler	

COMPULSORY FOR ALL GEARS Covers for Module: "Navigation and navigational aids". IOTC ROS OM v1.2, page 142.		– Distinguish between True and Magnetic North with reference to the heading of the vessel provided by different navigational aids. – Use information provided to calculate a future position, estimated distance and time of arrival (ETA)	
	2.1.2. Electronic navigation equipment usage and limitations (GPS; plotters; echo-sounders and sonar)	– Identify the functions of, and principal information provided by: GPS; chart plotter; gyro compass; magnetic compass; – Understands the dangers associated with misinterpreting information obtained from navigational aids.	
	2.1.3. Principal functions of electronic fishing aids and the information they provide.	– Identify the functions of, and principal information provided by: sonar; echo sounder; net depth instruments; Doppler current meter; bird radar; SST meter; GPS buoys; echo sounding buoys; radio beacon buoys; and XBT (Bathythermograph)	
2.2. Parameters of meteorology and oceanography relevant to scientific fisheries observers. **COMPULSORY FOR ALL GEARS** Covers for Module: "Oceanography and Meteorology". IOTC ROS OM v1.2, page 142.	2.2.1. Understanding and recording: 1) wind speed & direction, 2) the Beaufort scale, 3) sea state (height & direction), 4) sea waves vs. swell and 5) sea surface temperature.	– Correctly identifies electronic fishing aid(s) used to obtain current direction and speed; – Correctly records current direction and speed using the right units (cardinal units or degrees / knots). – Identifies electronic fishing aid(s) used to obtain SST and records SST correctly. – Able to explain the difference between sea waves and swell. – Correctly identifies and records sea and swell height and direction using the right units (meters / cardinal units or degrees). – Identifies equipment used to obtain wind direction and speed; – Correctly identifies and records wind speed and direction using the right units (cardinal units or degrees / knots). – Correctly describe sea state, using the Beaufort wind scale to estimate wind speed.	
	2.2.2. Provide instruction on basic oceanography of the Indian Ocean region covering currents, sea surface temperatures (SST) and regional up-welling.	N/A	

2.3. Radio communication protocols (VHF, HF & Inmarsat) **COMPULSORY FOR ALL GEARS** Covers for Module: "Communication and reports". IOTC ROS OM v1.2, page 142.	2.3.1. Equipment communication and use (VHF, HF & Inmarsat)	– Identify the different communication equipment that can be present on a fishing vessel and its usage: Satellite phone, MF/HF transmitters, VHF transmitters, NAVTEX, Inmarsat.	
	2.3.2. Setting up a radio telephone to transmit and receive (VHF, HF & Inmarsat)	– Identify the emergency frequencies to be used with VHF, MF and HF radios.	
	2.3.3. Emergency messages (distress, urgency and safety messages)	– Explain how to set up and adjust a VHF radio to transmit and receive an emergency message.	
3. Management			
Module	**Curriculum**	**Assessment criteria**	
3.1. Basic concepts of fisheries management **COMPULSORY FOR ALL GEARS**	3.1.1. Basic concepts of fisheries management including target species; bycatch species; non-target species, retained catch, discarded catch and overfishing	– The following terminology used to classify fishing catch is explained: target species; bycatch species; non-target species, retained catch and discarded catch – The impacts of overfishing on target species are summarised – The impacts of overfishing on bycatch species are summarised	
3.2. IOTC convention and CMMs relevant to scientific observers **COMPULSORY FOR ALL GEARS** Covers for "(…) Observers are required to: Have satisfactory knowledge of the IOTC CMMs"; IOTC ROS OM v1.2, page 39, Para. 2.	3.2.1. IOTC organisational structure, function and responsibilities	– Understand IOTC organisational structure, functions responsibilities and process for the establishment and implementation of Resolutions. – IOTC role is discussed with reference to the regional fisheries scheme.	
	3.2.2. IOTC CMMs relevant to scientific observers including ✓ recommended mitigation measures ✓ recommended good practices	– Be aware of Commission Conservation and Management Measures relevant to the work of scientific observers. – Demonstrate knowledge of Commission recommended mitigation measures to reduce the fishing impact on protected, endangered or threatened (PET), species that include seabirds, cetaceans, turtles and protected shark species. – Be aware of IOTC best practices for handling and safe release of non-target marine fauna (seabirds, marine mammals, turtles, sharks).	

3.3. Role of fisheries observer programs in fisheries management **COMPULSORY FOR ALL GEARS** Covers for Modules: "The role of the Observer" and "Observer protocols", IOTC ROS OM v1.2, page 141.	3.3.1. Regarding high seas transhipments, conservation management measures, the regional register of vessels, and the terms and conditions of access agreements;	– Role of the fisheries observer is explained regarding high seas transhipments, conservation management measures and the regional register of vessels.	
	3.3.2. The objectives of different categories of observers. *(Scientific-data collection / Compliance – monitoring / Fisheries –data collection + monitoring)*	– Observer categories are detailed and respective objectives explained.	
4. Vessel Operations			
Module	**Curriculum**	**Assessment criteria**	
4.1. Pelagic longline **COMPULSORY FOR LL TRAINING** Covers for Modules: "Ship layout and terminology", "Fishing methods, gear and related equipment", and "Monitoring interactions of fishing gear with non-target marine fauna". IOTC ROS OM v1.2, page 141.	4.1.1. Vessel Identification and Characteristics ✓ Nautical terminology ✓ Vessel structure ✓ Vessel identification and markings ✓ Working and observation areas ✓ Key personnel	– Understand basic nautical terminology and demonstrate knowledge of basic vessel structure. – Identify a vessel (from a photo or draw) using its marking (name, port of registration, registration number, call sign) – Demonstrate working knowledge of the structure of a pelagic longliner and possible different configurations. – Recognise (from photos or draws) working and observation areas on pelagic longliners with different configurations. – Detail rank and function of officers and crew of key importance to observer work.	
	4.1.2. Fishing gear and related equipment, design and specifications	– Be acquainted with the different components of a pelagic longline. – Able to identify distinct longline systems based on mainline storage method. – Recognise (from photos or draws) fishing apparats used on a longliner.	
	4.1.3. Fishing operations	– Knowledge of general procedures in longline fishing operations (setting, hauling, processing).	

	4.1.4. Fisheries impacts and inter-actions ✓ Species of special interest that interact with the fisheries ✓ Depredation ✓ By-catch mitigation methods ✓ Code of good practice for the release of PETS	– Understand the impact of longline fishing on PET species and understand how different recommended mitigation measures are deployed to prevent un-wanted by-catch. – Be aware of inter-actions such as depredation and capable of identifying depredatory species by the type of mark left on target species. – Detail IOTC best practices for the handling and safe release of seabirds and marine turtles.	
4.2. Tuna purse-seine **COMPULSORY FOR PS TRAINING** Covers for Modules: "Ship layout and terminology", "Fishing methods, gear and related equipment", and "Monitoring interactions of fishing gear with non-target marine fauna". IOTC ROS OM v1.2, page 141.	4.2.1. Vessel Identification and Characteristics ✓ Key personnel ✓ Nautical terms ✓ Vessel structure ✓ Vessel identification and markings	– Understand basic nautical terminology and demonstrate knowledge of basic vessel structure. – Identify a vessel (from a photo or draw) using its marking (name, port of registration, registration number, call sign) – Demonstrate working knowledge of the structure of a tuna purse-seiner. – Recognise (from photos or draws) working and observation areas on tuna purse-seiners with different configurations. – Detail rank and function of officers and crew of key importance to observer work.	
	4.2.2. Fishing gear, design and specifications	– Be acquainted with the different components of the tuna purse-seine gear. – Able to identify distinct processing and storing methods used by tuna purse-seiners. – Recognise (from photos or draws) vessels and fishing apparats used by tuna purse-seiners.	
	4.2.3. Fish aggregating devices (FADs) ✓ drifting vs anchored FADs ✓ ecological vs non-ecological FADs	– Explain the difference between anchored and drifting FADs – Understand IOTC FAD definition and able to name at least 1 artificial (man-made) FAD and 3 natural floating objects. – Capable of distinguishing the different components of a man-made FAD and naming materials used in the construction of ecological FADs. – Able to explain the reasons for the usage of artificial FADs	
	4.2.4. Fishing operations	– Detail search and detection operations conducted by tuna purse-seiners (direct and indirect). – Knowledge of general procedures in purse-seine fishing operations (setting, circling, pursing, hauling, brailling and shifting).	

	4.2.5. Fisheries impacts and inter-actions ✓ Species of special interest that interact with the fisheries ✓ The FAD "problem" ✓ By-catch mitigation ✓ methods ✓ Code of good practice for the release of PETS	– Understand the impact of tuna purse-seine fishing on PET species, particularly the impact of FADs. – Be aware of recommended best practices to minimize or prevent un-wanted by-catch and/or by-catch mortality. – Detail IOTC best practices for the handling and safe release of marine turtles.	
4.3. Pole and line **COMPULSORY FOR P&L TRAINING** Covers for Modules: "Ship layout and terminology", "Fishing methods, gear and related equipment", and "Monitoring interactions of fishing gear with non-target marine fauna". IOTC ROS OM v1.2, page 141.	4.3.1. Vessel Identification and Characteristics ✓ Key personnel ✓ Nautical terms ✓ Vessel structure ✓ Vessel identification and markings	– Understand basic nautical terminology and demonstrate knowledge of basic vessel structure. – Identify a vessel (from a photo or draw) using its marking (name, port of registration, registration number, call sign) – Demonstrate working knowledge of the structure of a pole and line vessel. – Recognise (from photos or draws) working and observation areas on a pole and line vessel. – Detail rank and function of officers and crew of key importance to observer work.	
	4.3.2. Fishing gear, design and specifications	– Be acquainted with the different components of the pole and line gear for tuna and bait fishing (if any). – Able to identify distinct processing and storing methods used. – Recognise (from photos or draws) fishing apparats used.	
	4.3.3. Fish aggregating devices (FADs) ✓ drifting vs anchored FADs ✓ ecological vs non-ecological FADs	– Explain the difference between anchored and drifting FADs – Understand IOTC FAD definition and able to name at least 1 artificial (man-made) FAD and 3 natural floating objects. – Capable of distinguishing the different components of a man-made FAD and naming materials used in the construction of ecological FADs. – Able to explain the reasons for the usage of FADs	
	4.3.4. Fishing operations including bait-fishing	– Detail search and detection operations conducted by pole and line vessels (direct and indirect). – Knowledge of procedures in pole and line bait fishing operations (setting, circling, pursing, hauling and brailling). – Knowledge of procedures in pole and line tuna fishing operations (chumming, fishing, processing).	

	4.3.5. Fisheries impacts and inter-actions ✓ Species of special interest that interact with the fisheries ✓ Bait fishing bycatch ✓ By-catch mitigation methods ✓ Code of good practice for the release of PETS	– Understand the impact of pole and line bait and tuna fishing on PET species, particularly the impact of FADs. – Be aware of recommended best practices to minimize or prevent un-wanted by-catch and/or by-catch mortality. – Detail IOTC best practices for the handling and safe release of marine turtles.	
4.4. Gillnet **COMPULSORY FOR GN TRAINING** Covers for Modules: "Ship layout and terminology", "Fishing methods, gear and related equipment", and "Monitoring interactions of fishing gear with non-target marine fauna". IOTC ROS OM v1.2, page 141.	4.4.1. Vessel Identification and Characteristics ✓ Key personnel ✓ Nautical terms ✓ Vessel structure ✓ Vessel identification and markings	– Understand basic nautical terminology and demonstrate knowledge of basic vessel structure. – Identify a vessel (from a photo or draw) using its marking (name, port of registration, registration number, call sign) – Demonstrate working knowledge of the structure of an industrial pelagic gillnet vessel. – Recognise (from photos or draws) working and observation areas on an industrial gillnet vessel. – Detail rank and function of officers and crew of key importance to observer work.	
	4.4.2. Fishing gear, design and specifications	– Be acquainted with the different components and characteristics of the pelagic industrial gillnet gear (set, trammel and drift nets). – Recognise (from photos or draws) fishing apparats used.	
	4.4.3. Fishing operations	– Knowledge of procedures with the industrial pelagic gillnet fishing operations (setting and hauling). – Able to identify distinct processing and storing methods used.	
	4.4.4. Fisheries impacts and inter-actions ✓ Species of special interest that interact with the fisheries ✓ PETS bycatch and mortality ✓ By-catch mitigation methods ✓ Code of good practice for the release of PETS	– Understand the impact of industrial pelagic gillnet fishing on PET species. – Be aware of recommended mitigation measures to minimize or prevent un-wanted by-catch and/or by-catch mortality. – Detail IOTC best practices for the handling and safe release of sea-birds, marine turtles, marine mammals and sharks.	

5. Species Identification			
Module	**Curriculum**	**Assessment criteria**	
5.1. Nomenclature and anatomical features **COMPULSORY FOR ALL GEARS** Covers for Modules: "Species identification", "Sea Bird, Marine Mammal and Turtle identification and sampling strategies"; "Shark identification and sampling strategies". IOTC ROS OM v1.2, page 141-142.	5.1.1. Nomenclature for recording family, genus and species	– Understand the need of using nomenclature for recording family, genus and species and the danger of incorrect identification from using common names.	
	5.1.2. Identify the anatomical and diagnostic features of ✓ Bony fish ✓ Cartilaginous fish (sharks and rays)	– Identify the anatomical differences between bony and cartilaginous fish. – Detail the basic external anatomical diagnostic features of bony fish used for species identification – Detail the basic external anatomical diagnostic features of cartilaginous fish (sharks and rays) used for species identification	
	5.1.3. Identify PETs diagnostic features: ✓ Seabirds ✓ Sea mammals ✓ Marine turtles	– Detail the basic external anatomical diagnostic features used for the identification of marine turtles, seabirds and marine mammal species	
5.2. Identify target and bycatch species encountered in the longline fishery using diagnostic features **COMPULSORY FOR LL FISHERY** Covers for Modules: "Species identification", "Sea Bird, Marine Mammal and Turtle identification and sampling strategies"; "Shark identification and sampling strategies" and "Fishing methods, gear and related equipment (para. 2)". IOTC ROS OM v1.2, page 141-142.	5.2.1. Identify main IO adult tropical and neritic tuna species	– Adult tropical and neritic tuna species are recognized by means of their diagnostic anatomical features	
	5.2.2. Identify IO billfish species	– Billfish species are recognized by means of their diagnostic anatomical features	
	5.2.3. Identify most prevalent IO shark species	– IO shark species encountered in longline fishery are recognized by means of their diagnostic anatomical features	
	5.2.4. Identify most prevalent by-catch species	– The fish bycatch species encountered in longline fisheries are recognized by means of their diagnostic anatomical features	
	5.2.5. Use identification guides to correctly identify fish and PET species	– Demonstrate use of the species identification guides to correctly identify fish and PET species, common name, scientific name, and FAO Species Code	

5.3. Identify target and bycatch species encountered in the purse-seine fishery using diagnostic features **COMPULSORY FOR PS FISHERY** Covers for Modules: "Species identification", "Sea Bird, Marine Mammal and Turtle identification and sampling strategies"; "Shark identification and sampling strategies" and "Fishing methods, gear and related equipment (para. 2)". IOTC ROS OM v1.2, page 141-142.	5.3.1. Identify main IO adult tropical and neritic tuna species	– Adult tropical and neritic tuna species are recognized by means of their diagnostic anatomical features	
	5.3.2. Identify main IO juvenile tropical tuna species	– Juvenile yellowfin and bigeye tuna species are recognized by means of their diagnostic anatomical features (external and internal)	
	5.3.3. Identify IO billfish species	– Billfish species are recognized by means of their diagnostic anatomical features	
	5.3.4. Identify most prevalent IO shark species	– IO shark species encountered in tuna purse-seine fishery are recognized by means of their diagnostic anatomical features	
	5.3.5. Identify most prevalent by-catch species	– The fish bycatch species encountered in tuna purse-seine fisheries are recognized by means of their diagnostic anatomical features	
	5.3.6. Use identification guides to correctly identify fish and PET species	– Demonstrate use of the species identification guides to correctly identify fish and PET species, common name, scientific name, and FAO Species Code	
5.4. Identify target and bycatch species encountered in the pole & line fishery using diagnostic features **COMPULSORY FOR P&L FISHERY** Covers for Modules: "Species identification", "Sea Bird, Marine Mammal and Turtle identification and sampling strategies"; "Shark identification and sampling strategies" and "Fishing methods, gear and	5.4.1. Identify main IO adult tropical and neritic tuna species	– Adult tropical and neritic tuna species are recognized by means of their diagnostic anatomical features	
	5.4.2. Identify main IO juvenile tropical tuna species	– Juvenile yellowfin and bigeye tuna species are recognized by means of their diagnostic anatomical features (external and internal)	
	5.4.3. Identify IO billfish species	– Billfish species are recognized by means of their diagnostic anatomical features	
	5.4.4. Identify most prevalent IO shark species	– IO shark species encountered in pole and line fishery are recognized by means of their diagnostic anatomical features	
	5.4.5. Identify most prevalent by-catch species	– The fish bycatch species encountered in pole and line fisheries are recognized by means of their diagnostic anatomical features. – The bait fish species encountered in pole and line fisheries are recognized by means of their diagnostic anatomical features	

related equipment (para. 2)". IOTC ROS OM v1.2, page 141-142.	5.4.6. Use identification guides to correctly identify fish and PET species	– Demonstrate use of the species identification guides to correctly identify fish and PET species, common name, scientific name, and FAO Species Code	
5.5. Identify shark and bycatch species encountered in the gillnet fishery using diagnostic features **COMPULSORY FOR GN FISHERY** Covers for Modules: "Species identification", "Sea Bird, Marine Mammal and Turtle identification and sampling strategies"; "Shark identification and sampling strategies" and "Fishing methods, gear and related equipment (para. 2)". IOTC ROS OM v1.2, page 141-142.	5.5.1. Identify main IO adult tropical and neritic tuna species	– Adult tropical and neritic tuna species are recognized by means of their diagnostic anatomical features	
	5.5.2. Identify main IO juvenile tropical tuna species	– Juvenile yellowfin and bigeye tuna species are recognized by means of their diagnostic anatomical features (external and internal)	
	5.5.3. Identify IO billfish species	– Billfish species are recognized by means of their diagnostic anatomical features	
	5.5.4. Identify most prevalent IO shark species	– Main IO shark species encountered in gillnet fishery are recognized by means of their diagnostic anatomical features	
	5.5.5. Identify most prevalent by-catch species	– The main fish bycatch species encountered in gillnet fisheries are recognized by means of their diagnostic anatomical features	
	5.5.6. Use identification guides to correctly identify fish and PET species	– Demonstrate use of the species identification guides to correctly identify fish and PET species, common name, scientific name, and FAO Species Code	
6. Observer Work			
Module	**Curriculum**	**Assessment criteria**	
6.1. The Observer **COMPULSORY** Covers for Modules: "Conduct on board" and "Cultural awareness",	6.1.1. Observer duties, code of conduct and status	– Outlines the importance of maintain professional integrity, being impartial and following approved standard Code of Conduct, as detailed in IOTC ROS OM v1.2. – Description includes the status and duties of fisheries observers as provided for in IOTC Res 11/04. – Explain the importance of observer work, and the impact of collecting inadequate or falsified data.	

detailed on IOTC ROS OM v1.2, page 141. Also covers for observer duties and status as detailed under Res 11/04.	6.1.2. Procedures to follow when onboard ✓ Hierarchy ✓ Work and confidentiality ✓ Cultural awareness	– Describe protocols an observer should follow while onboard concerning hierarchy and presentation to avoid potential conflict with vessel captain and officers. – Outline the importance of respecting crew culture and customs to avoid potential conflict. – Description includes potential areas of conflict between fisheries observers and vessel owners/operators with reference to commercial sensitivity and information disclosure.	
6.2. Sampling **COMPULSORY** Covers for Modules: "Species identification", Para 4; "Observer gear, care and maintenance"; detailed on IOTC ROS OM v1.2, page 142. Also covers for ROS Observer duties, para. 10, of IOTC Res 11/04.	6.2.1. Sampling programs employed in regional Indian Ocean tuna fisheries 6.2.2. Fisheries observer roles and tasks in relation to regional sampling programs	– Demonstrate general knowledge of sampling programs in place regionally in the Indian Ocean Tuna fisheries and the roles of fisheries observers in relation to these sampling programs.	
	6.2.3. Data collection tools, units, codes and formats ✓ Use, maintenance and calibration of sampling equipment ✓ Prescribed data forms, units and codes	– Demonstrate the use, maintenance and calibration of sampling equipment; – Identify the method established by the regional observer scheme for measuring fish length and weight according to species type and anatomical features. – Accurately measure and weight fish using the method appropriate to species type – Fish length and weight measurements are recorded using the data format and codes established by the regional fisheries observer scheme.	
	6.2.4. Weights and measures ✓ Accurately measure and record species lengths and weights (tuna, billfish, sharks, rays, other fish, sea-turtles and sea-birds)		
	6.2.5. Biological sampling ✓ Collect, preserve, store and record samples ✓ Photograph / preserve a species for ID	– Explain how to collect, preserve, store and record samples – Familiar with protocols for the photographing and preservation of an individual spp. for ID. – Able to store and record samples in accordance with specified procedures.	

6.3. Longline onboard data collection and recording **COMPULSORY FOR LL GEAR** Covers for Modules: "Onboard data collection and recording. Data forms and electronic data recording"; "Sampling methodologies"; and "Monitoring effectiveness of bycatch mitigation measures"; detailed on IOTC ROS OM v1.2, page 142. Also covers for ROS Observer duties, para. 10, of IOTC Res 11/04.	6.3.1. Estimate weights, volumes and ratios ✓ total catch in set ✓ ratio of species in set ✓ amount of bycatch ✓ amount of discards ✓ catch retained on board ✓ vessel hold capacity	– Explicate the concepts of: set total catch; catch composition; bycatch; discards; and retained catch weight. – Calculate vessel hold capacity from information provided. – Correctly execute 3 exercises for the calculation of set total catch, bycatch, discards and retained catch.	
	6.3.2. Mandatory data to be collected during longline fishing 6.3.3. Data gathering processes and priorities 6.3.4. Data recording procedures	– Correctly interpret at least 2 realistic written simulations of credible longline fishing scenarios and fill in national fisheries agencies and/or IOTC form templates with a minimum verified accuracy of 75%. – Correctly use and interpret supporting guidelines, species codes and identification resources for the completion of national fisheries agencies and/or IOTC form templates. – Correctly use prescribed units and codes for the completion of national fisheries agencies and/or IOTC form templates.	
	6.3.5. Information to be gathered on interactions, the effectiveness of mitigation measures and good practices	– Recognize species of special interest and be aware of levels of vulnerability. – Familiar with species groups that are likely to interact with pelagic longline gear and with main mitigation methods and good practices for species handling and release recommended by the IOTC. – Correctly interpret and record a given simulated interaction with a species of special interest, the use and effectiveness of recommended mitigation measure.	
	6.3.6. Cross-cheeking data with entries made in vessel logbook and fulfilment of logbooks;	– Recognise the need and importance of checking consistency between observer estimated data (e.g. catches) and entries made in the vessel logbook; – Familiar with the vessel logbook contents and structure; – Describe the importance of assisting vessel officers with the correct filling of vessel logbook; – Correctly cross-check observer estimated data with logbook entries interpret and correct wrong or missing entries on a logbook given simulated logbook.	
6.4. Purse-seine onboard data collection and	6.4.1. Estimate weights, volumes and ratios	– Explicate the concepts of: set total catch; catch composition; bycatch; discards; and retained catch.	

recording **COMPULSORY FOR PS GEAR** Covers for Modules: "Onboard data collection and recording. Data forms and electronic data recording"; "Sampling methodologies" and "Monitoring effectiveness of bycatch mitigation measures"; detailed on IOTC ROS OM v1.2, page 142. Also covers for ROS Observer duties, para. 10, of IOTC Res 11/04.	✓ total catch in set ✓ ratio of species in set ✓ amount of bycatch ✓ amount of discards ✓ catch retained on board ✓ vessel hold capacity	– Explain methods to set estimate total catch weight. – Estimate total catch weight using brail volume and number. – Understand processes to estimate catch composition of an associated and of an un-associated tuna school. – Calculate vessel hold capacity from information provided. – Correctly execute 3 exercises for the calculation of set total catch, bycatch, discards and retained catch.	
	6.4.2. Data to be collected during purse-seine fishing 6.4.3. Data gathering processes and priorities 6.4.4. Data recording procedures	– Correctly interpret at least 2 realistic written simulations of credible purse-seine fishing scenarios and fill in national fisheries agencies and/or IOTC form templates with a minimum verified accuracy of 75%. o PS fishing on a free school; o PS equipped with a discharge opening at the lower deck fishing on an associated school; o PS not equipped with a discharge opening at the lower deck fishing on an associated school; o PS fishing on a free school and conducting shifting. – Correctly use and interpret supporting guidelines, species codes and identification resources for the completion of national fisheries agencies and/or IOTC form templates. – Correctly use prescribed units and codes for the completion of national fisheries agencies and/or IOTC form templates.	
	6.4.5. Information to be gathered on interactions, the effectiveness of mitigation measures and good practices	– Recognize species of special interest and be aware of levels of vulnerability. – Familiar with species groups that are likely to interact with tuna purse-seine gear and with main mitigation methods and good practices for species handling and release recommended by the IOTC. – Correctly interpret and record a given simulated interaction with a species of special interest, the use and effectiveness of recommended mitigation measure.	
	6.4.6. Cross-cheeking data with entries made in vessel logbook and fulfilment of logbooks;	– Recognise the need and importance of checking consistency between observer estimated data (e.g. catches) and entries made in the vessel logbook; – Familiar with the vessel logbook contents and structure; – Describe the importance of assisting vessel officers with the correct filling of vessel logbook; – Correctly cross-check observer estimated data with logbook entries interpret and correct wrong or missing entries on a logbook given	

		simulated logbook.	
6.5. Pole and line onboard data collection and recording **COMPULSORY FOR P&L GEAR** Covers for Modules: "Onboard data collection and recording. Data forms and electronic data recording"; "Sampling methodologies" and "Monitoring effectiveness of bycatch mitigation measures"; detailed on IOTC ROS OM v1.2, page 142. Also covers for ROS Observer duties, para. 10, of IOTC Res 11/04.	6.5.1. Estimate weights, volumes and ratios for tuna fishing ✓ total catch in set ✓ ratio of species in set ✓ amount of bycatch ✓ amount of discards ✓ catch retained on board ✓ vessel hold capacity	– Explicate the concepts of: set total catch; catch composition; bycatch; discards; and retained catch weight. – Calculate bait tanks and vessel hold capacity from information provided. – Correctly execute 3 exercises for the calculation of set total catch, bycatch, discards and retained catch.	
	6.5.2. Data to be collected during pole and line fishing 6.5.3. Data gathering processes and priorities 6.5.4. Data recording procedures	– Correctly interpret at least 2 realistic written simulations of credible pole and line fishing scenarios and fill in national fisheries agencies and/or IOTC form templates with a minimum verified accuracy of 75%. o fishing on a free school; o fishing on an associated school; o fishing for bait; – Correctly use and interpret supporting guidelines, species codes and identification resources for the completion of national fisheries agencies and/or IOTC form templates. – Correctly use prescribed units and codes for the completion of national fisheries agencies and/or IOTC form templates.	
	6.5.5. Information to be gathered on interactions, the effectiveness of mitigation measures and good practices	– Recognize species of special interest and be aware of levels of vulnerability. – Familiar with species groups that are likely to interact with pole and line gear and with main mitigation methods and good practices for species handling and release recommended by the IOTC. – Correctly interpret and record a given simulated interaction with a species of special interest, the use and effectiveness of recommended mitigation measure.	
	6.5.6. Cross-cheeking data with entries made in vessel logbook and fulfilment of logbooks	– Recognise the need and importance of checking consistency between observer estimated data (e.g. catches) and entries made in the vessel logbook; – Familiar with the vessel logbook contents and structure;	

		– Describe the importance of assisting vessel officers with the correct filling of vessel logbook; – Correctly cross-check observer estimated data with logbook entries interpret and correct wrong or missing entries on a logbook given simulated logbook.	
6.6. Gillnet data collection and recording **COMPULSORY FOR GN GEAR** Covers for Modules: "Onboard data collection and recording. Data forms and electronic data recording"; "Sampling methodologies" and "Monitoring effectiveness of bycatch mitigation measures"; detailed on IOTC ROS OM v1.2, page 142. Also covers for ROS Observer duties, para. 10, of IOTC Res 11/04.	6.6.1. Estimate weights, volumes and ratios ✓ total catch in set ✓ ratio of species in set ✓ amount of bycatch ✓ amount of discards ✓ catch retained on board ✓ vessel hold capacity	– Explicate the concepts of: set total catch; catch composition; bycatch; discards; and retained catch weight. – Calculate vessel hold capacity from information provided. – Correctly execute 3 exercises for the calculation of set total catch, bycatch, discards and retained catch.	
	6.6.2. Data to be collected during gillnet fishing 6.6.3. Data gathering processes and priorities 6.6.4. Data recording procedures	– Correctly interpret at least 2 realistic written simulations of credible pelagic gillnet fishing scenarios and fill in national fisheries agencies and/or IOTC form templates with a minimum verified accuracy of 75%. – Correctly use and interpret supporting guidelines, species codes and identification resources for the completion of national fisheries agencies and/or IOTC form templates. – Correctly use prescribed units and codes for the completion of national fisheries agencies and/or IOTC form templates.	
	6.6.5. Information to be gathered on interactions, the effectiveness of mitigation measures and good practices	– Recognize species of special interest and be aware of levels of vulnerability. – Familiar with species groups that are likely to interact with pelagic gillnet gear and with main mitigation methods and good practices for species handling and release recommended by the IOTC. – Correctly interpret and record a given simulated interaction with a species of special interest, the use and effectiveness of recommended mitigation measure.	
	6.6.6. Cross-cheeking data with entries made in vessel logbook and fulfilment of logbooks;	– Recognise the need and importance of checking consistency between observer estimated data (e.g. catches) and entries made in the vessel logbook; – Familiar with the vessel logbook contents and structure; – Describe the importance of assisting vessel officers with the correct filling of vessel logbook; – Correctly cross-check observer estimated data with logbook entries interpret and correct wrong or missing entries on a logbook given	

		simulated logbook.	
6.7. Vessel sighting and transhipment activities **COMPULSORY** Covers for module "Onboard data collection and recording" for the collection of information required under Form 5-GEN and Form 6-GEN; detailed on IOTC ROS OM v1.2, page 99.	6.7.1. Information use for monitoring and surveillance	– Lists information usage for regional fisheries monitoring and management.	
	6.7.2. Information to be gathered by fisheries observers	– Understands the meaning and means for the collection of required information on vessels sightings. – Understands the meaning and means for the collection of required information on vessel transhipments.	
	6.7.3. Information recording	– Correctly interpret a given simulated vessel sighting and fill in national fisheries agencies and/or IOTC form templates with a minimum verified accuracy of 75%. – Correctly interpret a given simulated vessel transhipment and fill in national fisheries agencies and/or IOTC form templates with a minimum verified accuracy of 75%.	
6.8. Electronic trip reports (format and contents) **COMPULSORY** Covers for Modules: "Communication and reports-Electronic trip reports, submission - timeline and circulation", detailed on IOTC ROS OM v1.2, page 142. Also covers for ROS Observer duties, para. 11, of IOTC Res 11/04.	6.8.1. Detailed daily journal	– Able to keep a sequential, easy to read and understandable daily journal during training.	
	6.8.2. IOTC Observer trip report template and reporting procedures	– Capable of using daily journal relevant entries and written simulations and filled report templates to prepare Observer Trip Report following IOTC report template and reporting procedures.	
	6.8.3. Observer trip report submission - timeline and circulation	– Demonstrate knowledge of time-lines for the submission and circulation of Observer Trip Reports.	
6.9. Electronic data recording **OPTIONAL TRAINING** Module "Onboard data collection and recording Data forms and electronic	6.9.1. Instruction on electronic data bases to cover data capture from data sheets.	– Demonstrate ability to capture data from data sheets into a database with an accuracy of at least 75%.	

data recording". IOTC ROS OM v1.2, page 142.			

D. Observer competency standards

Observer competency should be standard throughout the IOTC ROS, independently of the organisation(s) in charge of training and manage CPCs observers. The following list of basic observer competency standards has been approved to ensure that observers have acquired / maintain required competency level.

1. Understand the importance of personal physical and mental well-being to safety and morale and of maintaining effective communication and good working relationships on the vessel.
2. Able to comply with emergency procedures and to correctly use different types of life-saving appliances. Demonstrate knowledge of abandon ship procedures and sea survival techniques. Able to operate an EPIRB or equivalent.
3. Capable to identify common health issues experienced onboard and fishing operation risks. Understand the importance of following safe working practices and wearing appropriate protective clothing and equipment as well as of following safety protocols and of being aware of emergency communication procedures.
4. Able to use vessel electronic equipment to fix a vessel position, to calculate vessel estimated position and time of arrival at a given point; and to collect parameters of meteorology and oceanography. Practical knowledge of the Beaufort scale.
5. Capable of using VHF/HF radios and send distress messages.
6. Understand the concept of target species; bycatch species; non-target species, retained catch, discarded catch, overfishing, FAD, associated and free school, improper for human consumption as defined by the IOTC.
7. Have satisfactory knowledge of the IOTC CMMs relevant to scientific observers;
8. Understand observer duties, code of conduct, status and procedures to follow onboard. Aware of the role & importance of the fisheries observer for the monitoring and management of tuna fisheries in the Indian Ocean.
9. Understands common nautical terminology. Recognises industrial tuna fishing vessels basic layout. Familiar with working and observation areas and common fishing operational scenarios for the fisheries in question.
10. Familiar with the species of special interest that interact with industrial tuna fisheries, most common inter-actions and strategies to avoid and mitigate such interactions.
11. Capable of identifying and distinguishing between the main tuna species, in their adult and juvenile forms and to use standard identification guides to identify species of billfish, sharks and other bycatch including marine turtles, seabirds and sea mammals.
12. Able to accurately measure and weight fish and to collect biological samples accordingly to IOTC ROS standard procedures.
13. Aware of IOTC ROS data gathering processes and priorities.
14. Capable of collecting and estimating catch weight, volumes, ratios according to ROS standard procedures. Conscious of the need to check consistency with entries made in the logbook and assist with logbook fulfilment.
15. Capable of collecting, formatting and accurately recording mandatory and recommended information as prescribed under the scheme.
16. Familiar with IOTC trip report data requirements and timelines for submission.

E. Observer Provider functions regarding observer deployment and coordination

1. Communicate to vessel operator /agents intended deployments sufficiently in advance and request a copy of the vessel safety certificate and P&I insurance cover and arrange date and time of boarding. Provide the vessel operator with a checklist for obligatory bycatch mitigation equipment for information.
2. Advise the observer, in a timely manner, and place him/her on "Standby", to allow for observers to take care of personal matters and suitably prepare themselves.
3. Communicate to the observer agreed boarding port, date and time. Provide observer with emergency information relevant to the country or port of deployment.
4. Assist with the procurement of observer visas, entry permits, waivers and any travel documents required to transport the observer to the departure or arrival port of the vessel.
5. Organize all travel arrangements including air, bus or ferry schedules;
6. Provide observers with a formal briefing prior to deployment and facilitate a placement meeting between the vessel captain, observer and a 'placement officer'.
7. Manage issues of refusal of observers by captains and provide captains a mechanism where they may report on the conduct of observers.
8. Ensure that the vessel on which an observer is placed shall provide accommodation, including lodging, food and adequate sanitary facilities, equal to those of officers;
9. Confirm that vessel masters shall ensure that all necessary cooperation is extended to observers in order for them to carry out their duties safely including providing access, as required:
    a. To the retained catch, and catch which is intended to be discarded;
    b. To satellite navigation equipment (consultation only)
    c. To radar display viewing screens when in use; (consultation only)
    d. To electronic means of communication;
10. Establish and maintain communications with the observer by inter alia the receiving and replying to observer "vessel pre-safety check", "deployment report" and "weekly observer status reports"[3233].
11. Debrief the observer as soon as possible on their return to port.
12. Receive and revise final version of the electronic trip report and ensure that it meets IOTC ROS requirements.
13. Maintain regular contact with the observers after their return to provide technical support, personal support, and information on new developments, and to assure the observer is in good health after the trip, and to inform the observer of any future boardings or relevant issues arising from the trip just completed.
14. Ensure that observers do not exceed two back-to-back trips on the same vessel.

[32] Report should be sent/receive every Wednesday.

[33] A "vessel pre-safety report "and an observer "deployment report" and a "weekly observer status reports" were developed for reference. These can be found under the Guidelines for IOTC ROS.

F. Coordinator training

Coordinator training should include:

1. Background and processes to follow when deploying observers.
2. Determining observer program mandate and objectives
3. Strategic planning (guidance on initiating an observer programme)
    a. necessary institutional structure for managing a programme
    b. resourcing requirements
    c. legal requirements
    d. selecting of fleets and vessels based on program objectives
    e. accessing number of observers required to meet objectives (e.g. to reach IOTC minimum required coverage)
4. Observer recruitment and administration
5. Sensitizing and planning deployments with the fishing industry and vessel operators
    a. Allocation of observers to vessels
    b. Notification processes
    c. MoU with vessel operators
6. Mechanisms for coordination with observer programmes of other CPCs where shared observers may be required.
7. Health and Safety checks and pre-sea safety inspections process
8. Preparation of observer gear lists, sampling equipment and data forms
9. Preparation of trip instructions
10. Preparation of a summary of IOTC Resolutions of relevance to the observer scheme.
11. Observer briefing process
12. In-trip coordination including communications and observer reports (deployment & periodic) while at sea
13. Observer disembarkation, debriefing and data verification processes;
14. Observer trip reports
15. Data management, processing, quality control and reporting procedures to facilitate the review of the quality of data collected, data management and reporting to the IOTC.

Coordinator training Instructors should have:

1. an intimate knowledge of observer work, data collections and reporting;
2. experienced with the management and coordination of at-sea observers;
3. a good understanding of the fishery and the management of that fishery;
4. good communication skills that can give clear and understandable messages in a straight forward manner;

G. Briefing and debriefing procedures

Briefing procedures should include:

1. Providing the observer with travel itinerary and any necessary travel documents to enter the country and access the port where the vessel is docked. Including inter alia: contact name and number of vessel agents and owner.
2. Providing the observer with a communication protocol.
3. Instructing observer on specific data collection protocols and biological requirements for the trip and provide him/her with briefing notes;
4. Advising observer on reporting requirements.
5. Ensuring necessary health requirements/medications are met by the observer, issue safety equipment and work materials to fulfil observer tasks, including for the collection of biological samples.
6. Supplying current forms and workbooks in whatever format is used in the national programme, but ensuring that it complies with the ROS minimum data standards;
7. Verifying that the observer is prepared to travel and that he/she is in possession of all essential items required for a trip: passport, cash and/or credit card, mobile/cell phone, copy of the MoU (if any), copy of pre-sea safety check list and letter of introduction or order of mission.
8. If practical, briefing should include a placement meeting on board the vessels between the observer, the vessel captain and the briefer to ensure a common understanding of the duties of the observer and safe practices on board the vessel.
9. Providers may wish to have a briefing form that can be read out and given and/or signed by the captain and observer. Such briefing form should state observer status, roles and duties while onboard the vessel; Captain/Master and crew obligations towards the observer; as well as any existing penalties concerning attempts to bribing, threatening, intimidation, assault and/or sexual harassment of an observer.

De-briefing procedures should include:

1. Collect from the observer all issued equipment;
2. Collect from the observer all data, images, and reports after their trip;
3. Conduct a preliminary review of observer data, check if it meets IOTC ROS data requirements and run routine error checks. This will provide the opportunity for the observer to discuss and explain missing, unusual or unexpected data.
4. Debriefing of critical incidents should be reported immediately to the relevant authorities.
5. Observer providers should attempt to debrief all observer trips that they manage and build sufficient authorised debriefers among their observers to ensure debriefing is a quality routine of their observer operations (1 debriefer :5 observers)

H. Health and Safety Equipment and Work Materials list

Fishing Gear Type	Equipment and Materials											
	Safety							Health				
	Two- way communication device[34]	EPIRB[35]	Immersion suit	PFD[36]	Strobe light	Signal mirror	Dry bag	Safety helmet	Deck working boots[37]	Waterproof clothing	Working gloves	Sun glasses
Longline	X	X	X	X	X	X	X	X	X	X	X	X
Purse-seine	X	--	--	X	X	X	X	X	X	--	X	X
Pole and Line (tropical & sub-tropical areas)	X	--	--	X	X	X	X	X	X	--	X	X
Pole and Line (temperate areas)	X	--	X	X	X	X	X	X	X	X	X	X
Gillnet	X	X	--	X	X	X	X	X	X	--	X	X

Fishing Gear Type	Equipment and Materials											
	Work											
	Calliper	Measuring Board (or hard tape)	Flexible tape	Scales	Waterproof slates	Knife	Sampling Equipment	Camera	Laptop computer	Data collection forms	Observer Manual	IOTC Spp. ID Guides
Longline	X	X	X	Only if observer is required to collect weight information in the context of a specific	X	X	X	X	Only if observer is required to input data while onboard	X	X	X
Purse-seine	X	X	X		X	X	X	X		X	X	X
Pole and Line	X	X	X		X	X	X	X		X	X	X
Gillnet	X	X	X		X	X	X	X	--	X	X	X

[34] Two way texting device (satellite messenger) or a satellite phone independent of the vessel communications systems.

[35] Personal Emergency Position Indicating Radio Beacon (406 MHz EPIRB, preferably with integral GPS navigation receiver).

[36] Personal Floatation Devices (abbreviated as PFD) include: life jacket, buoyancy aid and survival suit .A minimum safety requirement for the vessel will be to supply the observer with a SOLAS approved Life Jacket.

[37] Waterproof boots with steel-cap toe and ankle protection.

				sampling program								

I. Emergency Action Plan (EAP)

CPCs EAP must include as a minimum IOTC-ROS safety-at-sea standard procedures detailed below.

1) Communications protocol and appropriate contact information

Observer programme must establish a communications protocol and have a "Designated Officer/s" responsible for maintaining a device capable of receiving a signal from an independent two-way satellite communication device[38].

Communications protocol must include:

a) Routine reports

i) Deployment reports submitted within 24-hours after sailing confirms a line of communication between the observer and the Observer Provider;

ii) Weekly status reports allow for regular communications to be maintained and for the observer to communicate any safety problem (any instance of interference, harassment, intimidation, or assault)[39]).

b) Emergency communication procedures:

Observer programme must have an established procedure to initiate contact with the observer, the vessel, the vessel owner / operator and, if necessary, the appropriate enforcement authority of Flag CPC and relevant Coastal CPC.

c) 24 hr emergency contact

A 24 hr emergency service will need to be established. This service need not be in the "Fisheries Departments" and other services like police, patrol boat bases may be utilised. Observer Programme must nominate "Designated Officer/s" responsible for maintaining a device capable of receiving a signal from the approved independent two-way satellite communication device).

2) Follow up responses

Observer programme must establish a procedure to initiate contact with the observer, the vessel, and, if necessary, the appropriate enforcement authority of Flag CCM's and relevant Coastal CCM's.

3) Remedial action

CPCs must establish appropriated procedures for addressing issues related to the safety of observers including violations against observers. These measures must include clear actions that must be taken in the event of various emergencies including: observer illness, injury and death, observer missing at-sea or presumed fallen overboard; assault, intimidation, threatening and/or harassing of an observer.

Procedures must include at the very least the following actions:

d) In the event that an observer dies, is missing or presumed fallen overboard, the CPCs to which the fishing vessel is flagged shall ensure that:

i) the fishing vessel immediately ceases all fishing operations;

ii) the fishing vessel immediately commences search and rescue if the observer is missing or presumed fallen overboard, and searches for at least 72 hours, unless the observer is found

[38] Two way texting satellite device or a satellite phone independent of the vessel communications systems.

[39] Communication codes describing problems to be agreed between observers and their coordinators.

sooner, or unless instructed by the flag CPC to continue searching;1

iii) the fishing vessel immediately notifies the flag CPC and the observer provider;

iv) the fishing vessel immediately alerts other vessels in the vicinity by using all available means of communication;

v) the appropriate Maritime Rescue Coordination Centre is immediately notified and provided with a report on actions undertaken;

vi) the fishing vessel cooperates fully in any search and rescue operation whether or not the search is successful and after such search and rescue operation has been terminated, orders the vessel to the nearest port for further investigation, as agreed by the flag CPC and the observer provider;

vii) the fishing vessel provides the report to the observer provider and appropriate authorities on the incident; and

viii) the fishing vessel cooperates fully in any and all official investigations, and preserves any potential evidence and the personal effects and quarters of the deceased or missing observer;

ix) the fishing vessel ensures that, to the extent practicable, the body is well-preserved for the purposes of an autopsy and investigation.

e) In the event that an observer suffers from a serious illness or injury that threatens his or her life and/or long-term health or safety he CPC to which the fishing vessel is flagged shall ensure that:

i) the fishing vessel immediately ceases fishing operations;

ii) the fishing vessel immediately notifies the flag CPC and the observer provider;

iii) the appropriate Maritime Rescue Coordination Centre is immediately notified and provided with a report on actions undertaken;

iv) the fishing vessel takes all reasonable actions to care for the observer and provide any medical treatment available and possible on board the vessel, and where appropriate seek external medical advice;

v) the fishing vessel, where directed by the observer provider, if not already directed by the flag CPC, facilitates the disembarkation and transport of the observer to a medical facility equipped to provide the required care, as soon as practicable; and

vi) the fishing vessel cooperates fully in any and all official investigations into the cause of the illness or injury.

f) In the event that there are reasonable grounds to believe an observer has been assaulted, intimidated, threatened, or harassed such that their health or safety is endangered and the observer or the observer provider indicates to the CPC to which the fishing vessel is flagged that they wish for the observer to be removed from the fishing vessel, the CPC to which the fishing vessel is flagged shall ensure that the fishing vessel:

i) immediately takes action to preserve the safety of the observer and mitigate and resolve the situation on board;

ii) notifies the flag CPC and the observer provider of the situation, including the status and location of the observer, as soon as possible;

iii) facilitates the safe disembarkation of the observer in a manner and place, as agreed by the flag CPC and the observer provider, that facilitates access to any needed medical treatment; and

iv) cooperates fully in any and all official investigations into the incident.

g) In the event that there are reasonable grounds to believe that an observer has been assaulted, intimidated, threatened, or harassed but neither the observer nor the observer provider requests that the observer be removed from the fishing vessel, the CPC to which the fishing vessel is flagged shall ensure that the fishing vessel:

i) a. takes action to preserve the safety of the observer and mitigate and resolve the situation on board as soon as possible;

ii) notifies the flag CPC and the observer provider of the situation as soon as possible; and

iii) cooperates fully in all official investigations into the incident.

h) After disembarkation from a fishing vessel of an observer, an observer provider identifies—such as during the course of debriefing the observer—a possible violation involving assault or harassment of the observer while on board the fishing vessel, the observer provider shall notify, in writing, the flag CPC, and the flag CPC shall:

i) investigate the event based on the information provided by the observer provider and take any appropriate action in response to the results of the investigation;

ii) cooperate fully in any investigation conducted by the observer provider, including providing the report to the observer provider and appropriate authorities of the incident; and

iii) notify the observer provider and the Director of the results of its investigation and any actions taken.

i) CPCs shall ensure that their national observer providers:

i) immediately notify the flag CPC in the event that an observer dies, is missing or presumed fallen overboard in the course of observer duties;

ii) cooperate fully in any search and rescue operation;

iii) cooperate fully in any and all official investigations into any incident involving an observer;

iv) facilitate the disembarkation and replacement of an observer in a situation involving the serious illness or injury of that observer as soon as possible;

v) facilitate the disembarkation of an observer in any situation involving the assault, intimidation, threats to, or harassment of that observer to such an extent that the observer wishes to be removed from the vessel, as soon as possible; and

vi) provide the flag CPC with a copy of the observer report on alleged violations involving that provider's observer upon request.

Observer Provider must establish appropriate measures for addressing issues related to the safety of observers including violations against observers. These measures should cover:

a) Pre-boarding

i) Only observers trained to an international standard (STCW or equivalent) on Safety at Sea by a certified person, school, college or maritime authority, are permitted to carry out duties

on board a vessel at sea.

ii) Only observers' holders of a valid Basic Safety Training Certificate (STCW or equivalent) are permitted to carry out duties on board a vessel at sea under the IOTC ROS.

iii) Only observers holders of a valid Certificate of Medical Fitness (STCW or equivalent) issued by an authorised medical practitioner are permitted to carry out duties on board a vessel at sea under the IOTC ROS.

iv) Observers shall not board vessels until they have been fully equipped with at least the health and safety equipment detailed under the Guidelines for IOTC ROS. Safety equipment must be in a good working order and should have regular checks.

v) Vessel safety conditions will be surveyed against minimum safety requirements. A Vessel Safety Check will be done before each boarding of an observer on a vessel and a vessel pre-sea safety checklist or form will be filled out by the provider/observer to ensure that vessel safety conditions meet minimum safety requirements and that there is adequate safety equipment to cater for the extra observer on board. The Commission has a guideline format on the ROS OM v1.2., appendix II, page 135 and national formats should be similar or the same (see Guidelines for the IOTC ROS).

vi) Observers have the right to refuse the boarding if the Vessel Safety Check highlights that the vessel does not comply with expected standards or if they consider a particular vessel to be un-safe.

4) Completing the EAP protocols

CPCs must establish appropriate measures for addressing violations made against observers. Incidents involving observer reporting of Interference Harassment, Intimidation must be resolved through a legal or nationally recognized procedure.

5) Reporting to the IOTC

CPCs must have an establish procedure to report on incidents involving observers to the Secretariat.

J. Vessel pre-sea safety checklist and vessel minimum safety requirements

Pre-Sea Safety Inspection Checklist

Observer		Date		Signature	
Vessel Agent		Date		Signature	
Port / Position					

Vessel Details:

Vessel Name		
Captain Name/Fishing Master		
Call Sign		
Flag		
Size GRT		
LOA		
Vessels Compliment		
Vessel contact Number	Telephone	
	Fax	
	Inmarsat (A/C/M) & No.	
Vessel Owners / Charter's	Name	
	Telephone	
	Fax	
	Mobile	

Safety Equipment:

Safety Certificate In-date (Y/N)		Issuing Authority	
Flares: Location		If checked No. / Exp Date	
First Aid Materials: Location		Name of Medical Officer	

Life Rafts				
Type	Number	Capacity	Hydrostatic release *Y / N*	Date Next Service Due
Life Jackets				
Type Inflatable/Packed	Number on-board	Location Cabin /Muster Station/ Both		SOLAS Approved Yes/ No
Fire Extinguishers				
Positioned in main corridor's (Y/N)		Charge seals intact (Y/N)		
Positioned on bridge (Y/N)		Charge seals intact (Y/N)		
Immersion Suits *(only required by vessels operation south of 30º S)*				
Type	Number on-board	Location Cabin /Muster Station/ Both		SOLAS Approved Yes/ No

GMDSS

Radio Equipment	HF Operational yes or no	MF Operational yes or no	VHF Operational yes or no	INMARSAT Operational yes or no	NAVTEX Operational yes or no

EPIRB			
Type / Manufacturer	Number of units on board	Location	Release method manual / float free

SART's			
Type / Manufacturer	Number of units on board	Location	Release method manual / float free

Accommodation:

Vessel Emergency Evacuation and Muster Stations Lists – Displayed (Y/N)	
Cabin - Single or Sharing	

General Comments:

MINIMUM SAFETY REQUIREMENTS

The following items that will be checked as part of the "Pre-Sea Inspection" will be considered as the minimum compulsory requirements. Should any of these items not comply the Observer will not be permitted to embark on-board the vessel.

Safety Certificate (Safety Management Certificate)

The vessel must have on-board a current and valid Safety Certificate that does not expire for a period of at least four months from the date of embarkation of the observer. Check that including the observer on-board that the full compliment does not exceed the limit for the number shown on the safety certificate.

Life Rafts

The Life rafts must have the capacity to accommodate the full crew compliment including the observer. Life Rafts must be within their serviceable date, which must cover the expected maximum duration of observer deployment. All Life Rafts must be fitted with a Hydrostatic Release mechanism.

Life Jackets

There must be a total number of life jackets on-board, readily available at the emergency muster stations to accommodate each of the compliment on-board the vessel.
All Life Jackets must comply with IMO – SOLAS LSA standards.

Immersion Suits

For a vessel that will operate south of 30º S there must be a total number of Immersion Suits on-board, readily available at the emergency muster stations to accommodate each of the compliment on-board the vessel. All Immersion Suits must comply with IMO – SOLAS LSA standards.

K. Observer Deployment Report

To be submitted within 24-hours of the vessels departure from port

If a report is not received within 24 hours of the due date, contact vessel operator to send a message to the vessel to remind the observer of his/her obligation in this respect.

If a report is not received within a further 24 hours assumed that there is no means of formal communication with the vessel. Contact vessel operator to make arrangements either to establish these or to request the immediate return of the observer.

If no contact is established initiate emergency search and rescue operations.

Date		
Observer		
Vessel Name / Call sign		
Company		
Captain / Fishing Master		
Vessel Contact Details	Number	
	Email	

Deployment Details	
Briefing Date	
Contract "Start Date"	
Flight No's *(Observers must retain their flight boarding passes)*	
Departure date from	
Departure time from	
Landing date at destination	
Landing time at destination	
Safety Inspection completed (yes /no)	
Boarding date	
Sailing Date	
Sailing Time	
Port of departure	
Comment	

L. Observer Status (or five days) Report

To be submitted <u>every five days</u> following the submission of the deployment report

If a report is not received within 24 hours of the due date, contact vessel operator to send a message to the vessel to remind the observer of his/her obligation in this respect.

If a report is not received within a further 24 hours assumed that there is no means of formal communication with the vessel. Contact vessel operator to make arrangements either to establish these or to request the immediate return of the observer.

If no contact is established initiate emergency search and rescue operations.

Vessel Name / Call sign	
Observer	
Date / Report Period	
Location at time of report	

No. sets sampled in period		
Number and / or weight per species retained or discarded *(Increase number rows as required)*		
Species	Retained	
	Released	
Number and / or weight per species sampled *(Increase number rows as required)*		
Species	Retained	
	Released	
Seabird Marine mammal interactions *(Give brief details)*		
IUU vessels sighted or detected *(Give details, date / time / position)*		
Lost gear recovered *(Give details)*		
General Comments *(comment on any items considered important for immediate attention)*		

M. Code of Conduct

Observers are required to conform to an internationally recognised code of conduct to become certified. This requires that:

1) Observers may not participate in any activity which would cause a reasonable person to question the impartiality or objectivity with which the Regional Observer Scheme is administered.

   - Observers may not have a direct financial interest in the observed fishery, other than the provision of observer services. This includes, but is not limited to, vessels or shore-side facilities involved in the catching or processing of the fishery products, companies selling supplies or services to those vessels or shore-side facilities or companies purchasing raw or processed products from these vessels or shore-side facilities. The interests of a spouse or minor child are considered those of the observer.
   - Observers may not solicit or accept, directly or indirectly, any gratuity, gift, favour, entertainment, loan or anything of monetary value from anyone who conducts activities that are regulated by IOTC, or who has interests that may be substantially affected by the performance or non-performance of the observers' official duties.
   - Observers may not solicit or accept employment as a crew member or an employee of the vessel in any fishery while employed as an observer.
   - Observers may not serve as observers on any vessel owned or operated by a person who previously employed the observer in any capacity.
   - A person may not serve as an observer in a fishery during the 3 consecutive months following the last day of his/her employment as a paid crew member or employee in that fishery.

2) Observers may not participate in any activity which could impair the observer's ability to perform his/her duties. This includes, but is not limited to:
   - Engaging in drinking of alcoholic beverages while on duty
   - Engaging in the use or distribution of illegal substances
   - Becoming physically or emotionally involved with vessel personnel

3) Observers may not participate in any activity which could adversely affect the efficient accomplishment of the Scheme's mission.
   - Observers must refrain from engaging in any illegal actions according to the laws and regulations of the flag State that exercises jurisdiction over the vessel to which the observer is assigned.
   - Observers must avoid any behaviour that could adversely affect the confidence of the public in the integrity of observers, the IOTC Regional Observer Scheme or the IOTC.
   - Observers must record all scientific data accurately and honestly.
   - If the observer chooses to report any suspected violations of regulations relevant to conservation of marine resources or their environment that they observe, it must be done honestly.
   - Observers must preserve the confidentiality of the collected data and observations made on board the fishing vessels, in accordance with Resolution 12/02, and shall treat as confidential all information with respect to the fishing operations of the vessel on which they are deployed.

4) Observer involvement in vessel operations

- Observers shall respect the hierarchy and general rules of behaviour which apply to all vessel personnel, provided such rules do not interfere with the duties of the observer under this scheme.
- In all aspects involving vessel operations and safety at sea the observer will fall under the authority of the Captain.
- Scientific observers will have no authority to advise or direct any of the vessel operational activities or have any authority over any of the vessel personnel.
- Scientific observers should have access to all operational areas of the vessel necessary to complete their work including the bridge, navigation and communication equipment. However, the observer should attempt to secure co-operation with officers to ensure that their work does not interfere with normal fishing and operational activities.

ANNEX III. PROPOSED CHANGES TO DATA FIELDS (DF) FOR MANDATORY REPORTING

MANDATORY REPORTING DF

ADDITIONAL DF PROPOSED

GENERAL VESSEL AND TRIP INFORMATION FOR ALL VESSEL TYPES[40]

#	DF name	Current DF description	Proposed changes and justification
1	New	New	Trip number: Record trip unique identifier. This should begin with trip's start date (YYYYMMDD), followed by flag country three digit code (ISO3) and vessel main gear code (Table #). E.g. **20180123FRAPS**.

[40] This information is presently grouped under IOTC Form 1-GEN.

LONGLINE INFORMATION

Fishing event[41]

#	DF name	Current DF description	Proposed addition and justification
27	New	New	VMS on (Y/N): Record if the VMS was on during operations or not. Mandatory for reporting. Useful to know whether or not VMS data may be available for scientific analyses.
29	New	New	Night setting (Y/N): Note that night setting is binary - if all hooks were set between dusk and dawn, then night setting was used. If any hooks were not set during nautical darkness, then night setting was not used. Night setting as defined in Res. 12/06.
76	New	New	Weight estimation method: Record estimation method used to collect weight (Table #). Observers don't weigh fish on a regular basis, as this information is considered unreliable, weight being mainly estimated.
92	New	New	Sampling methods for the collection of biological information: Record sampling method used for the collection of biological sub-sample (Table #). Insert new table named "Sampling methods for the collection of biological information". Different sampling methods for the collection of biological information can be used. Allows for the: (1) standardizing of sampling methods accordingly to IOTC Observer Manual v.1.2., (2) collection of information on non-text format via the use of standard tables and codes.

[41] Information required for every set/operation. This information is presently grouped under IOTC Form 4-LL.

GILLNET INFORMATION

Gear specifications

#	DF name	Current DF description	Proposed addition and justification
3	New	New	Gillnet sequential number: A unique sequential number is to be allocated to each gillnet present on-board. Any changes done to individual gillnet specification are to be considered as if changing of gillnet and the "new" gillnet will need to be characterised accordingly. A unique sequential number needs to be allocated to different gillnets to allow the identification of the gillnet used in each set.
4	New	New	Stacked panels: Record if there are any panels stacked (Y/N). I.e. if two panels of netting are sewn together vertically, one on top of the other, to intentionally fish "double deep". The stacking of panels is a known practice and is illegal in certain countries of the IO (e.g. Iran). This practice changes net catchability and so should be reported.
12	New	New	Net webbing colour (s): Record the colour(s) of the net webbing using codes provided (Table #). Different net colours can have an impact on cetacean and turtle bycatch as some colours are more visible than others. Mandatory for reporting since this information is important to evaluate differences in catchability for both target and bycatch species. Consistent with SC16.24 (para. 53)

Fishing event

#	DF name	Current DF description	Proposed addition and justification
25	New	New	Net condition: Indicate the condition of the net at haul-back, even if the condition was the same at setting, using codes provided (Table #).
26a	New	New	Mitigation measures (Y/N): Record if any bycatch mitigation device(s) was installed in this net(Y/N). Covers for any future trials/usage of bycatch mitigation techniques. Consistent with SC16.24 (para. 53)
48	New	New	Number: Record the number of individuals corresponding to the recorded weight. Large amounts are to be recorded in tonnes. The observer cannot count, identify and weigh every single fish caught by the gillnet. Therefore he must be allowed to estimate weight / number per species and fate category.
50	New	New	Weight estimation method: Record estimation method used to collect weight (Table #). Observers don't weigh fish on a regular basis, as this information is considered unreliable, weight being mainly estimated.
64	New	New	Sampling methods for the collection of biological information: Record sampling method used for the collection of biological sub-sample (Table #). Insert new table named "Sampling methods for the collection of biological information". Different sampling methods for the collection of biological information can be used. Allows for the: (1) standardizing of sampling methods accordingly to IOTC Observer Manual v.1.2., (2) collection of information on non-text format via the use of standard tables and codes.

PURSE-SEINE INFORMATION

Fishing event

#	DF name	Current DF description	Proposed changes and justification
70	New	New	Well N°: Record well number from which the tagged fish has been recovered. This information will allow a tagged fish to be traced back to the location where it was caught.
42	New	New	Weight estimation method: Record estimation method used to collect weight (Table #). Observers don't weigh fish on a regular basis, as this information is considered unreliable, weight being mainly estimated.

POLE AND LINE INFORMATION

Gear specifications

#	DF name	Current DF description	Proposed addition and justification
3	New	New	Pole material: Record if the pole is made of bamboo, fibre glass or carbon. If another material is used, describe it. Proposed for Mandatory reporting. Pole material affects catchability. E.g. Azorean pole and line fishery uses multiple types of bamboo and wood poles to catch different sized fish. Carbon poles have recently been introduced to this fishery. As a result fishers using carbon poles don't change poles during the fishing event and catch more fish than fishers using bamboo/wood poles.

Tuna fishing event

#	DF name	Current DF description	Proposed addition and justification
41	New	New	Weight estimation method: Record estimation method used to collect weight (Table #). Observers don't weigh fish on a regular basis, as this information is considered unreliable, weight being mainly estimated.
45	New	New	Number: If an accurate count is possible record the number of individuals for each specified fate. Large amounts are recorded in tonnes. In pole and line the observer won't be able to count, identify and weigh every single fish. Therefore he must be allowed to estimate weight / number per species and fate category.
46	New	New	Depredation source: For depredated specimens record depredation source based on depredation scar characteristics (Table #). There are cases of depredation in the pole and line fisheries.
47	New	New	Predator Observed: Record if the predator was directly observed and identified (Y/N). If Y record the species (Table # to #). Take note under comments of any associated evidence of depredation such as oil slicks and feeding birds that may associate marine mammals with depredation. Note that species observed in the area may not necessary be associated with depredation unless directly observed. Similarly for shark and squid damage the species may be difficult to determine. There are cases of depredation in the pole and line fisheries.

59	New	New	Sampling methods for the collection of biological information: Record sampling method used for the collection of biological sub-sample (Table #). Insert new table named “Sampling methods for the collection of biological information”. Different sampling methods for the collection of biological information can be used. Allows for the: (1) standardizing of sampling methods accordingly to IOTC Observer Manual v.1.2., (2) collection of information on non-text format via the use of standard tables and codes.

Bait fishing event

#	DF name	Current DF description	Proposed addition and justification
2	New	New	Event date: Record the date at the start of the fishing operation"
3	New	New	Event start time: Record the time at the start of the bait fishing event (hh:mm). When chumming starts.
5	New	New	Event position: Record the position in latitude and longitude for the start of the fishing event noting whether the latitude is North or South of the equator (specify units).
7	New	New	Depth: Depth of the place where the net is being deployed (specify units).
10	New	New	Sampling methods for obtaining total catch estimates per species: Record sampling method used to obtain total catch estimates per species for the observed event (Table#).
10			Species code: Record the species using FAO three figure alpha codes (Tables #). Record species scientific name for species than cannot be positively identified or for which a FAO code is not available. Record "unknown" for species that cannot be positively identified and give a reference number in the 'Comments' column. Use the same reference number throughout the trip for that species. Retain a sample and / or take a photograph of the unidentified organism for latter identification.
11			Fate: Record species fate which includes whether it was retained or discarded and the reason.
12			Weight estimation method: Record weight estimation method used to collect weight (Table #).
13			Weight: Record weight per species (spp group).

14			Gear interaction (for SSI[42]: Describe fishing gear interaction with the specimen (Table #). This information is only to be collected for species of special interest as defined in IOTC-2018-SC21-R or any subsequent report from the Scientific Committee." This DF will provide information on whether bycatch was accidental due to the animal's presence in the area or as a result of the animal actively interacting with the fishing gear and also on type of gear interaction with the animal. Consistent with Resolutions 13/04; 13/05; 12/04; 12/06; 12/09.
18			Condition (or SSI): Record the condition of the individual at the time of release (Table #). This information is only to be collected for species of special interest as defined in IOTC-2018-SC21-R or any subsequent report from the Scientific Committee.

[42] A list of Species of Special Interest (SSI) is to be defined by IOTC Scientific Committee (SC). This should include all Protected Endangered and Threatened species (PETs), billfish (all/specific), shark species (all/specific) and any other species deemed of special interest by the SC for the collection of detailed information under IOTC ROS.

DATA FIELDS PROPOSED FOR REMOVAL

GENERAL VESSEL AND TRIP INFORMATION FOR ALL VESSEL TYPES

#	DF name	Current DF description	Justification for removal
3	Vessel type	This records the type of vessel (***Error! Reference source not ound.***). For example a European type industrial purse seiner (PSEU). In most cases a vessel is purpose-built and can only fish in a single sector using the specific gear for which it was designed, however, some vessels have the ability to fish in more than one sector by changing their gear and it is therefore important to also record the main gear.	Not necessary. Vessel type is unlikely to ever be used in any analysis.
25	Details of sampling strategy	If not all of the sets that took place during the time the observer was onboard were monitored, describe the rationale and procedure used for sampling sets (e.g. the first two of every three sets were fully sampled). If 100% of sets were sampled, this is N/A.	Duplication. Information captured at fishing event/set level for each individual fishery.
46	Blast freezer capacity	The volume of catch that can be blast frozen prior to storage, expressed in cubic metres	Redundant. Information included under fish storage capacity.

LONGLINE INFORMATION

Gear specifications

#	DF name	Current DF description	Justification for removal
1	Longline Type	Record the type of longline used, according to the IOTC categories (Table 16).	Redundant, duplicated in general vessel and trip information logs.

Fishing event

#	DF name	Current DF description	Justification for removal
35	Hook type	Record the type and size of hooks used according to the IOTC categories (Table 21).	Collection of hook size is considered unnecessary. Information on hook type is already collected under "Number of hooks set per type" (DF N°27).
64	Tag details Specimen ID	Note the specimen ID number to link this individual to the catch information.	Unnecessary. Not a field for the collection of data but to link data from a particular specimen between forms. How such a link is done will depend on how data collection forms are designed.
70	Catch details Specimen ID	This is a unique numeric ID which increases sequentially to identify an individual.	Unnecessary. Not a field for the collection of data but to link data from a particular specimen between forms. How such a link is done will depend on how data collection forms are designed.
81	Hooking location	Record the geographical coordinates of the point at which the catch was hauled or the bycatch interaction took place.	Hooking location as defined by this DF is redundant, as it corresponds to the hauling location.

GILLNET INFORMATION

Fishing event

#	DF name	Current DF description	Justification for removal
39	Tag details Specimen ID	Note the specimen ID number to link this individual to the catch information.	Unnecessary. Not a field for the collection of data but to link data from a particular specimen between forms. How such a link is done will depend on how data collection forms are designed.
45	Catch details Specimen ID	This is a unique numeric ID which increases sequentially to identify an individual.	Unnecessary. Not a field for the collection of data but to link data from a particular specimen between forms. How such a link is done will depend on how data collection forms are designed.

Gear specifications

#	DF name	Current DF description	Proposed changes and justification
4a	Support vessel	Record the presence or absence of a support vessel (Y/N)	Redundant. If here we are mentioning "Supply vessels" as information on this type of vessel can be found in the Purse-seiners IOTC licence. Alternatively, if support vessel definition is as per IOTC-2018-WPICMM01-04_Rev2_-_Glossary_of_terms_and_definitions[43] then agreed to maintain DF collection.
18	Sampling operations	Provide details of the sampling strategy if <100% of sets were observed during the trip.	Duplication. Information to be collected at set level.

[43] Support vessel: (1): Includes any vessel used equipped to be used, or intended to be used for fishing related activities involving transporting goods, personnel, equipment or other supplies in support of fishing vessels for supporting fishing vessels in the purse seine fishery using drifting FADs, including deploying, monitoring, modifying and retrieving drifting FADs and motherships.

Fishing event

#	DF name	Current DF description	Justification for removal
37	Specimen ID	This is a unique numeric ID which increases sequentially to identify an individual.	Redundant. Not a field for the collection of data but yes as a field to link data from a particular specimen between forms. How such a link is done will depend on how data collection forms are designed.
43	Weight code	Record the product code according to the IOTC processing codes (***Error! eference source not found.***).	Not applicable to Purse-seiners. All catch is retained unprocessed.
53	Biological sample Specimen ID	Note the specimen ID number to link this individual to the tag information.	Not a field for the collection of data but to link data from a particular specimen between forms. How such a link is done will depend on how data collection forms are designed.
54	Species code	As above	Duplication. DF can be duplicated as many times as needed when building data collection forms and form filling manual, but shouldn't be duplicated in ROS list of required DFs per fisheries.
55	Fate	Record an IOTC fate code which includes whether it was retained or discarded and the reason, e.g. "Discarded – too small" (***Error! eference source not found.***).	Duplication. DF can be duplicated as many times as needed when building data collection forms and form filling manual, but shouldn't be duplicated in ROS list of required DFs per fisheries.
56	Weight code	Record the product code according to the IOTC processing codes.	Duplication and not applicable to Purse-seiners. DF can be duplicated as many times as needed when building data collection forms and form filling manual, but shouldn't be duplicated in ROS list of required DFs per fisheries.
57	Weight	Record the raw weight measurement in kilograms (kg) corresponding to the specified product type	Duplication. DF can be duplicated as many times as needed when building data collection forms and form filling manual, but shouldn't be duplicated in ROS list of required DFs per fisheries.
58	Number	Record the number of individuals of the recorded weight.	Duplication. DF can be duplicated as many times as needed when building data collection forms and form filling manual, but shouldn't be duplicated in ROS list of required DFs per fisheries.
64	Specimen ID	Note the specimen ID number to link this individual to the biological information.	Redundant. Not a field for the collection of data but yes as a field to link data from a particular specimen between forms. How such a link is done will depend on how data collection forms are designed.

Fishing event

#	DF name	Current DF description	Justification for removal
18	Number of lines observed	Total number of lines monitored by the observer during the poling operation	Not applicable to pole & line operations. Observer monitors the totality of the lines operational during the poling event.
20	Hook type	Record the code corresponding to the type of hooks used (Table 21).	Redundant on a fishing event basis since fisherman doesn't change hooks between fishing events.
21	Hook number	Record the total number of hooks used in the poling operation.	Redundant. Only one hook is used per line even if the line is attached to 2 or more poles.
38	Catch details Specimen ID	This is a unique numeric ID which increases sequentially to identify an individual.	Redundant. Not a field for the collection of data but to link data from a particular specimen between forms. How such a link is done will depend on how data collection forms are designed.
48	Hooking location	Record the geographical coordinates of the point at which the catch was hauled or the bycatch interaction took place.	Redundant. Hooking geographical location, for the pole and line fisheries is the same as for the fishing event.

PROPOSED CHANGES TO EXISTING DATA FIELDS

GENERAL VESSEL AND TRIP INFORMATION FOR ALL VESSEL TYPES

[44]#	DF name	Current DF description	Proposed changes and justification
4	Main gear	Main gear type/s (if more than one type of fishing gear is used) for the observed trip, e.g. drifting longline (up to 1800 hooks), LLFR (***Error! eference source not found.***).	Eliminate gear sub-types from the "Main gear" table. Table should include only main IOTC gear types i.e. LL, PS, GN, PL, etc.
6	Vessel IOTC number	Record the vessel IOTC number as per the IOTC Record of Authorized Vessels. Check the Certificate of Registry that should be issued by the flag state to confirm that the name displayed corresponds to this and relevant safety certificates (should there be any discrepancies note these in the comments section).	Change DF description as follows: Record vessel IOTC number as per the IOTC Record of Authorized Vessels[45] and crosscheck it with the number recorded on vessel Certificate of Registry issued by the flag state and relevant safety certificates (should there be any discrepancies note these in the comments section).
17	Employer	Record the full name and address of the observer controlling organisation and/ or national fisheries organisation responsible for managing deployment Include postal and physical addresses and relevant telephone numbers and email addresses.	Change DF name to Observer provider - country and or organization to homogenize with IOTC ROS standards.
23	Total number of fishing operations/sets	Record the total number of all fishing sets/events that took place during the trip for target species (not including operations for bait species)	Not clear. Change DF as follows:: N° of tuna fishing events/sets while the observer was onboard: Total number of fishing events/sets conducted by the vessel while the observer was onboard, regardless of their success and whether they were sampled by the observer. Note that this should not include pole and line bait fishing events/sets.
24	Total number of operations/sets observed	The total number of fishing events monitored by the observer (this number must be equal to the number of operation numbers provided for the trip)	Not clear. Change DF as follows: Total number of fishing events/sets observed: The total number of fishing events/sets monitored by the observer. Note that this should not include pole and line bait fishing events/sets.
28	Dates searching	Record the dates the vessel was engaged in actively searching for fish.	Change DF as follows: Number of days searching: Record the total number of days that the vessel was engaged in actively searching for fish (this includes active fishing days).

[44] This information is presently grouped under IOTC Form 1-GEN.

[45] http://www.iotc.org/vessels/current

29	Dates active fishing	Record the dates the vessel actively fished (when the vessel had gear in the water). For some fishing events this may be for only a few hours of the day. Alternatively a single fishing event/set may span part of two days.	Change DF as follows: Number of active fishing days: Record the total number of days that the vessel actually fished (when the vessel had gear in the water). For some fishing events this may be for only a few hours of the day. Alternatively a single fishing event/set may span part of two days.
30	Number of days lost	The total number of days where a vessel was unable to fish dues to factors such as adverse weather conditions, mechanical failure or other unforeseen events	Change DF as follows: Number of days lost: Record the total number of days where a vessel was unable to fish due to factors such as adverse weather conditions, mechanical failure or other unforeseen events.
31	Reasons for time lost	Record the reasons a vessel was unable to fish: (i) adverse weather conditions, (ii) mechanical breakdown or inoperative gear or processing plants that prevented the vessel from either steaming, using any of its gear or being able to process fish or (iii) unforeseen events (specify).	Change DF as follows: Reason(s) for days lost: Record the reason(s) a vessel was unable to fish: (i) adverse weather conditions, (ii) mechanical breakdown or inoperative gear or (iii) unforeseen events (specify).
41	Gross tonnage (GRT or GT)	Overall internal volume of the ship (GT), as per the IMO International Convention on Tonnage Measurement of Ships.	Change DF as follows: Overall internal volume of the ship (GT), as per the IMO International Convention on Tonnage Measurement of Ships. Record vessel gross tonnage (GT) or gross registered tonnage (GRT) in tonnes. These can be checked against the vessels registration and safety certificates. Note that GT and GRT are both units of vessel volume, but they are calculated differently.
42	Length overall (LOA)	Record the maximum length of a vessel's hull measured parallel to the waterline, in metres.	Change DF description as follows: Record the vessel overall length (LOA) as specified in vessel registration papers (specify units).

43	Fish storage capacity	Record the capacity of a vessel to store its catch (hold or volume capacity in cubic meters). Depending on the type of vessel and method of fishing and catch preservation, this can be recorded by volume and / or weight. Normally volume is converted to weight. Larger fish that are frozen and packed loose take up a high volume relative to their weight. In this instance the volume of the hold may be the limiting factor to determine a vessel's maximum tonnage. Smaller fish packed directly into a hold with ice, CSW or RSW will have a lower volume to weight ratio.	Change DF description as follows: Record the vessel total maximum capacity to store catches in metric Tons (mT.) or cubic meters (m^3). This should include blast freezer(s) capacity.
44	Refrigeration methods(s)	Record the method/s used by the vessel to cool and preserve catch (e.g. blast freezing).	Change DF as follows: Fish preservation methods: Record the method(s) used by the vessel to preserve the catch (Table #). Insert code table for fish preservation methods.
45	Fish Storage Method(s)	Record the method used by the vessel to store catch. Note: a method to preserve fish may involve several processes, e.g. a fish may first be cooled in a blast freezer at a specific temperature for a time before being transferred to a holding facility for storage at a different temperature. At the same time other species may be placed directly into a freezer hold with no intermediate blast freezing process. Vessels undertaking shorter trips may keep the fish fresh on ice or in RSW.	Change DF as follows: Fish storage type: Record the type of structure(s) present on-board used by the vessel to store the catch (Table #). Insert table for fish storage type.
58	Communications equipment	Record presence/absence.	Change DF description as follows: Record presence/absence of VHF radios on-board the vessel. Record presence/absence of HF radios on-board the vessel.

60	Satellite communication systems	These systems provide ship/shore, ship/ship and shore/ship telephone, telex and high-speed data services, including a distress priority telephone and telex service to and from rescue coordination centres. Satellite systems operated by the Inmarsat, overseen by IMSO, International Mobile Satellite Organization are also important elements of the GMDSS. The types of Inmarsat ship earth station terminals recognized by the GMDSS are: Inmarsat B, C and F77. Record the make and model.	Change DF as follows: Record presence/absence (Y/N) of Satellite communication systems on-board. Information on make and model should not be collected by Observers. If interested in having such information CPCs should develop a gear catalogue to be updated by trained personnel.

LONGLINE INFORMATION

Fishing event[46]

[46] Information required for every set/operation. This information is presently grouped under IOTC Form 4-LL.

#	DF name	Current DF description	Proposed changes and justification
30	Branchline weighting	Record the average weight (in grams) of weights or sinkers attached to the branchlines. These could be in the form of lead sinkers on the traces close to the hook or lead-weighted swivels between sections of the branch line (do not confuse coated steel wire trace or integral weighted cord with attached weights). If not all lines are weighted, note the proportion in the comments section.	Change DF as follows: Branchline weighting: (a) Indicate (Y/N) if the branch line is weighted; (b) Record the average weight (in grams) of weights/ sinkers attached to the branchlines; (c) Record the proportion (%) of branchlines weighted. If all weighted than record 100%.
52	Sampling details	If not all hooks were observed within the set, include information on how hooks were selected for the sample, e.g. the first 30 hooks were selected, every third hook, all hooks within the set were observed etc.	Change DF as follows: Sampling methods for obtaining total catch estimates per species: Record sampling method used to obtain total catch estimates per species for the observed set (Table#). Insert new table named "Sampling methods for the estimation of catch per species". Allows for the: (1) standardizing of sampling methods accordingly to IOTC Observer Manual v.1.2., (2) collection of information on non-text format via the use of standard tables and codes.
67	Tag number	Provide the tag number	Change DF as follows: Record tag number. If a turtle make sure to collect both tag numbers (right and left flipper). Never remove tags from live birds and turtles. Information to be also collected for turtles and birds.
68	Tag type	Record the type of tag used (Table 37)	Information to be also collected for turtles and birds. Corresponding table (#) to be changed accordingly (i.e. turtle and bird tag codes are to be added).

78	Scar	Record the type of scar present on the specimen based on the IOTC categories. This might be no scar, an unknown scar, a tag scar, cookie-cutter shark, shark/killer whale or some other identifiable scar type which can be specified (Table 32).	Change DF as follows: Depredation source: For depredated specimens record depredation source based on depredation scar characteristics (Table #). Associated Table (#) to be changed as follows: *1)* shark/killer whales to be replaced by sharks/toothed whales (SW); *2)* codes for shark (SH); toothed whales (TW); seabirds (SB) to be added; *3)* no scar (NS) and tag scar (TS) to be removed as these are not considered useful and not related to depredation.
79	Depredation	If the predator was observed and identified, record the species code. If no depredation was directly observed, indicate "Not observed". Note that species observed in the area may not necessary be associated with depredation unless directly observed. Take note of any associated evidence of depredation such as oil slicks and feeding birds that may associate marine mammals with depredation. Similarly for shark and squid damage the species may be difficult to determine.	Change DF as follows: Predator Observed: Record if the predator was directly observed and identified (Y/N). If YES record the species (Table # to #). Take note under comments of any associated evidence of depredation such as oil slicks and feeding birds that may associate marine mammals with depredation. Note that species observed in the area may not necessary be associated with depredation unless directly observed. Similarly for shark and squid damage the species may be difficult to determine.

85	Comments	Include any comments such as possible reasons for incidental capture. Note whether this was accidental due to the animal's presence in the area or as a result of the animal actively interacting with the catch or fishing gear.	Change DF as follows: Gear interaction (for SSI[47]): Describe fishing gear interaction with the specimen (Table #). This information is only to be collected for species of special interest as defined in IOTC-2018-SC21-R or any subsequent report from the Scientific Committee. Allows for the input of information on non-text format. Main objective being the collection of information on incidentally taken /affected bycatch such as PTS and SSI. This DF will provide information on whether bycatch was accidental due to the animal's presence in the area or as a result of the animal actively interacting with the fishing gear and also on type of gear interaction with the animal. Consistent with Resolutions 13/04; 13/05; 12/04; 12/06; 12/09. Table codes will be further developed based on Ward 2009 - Fisheries Res 97, for hooking location descriptions.

[47] A list of Species of Special Interest (SSI) is to be defined by IOTC Scientific Committee (SC). This should include all Protected Endangered and Threatened species (PETs), billfish (all/specific), shark species (all/specific) and any other species deemed of special interest by the SC for the collection of detailed information under IOTC ROS.

88	Condition (for discards)	Record the condition of the individual at the time of release (according to the categories for condition, e.g. alive – injured, distressed)	Change DF as follows: Condition (for SSI): Record the condition of the individual at the time of release (Table #). This information is only to be collected for species of special interest as defined in IOTC-2018-SC21-R or any subsequent report from the Scientific Committee. Definition of the code A0 to be modified to alive excellent (see, Hutchinson, et al 2015 MEPS). Proposed to collect this information only for SSI[48] as to be defined by the IOTC. To provide an assessment of the life status of the animal on release. Consistent with IOTC Resolutions 13/04; 13/05; 12/04; 12/06; 12/09. However SC17.10 (para. 41) indirectly notes the need for the collection of discards condition both at capture and at release to "Assess the species-specific percentage of discards that is captured dead versus alive, as well as the post-release mortality of species that are discarded alive, in order to estimate what will be the added fishing mortality to the populations, based on the best current information". This information being required to evaluate benefits of retaining non-target species. It infers that information should not only be collected for all discards at release but also at capture. This needs to be discussed during the WPDCS
94	Length 1	Record the length (in centimetres) corresponding to the length type taken (length code 1) rounded to the lowest centimetre size bin.	Change DF description as follows: Record the length corresponding to the length type taken rounded to the lower centimetre. For LD1 this should be rounded to the lower half centimetre.
98	Maturity stage	Specify the stage of maturity of the specimen.	Change DF description as follows: Specify the stage of maturity of the sampled fish specimen (elasmobranchs, tuna and billfish) using standard maturity scales approved by the IOTC.

[48] A list of Species of Special Interest (SSI) is to be defined by IOTC Scientific Committee (SC). This should include all Protected Endangered and Threatened species (PETs), billfish (all/specific), shark species (all/specific) and any other species deemed of special interest by the SC for the collection of detailed information under IOTC ROS.

99	Sample collected	Describe the collection of samples, including the type and location to be sent/stored. If samples are retained they must be clearly labelled recording the date, position, vessel and fishing event information and the observer's name. Observers must also record what samples were kept during the trip and where they are stored.	Change DF description as follows: Sample collected: Describe the collection of samples trough the recording of (a) sample type (e.g. otoliths, spine clippings, and genetic samples); (b) sample preservation method (e.g. alcohol, frozen, etc.); and (c) destination i.e. location to be sent/stored. If samples are retained they must be clearly labelled recording the date, position, vessel and fishing event information and the observer's name.

GILLNET INFORMATION

Gear specifications

#	DF name	Current DF description	Proposed changes and justification
1	Total number of nets onboard	Record the number of nets which are held onboard the vessel	Change DF as follows: Total number of pelagic gillnets on-board: Record the total number of operational pelagic gillnets held on-board the vessel.
2	Net drum/hauler	Record if a net hauler is present or absent. A net drum may also be used that both hauls and on which the net is stored.	Change DF as follows: Net drum/hauler: Record if a net hauler/drum is present on-board (Y/N).Note: Vessels are normally equipped with a hydraulic net hauler; However they can also use net drums to both haul and store the net. If interested in having such information CPCs should develop a gear catalogue to be updated by trained personnel.

Fishing event

#	DF name	Current DF description	Proposed changes and justification
10	Net type	Record which net type is used (based on the specifications detailed by the observer in form 2-GIL)	Change DF as follows: Gillnet sequential number: Specify gillnet used on this set by recording its sequential number. A unique sequential number is allocated to different gillnets to allow to relate gillnet used with its specifications. A unique sequential number needs to be allocated to different gillnets to allow to identify the gillnet used in each set.
11	Set type	Record how the net is set, e.g. if it is anchored (attached to the boat), left drifting or actively used to encircle the target school (***Error! Reference ource not found.***).	Change DF name to: Net setting strategy
12	Vertical set	Record the level the net is set at vertically in the water column (***Error! eference source not found.***)	Change DF as follows: Record the level the net is set at vertically in the water column if at the surface or at sub-surface. Remove Table 23.
13	Hanging ratio	The ratio between the length of the float line and the length of the stretched mesh hanging on the float line (***Error! Reference source not ound.***).	Change DF as follows: Hanging ratio (%): Record the ratio between the length of the float line and the length of the stretched mesh hanging on the float line. This value can be calculated by counting 10 or 12 meshes horizontally, measuring the length of the floatline they are attached to, and comparing that distance to the stretched out length of the meshes. This information may also be obtained from the captain. Information initially requested at event/set level under DF N° 13 – Hanging ratio: The ratio between the length of the float line and the length of the stretched mesh hanging on the float line (***Error! eference source not found.***). To be collected at trip level as the hanging ratio of a specific gillnet will not change between sets.

19	Haul start time	Record the start time of the hauling operation (hh:mm). This is the time that a net panel first leaves the water.	Change DF as follows: Haul start time: Record the start time of the hauling operation (hh:mm). This is the time when the hauling equipment is put into gear or when the net starts being hauled." Technically haul starts when the hauling equipment is put into gear since the net starts being hauled at this moment not when the first panel leaves the water.
27	Sampling details	Indicate whether the entire haul was observed, or if a sample was taken. Describe the process (e.g. random/stratified sample of panels observed). Describe if subsampling took place for collecting the different levels of biological information (e.g. otoliths, length measurements)	Change DF as follows: Sampling methods for obtaining total catch estimates per species: Record sampling method used to obtain total catch estimates per species for the observed set (Table#). Allows for the: (1) standardizing of sampling methods accordingly to IOTC Observer Manual v.1.2., (2) collection of information on non-text format via the use of standard tables and codes.
42	Tag number	Provide the tag number	Tag number: Record tag number. If a turtle make sure to collect both tag numbers (right and left flipper). Never remove tags from live birds and turtles. Information to be also collected for turtles and birds.
43	Tag type	Record the type of tag used (Table 37)	Information to be also collected for turtles and birds. Corresponding table (#) to be changed accordingly (i.e. turtle and bird tag codes are to be added).
47	Fate	For each specimen record an IOTC fate code which includes whether it was retained or discarded and the reason, e.g. "Discarded – too small" (***Error! Reference source not ound.***).	Change DF description as follows: Record an IOTC fate code which includes whether it was retained or discarded and the reason, e.g. "Discarded – too small".
55	Scar/marks	Record the type of scar present on the specimen based on the IOTC categories. This might be no scar, an unknown scar, a tag scar, cookie-cutter shark, shark/killer whale or some other identifiable scar type which can be specified (Table 32).	Change DF name to: Depredation source Associated Table (#) to be changed as follows: *1)* shark/killer whales to be replaced by sharks/toothed whales (SW); *2)* codes for shark (SH); toothed whales (TW); seabirds (SB) to be added; no scar (NS) and tag scar (TS) to be removed as these are not considered useful and not related to depredation.

56	Depredation	If the predator was observed and identified, record the species code. If no depredation was directly observed, indicate "Not observed". Note that species observed in the area may not necessary be associated with depredation unless directly observed. Take note of any associated evidence of depredation such as oil slicks and feeding birds that may associate marine mammals with depredation. Similarly for shark and squid damage the species may be difficult to determine.	Change DF as follows: Predator Observed: Record if the predator was directly observed and identified (Y/N). If YES record the species (Table # to #). Take note under comments of any associated evidence of depredation such as oil slicks and feeding birds that may associate marine mammals with depredation. Note that species observed in the area may not necessary be associated with depredation unless directly observed. Similarly for shark and squid damage the species may be difficult to determine.
58	Comments	Include any comments such as possible reasons for incidental capture. Note whether this was accidental due to the animal's presence in the area or as a result of the animal actively interacting with the catch or fishing gear.	Change DF as follows: Gear interaction (for SSI): Describe fishing gear interaction with the specimen (Table #). This information is only to be collected for species of special interest as defined in IOTC-2018-SC21-R or any subsequent report from the Scientific Committee. Allows collecting required information on standard format and not on a text format. Main objective being the collection of information on incidentally taken /affected bycatch such as PETs and SSI. This DF will provide information on whether bycatch was accidental due to the animal's presence in the area or as a result of the animal actively interacting with the fishing gear and also on type of gear interaction with the animal. Consistent with Resolutions 13/04; 13/05; 12/04; 12/06; 12/09.

60	Condition (for discards)	Record the condition of the individual at the time of release (according to the categories for condition, e.g. alive – injured, distressed)	Change DF as follows: Condition (for SSI): Record the condition of the individual at the time of release (Table #). This information is only to be collected for species of special interest as defined in IOTC-2018-SC21-R or any subsequent report from the Scientific Committee. Definition of the code A0 to be modified to alive excellent (see, Hutchinson, et al 2015 MEPS). Proposed to collect this information only for SSI[49] as to be defined by the IOTC. To provide an assessment of the life status of the animal on release. Consistent with IOTC Resolutions 13/04; 13/05; 12/04; 12/06; 12/09. However SC17.10 (para. 41) indirectly notes the need for the collection of discards condition both at capture and at release to "Assess the species-specific percentage of discards that is captured dead versus alive, as well as the post-release mortality of species that are discarded alive, in order to estimate what will be the added fishing mortality to the populations, based on the best current information". This information being required to evaluate benefits of retaining non-target species. It infers that information should not only be collected for all discards at release but also at capture. This needs to be discussed during the WPDCS
66	Length 1	Record the length (in centimetres) corresponding to the length type taken (length code 1) rounded to the lowest centimetre size bin.	Change DF description as follows: Record the length corresponding to the length type taken rounded to the lower centimetre. For LD1 this should be rounded to the lower half centimetre.
70	Maturity stage	Specify the stage of maturity of the specimen.	Change DF description as follows: Specify the stage of maturity of the sampled fish specimen (elasmobranchs, tuna and billfish) using standard maturity scales approved by the IOTC.

[49] A list of Species of Special Interest (SSI) is to be defined by IOTC Scientific Committee (SC). This should include all Protected Endangered and Threatened species (PETs), billfish (all/specific), shark species (all/specific) and any other species deemed of special interest by the SC for the collection of detailed information under IOTC ROS.

71	Sample collected	Describe the collection of samples, including the type and location to be sent/stored. If samples are retained they must be clearly labelled recording the date, position, vessel and fishing event information and the observer's name. Observers must also record what samples were kept during the trip and where they are stored.	Change DF as follows: <u>Sample collected:</u> Describe the collection of samples trough the recording of (a) sample type (e.g. otoliths, spine clippings, and genetic samples); (b) sample preservation method (e.g. alcohol, frozen, etc.); and (c) destination i.e. location to be sent/stored. If samples are retained they must be clearly labelled recording the date, position, vessel and fishing event information and the observer's name.

Gear specifications

#	DF name	Current DF description	Proposed changes and justification
3	Stretched mesh size	Record the average stretched mesh size of the main body of the net, knot to knot (in mm). Observers should measure at least 10 mesh lengths from the main body of the net and record the average.	DF to be divided into two different fields: Bag stretched mesh size: The average stretched mesh length (knot to knot) of the bag of the net. Usually calculated by measuring 3 stretched mesh lengths. Mid-net stretched mesh size: The average stretched mesh length (knot to knot) of the mid-net. Usually calculated by measuring 3 stretched mesh lengths.
8	Brail size	Record the average weight of a full brail	Change DF as follows: Maximum Brail Capacity: record the maximum weight capacity of a full brail in Mt.
14	Number of FADs deployed	The total number of FADs deployed during the trip	For clarification: If requesting A- Number of artificial FADs (man-made) deployed Record the total number of man-made FADs deployed during the trip. B- Number of instrumented buoys deployed Record the total number of instrumented buoys deployed during the trip. Instrumented buoys can be deployed with vessel artificial FADs, attached to drifting natural FADs or used to replace other vessels buoys attached to artificial/natural FADs.

Fishing event

#	DF name	Current DF description	Proposed changes and justification
22	Sampling methods for (i) obtaining total catch estimates	Describe the sampling methods used for obtaining total catch estimates, e.g. grab/spill/other direct from brails, or from pre-sorted catch, if random or stratified, or if total enumeration was used.	Change DF as follows: Sampling methods for obtaining total catch estimates per species: Record sampling method used to obtain total catch estimates per species for the observed set (Table#). Insert new table named "Sampling methods for the estimation of catch per species". Allows for the: (1) standardizing of sampling methods accordingly to IOTC Observer Manual v.1.2., (2) collection of information on non-text format via the use of standard tables and codes.
23	Sampling methods for (ii) biological sub-sample	Describe the sampling methods used for selecting biological samples. Note whether all species groups were sampled equally or if some groups were prioritised, e.g. particular bycatch species.	Change DF as follows: Sampling strategies for the collection of biological information: Record sampling method used for the collection of biological sub-sample (Table #). Insert new table named "Sampling methods for the collection of biological sub-samples. Move DF under "Biological sample" section as different sampling methods can be used for the same set and species. Allows for the: (1) standardizing of sampling methods accordingly to IOTC Observer Manual v.1.2., (2) collection of information on non-text format via the use of standard tables and codes.
39	Fate	Record an IOTC fate code which includes whether it was retained or discarded and the reason, e.g. "Discarded – too small" (***Error! eference source not found.***).	Change "Fate" codes (Table #) as follows: • Insert new code for sharks, option to have "trunk retained, fins discarded". • Change DRB description to "Discarded due to flag state measures." as IOTC is already covered in DUD. • Remove code RCP. • Remove "not due to depredation" in the description of RCC. • Include "Unknown" fate option

40	Number	Record the number of individuals of the recorded weight.	Change DF description as follows: If an accurate count is possible record the number of individuals by species for each specified fate category. Note that large amounts are to be recorded in ""tonnes". In purse-seine the observer won't be able to count, identify and weigh every single fish. Therefore he must be allowed to estimate weight / number per species and fate category.
41	Weight	Record the raw weight measurement in kilograms (kg) corresponding to the specified product type	Change DF description as follows: Record the weight in tonnes .corresponding to the specified weight estimation method used and fate category. Small amounts are to be recorded in numbers. In purse-seine the observer won't be able to count, identify and weigh every single fish. Therefore he must be allowed to estimate weight / number per species and fate category.

50	Condition (for discards)	Record the condition of the individual at the time of release (according to the categories for condition, e.g. alive – injured, distressed)	Change DF as follows: Condition (for SSI): Record the condition of the individual at the time of release (Table #). This information is only to be collected for species of special interest as defined in IOTC-2018-SC21-R or any subsequent report from the Scientific Committee. Definition of the code A0 to be modified to alive excellent (see, Hutchinson, et al 2015 MEPS). Proposed to collect this information only for SSI[50] as to be defined by the IOTC. To provide an assessment of the life status of the animal on release. Consistent with IOTC Resolutions 13/04; 13/05; 12/04; 12/06; 12/09. However SC17.10 (para. 41) indirectly notes the need for the collection of discards condition both at capture and at release to "Assess the species-specific percentage of discards that is captured dead versus alive, as well as the post-release mortality of species that are discarded alive, in order to estimate what will be the added fishing mortality to the populations, based on the best current information". This information being required to evaluate benefits of retaining non-target species. It infers that information should not only be collected for all discards at release but also at capture. This needs to be discussed during the WPDCS

[50] A list of Species of Special Interest (SSI) is to be defined by IOTC Scientific Committee (SC). This should include all Protected Endangered and Threatened species (PETs), billfish (all/specific), shark species (all/specific) and any other species deemed of special interest by the SC for the collection of detailed information under IOTC ROS.

51	Comments	Include any comments such as possible reasons for bycatch interactions.	Change DF as follows: Gear interaction (for SSI): Describe fishing gear interaction with the specimen (Table #). This information is only to be collected for species of special interest as defined in IOTC-2018-SC21-R or any subsequent report from the Scientific Committee. Allows collecting required information on standard format and not on a text format. Main objective being the collection of information on incidentally taken /affected bycatch such as PETs and SSI. This DF will provide information on whether bycatch was accidental due to the animal's presence in the area or as a result of the animal actively interacting with the fishing gear and also on type of gear interaction with the animal. Consistent with Resolutions 13/04; 13/05; 12/04; 12/06; 12/09.
60	Length	Record the length (in centimetres) corresponding to the length type taken rounded to the lowest centimetre size bin.	Change DF description as follows: Record the length corresponding to the length type taken rounded to the lower centimetre. For LD1 this should be rounded to the lower half centimetre.
62	Maturity stage	Specify the stage of maturity of the specimen.	Change DF description as follows: Specify the stage of maturity of the sampled fish specimen (elasmobranchs, tuna and billfish) using standard maturity scales approved by the IOTC SC. Maturity scales should be standardized as per other tRFMOs.
63	Sample collected	Describe the collection of samples, including the type and location to be sent/stored. If samples are retained they must be clearly labelled recording the date, position, vessel and fishing event information and the observer's name. Observers must also record what samples were kept during the trip and where they are stored.	Change DF as follows: Sample collected: Describe the collection of samples trough the recording of (a) sample type (e.g. otoliths, spine clippings, and genetic samples); (b) sample preservation method (e.g. alcohol, frozen, etc.); and (c) destination i.e. location to be sent/stored. If samples are retained they must be clearly labelled recording the date, position, vessel and fishing event information and the observer's name.

POLE AND LINE INFORMATION

Gear specifications

#	DF name	Current DF description	Proposed changes and justification
2	Maximum number of operational poles (manual)	The maximum number of manual poles that can be operated from the bait-boat, considering the size of the boat and the crew available.	Change DF as follows: Maximum number of anglers: Record the maximum number of anglers observed during the trip. Fishers have several poles but during the fishing event they will only use one at a time. Therefore number of anglers should be used to quantify fishing capacity rather than poles (anglers can include the captain, the cook and the person responsible for the bait). Note: N° of fishers under IOTC Res 15/01.
5	Hook type	Record hook type using codes provided in Table 21.	Observers can't check hook type for every single pole on-board on an event basis. This information should be collected at trip level. For coherence among hook fisheries "Table 21: Hook type" is to be replaced with SPC hook catalogue as proposed by the longline experts group.

Fishing event

#	DF name	Current DF description	Proposed changes and justification
1	Fishing event / operation number	Each time the vessel activates its sprayers, starts chumming and actively catching fish, record this event with a unique event number. Event numbers should be consecutive from the start of the observed trip to the end of the trip. This should be a four digit numerical code beginning 0001. (If the vessel does not catch fish then scrap the event number and record this under daily activity. This will then form part of the time of the vessel was searching for fish).	Change DF description as follows: Each time the vessel activates its sprayers, starts chumming and/or actively catching fish, record this event with a unique event sequential number. This should be a four digit numerical code beginning 0001. Event numbers should be consecutive from the start to the end of the observed trip. In pole and line fisheries an event should always be connected to fishing activity even if there are no fish caught.
8	Time start fishing	Record the time of the first activity (spray / chumming / poling) that starts. This may not coincide exactly with the time the first fish is caught, however, if no fish are caught then this will not be recorded as an event and the time will be recorded as part of the daily activity instead.	Change DF description as follows: Record the time at the start of the fishing event (hh:mm). When the first line enters the water. Start fishing time should be defined as the moment that the first gear (in this case "line" enters the water).
11	N° of manual poles used (#)	Number of manual poles used during the peak of the activity	Replace DFs n° 11 and12 with a unique DF as follows: <u>Maximum lines fishing at the same time:</u> Record maximum number of lines fishing at the same time. This should include all lines deployed (from manual and automatic poles and any other type of line, which should be specified). One count should be undertaken when the fishing activity is well established (not right at the beginning or right at the end). Lines fishing should be counted rather than poles since one line can be attached to two or more poles (e.g. when fishing for large fish). This will also allow accounting for lines not attached to a pole (e.g. hand lines) by counting them under "other".
12	N° of automatic poles used (#)	Number of automatic poles used during the peak of the activity	

22	Sampling details	Indicate whether the entire fishing operation was observed, or if a sample was taken. Describe the process (e.g. random sample of lines observed). Describe if subsampling took place for collecting the different levels of biological information (e.g. length measurements).	Change DF as follows: Sampling methods for obtaining total catch estimates per species: Record sampling method used to obtain total catch estimates per species for the observed set (Table#). Insert new table named "Sampling methods for the estimation of catch per species". Allows for the: (1) standardizing of sampling methods accordingly to IOTC Observer Manual v.1.2., (2) collection of information on non-text format via the use of standard tables and codes. Sampling for length-weight frequency and biological sub-sampling is dangerous to be conducted on-board pole and line vessels. For target species this information can be inferred using weigh-length frequency tables (tables have been developed by the Azorean Observer Program) or by instructing observer to conduct sampling at port during unloading. For bycatch species the observer can conduct sampling on-board at the end of the fishing
35	Tag number	Provide the tag number	Change DF description as follows: Provide the tag number. If a turtle make sure to collect both tag numbers (right and left flipper).
36	Tag type	Record the type of tag used/recovered using codes provided in Table 44.	Add turtle and bird tag codes to table 44.
46	Scar / marks	Record the type of scar present on the specimen based on the IOTC categories. This might be no scar, an unknown scar, a tag scar, cookie-cutter shark, shark/killer whale or some other identifiable scar type which can be specified.	Change DF name as follows: Depredation source Associated Table (#) to be changed as follows: *1)* shark/killer whales to be replaced by sharks/toothed whales (SW); *2)* codes for shark (SH); toothed whales (TW); seabirds (SB) to be added; 3) no scar (NS) and tag scar (TS) to be removed as these are not considered useful and not related to depredation

52	Comments	Include any comments such as possible reasons for incidental capture. Note whether this was accidental due to the animal's presence in the area or as a result of the animal actively interacting with the catch or fishing gear.	Change DF as follows: Gear interaction (for SSI): Describe fishing gear interaction with the specimen (Table #). This information is only to be collected for species of special interest as defined in IOTC-2018-SC21-R or any subsequent report from the Scientific Committee. Allows collecting required information on standard format and not on a text format.Main objective being the collection of information on incidentally taken /affected bycatch such as PETs and SSI. This DF will provide information on whether bycatch was accidental due to the animal's presence in the area or as a result of the animal actively interacting with the fishing gear and also on type of gear interaction with the animal. Consistent with Resolutions 13/04; 13/05; 12/04; 12/06; 12/09.

56	Condition (for discards)	Record the condition of the individual at the time of release (according to the categories for condition, e.g. alive – injured, distressed)	Change DF as follows: Condition (for SSI): Record the condition of the individual at the time of release (Table #). This information is only to be collected for species of special interest as defined in IOTC-2018-SC21-R or any subsequent report from the Scientific Committee. Definition of the code A0 to be modified to alive excellent (see, Hutchinson, et al 2015 MEPS). Proposed to collect this information only for SSI[51] as to be defined by the IOTC. To provide an assessment of the life status of the animal on release. Consistent with IOTC Resolutions 13/04; 13/05; 12/04; 12/06; 12/09. However SC17.10 (para. 41) indirectly notes the need for the collection of discards condition both at capture and at release to "Assess the species-specific percentage of discards that is captured dead versus alive, as well as the post-release mortality of species that are discarded alive, in order to estimate what will be the added fishing mortality to the populations, based on the best current information". This information being required to evaluate benefits of retaining non-target species. It infers that information should not only be collected for all discards at release but also at capture. This needs to be discussed during the WPDCS
65	Maturity stage (GSI)	Specify the stage of maturity of the specimen.	Change DF description as follows: Specify the stage of maturity of the sampled fish specimen (elasmobranchs, tuna and billfish) using standard maturity scales approved by the IOTC.

[51] A list of Species of Special Interest (SSI) is to be defined by IOTC Scientific Committee (SC). This should include all Protected Endangered and Threatened species (PETs), billfish (all/specific), shark species (all/specific) and any other species deemed of special interest by the SC for the collection of detailed information under IOTC ROS.

66	Sample collected	Describe the collection of samples, including the type and location to be sent/stored. If samples are retained they must be clearly labelled recording the date, position, vessel and fishing event information and the observer's name. Observers must also record what samples were kept during the trip and where they are stored.	Change DF as follows: <u>Sample collected:</u> Describe the collection of samples trough the recording of (a) sample type (e.g. otoliths, spine clippings, and genetic samples); (b) sample preservation method (e.g. alcohol, frozen, etc.); and (c) destination i.e. location to be sent/stored. If samples are retained they must be clearly labelled recording the date, position, vessel and fishing event information and the observer's name.

PROPOSED CHANGES TO EXISTING DATA FIELD REPORTING REQUIREMENT

GENERAL VESSEL AND TRIP INFORMATION FOR ALL VESSEL TYPES

#	DF name	Current reporting requirement [52]	Current DF description	Proposed changes and justification
4	Main gear	Mandatory reporting	Main gear type/s (if more than one type of fishing gear is used) for the observed trip, e.g. drifting longline (up to 1800 hooks), LLFR (***Error! eference source not found.***).	Change to 'not mandatory' as vessel IOTC registration number should be the only mandatory reporting vessel ID feature for data quality purposes.
8	Licensed target species	Not mandatory for reporting	Vessels will generally target a narrow range or aggregation of species and specified by the licences or permit conditions under which authority the vessel is operating (***Error! Reference ource not found.***).	If changes to DF description approved, change to 'mandatory reporting'. Licences target species such as oilfish would be very important to record, to explain low CPUE for IOTC spp.
9	IMO or Lloyd's number	Not mandatory for reporting	The IMO number refers to the number allocated to the vessel if it is registered to the International Maritime Organisation of the United Nations.	Change to 'mandatory reporting'. Note that presently this information can't be retrieved for vessels under 24 m LOA. Yet this will change in the future since IMO is extending the allocation of a Lloyd's number to these vessels.
10	Port of departure	Mandatory reporting	If the fishing vessel departed from port the name of the port and geographical coordinates corresponding to the port; if the vessel started a new trip at sea following a transhipment just record 'at-sea' plus the geographical coordinates corresponding to the location the trip started.	Change to 'not mandatory' as this information is only important for administration purposes.
11	Date / time vessel sailed	Mandatory reporting	The date (YYYY-MM-DD) and time (hh:mm) the fishing vessel started the trip that is being observed, i.e. the date in which the fishing vessels sailed back to the fishing grounds from port or a transhipment location.	Change to 'not mandatory' as this information is only important for administration purposes.
12	Date / time vessel returned to port	Mandatory reporting	The date (YYYY-MM-DD) and time (hh:mm) the fishing vessel ended the trip that is being observed, i.e. the date in which the fishing vessel arrived back in port or to a transhipment location. Where an observer disembarks	Change to 'not mandatory' as this information is only important for administration purposes.

[52] “Mandatory for reporting” or not “mandatory for reporting”.

			before the vessel returns to its home port at the end of the trip then the observer can request the vessel ETA from the captain but this must be clearly reflected.	
13	Port of return	Mandatory reporting	If the fishing vessel arrived in port record the name of the port or geographical coordinates corresponding to the port; if the vessel arrived at a transhipment location just record 'at-sea' plus the geographical coordinates corresponding to the location the transhipment started. If the observer disembarks before the vessel returns then the observer can request the information from the captain and record this.	Change to 'not mandatory' as this information is only important for administration purposes.
14	Observer name	Mandatory reporting	Name of the scientific observer(s) that collected the data onboard the fishing vessel. The observer must print first and family names in full.	Change to 'not mandatory' as information already in the possession of the IOTC Secretary for all IOTC registered Observers.
15	Observer nationality	Mandatory reporting	Record nationality as it appears in passport.	Change to 'not mandatory' as information already in the possession of the IOTC Secretary for all IOTC registered Observers.
17	Employer	Mandatory reporting	Record the full name and address of the observer controlling organisation and/ or national fisheries organisation responsible for managing deployment. Include postal and physical addresses and relevant telephone numbers and email addresses.	Change to 'not mandatory' as information already in the possession of the IOTC Secretary for all IOTC registered Observers.
18	Date / time embarkation	Mandatory reporting	Record the date and time that the observer embarks onboard the vessel (DD:MM:YYYY:hh:mm). It is important to record the vessel's time and note the time zone (±GMT) that the vessel is using.	Change to 'not mandatory' as information important only at national level for administrative purposes.
19	Location of embarkation	Mandatory reporting	Record the port and country where the observer embarks. Note: if the observer embarks via a port launch within port limits, this is still recorded as a port embarkation. If the observer embarks at sea outside port limits via a vessel transfer, record "at sea" and record the position in Latitude and	Change to 'not mandatory' as information important only at national level for administrative purposes.

			Longitude (specify units; preferably ±(d)dd.dddd°).	
20	Date / time disembarkation	Mandatory reporting	Record the date and time that the observer disembarks from the vessel (DD:MM:YYYY:hh:mm). The observer's embarkation and disembarkation may not coincide with the vessel trip information.	Change to 'not mandatory' as information important only at national level for administrative purposes.
21	Location of disembarkation	Mandatory reporting	Record the port and country where the observer disembarks. Note: if the observer disembarks via a port launch within port limits then this is still recorded as a port disembarkation. If the observer disembarks at sea outside port limits via a vessel transfer, record "at sea" and record the position in Latitude and Longitude (specify units; preferably ±(d)dd.dddd°).	Change to 'not mandatory' as information important only at national level for administrative purposes.
40	International radio call sign (IRCS)	Mandatory reporting	This is the number allocated to the vessel by the International Telecommunications Union. This should be displayed prominently on the vessel's side or superstructure. Where a vessel does not have an IRCS it should display the characters allocated to its Flag State by the International Telecommunications Union (ITU) followed by the licence or registration number that the Flag State has allocated to the vessel.	Change to 'not mandatory' as information important only at national level for administrative purposes.
44	Refrigeration methods(s)	Mandatory reporting	Record the method/s used by the vessel to cool and preserve catch (e.g. blast freezing).	Change to 'not mandatory' as information important only at national level for administrative purposes.
45	Fish Storage Method(s)	Mandatory reporting	Record the method used by the vessel to store catch. Note: a method to preserve fish may involve several processes, e.g. a fish may first be cooled in a blast freezer at a specific temperature for a time before being transferred to a holding facility for storage at a different temperature. At the same time other species may be placed directly into a freezer hold with no intermediate blast freezing process. Vessels undertaking shorter trips may keep the fish fresh on ice or in RSW.	Change to 'not mandatory' as information not used for scientific purposes by IOTC.

47	Hull material	Not mandatory for reporting	Record the hull material; steel, wood or glass-reinforced plastic (GRP) also known as fibre glass.	Change reporting requirement to ‘mandatory reporting’.
48	Main engine Make/ Power	Not mandatory for reporting	Record the make and power of the main engines.	Change reporting requirement to ‘mandatory reporting’.
56c	Acoustic equipment Sonar	Not mandatory for reporting	Record presence/absence (Y/N) of acoustic sonar(s). For each acoustic sonar present on-board record: make, model, frequency of use, by means of the codes provided in Table 15.	If approved to change DF to: “Record presence/absence (Y/N) of acoustic sonar(s)” than change reporting requirement to ‘mandatory reporting’.
56c	Acoustic equipment Doppler current meter	Not mandatory for reporting	Record if the vessel has an acoustic doppler current meter, the make and model. This is important to ascertain the current speed	If approved to change DF to: “Record presence/absence (Y/N) of acoustic doppler current meter” then change reporting requirement to ‘mandatory reporting’.
57	Expendable bathythermographs (XBT)	Not mandatory for reporting	Record if the vessel has onboard and deploys expendable bathythermographs XTBs. These are usually mounted on the bridge wings and are used periodically to determine the depth of the thermocline. Note the make and model.	If approved to change DF to: “Record if the vessel has onboard and deploys expendable bathythermographs XTBs (Y/N)”. Then change reporting requirement to ‘mandatory reporting’.
58	Communications equipment	Mandatory reporting	Record presence/absence of VHF, HF radios onboard.	Change reporting requirement to ‘Not mandatory’ as information not used for scientific purposes by IOTC.
60	Satellite communication systems	Mandatory reporting	These systems provide ship/shore, ship/ship and shore/ship telephone, telex and high-speed data services, including a distress priority telephone and telex service to and from rescue coordination centres. Satellite systems operated by the Inmarsat, overseen by IMSO, International Mobile Satellite Organization are also important elements of the GMDSS. The types of Inmarsat ship earth station terminals recognized by the GMDSS are: Inmarsat B, C and F77. Record the make and model.	Change reporting requirement to ‘Not mandatory’ as information not used for scientific purposes by IOTC.

Gear specifications

#	DF name	Current reporting requirement	DF description	Proposed changes and justification
16	Branchline length (m)	Not mandatory for reporting	Record the length of the branchline (in metres) for each of the four sections where section 1 is that closest to the mainline and section 4 is the leader.	Change to ‘mandatory reporting’ as this information is useful to estimate hook fishing depth and assess target species (or group of target species).

Fishing event

#	DF name	Current reporting requirement	DF description	Proposed changes and justification
1	Set/operation number	Mandatory reporting	Each time the net is deployed a unique number is allocated for the setting operation. Set numbers should be consecutive from the start of the first set to the last set of the observed trip. This should be a four digit numerical code beginning 0001. The vessel log may follow a different sequence. Observers should note this so that the reported sets can be compared to the observed sets.	Change to 'not mandatory reporting' as date and time already provide a unique ID. This information provides a link between paper forms.
5	End Setting time	Not mandatory for reporting	Record the time that the last dhan buoy and / or radio buoy is deployed.	Change to 'mandatory reporting'. Information required for estimating gear soaking time. Consistent with SC16.24 (para. 53)
22	Number of shark lines set	Not mandatory for reporting	Record the number of shark lines set during the operation.	If approved to change DF to: (a) Record if shark lines are used (Y/N) (b) Record the number of shark lines set during the operation. If no shark lines are set than record zero (0). Than change reporting requirement as follows: a) For Mandatory Reporting. Information is critical to assess fishing effort targeting sharks, improve shark stock assessment and better manage the impact of pelagic longline in the wider ecosystem. b) Not mandatory for reporting Quantifying the shark lines used will provide information for estimating shark mortality.

36	Number of hooks set by type	Not mandatory for reporting	Record the number of each type of hook set	If approved to change DF from n° to % of hooks set by type, then change to mandatory reporting. This information is critical to estimate turtle bycatch and mortality as are "Bait Type" and "Bait species" DFs that are already mandatory for reporting. Consistent with SC20.23 (para. 67).
97	Sex	Mandatory reporting	Record the sex, male or female, where possible. On some tuna longline vessels the observer may not be permitted to physically handle the fish, however, the entrails can be obtained from the crew while they clean the fish.	Change to 'not mandatory for reporting' since consistent data quality will be difficult to achieve.
98	Maturity stage	Mandatory reporting	Specify the stage of maturity of the specimen.	Change to 'not mandatory for reporting' since consistent data quality will be difficult to achieve.
99	Sample collected	Mandatory reporting	Describe the collection of samples, including the type (e.g. otoliths, spine clippings, and genetic samples) and location to be sent / stored. If samples are retained they must be clearly labelled recording the date, position, vessel and fishing event information and the observer's name. Observers must also record what samples were kept during the trip and where they are stored.	Change to 'not mandatory for reporting' since consistent data quality will be difficult to achieve.

Fishing event

#	DF name	Current reporting requirement	DF description	Proposed changes and justification
1	Set number	Mandatory reporting	For each net set a unique number is allocated. Set numbers should be consecutive from the start of the first net set to the last net set of the observed trip. This should be a four digit numerical code beginning 0001.	Change to 'not mandatory for reporting' as date and time already provide a unique ID. This information provides a link between paper forms.
7	Set end date	Not mandatory for reporting	Record the date at the end of net setting (YYYY-MM-DD).	Change to 'mandatory for reporting', since this information is needed to calculate soaking time. Consistent with SC16.24 (para. 53)
8	Set end time	Not mandatory for reporting	Record the end time of the setting operation (hh:mm). This is the time that the last net panel has entered the water.	Change to 'mandatory for reporting', since this information is needed to calculate soaking time. Consistent with SC16.24 (para. 53)
49	Weight	Not mandatory for reporting	Record the raw weight measurement in kilograms (kg) corresponding to the specified product type	In gillnet the observer won't be able to count, identify and weight every single fish. Therefore he must be allowed to estimate weight / number per species and fate category. Change to 'mandatory for reporting', as this information is needed for CPUE.

Fishing event

#	DF name	Reporting requirement	DF description	Proposed changes and justification
1	Set/operation number	Mandatory reporting	Each time the net is deployed a unique number is allocated for the setting operation. Set numbers should be consecutive from the start of the first set to the last set of the observed trip. This should be a four digit numerical code beginning 0001. The vessel log may follow a different sequence. Observers should note this so that the reported sets can be compared to the observed sets.	Change to 'Not mandatory for reporting' as date and time already provide a unique ID. This information provides a link between paper forms.

POLE AND LINE INFORMATION

Fishing event

#	DF name	Reporting requirement	DF description	Proposed changes and justification
1	Fishing event / operation number	Mandatory reporting	Each time the vessel activates its sprayers, starts chumming and actively catching fish, record this event with a unique event number. Event numbers should be consecutive from the start of the observed trip to the end of the trip. This should be a four digit numerical code beginning 0001. (If the vessel does not catch fish then scrap the event number and record this under daily activity. This will then form part of the time of the vessel was searching for fish).	Change to 'Not mandatory for reporting' as date and time already provide a unique ID. This information provides a link between paper forms.
9	Time end fishing	Not mandatory for reporting	Record the time when fishing activity stops and the vessel starts a new activity (hh:mm). When the last line comes out of the water. If the vessel targets the same school more than once and it stops fishing for a period of at least 10 minutes than the Observer should consider that the fishing event ended even if fishing is to restarts shortly after.	Change DF reporting requirement to 'mandatory for reporting'. This information is needed to estimate fishing time and therefore CPUE.
43	Weight 1 (pre-processing)	Not mandatory for reporting	Record the weight in kilograms of the unprocessed, round, whole, live weight of the specimen.	If approved to replace DFs with a unique field "Weight" than change to 'Mandatory for reporting' as this information will be needed to estimate CPUE since in pole and line the observer won't be able to count, identify and weight every single fish. Therefore he must be allowed to estimate weight / number per species and fate category.
44	Weight 2 (post-processing)	Not mandatory for reporting	Record the raw weight measurement in kilograms (kg) corresponding to the specified product type	

PROPOSED TABLES

Fish preservation methods

Code	English Description
NO	None
ST	Salt
DR	Dried
SM	Smoked
IC	Ice
CWS	Chilled with Sea Water (higher temp than refrigerated sea water)
RW	Refrigerated sea water
BR	Refrigerated brine (cooler than RW)
FR	Cold storage between 0 and -30 degrees
DF	Cold storage below -30 degrees

Fish storage type

Code	English Description
WL	Well
BF	Blast Freezer
RC	Refrigeration chamber

Weight estimation method

Code	English Description
EB	Electronic balance
SB	Spring balance
MB	Mechanical balance
EM	Eye measurement (observer)
LO	Vessel logbook (eye measurement crew)
LW	Length weight relationship

Sampling methods for obtaining total catch estimates per species

Code	English Description
EXS	Exhaustive Sampling: The observer weighted/counted every individual for the entire catch (only feasible if the catch is small)
MRS	Observer collected Multiple Random Samples, divided fish into species and weighted/counted them. Observer raised sample to obtain set catch per species (e.g. brail capacity x brail tally; fish weight x number of fish)
SPS	Systematic Proportional Sampling: a proportion (%) of the catch or of the individuals caught and brought on-board was weighted/counted in a systematic way to obtain set catch composition (e.g. the first 30 hooks, every third hook, first 30 fish in the panel, every third panel, etc.).

VES	Observer used Vessel Estimates to estimate catch per species (e.g. logbook, well contents, etc.)
CMB	Observer used a Combination of vessel estimates for retained catch and own estimates for discards to estimate catch per species.
OTH	Other. Provide details in comments

Sampling methods for the collection of biological information

Code	English Description
EXS	Exhaustive Sampling: the totality of the catch or all individuals caught for this species has been subsampled.
SPS	Systematic Proportional Sampling: a proportion (%) of the catch or of the individuals caught and brought on-board for this species has been subsampled in a systematic way. (E.g. every 10th fish is sub-sampled).
SSS	Stratified Sampling of a sample taken via "Spill method". The observer tipped the fish from a pile/receptacle/conveyer belt into a bin to avoid hand selection of individual fish, divided fish into homogeneous subgroups before subsampling. (e.g.: observer sub-sampled 50 fish for large fish (≥15 kg))
SSG	Stratified Sampling of a sample taken via "Grab method". The observer pulls by hand a selected number of fish from a pile/ receptacle/ conveyer belt and divided fish into homogeneous subgroups before subsampling (e.g.: observer sub-sampled 50 yellowfin tuna).
SRF	Systematic Random sampling of a Fixed number of each species: of the random sample taken, the fish are identified to species level. Once the main species have been determined, a pre-determined number of fish of each species is subsampled.
SRM	Systematic Random sampling of a Mixed species sample: of the random sample taken, a small random subsample is taken and biological information extracted.
SRP	Systematic Random sampling of Priority species: of the random sample taken, priority species are selected and biological information extracted.
OTH	Other. Provide details in comments

Specimen(s) fate code

Code	English Description
DTS	Discarded - too small. Fish of no commercial value due to being of small size
DUS	Discarded - unwanted species (e.g. with no commercial value or other than target species)
DRB	Discarded - retention ban on the species due to flag state measures
DFL	Discarded - vessel fully loaded
DUD	Discarded – due to IOTC retention ban
DPQ	Discarded – are unfit for human consumption[53]

[53] IOTC Res 17/04 : "unfit for human consumption" are fish that:

- is meshed or crushed in the purse seine; or

- is damaged due to depredation; or

- has died and spoiled in the net where a gear failure has prevented both the normal retrieval of the net and catch, and efforts to release the fish alive;

DDL	Discarded - too difficult to land
DFR	Discarded - trunk - fins retained (shark only)
DTR	Discarded - trunk retained, fins discarded (shark only)
RCC	Retained - crew consumption
RFL	Retained - for landing / sold
RFR	Retained trunk - fins retained (shark only)
RFT	Retained for at-sea-transhipment
ESC	Escaped
UNK	Unknown fate

Tag type

Code	English description
TC	Conventional (plastic spaghetti or dart tags are attached on the back of the fish)
TR	Rototags (a two-piece, plastic cattle ear tag, which is inserted through the first dorsal fin)
TS	Sonic tags (miniature radio transmitting devices that are surgically implanted inside the tuna. Since these are not visible externally, a conventional tag of a certain colour will be visible on the outside).
TP	Pop-up tags (Pop-up Satellite Archival Tags are inserted with an anchor and a tether into the dorsal musculature, recording temperature, pressure, and light, and they detach from the animal on a pre-programmed date).
TI	Internal archival tags (internal archival tags are implanted in the body cavity and record internal body temperature and the environment's temperature, pressure, and light).
TT	Smart Position or Temperature Transmitting tags are attached to the dorsal fin and send a signal to a satellite every time the animal surfaces
TO	Other (specify)

NB: Tag types for birds and turtles to be added

Depredation source

Code	English Description
SH	Shark
TW	Toothed whales
SW	Sharks/toothed whales
MM	Marine mammal
CC	Cookie-cutter shark
BA	Depredation on bait
SQ	Squid
SB	Birds
OT	Other (specify)

UNK	Unknown

Gear interaction (for incidentally taken /affected bycatch)

Code	English Description
HB	Hooked in the beak or mouth
HR	Hooked in the rostrum (billfish only)
HJ	Hooked in the fish/shark jaw (include jaw hinge, lower and upper jaw).
HL	Hooked in the fish/shark lip
HG	Hooked in the gills (include gill plate and gill slits)
HI	Hooked in the throat (internal including gullet)
HG	Hooked in the gut (internal)
HH	Hooked in the head
HF	Hooked on the flipper, fins or wings
HC	Hooked carapace
HO	Foul hooked (any other external location
EN	Entangled in the net
EN	Entangled in the line
EF	Entangled with FAD
EG	Entangled in ghost fishing gear
OT	Other (describe)
UK	Unknown

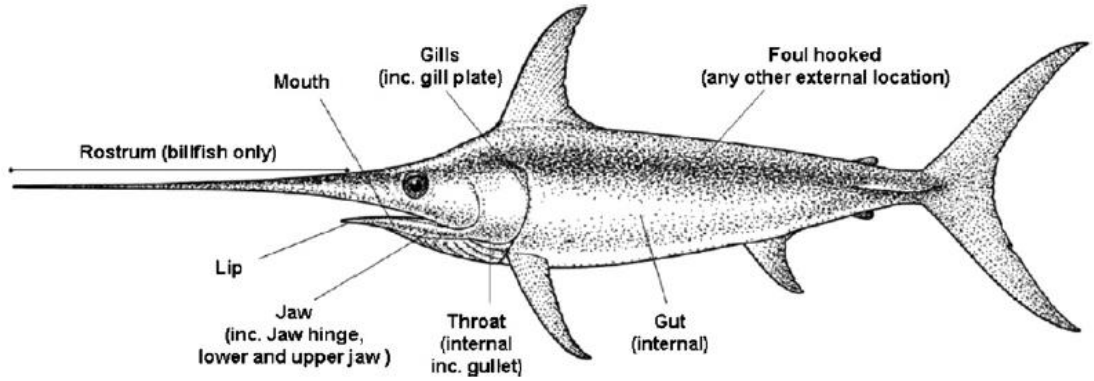

Figure 1 - Categories used in analysing hooking locations in fish and shark bycatch (Ward 2009 - Fisheries Res 97).

Condition for the discard/release of incidentally taken/affected bycatch

Code	English description
A0	Alive excellent condition (Hutchinson, et al 2015 MEPS)
A1	Alive - active, healthy
A2	Alive - injured, distressed

A3	Alive - very weak, dying
D	Dead
U	Condition unknown

Maturity scales for the staging of elasmobranchs, tuna and billfish species

To be added

Gillnet net webbing colour

Code	**English description**
GRE	Green
CLA	Clear
WHI	White
PIN	Pink
BLA	Black
GRY	Grey
BLU	Blue.
MUL	Multi-colour
RED	Red
OTH	Other

Net condition at hauling

Code	**English description**
NGD	No gear damage or very few small, scattered holes.
005	Less than 5% of the net torn
025	Between 5% and 25% of the net torn.
050	Between 25% and 50% of the net torn.
075	Greater than 50% of the net torn.
100	Net totally rolled up.
OTH	Other, specify in comments
UNK	Unknown

ANNEX IV. PROPOSED SPECIES OF SPECIAL INTEREST (SSI) TO IOTC

The proposed list of SSI for IOTC is:

- All marine turtles
- All marine mammals
- All seabirds
- Designated shark species
    - Species with a retention ban (whale sharks, oceanic whitetip sharks and thresher sharks)
    - Species ranked as high vulnerability in the most recent ERA[54] (mako spp., silky shark, porbeagle, blue shark, hammerhead sharks spp., tiger sharks, crocodile sharks, Great white shark, rays spp.)
- All billfish species[55]

This list has been compiled with reference to the species regarded by WCPFC as of special interest[56].

[54] Murua et al. 2018. IOTC-2018-SC21-14

[55] Resolution 18/05 indicates that the Commission is interested in the conservation of striped marlin, black marlin, blue marlin and Indo-Pacific sailfish so the addition of all billfish species has been proposed for practical reasons (i.e. to avoid potential species misidentification issues).

[56] WCPFC, 2018. Handbook of Conservation Management Measures & Resolutions For WCPFC Regional Observer Programmes, v.4.0. This indicates that all cetaceans, seabirds and sea turtles are considered SSI as well as FAL, OCS and RHN. It is unclear whether any non-target fish species are also included based on Res 2005-03.