Food and Agriculture Organization of the United Nations

Indian Ocean Tuna Commission
Commission des Thons de l'Ocean Indien
iotc ctoi

IOTC ELECTRONIC MONITORING SYSTEM & DATA STANDARDS

PREPARED BY: IOTC WGEMS, 10 NOVEMBER 2022

PURPOSE

To agree and adopt IOTC Regional Electronic Monitoring System and Data Standards as required by the WGEMS Terms of Reference and Resolution 22/04 for the IOTC Scientific Committee and Commission endorsement.

BACKGROUND

Electronic Monitoring Systems is a proven technology to collect fishery information, including when external circumstances prevent human observers from being deployed onboard, and complement human observers to address the data requirements under IOTC Resolution 22/04 On a Regional Observer Scheme.

The IOTC Scientific Committee in 2020 (SC23) noted that EMS is a very promising tool for enhancing observer coverage and complement data collected by onboard observers. IOTC SC23 also recommended that an ad-hoc, intersessional Working Group on the development of EM Programme Standards be constituted to further progress with the definition of EMS minimum standards as well as on the implementation of electronic monitoring projects by CPCs in support of the Regional Observer Scheme (ROS). The Commission at its 25th meeting (June 2020) endorsed the recommendation of the Scientific Committee and created the ad-hoc working group on the Development of Electronic Monitoring Programme Standards (WGEMS).

The WGEMS adopted its Terms of References and the WGEMS workplan, which were subsequently endorsed by the Scientific Committee in 2021 and, recently, by the IOTC Commission at its annual meeting on May 2022. The endorsed IOTC WGEMS Terms of References (see Appendix IV of IOTC-2021-WGEMS01-R) identify the need to develop and adopt EM Program Standards - covering program objective, purpose, scope, roles/responsibilities, guiding principles and vessel monitoring plans- and EM Systems and Data Standards – covering the technical standards (for vessel EM equipment), the logistical standards (for EM record retrieval, back up, chain of custody and frequency) and data analysis standards (including EM record review, quality, coverage, EM data submission, storage, ownership, etc.-

Moreover, the IOTC Regional Observer Scheme (ROS) established under Resolution 22/04 aims to collect verified catch data and scientific information. IOTC Resolution 22/04 requires the collection of independent data on fishing activity through human observers for at least 5% of the operations for each gear type. Resolution 22/04 on a Regional Observer Scheme requests "*the IOTC Scientific Committee, **in collaboration with the Compliance Committee, to develop and agree on minimum standards for the use of EMS for purse seine, longline, bait boat (pole and line), handline, and gillnet fleets by 2023 at the latest**, including on modalities of the substitution of the human observer coverage by an EMS, taking into account factors such as, the principles and regulations regarding minimum safe manning requirements. The Commission may consider and adopt these standards by 2024 in a separate Resolution*". Moreover, the Resolution stated that "*Once the **EMS standards are adopted and providing CPCs meet the minimum mandatory ROS data reporting standards, the minimum human observer coverage provided for in paragraph 3 may be complemented or substituted by means of an EMS**. To ensure the minimum mandatory ROS data reporting standards are met, the EMS may be complemented by port sampling and/or other Commission approved data collection methods. And CPCs are encouraged to use an EMS to improve the collection of scientific data before the standards mentioned in paragraph 4 are adopted.*"

DISCUSSION

The 2nd meeting of the WGEMS (June, 2022), including the participation of different stakeholders (i.e., scientists, EMS designers/vendors, fishermen, representatives from the industry, managers), discussed the potential for electronic monitoring (EM) implementation for tuna fisheries in the IOTC and to develop a roadmap and next steps in progressing these initiatives. The WGEMS also discussed EM System and Data

Standards. The WGEMS agreed to an intersessional process to continue discussing EM System and Data Standards. **This paper presents the agreed IOTC EM System and Data Standards for the implementation of EMS for IOTC fisheries arising from the WGEMS intersessional work.**

The paper focuses on EM System and Data Standards; including the technical standards and specifications (for vessel EM equipment), the logistical standards (for EM record retrieval, back up, chain of custody and frequency) and data analysis standards (including EM record review, quality, coverage, EM data submission, storage, ownership, etc.; that would aid to standardize Electronic Monitoring Systems in the Indian Ocean region. This IOTC EM System and Data in conjunction with EM Program Standards will define the requirements for the implementation of the IOTC Regional Electronic Monitoring Program.

Participants at the WPDCS18 are requested to discuss, consider and adopt the WGEMS agreed EM System and Data Standards as requested by WGEMS Terms of References and Resolution 22/04.

RECOMMENDATION/S

That the WPDCS18:

1) **NOTE** paper IOTC–2022–WPDCS18–34, which provides the WGEMS agreed IOTC EM System and Data Program Standards.
2) **ADOPT** IOTC EM System and Data Standards and **RECOMMEND** to the Scientific Committee for its consideration and potential endorsement.

APPENDICES

Appendix A: WGEMS Agreed IOTC Electronic Monitoring System and Data Standards.

Appendix A

IOTC ELECTRONIC MONITORING SYSTEM AND DATA STANDARDS

EM TECHNICAL MINIMUM STANDARDS

The Technical Minimum Standards shall describe the requirements of the EM. CPCs shall ensure all EM equipment installed in their national or subregional programs are consistent with these technical specifications.

Customized to vessel level: there is no standard configuration that will cover all vessels from fleets operating in the Indian Ocean region, therefore each EM equipment installation must be customized at the vessel level. An EM equipment to be installed on board of a fishing vessel should consist of a control system connecting a number of cameras, and optionally to a number of different sensors, to collect and record images to address the objectives of the EM Program. The number of cameras and sensors should be tailored to each vessel through a Vessel Monitoring Plan to meet overall objectives of the program rather than being too prescriptive and should include a sufficient number of cameras. Although it will depend on the configuration of each particular vessel, as a general setup, cameras shall capture the areas and activities provided in **Table 1 and 2 and Figure 1 to 3 of Annex 1**. Each vessel should develop a "Vessel Monitoring Plan" specifying how many and where the cameras are located, and their settings, to collect the required ROS minimum "mandatory" data fields[1] (**Annex 2**). Within a given EM program, a certain level of harmonisation among vessels may also be necessary (camera placement and settings).

Include sensor/automatic devices: since EM records require large storage capacities, most EMS are not recording vessel activities on a full-time basis. The recording of some cameras may be triggered by the detection of gear usage or fishing activity. EMS may therefore include sensors, and other procedures (Computer Vision, Artificial Intelligence), to detect when fishing or other activities of interest occur on board. This will ensure proper EM record acquisition (e.g. trigger video recording when fishing operation starts) and facilitate EM record reviewing.

Include Global Positioning System (GPS): to monitor vessel position, route, speed and provide information on date/time and location of fishing activities. Fishing vessel position and date/time stamps should be incorporated directly on images or in the metadata of images.

Compatibility: the EMS could ideally be capable of integrating with other Monitoring, Control and Surveillance (MCS) tools (e.g. Vessel Monitoring System).

Robust System: the EM equipment components installed outdoors (such as cameras/camera housing and sensors) should be capable to resist rough conditions at-sea and harsh environment on board the vessels.

Secure System: the EM equipment components and data need to be tamper-resistant and tamper-evident, ideally using encrypted data, such that attempts at unauthorized modifications are not possible.

Cameras: digital, high-resolution when possible, cameras covering all areas of interest on the vessel according to the vessel and fishing operations are recommended. Camera placement, settings and recording must assure the detection of vessel activities, catch and bycatch species, and enable

[1] The collection of some of the required ROS minimum data standards may be complemented by port sampling and/or other data collection methods.

Comentado [HM1]: Have a look and check if you can agree on those tables/figures which I think are good examples of VMPs.

Comentado [HM2]: I suggest leaving this as it was in table 4 of paper IOTC-2022-WPEMS02-05_Rev2 - EMS minimum standards Murua et al

with the footnote that the collection could be complemented by other sampling tools…

accurate species identification (at least for all species under the IOTC mandate). The system should be able to record activities in low and very bright natural light conditions (low and high contrasts). The cameras must be water resistant and in a self-contained, weather resistant box.

EM records: EM records shall contain the following information: EM record file name including, at a minimum, the vessel name and vessel ID, camera ID, trip ID, geolocation data (date, time (UTC), latitude and longitude), camera recording status, (EM health status), images, and sensor data when used.

Comentado [HM3]: To be discussed.

Comentado [FAJ4R3]: Should be deleted or recommended. It would be appreciated if you could clarify what the health status is. Our understanding is that health status does not associate with the VMS. Not sure what the difference is from the "camera recording status".

Comentado [HM5R3]: Hilario: right, the health status is not associated with VMS.

Camera recording status could be included (in my understanding) in the EM health status. I think that all EM equipment has this feature, informing the vendor/user that the system is working.

Independence: the system needs to be self-governing with the exception of minimal maintenance by the crew (e.g., cleaning sensors and cameras). The system may include remote verification of its functionality in real time to collect all information. A designated person should ensure that the system is working properly before leaving port and at sea, and a protocol (checklist) should exist for that purpose.

No interference: EM equipment should not generate or cause radio frequency interference with other on-board vessel communication, navigation, safety, geolocation devices (e.g. VMS) or fishing equipment.

Autonomy: the EM equipment should have its own uninterruptible power supply or be connected to that of the vessel to ensure that it can work even in the event of a vessel power outage. The EM equipment should include separate, duplicate backup devices to ensure that data are not lost if a storage device fails.

EM Data storage autonomy: the EM equipment should have enough storage capacity to store all EM records for a certain period of time, which should be at minimum a complete trip. The duration will depend on the vessel's operational characteristics that could range from 4 months (in the case of purse seiners) to 12 months or more (in the case of longliners).

Interoperability: EMS ideally should generate EM records that are interoperable between different EM service and review providers and, where possible, integrate with other data collection and monitoring tools.

Maintenance: a designated person on board (and/or on land) should be designated to maintain the equipment (e.g., clean of lenses, etc.) and report to the EM equipment provider and the competent authority (e.g., IOTC or flag state) when the system is malfunctioning at port or at sea so the system is fixed as soon as possible, and should record any failure of the EM equipment in a dedicated form.-

EM LOGISTICAL MINIMUM STANDARDS

EM records retrieval: the EM records should be transmitted via mobile networks, Wi-Fi, or satellite, or storage device (i.e., SSD or HDD) exchange. For the latter, a protocol to recover and send the storage devices to the designated EM review center should also be implemented.

EM record storage: EM records should be stored by the vessel/company/EM service provider/EM review provider/EM program administrator for at least 1 year or for the period established in the national/regional EM programs.

EM records backup: if EM records are automatically transmitted electronically, operational procedures for their receipt and backup should be implemented taking into account any necessary chain of custody arrangements.

Storage device chain of custody: the EMS must ensure traceability of every storage device and EM records. The chain of custody of the EMS storage devices should be assured.

Frequency: EM programs should include requirements on the method and frequency (e.g. after each trip) of EM records transmission to EM review centers, that should be consistent with the minimum standards established by the CPC or IOTC.

EM DATA REVIEW MINIMUM STANDARDS

EM review software: EMS should include software to facilitate the review of EM records and to produce EM data that will allow compiling and reporting in an IOTC common output format for exchange/submission to IOTC. Ideally, EM review software can be used to review EM records collected from different EM equipment providers.

EM review and EM data reporting: EM records reviewing and EM data reporting should be done by institutions, organizations and independent companies with proven expertise and experience (e.g., work experience with onboard observers). These tasks can be centralized in a "regional EM review center" when implementing a regional program and/or can be carried out by national or independent organizations.

EM records and EM data quality check: the reviewing process of EM records should include quality controls through EM records quality check, EM data entry checks, possible automatic error identification in EM data (e.g. incorrect fishing set positions on land, etc), debriefing of EM observers. The produced EM data should be checked prior to reporting to the IOTC Secretariat.

EM data: EMS should allow collecting and reporting, at a minimum, the ROS Minimum Standard Data Fields. EM data will be submitted to the IOTC Secretariat using IOTC standard forms according to the time frame specified in Resolution 22/04, or any superseding Resolution. Data confidentiality requirements outlined in Resolution 12/02, Data Confidentiality Policy and Procedures, or any superseding Resolution, shall apply to all EM data submitted to the IOTC Secretariat.

EM observers' training: EM observers must have specific qualifications related to EM record review which should be integrated into the regional or national EM program standards. The EM observer should participate in specialised training courses that should be updated upon modification of the EM review protocol to ensure EM data high-quality standards.

EM observer's qualifications: EM observers must have the ability to review EM records and produce EM data according to IOTC requirements. EM observers should be familiar with fishing activities and be capable of identifying (i) IOTC species and species of special interest, (ii) IOTC fishing methods, and (iii) IOTC mitigation methods.

Compatibility with ongoing standardized data flow and databases: EM data should have compatible output format (including usage of standardized, well-established code lists) to exchange collected information with current IOTC data reporting format and standards, and should be consistent with IOTC data rules. EM data will be submitted in an approved electronic data reporting format to the IOTC Secretariat, using IOTC standard codes and units.

Data storage and retention: legal provisions on data protection, storage, and retention by IOTC should be developed and agreed upon whether it is a REMP or EM National Programs.

EM records ownership: EM records ownership is of the vessel owner/flag state but should provide IOTC with the EM data outputs to incorporate in the IOTC database for use, analysis, and disposal as required by the IOTC observers Resolution on Regional Observer Scheme.

Hardware/software ownership: irrespective of the scope of the EM program, it is recommended that hardware and software license ownership (and maintenance) is of the vessel owner/flag state.

Annex 1 – Vessel Monitoring Plans

Each vessel should develop a "Vessel Monitoring Plan" so as to define how many and where cameras are located to collect the required ROS minimum data fields. Vessel Monitoring Plans should be reviewed by the CPCs fishery management agency and presented to the WGEMS/WPDCS to ensure it meets IOTC REMP Program and EM System and Data Standards.

On purse seine vessels, the minimum areas that cameras are recommended to cover:

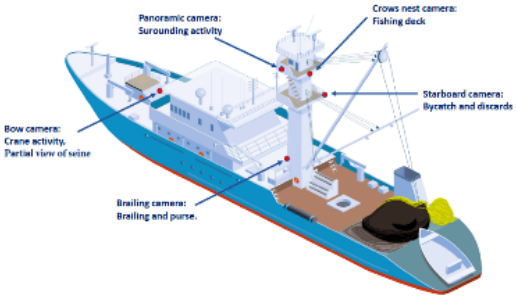
- the working deck (both port and starboard sides),
- the net sack and the brailer,
- the foredeck or amidships (e.g., FAD activity),
- and the well deck and conveyor belt (Murua et al., 2022; Restrepo et al., 2018): for the conveyor belt, in more than one place (e.g. at the beginning and at the end of the conveyour belt as a minimum). If a discard conveyor belt exists, it should also be covered.
- Cameras must cover the following actions: fishing set, brailing, net hauling, FAD activities, total catch, catch well sorting (process of putting the catch in the hold or wells), bycatch handling and release, and tuna discards (**Figure 1 and Table 1**).
- In large purse seines, at least 6 cameras are needed to cover fishing and fish-handling operations; however, less fewer cameras (e.g. 4 cameras) could cover the activity to collect the data required of smaller purse seines (e.g. 300-400 tonnes capacity).

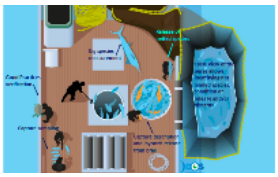
The preferred EM equipment configuration would be the one that allows a greater number of images (frames) of higher quality/resolution. Digital video is generally preferred, but still images can also be a viable option to capture information during the various phases of the vessel activity. However, considering that storage capacity is limited, an optimal configuration may have video on certain areas/cameras/moments, while still photos on others. In the case of photographs, the minimum requirement should be that a picture is taken by the camera with viewing angle fully covering the fish management areas at least every 2 seconds when fishing action occurs (Restrepo et al., 2018). Image quality should also be adequate enough to allow accurate collection of all required data field, such as species ID, FAD materials and design, or bait used and, hence, achieve the monitoring objectives.

A


C3
C2
C1
C4
C5
C6

B


Panoramic camera:
Surrounding activity
Crows nest camera:
Fishing deck
Starboard camera:
Bycatch and discards
Bow camera:
Crane activity.
Partial view of seine
Brailing camera:
Brailing and purse.




B1


B2

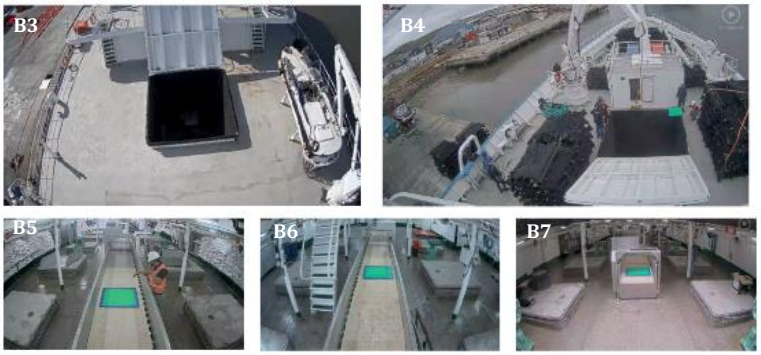


Figure 1. (A) 6-cameras EM system installed in a purse seine covering main areas of fishing and fish handling operations (from Murua et al., 2020b) and (B) 7-cameras EM system (4 in the upper deck and 3 in the well deck) installed in a purse seine covering main areas of fishing and fishing handling operations including 1 more camera in the conveyor belt: (B1) 360˚ Panoramic view camera (e.g port side view), (B2) Crows nest stern view camera, (B3) Working deck crane camera view , (B4) Foredeck view camera, (B5) Conveyor belt stern camera view, (B6) Conveyor belt middle camera, and (B7) Conveyor belt bow camera (source: Digital Observer Services).

Table 1. Minimum areas and actions that should be monitored (adapted from Murua et al., 2022; Ruiz et al., 2017).

Area covered	Action covered	Purpose	Minimum data requirements to be monitored
Work deck (port side)	Brailing	Total catch by set Species composition	Number of brails & fullness by brail. Weight, size and species of retained tuna
	Tuna discards	Total tuna discards by set	Weight, size and species of discarded tuna
	Bycatch handling	Bycatch estimation	number of individuals handling mode Species ID
Work deck (starboard side)	Bycatch handling	Bycatch estimation	Handling mode
	Bycatch release	Total bycatch by	Number of individuals and species ID
In-water purse seine area	Brailing	Total catch by set	Number of brails & fullness by brail
	Bycatch handling and safe-release of individual animals (whale sharks, manta rays…)	Total bycatch by set . Application of handling and safe-release best practices	Handling mode
	Bycatch release of big species (whale sharks, manta rays…)	Total bycatch by set Application of handling and safe-release best practices.	Number of individuals and species ID
Foredeck or amidships	FAD activity (deploying, replacement, reparation…)	Total number of FAD deployments, FAD design and FAD activities by trip	Number, material (natural or artificial), and FAD characteristics (entangling or no entangling)
Well deck and conveyor belt	Catch well sorting	Species composition	Weight, size and species of retained tuna.
	Bycatch handling	Best practices	Handling mode
	Estimation of bycatch	Total bycatch by	Number, size or weight of individuals,

	discards, releases or retention	set Species composition Application of handling and safe-release best practices.	species ID and fate

On longline vessels, the minimum areas and activities that cameras are recommended to cover (**Table, 2, Figure 2**):

- The area of setting the longline (usually vessel stern site camera),
- the area of hauling the longline,
- the working deck where catch is handled,
- and the surrounding water area for those discarded species not brought onboard
- Cameras must cover the following actions: setting of the longline, bait type information, whether mitigation techniques are being used (e.g. tori lines for seabirds), hauling of the longline, all hooked species (both retained and discarded), the fate of the catch, and the size of the specimens.
- On most tuna longlines, at least 3 cameras are needed to cover fishing activities and fish handling operations: one capturing images when setting the longline, one to record the hauling and boarding of the catch, and other mounted over the processing deck to record species, size of specimens and fate (Murua et al., 2020a). And additional camera to cover the surrounding water area for those discarded species not brought onboard is also recommended.

Figure 2. 3-cameras EM equipment installed on a longline covering main areas of fishing and fish handling operations. View of the 3 cameras: (left panel) Stern camera - setting longline providing information on hooks, floats, mitigation techniques and bait; (middle panel) Fishing deck 1 - hauling information, captures and discards, species ID, size and fate; and (right panel) Fishing deck 2 - fate of the species, size, species ID (source: Digital Observer Services).

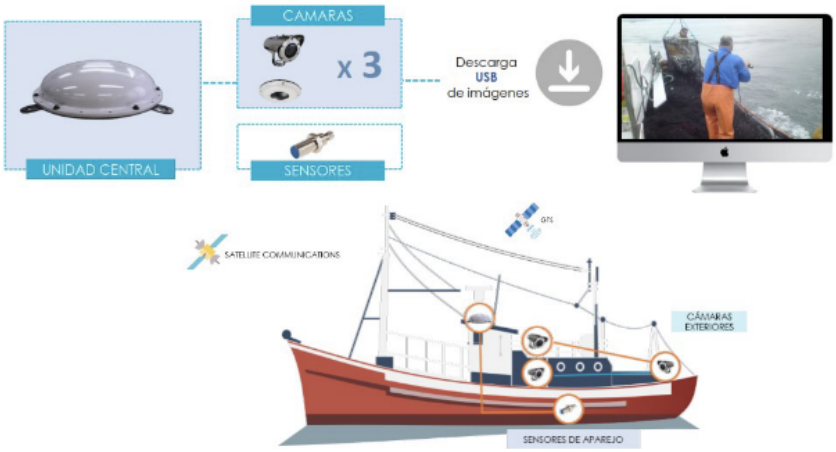
Comentado [FAJ6]: Locating camera to the position of cam3 indicated by Figure2 needs longer cable. Given the fact that it causes high damage to the vessel body and high risk of breaking down the cable, it would not be cost effective. We understand how many and where the camera is located depend on the Vessel Monitoring Plan developed by each CPC, but I hope this will help.

Table 2 – General configuration and areas/activities covered by the EM system onboard tropical tuna longline vessels

Area covered	Action covered	Minimum data requirements to be monitored
Stern camera of the boat	Start and end setting operation	Position, date, and time
		Total number of hooks set and between floats
		Total number of floats set
		Bait type
		Bait species
		Bait ratio (%)
		Mitigation measures/marine pollution
Work deck	Catch onboard	Length and weight[2] by capture
		Condition
		Fate
		Predator observed
	Bycatch discarded, released, or retained	Total bycatch by set and species composition
Processing area	Catch	Total catch by set
		Length and weight1 by capture
		Sex
		Fate
Surrounding water area	Start and end hauling operation	Position, time and date
	Estimation of bycatch discards, releases or retention	Total bycatch by set and species composition
		Species condition and fate

Comentado [FAJ7]: As indicated by the above photograph of C1, it seems to be difficult to track Line weighting as well as toriline by one stern camera. Additional camera is required above the camera1 to cover such mitigation measures and that would not be cost effective.
Please refer to the details we submitted as EMS_longline_list_opinion on 2 November.

On pole and line vessels, the minimum areas that cameras are recommended to cover are the area of bait fishing activity, the area of the fishing set and pole and line fishing activity (vessel stern site camera) and the working deck where catch is handled. On a typical Indian Ocean pole and line vessels, this will require at least 2 or 3 cameras to cover main fishing activity areas, fish handling operations and bait fishing (**Figure 3**).



[2] Estimated through length-weight relationships.

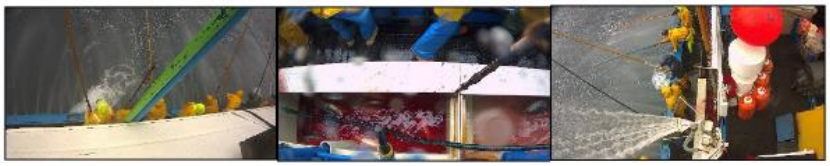


Figure 3. 3-cameras EM equipment installed on a Bay of Biscay (Atlantic Ocean) pole and line vessel covering main areas of fishing activity and fish handling operations. View of the 3 cameras: (left panel) Vessel bridge camera stern view – pole and line activity; (middle panel) Fish handling - catch storage; (right panel) Vessel bridge camera bow view - bait and pole and line fishing activity (source: Marine Instruments).

Annex 2 – IOTC ROS Minimum Data Standards

Comentado [FAJ8]: To this part, we submitted comments as EMS_longline_list_opinion on 2 November.
If you could consider it as our comments on Annex2, that would be appreciated.

Comentado [HM9R8]: Japan's comments included in red.

The IOTC ROS minimum standard data fields for all fisheries, and fields specific to longline and purse seine fisheries, including an assessment of EM applicability following SPC (2017) and Emery et al. (2018) categories. Some of the items such as vessel capacity and equipment, gear dimensions and configuration, which EM cannot record, should be collected before EM installation. MR: *Mandatory for Reporting* to be mandatorily collected and reported to the IOTC Secretariat; OR: *Optional for Reporting* to be reported to the IOTC Secretariat when the collection is feasible/practical. "---": *Suggested for Collection,* to be collected by national Programs, based on best practice as agreed by the IOTC, but not mandatory to be reported to the IOTC Secretariat.

The categories for assessing EM systems ability to collect the IOTC Observer minimum data requirements are the following:

R1	Ready now or require little work	**P1**	Possible, requires minor work
R2	Ready now but requires significant crew support	**P2**	Possible, requires major work
R3	Ready now but requires dedicated or additional work in the equipment	**NP**	Not possible
R4	Ready Now but inefficient/costly to analyze		

In addition to the above, following the approach of (SPC-OFP, 2017) workshop, the source from and the moment at which each data field could be collected (or not) is identified. These were coded as follows:

- SETUP — Hard-coded or recorded at the time in which the EM equipment is installed on the vessel,
- PRE — Hardcopy reporting or preferably E-Reporting from a pre-trip onsite inspection of the vessel and discussion with owner/captain/crew,
- EM-A — Recorded by an EM-Analyst based on visual reference to images/footage/sensors,
- POST — Hardcopy reporting or preferably E-Reporting from a post-trip onsite inspection of the vessel and discussion with owner/captain/crew,
- AG — Automatically generated by the EM system components,
- EM-A -> AG — A special case of the above where an event is detected by the EM Analyst and the EM system automatically generates the field value,
- CF — A calculated field arithmetically generated from one or more of the above field types

GENERAL VESSEL AND TRIP INFORMATION FOR ALL VESSEL TYPES

Data field name	Data field description	Reporting	EM	Source
Observed trip number	Record trip unique identifier. This is the observed trip unique identifier. This should begin with trip's start date (YYYY-MM-DD), followed by IOTC observer number, and vessel main gear code as per IOTC classification (E.g. 2018/01/23-IOTCFRA001-PS).	**MR**	**R1**	**AG**
OBSERVER IDENTIFICATION				
Observer IOTC registration number	Record observer registration number allocated by the IOTC Secretariat to be used on all observer data submissions.	**MR**	**R1**	**AG**
Observer name	Record the name of the scientific observer(s) that collected the data on-board the fishing vessel. Note: print in full. First name First - Last name Last (do not use initials).	---	**Null**	
Observer nationality	Record the nationality of the scientific observer as it appears in passport (Table 9).	---	**Null**	
OBSERVER TRIP DETAILS				
Location of embarkation	Record the name and/or geographical coordinates of the port where the observer boarded the vessel – also include the country. If the observer embarked via a port launch within port limits, this is still recorded as a port embarkation. If the observer embarked at sea outside port limits via a vessel transfer, record "at sea" and record the position in Latitude and Longitude. Note: latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	---	**R1**	**AG**

Date / time embarkation	Record the date and time that the observer boarded the vessel. Note: specify units (preferably hh:mm and YYYY/MM/DD).	---	**R1**	**AG**
Location of disembarkation	Record the name and/or geographical coordinates of the port where the observer disembarked– also include the country. If the observer disembarked via a port launch within port limits then this is still recorded as a port of disembarkation. If the observer disembarked at sea outside port limits via a vessel transfer, record "at sea" and record the position in Latitude and Longitude. Note: Latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	---	**R1**	**AG**
Date / time disembarkation	Record the date and time that the observer disembarked from the vessel. Note: specify units (preferably hh:mm and YYYY/MM/DD).	---	**R1**	**AG**
VESSEL IDENTIFICATION				
Name of the vessel	Record the vessel full name as recorded on vessel official documentation and crosschecked with the name recorded on the vessel itself (any discrepancies are to be reported to the IOTC Secretariat). Note: care should be taken to record the correct spelling of the vessel's name including any corresponding numbers. i.e. "Agnes 83".	**MR**	**R1**	**SETUP**
Vessel flag state (or where chartering occurs, chartering state)[3]	Record the name of country in which vessel is registered as shown on its registration documents (Table 9). Where chartering occurs, record name of the chartering country. Note: vessel flag state (or chartering state when chartering occurs) may not be the same as the nationality from which the vessel originates.	**MR**	**R1**	**SETUP**
Vessel IOTC number	Vessel IOTC number as per the IOTC Record of Authorized Vessels[4] and crosschecked with the number recorded on vessel certificates. Note: any discrepancies are to be reported to the IOTC Secretariat.	**MR**	**R1**	**SETUP**
Vessel IMO or Lloyd's number	Record vessel IMO number. This is the number allocated to the vessel when registered to the International Maritime Organization of the United Nations (e.g.: IMO8814275).	**OR**	**R1**	**SETUP**
International radio call sign (IRCS)	Record vessel radio call sign if available. This is the number displayed prominently on the vessel's side or superstructure.	---	**R1**	**SETUP**
Vessel port of registration	Record the name of vessel's port of registry (also called home port) shown on its registration documents and lettered on the stern of the ship's hull – also include the country.	**MR**	**R1**	**SETUP**
Vessel registration number	Record the number issued by country in which the vessel is registered, shown on its registration documents and written on the hull of the vessel. This may be a combination of characters and numbers; record them all (e.g.: CBG303).	---	**R1**	**SETUP**
Vessel phone, fax and email	When available, record vessel contact details, taking note of the ocean region code. A vessel may have several contact numbers and email addresses depending on the satellite communications systems installed onboard; record them all.	---	**NULL**	
Licensed target species	Record licensed target species (FAO spp. 3-alpha code) as specified in vessel licences or permit conditions (Table 1, Table 2, Table 3, Table 4, Table 8). Vessels will generally target a narrow range or aggregation of species, however one or more might not be an IOTC species; record them all.	**OR**	**NULL**	
Main fishing gear	Record vessel main fishing gear (Table 10).	---	**R1**	**AG**
VESSEL OWNER AND PERSONNEL				
Registered owner	Record the owner's name, nationality (Table 9) and contact details in full. These can be obtained or cross-checked on the vessel registration forms.	---	**R1**	**SETUP**
Charterer / operator	Where the vessel has been chartered and is operated and managed by a company other than the owner, record operator's full name (company or individual as appropriate), nationality (Table 9) and contact details.	---	**NULL**	
Fishing Master	Record the fishing master name and nationality in full (Table 9).	---	**R1**	**POST**

[3] IOTC Res. 18/10

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

Código de campo cambiado

Skipper	Record skipper name and nationality in full (Table 9). Note: in some instances the fishing master and skipper may be the same person. In such cases record here "N/A" for not applicable.	---	**R1**	**POST**
Crew number	Record the number of crew. This should be cross checked against the vessel's crew list.	---	**NULL**	
VESSEL TRIP DETAILS				
Port of departure	Record the name and/or geographical coordinates of the port from where the vessel sailed – also include the country. If the vessel started a new trip at sea following transhipment record 'at-sea' plus the geographical coordinates corresponding to the location the trip started. Note: latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	---	**R1**	**AG**
Date / time vessel sailed	Record the date and time the vessel departed from port or from a transhipment location. Note: specify units (preferably YYYY/MM/DD and hh:mm).	---	**R1**	**AG**
Port of return	Record the name and/or geographical coordinates of the port where the vessel returned – also include the country. If the vessel arrived at a transhipment location record 'at-sea' plus the geographical coordinates corresponding to the location the transhipment started. If the observer disembarked before the vessel returned then record expected port of return as provided by the vessel. Note: latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	---	**R1**	**AG**
Date / time vessel returned to port	Record the date and time the fishing vessel finishes its fishing campaign. i.e. returns to port or to a transhipment location for unloading. If the observer disembarks before the vessel returns then record expected date and time of arrival (ETA) as provided by the vessel. Note: specify units (preferably YYYY/MM/DD and hh:mm).	---	**R1**	**AG**
VESSEL ATTRIBUTES				
Tonnage	The vessel tonnage as specified in vessel registration papers. Note: specify units, i.e. if the vessel is registered using Gross Tonnage (GT) or Gross Registered Tonnage (GRT).	**MR**	**P1**	**PRE**
Length overall	The vessel overall length (LOA) as specified in vessel registration papers. Note: specify units (preferably metres).	**MR**	**P1**	**PRE**
Hull material	Record the vessel hull material (s) (steel, wood, aluminium, fibre glass, etc.) (Table 11).	**MR**	**P1**	**PRE**
Main engines (make and power)	The make (brand) and power of the main engines. Note: specify units (HP, Kilowatt or BHP).	**MR**	**P1**	**PRE**
Fish storage capacity	The vessel total maximum capacity to store catches. This should include blast freezer(s) capacity. Note: specify units (metric Tons (mT.) or cubic metres (m^3)).	**MR**	**P1**	**PRE**
Fish preservation methods	Fish preservation methods: Record the method(s) used by the vessel to preserve the catch (Table 12).	---	**P1**	**PRE**
Fish storage type	Record the type of structure(s) present on-board used by the vessel to store the catch (Table 13).	---	**P1**	**PRE**
Vessel autonomy / range	Record vessel autonomy, expressed by the time (days) a vessel can spend at sea without refuelling. If this information is not available then record vessel range expressed in cruising distance (nautical miles). If a figure for the range cannot be obtained, the observer should calculate vessel range as follows. <Vessel range (nm)> = <Vessel average cruising distance per metric ton (nm/mT)> : <Tonnage of fuel carried (mT)> Note: specify units(days or nautical miles)	---	**NULL**	
VESSEL ELECTRONICS				
Global Positioning System (GPS)	Indicate Yes if on board No if not sighted. Note: a GPS may be an independent unit or linked or incorporated into track plotters and acoustic systems.	**MR**	**P1**	**PRE**

Vessel Monitoring Systems (VMS)	Indicate Yes if on board No if not sighted	**MR**	**P1**	**PRE**
Radars	Indicate Yes if on board No if not sighted. Note: include high frequency radars used by the vessel to search for seabird activity or activity on the sea surface.	**MR**	**P1**	**PRE**
Track Plotter	Indicate Yes if on board No if not sighted	**MR**	**P1**	**PRE**
Depth Sounder	Indicate Yes if on board No if not sighted	**MR**	**P1**	**PRE**
Sonar	Indicate Yes if on board No if not sighted	**MR**	**P1**	**PRE**
Doppler Current Meter	Indicate Yes if on board No if not sighted Note: acoustic doppler current meter is used to ascertain current speed.	**MR**	**P1**	**PRE**
Expendable bathythermographs (XBT)	Indicate Yes if on board No if not sighted. XTBs are usually mounted on the bridge wings. Note: XTBs are periodically used to determine the depth of the thermocline.	**MR**	**P1**	**PRE**
VHF radios	Indicate Yes if on board No if not sighted	**---**	**P1**	**PRE**
HF radios	Indicate Yes if on board No if not sighted	**---**	**P1**	**PRE**
Satellite communication systems	Indicate Yes if on board No if not sighted.	**---**	**P1**	**PRE**
Sea Surface Temperature (SST) gauge	Indicate Yes if on board No if not sighted. SST gauge is usually mounted on the bridge. Note: the vessel may also have access to SST charts received from Fisheries Information Services systems.	**---**	**P1**	**PRE**
Weather facsimile	Indicate Yes if on board No if not sighted. Note: weather information may also be received from Fisheries Information Services systems.	**---**	**P1**	**PRE**
Fisheries information services	Indicate Yes or No if the vessel has access to a Fisheries information service. Note: Vessels may access fishery information services for instant information on weather and oceanographic features (SST, phytoplankton densities or sea height).	**---**	**P1**	**PRE**
WASTE MANAGEMENT (MARPOL Agreement Annex 5)				
Waste category	Record the category of the waste produced by the vessel (Table 14).	**OR**	**NP (R3&4[5])**	
Storage/Disposal method	Record how the waste was disposed of (Table 15). For example, incinerated, stored in sacks or disposed of overboard.	**OR**	**NP (R3&4[3])**	
OBSERVED TRIP SUMMARY				
Number of fishing events/sets conducted by the vessel while the observer was on-board.	Record the total number of fishing events/sets conducted by the vessel while the observer was on-board, independently of their success and of being sampled or not by the observer. Note: this should not include pole and line bait fishing events/sets.	**MR**	**R1**	**EM-A**
Number of fishing events/sets observed	Record the total number of fishing sets/events monitored by the an observer. Note: this should not include pole and line bait fishing events/sets.	**MR**	**R1**	**EM-A**
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).	**MR**	**R1**	**EM-A**
Number active fishing days	Record the total number of days that the vessel actually fished (i.e. when the vessel had gear in the water). Note: 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."	**MR**	**R1**	**EM-A**
Number of days lost	Record the total number of days where a vessel was unable to fish due to	**MR**	**R1**	**EM-A**

[5] Partially can be recorded with extra cameras and/or costly analisis of EM images (e.g. bait plastic boxes for LL or the material of FADs)

	factors such as adverse weather conditions, mechanical failure or other unforeseen events.			
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).	**OR**	**NP**	
Number of days in the fishing area	Record the number of days the vessel spent in the fishing area while the observer was onboard. This does not include transit time even if the area being transited is within the fishing area.	**---**	**R1**	**AG**
Number of days transiting	Record the number of days the vessel spent steaming or transiting to/between/from fishing areas while the observer was onboard.	**---**	**R1**	**AG**

LONGLINE INFORMATION

Gear specifications[6]

Data field name	Data field description	Reporting	EM	Japan	Source
SPECIAL EQUIPMENT OR MACHINERY					
Line setter	Indicate Yes if on board No if not sighted. Many long line vessels will be fitted with equipment or machinery that regulates line setting speed allowing the line to be set at uniform depth.	**MR**	**R3** **P1**	P	
Line hauler	Indicate Yes if on board No if not sighted. Most long line vessel will be fitted with equipment or machinery that hauls the line in after it has been set.	**MR**	**R3** **R1**	**R1**	**AG**
Bait casting machine	Indicate Yes if on board No if not sighted. Most vessels manually deploy branch lines with the bait. However there are a number of vessels that use automatic bait casting machines.	**MR**	**R3** **P1**	P	
GENERAL GEAR ATTRIBUTES					
Mainline material	Record the material the mainline is made out of, e.g. kevlar, nylon, nylon multifilament (Table 16).	**MR**	**NP** **P1**	P	
Mainline length	Record the total length of the mainline (i.e. mainline maximum length). This information can be obtained from the Captain or Fishing Master. Note: specify units (preferably 'Kilometres')	**MR**	**P2**	---	
Mainline diameter	Record the diameter of the mainline. This information can be obtained from the Captain or crew and crosschecked by measuring mainline diameter with callipers. Note: specify units (preferably 'millimetres')	---	**NP**	---	
Branchline configuration number	Unique number for a specific branchline specification as detailed based on the fields below.	MR	**R3** **P2/NP**	P2/	
Branchline material	Record the branchline material for each of the four sections where section 1 is that closest to the mainline and section 4 is the leader; note that wire trace may be sheathed by a plastic or nylon coating (Table 16).	---	**NP**		
Branchline length	Record the length of the branchline for each of the four sections where section 1 is that closest to the mainline and section 4 is the leader. Note: specify units (preferably 'metres')	**MR**	**NP**		
Branchline diameter	Record the diameter of the branchline for each of the four sections where section 1 is that closest to the mainline and section 4 is the leader. Note: specify units (preferably 'millimetres')	**MR**	**NP**		
Branch line storage	Record if the branch lines are coiled up and packed into baskets (BSK), or layered out in tubs (TBS), or coiled up onto reels (RLS).	---	**R3** **R1**	R	
MITIGATION DEVICES					
DMDs used	Record depredation mitigation device/s DMDs used by the vessel (if	---	**P2**		

Comentado [HM10]: EM system would not be able to gather this information. It is possible to identify from the interview with captain or fishing master.

Comentado [HM11]: It is possible to identify from the footage.

Comentado [HM12]: EM system would not be able to gather this information. It is possible to identify from the interview with captain or fishing master.

Comentado [HM13]: EM system would not be able to gather this information. It is possible to identify from the interview with captain or fishing master.

Comentado [HM14]: EM system would not be able to gather this information because focusing the camera on board to the branchline is unpractical. It is possible to identify from the interview with captain or fishing master.

Comentado [HM15]: It is possible to identify from the footage.

[6] Information designed to capture detailed specifications of the different components of the longline gear used by the vessel.

	any) (Table 38).				
TORI LINE DETAILS	If the vessel was equipped with a tori line provide tori line details below. If no tori line was present on-board fill in NA for not applicable.		**R1** **NP**		
Tori line length	Record the total length of the tori line (not including streamers). Note: specify units (preferably metres)	**MR**	**P2** **NP**		
Streamer type	Indicate the type of streamers which are used with the tori line (e.g. paired or single)	**MR**	**P2**		
Streamer line length	Record length of individual streamer lines (minimum and maximum where lengths vary). Record only one length if they do not vary. Note: specify units (preferably metres)	**MR**	**NP**		
No. streamers per line	Record the number of streamers that are attached to a single tori line	**MR**	**NP**		
Distance between streamers	Record the distance between streamers. Note: specify units (preferably metres)	---	**NP**		
Attached height	Record the height hat the tori line is attached above the water level. Note: specify units (preferably metres)	**MR**	**P2** **NP**		
Streamers reach surface	Indicate Yes if the streamers are long enough to touch the surface of the water in calm conditions and No if they are not.	---	**P2** **NP**		
Towed objects	Record the total number and type of towed objects used to maintain tori line tension and achieve aerial extent when deployed.	---	**NP**		
Diagram	Sketch/complete a diagram containing Tori line key features (e.g. Fig. 1 of IOTC Resolution 12/06).	---	**NP**		

Comentado [HM16]: Setting the camera dedicated to the Toriline at the stern is not cost effective.

Comentado [HM17]: It is difficult to measure toriline length by the footage because the end part of toriline usually sinks into the water and the whole toriline cannot be tracked in the footage.

Comentado [HM18]: The camera that monotiors setting operation does not capture whole the structure of toriline, thereby making it difficult to estimate attached height of toriline.

Comentado [HM19]: Setting the camera dedicated to the Toriline at the stern is not cost effective.

Fishing event[7]

Data field name	Data field description	Reporting	EM	Source
Set number	Record set number. This should be a four digit numerical code beginning 0001. Set numbers should be consecutive from the start of the first line set to the last line set of the observed trip. A unique number is to be allocated to each individual set.	**MR**	**R1**	**AG**
SETTING OPERATIONS				
Start setting date and time	Record the date and the time the first dhan buoy and / or radio buoy is deployed to start the setting of the line. Note: specify units (preferably hh:mm and YYYY/MM/DD).	**MR**	**R1**	**AG**
Start setting position	Record the position in latitude and longitude for the start of the setting operation Note: latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	**MR**	**R1**	**AG**
End setting	Record the date and the time that the last dhan buoy and / or radio buoy is deployed. Longline vessels often set lines at the night and the	**MR**	**R1**	**AG**

[7] Information required for every set/operation.

date and time	setting operation may continue beyond midnight and into the following day. Note: specify units (preferably hh:mm and YYYY/MM/DD).			
End Setting Position	Record the position in latitude and longitude for the end of the setting operation Note: latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	---	**R1**	**AG**
Vessel speed	Record the vessel's average speed during setting (knots). Note: Collect vessel speed from the GPS several times during the operation and take the average.	---	**R1**	**AG**
Line setter speed	Record the speed setting of the line setter (metres/second).	---	**R3**	**AG**
Length of mainline set	Record mainline total set length (i.e. the total deployed length of the mainline for the specific set). Usually calculated by multiplying the total time to set the line and the average line setter speed, taking into account any interruption times. This information can be obtained from the Fishing Master and cross checked against observer calculations. Note: specify units (preferably in Kilometres).	**MR**	**P2**	
Branchline clip on time	Record the average time interval in seconds between the "beeps" that indicate to the crew to clip on a branch line. Note: the timing of this is usually controlled by the Fishing Master.	---	**R1**	**AG**
Buoys clip on time	Record the average time interval in seconds between the "beeps" that indicate to the crew to clip on a buoy. Note: the timing of this is usually controlled by the Fishing Master.	---	**R1**	**AG**
Total number of hooks set	Record the total number of hooks deployed for the set. Usually calculated by multiplying number of baskets by the average number of hooks between the baskets. This information can be obtained from the Fishing Master and cross checked against observer calculations. Note: total length of line set and spacing between branch lines can also be used to determine the number of hooks set.	**MR**	**R1**	**AG**
Total number of floats set	Record the total number of floats deployed during the set (this should not include the radio/dhan buoys). Usually calculated by subtracting the number of buoys in their holders before setting by the number of buoys in their holders after setting. This information can be obtained from the Fishing Master and cross checked against observer calculations.	---	**R1**	**AG**
N° of hooks set between floats	Record the number of hooks set between floats. This will correspond to the number of hooks stored in each basket/tub, or on a reel and will be equivalent to the number of branch lines set.	---	**R1**	**AG**
Distance between branchlines	Record the distance between branch lines (i.e. the interval at which they were set along the mainline) in metres. Usually calculated by multiplying 'Branch line clip on time (s)' by the 'line setter speed' (m/s).	---	**R3 & R4**	
Floatline lengths (1, 2 and 3)	Record the different lengths of the floatlines used (1, 2 and 3). Note: specify units (preferably metres).	---	**NP**	
Total radio/dhan	Record the total number of radio and /or dhan buoys deployed.	---	**R4** R1	

Comentado [HM20]: It is possible to count buoys from the footage that records line setting/hauling.

buoys set				
Attached lights	Record number of lights attached to the branchlines per type (Table 22) and colour (Table 23)."	---	R4	
Shark lines set	Indicate Y or No if shark lines were set during the operation. Note: shark lines are branch lines running directly off the longline floats or drop lines, specifically for targeting sharks.	MR	R1	AG
N° of shark lines set	Record the number of shark lines set during the operation. If no shark lines are set then record zero (0).	---	R1	AG
Target species	Record the target species for the set (FAO spp. 3-alpha code), (Table 1, Table 2, Table 3 and Table 4).	MR	R1 P1	
VMS on	Indicate Y or No to sign if he VMS was on or not while setting and hauling.	OR	NP	
Mitigation measures				
Number of Tori lines deployed	The total number of tori lines deployed during the setting operation. Record zero if none were deployed.	MR	R3	AG
Low light night setting	Indicate Y or No for whether minimum deck lighting is used during night setting (as defined in Table 1. Mitigation measures of IOTC Res 12/06). Note: night setting is binary. i.e. if all hooks are set between dusk and dawn, then night setting was used. If some hooks are set outside of nautical darkness, then night setting was not used. [Consistent with IOTC Res 12/06]	MR	R1 P2	
Branchline weighted	Indicate Yes or No if the branch line is weighted. [Consistent with IOTC Res 12/06]	MR	NP	
Sinker average weight	Record the average weight of weights or sinkers attached to the branchlines (weights deployed on the snood prior to setting). Note: specify units (preferably grams (g)). [Consistent with IOTC Res 12/06]	MR	NP	
% branchlines weighted	Record the proportion of branchlines weighted (%). If all weighted, record 100%.	MR	NP	
Hook-sinker distance	The distance of the weights/sinkers from the eye of the hook. Note: specify units (preferably centimetres (cm)).	MR	NP	
Underwater setting	Indicate Yes or No if the bait is protected on the branchlines until they are a certain depth below the surface.	---	R3 R1	
Other mitigation measures used	Record any other mitigation measures observed (Table 38).	---	R3 P1	
N° of branchlines set by type	Record the number of branchlines set by type (branchline configuration number. Branchlinline types must be in accordance to types previously defined under the "Gear specifications" section.	---	NP	
Hook type	Record the type of hooks used (Table 17).	MR	NP	
% hooks set by type	Record the percentage (%) of hooks set by type. [As per SC20.23 recommendations]	MR	NP	

Comentado [HM21]: It would be difficult to estimate the target species without an interview with the fishing master.

Comentado [HM22]: EM system would not be able to gather this information.It is possibe to estimate from the time and geographical information.

Comentado [HM23]: It is possible to identify by recording the back of the vessel.

Comentado [HM24]: EM system would not be able to gather this information. It is possible to identify from the interview with captain or fishing master.

Variations in hook type[8]	Where possible indicate any variations in hook type, hook material and presence/absence of hook ring (Table 17).	---	NP	
Bait type	Record bait type/condition used (Table 25).	MR	R1 NP	
Bait species	Record the species of bait used (FAO spp. 3-alpha code) (Table 8).	MR	R3 P1	
Bait ratio (%)	Record the approximate proportion of bait species and condition used across all hooks in the set (%).	MR	R4	
Bait dye colour	Record the colour or colours that the different baits are dyed (e.g. blue to avoid bird bycatch). If none, write NONE.	---	R1	
HAULING OPERATIONS				
Start hauling date and time	Record the date and the time when the first dhan buoy and / or radio buoy is hauled back on-board to start hauling the line. Note: specify units (preferably hh:mm and YYYY/MM/DD).	MR	R1	AG
Start hauling position	Record the position in latitude and longitude for the start of the hauling operation. Note: latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	MR	R1	AG
End hauling date and time	Record the date and the time when the when the last component of the longline gear (dhan buoy and / or radio buoy) is hauled back on-board. Note: specify units (preferably hh:mm and YYYY/MM/DD).	---	R1	AG
End hauling position	Record the position in latitude and longitude for the end of the hauling operation. Note: latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	---	R1	AG
Offal management	Record fate given to the offal (fish heads, guts, etc.) and bait produced during the observed set. Indicate if these are retained for **batch disposal (BD)** at a later stage and/or **disposed of ad hoc (AH)** as they accumulate.	---	R3	
Position of offal disposal	Record the position where offal and used bait was disposed. Indicate if these are disposed at port side (BB), starboard (SB) or aft (AF).	---	NP	
Method/s to stun fish	Record the method/s used to stun fish during hauling (Table 24).	---	R1	AG
Bird scaring device at hauler	Indicate Yes if a bird scaring device was deployed during hauling operations and No if not. Note: report on the construction and effectiveness of all devices used in the comments section and trip report.	---	R3 NP	
Number of bite-offs (by branchline type)	Record for each type of branchline set up previously identified how many have had the hook bitten off. This only includes bite-offs observed while the observer was in a position to observe and record the hooks coming directly out of the water.	---	R4 NP	

Comentado [HM25]: It would be difficult to identify whether the bait is frozen or not from the footage.

Comentado [HM26]: EM system would not be able to gather this information. It is possible to identify from the interview with captain or fishing master.

Comentado [HM27]: It is difficult to record the whole structure of toriline.

Comentado [HM28]: It is difficult to identify the bite-off, tangling with screw or deterioration of the branchline from the footage.

[8] Hooks used in pelagic fisheries are correctly identified and characterised based on type, type variations, material and presence/absence of hook ring. Standardization of hook types and characteristics is therefore very important for data recording and analysis and for scientific studies on their effects on catch rates and post-capture survival.

Number of retrieved hooks observed	Record the number of hooks observed.	**MR**	**R1**	**AG**
Sampling protocol	Indicate sampling protocol followed by the observer (Table 39).	**MR**	**R1**	**EM-A3**
CATCH DETAILS				
Set number	Unique within a specific trip	**MR**	**R1**	**AG**
Catch detail number	Unique within a specific set	**MR**	**R1**	**AG**
Species	Record the species code for each specimen observed using FAO three figure alpha codes (Table 1, Table 2, Table 3, Table 4, Table 5, Table 6 and Table 7). If species FAO code is not available, record the species scientific name. Note: Record "unknown" for species that cannot be positively identified and give it a reference number. 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.	**MR**	**R1** NP	
Fate	Specify the fate which includes whether it was retained or discarded and the reason, e.g. "Discarded – too small" (Table 41).	**MR**	**R1** P2/NP	**AG**
Sampling methods for obtaining total catch estimates per species	Indicate the sampling method used to obtain total catch estimates per species for the catch detail (Table 40).	**MR**	**R1** ---	
Number	Record the number of individuals per species for each specified fate. If weight is recorded, insert NA here (for large fish, record number of individuals).	**MR**	**R1**	**AG**
Weight	Record the weight corresponding to the specified species and fate category. If number of individuals is recorded, insert NA here (for small fish, record weight). Note: specify units (preferably tons).	**MR**	**R1**	**AG**
Weight estimation method	Indicate the weight estimation method used to collect weight (Table 43). Note: If number of individuals is recorded, insert NA here.	**MR**	**R1**	**EM-A**
Weight code	The code corresponding to the type of processing the specimen underwent prior to weighing (Table 44). If the fish has not been processed, record code for unprocessed (or round, whole, live) weight (i.e. RD). Note: If number of individuals is recorded, insert NA here.	**MR**	**R1**	**EM-A**
SPECIMEN INFORMATION				
Set number	Unique within a specific trip	**MR**	**R1**	**AG**
Catch detail number	Unique within a specific set	**MR**	**R1**	**AG**

Comentado [HM29]: NP for released individuals when the line is cut far from the camera.

Comentado [HM30]: The fate category is too many detailed so that it is difficult to determine (e.g. retain for transhipment). If category becomes simple such as discarded/released or retained, this information is R1.

Specimen number	Unique within a specific catch detail	**MR**	**R1**	**AG**
Depredation details	[In agreement with SC18.16 (para. 53)]			
Depredation source	For depredated specimens, record the depredation source based on depredation scar characteristics (Table 45). For non-depredated specimens record NA.	**MR**	**NP**	
Predator Observed	For depredated specimens, record the predator species directly observed and identified (FAO spp. 3-alpha code). If the predator was not observed record UNK (unknown). For non-depredated specimens record NA. Note: species observed in the area may not necessarily be associated with depredation unless directly observed. Similarly for shark and squid damage the species may be difficult to determine.	**MR**	**NP**	
Additional details on non-target species	Catch details on non-target species to be collected where possible and reported to the IOTC Secretariat as recommended by the Scientific Committee.			
Condition at capture	State the condition of the specimen at capture (Table 46).	**OR**	**R3/R4**	
Condition at release	State the condition of the specimen at the time of release (Table 46).	**OR**	**R3/R4**	
Additional catch details on SSIs	Additional catch details on Species of Special Interest (Table 47) to be collected where possible and reported to the IOTC Secretariat as recommended by the Scientific Committee.			
Gear interaction	For SSI only, specify the type of interaction of the specimen with the fishing gear (Table 48).	**OR**	**R1**	**AG**
Hook type	For SSI only, record the type of hook the individual was hauled on (Table 17) [Consistent with IOTC Res 12-04]	**OR**	**NP**	
Bait type	For SSI only, record the type/condition of bait the individual was hauled on (Table 25). [Consistent with IOTC Res 12-04]	**OR**	**R1 NP**	
Leader material	For SSI only, record the leader material the individual was hauled on (Table 16). [Consistent with IOTC Res 12-04 and IOTC Res. 17/05]	**OR**	**NP**	
Leader thickness	For SSI only, record the thickness of the leader the individual was hauled on. Note: precise units (preferably millimetres (mm)). [Consistent with IOTC Res 12-04 and IOTC Res. 17/05]	**OR**	**NP**	
De-hooker/line cutter	Specify de-hooking or line cutting device used to extract the hook (Table 50). [Consistent with IOTC Res 12-04]	**OR**	**R3 NP**	
Brought on board	Indicate Yes or No, if the specimen was brought on board. [Consistent with IOTC Resolutions 13/04; 13/05; 12/04; 12/06; 12/09]	**OR**	**R1**	**AG**
Hauling	Detail how the specimen was brought on-board (Table 49).	**OR**	**R1**	**AG**

Comentado [HM31]: Japanese LL vessel uses different bait types even within the same basket. It is difficult to identify the bait type at the time of hauling.

Comentado [HM32]: It is difficult to identify the tools that the crew uses.

method	[Consistent with IOTC Res 12-04]			
Resuscitation (for turtles only)	For turtles indicate Yes if the release took place with resuscitation and No if not.	---	**R1/R3**	
Photo ID	If a photo is taken, record photo number/code so that it can be linked back to the specimen for onshore examination.	**---**	**R1**	**AG**
BIOMETRIC INFORMATION Details concerning any extra biometric measurements, sex, maturity and the collection of biological samples.				
Sampling methods for the collection of biological information	Indicate the sampling method used for the collection of biological sub-sample (Table 42).	**MR**	**NULL**	
Length code 1	Specify the length code used for the measurement (Table 53).	**MR**	**R1**	**AG**
Length 1	Record the length corresponding to the length type taken rounded to the lower centimetre.	**MR**	**R1**	**AG**
Length code 2	When an additional length measurement is taken, the corresponding length code should be recorded (Table 53).	**OR**	**R1**	**AG**
Length 2	When an additional length measurement is taken, the corresponding length should be recorded rounded to the lower centimetre.	**OR**	**R1**	**AG**
Weight code	Record the code corresponding to the type of processing the specimen underwent prior to weighing (Table 44).	**OR**	**R1**	**CF**
Weight	Record the specimen's weight (in kilograms) corresponding to the specified product type recorded in 'weight code'. If the fish has not been processed, record the unprocessed (or round, whole, live) weight (i.e. RD).	**OR**	**R1**	**CF**
Weight estimation method	Specify the weight estimation method used to obtain the weight (Table 43).	**OR**	**R1**	**EM-A**
Sex	Record the sex of the sampled fish specimen (Table 51). If unknown record UNK.	**OR**	**NP** P2	
Maturity stage[9]	Record the stage of maturity of the sampled fish specimen according to standard maturity scales approved by the IOTC. If unknown record UNK.	**OR**	**NP**	
Sample collected	Record the following details on the collection of samples: *a)* type (e.g. otoliths, spine clippings, and genetic samples) *b)* preservation method (e.g. alcohol, frozen, etc.) c) destination (i.e. location to be sent/stored)	**OR**	**NP**	
TAG DETAILS Note that all tagged specimens are to be identified to species level and to be sampled for length. Elasmobranches and turtles are also to be sexed and ascertained for maturity.				
Tag release	Indicate Yes or No, whether this individual was re-released with a tag	**MR**	**R1**	**AG**

Comentado [HM33]: Sex of some species could be identified such as sharks and adult sea turtles when they are placed in the specific area on the deck.

[9] Until a standard maturity stage has been approved by the Scientific Commitee, record both stage and scale used.

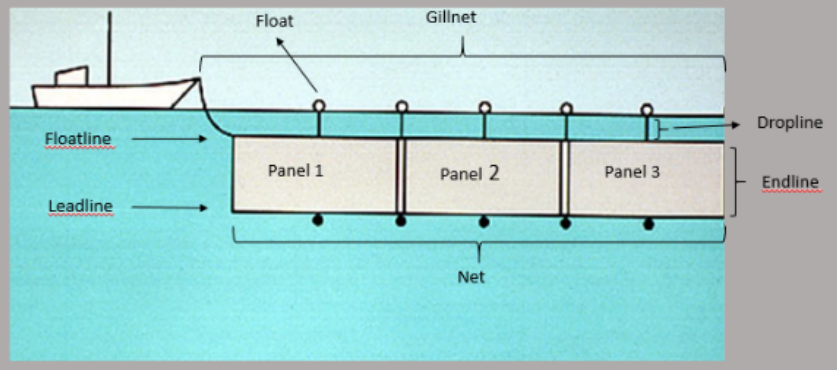
	attached.		R4/NP	
Tag recovery	Indicate Yes or No, whether a tag was recovered from this individual.	**MR**	**R2** R4/NP	**AG**
Tag number	Provide the tag number. If a turtle, provide both tag numbers (right and left flipper).	**MR**	**NP**	
Tag type	Record the type of tag used (Table 52).	**MR**	**R2** R4/NP	**AG**
Tag finder	Record the name and contact details of the person who recovered the tag.	**MR**	**NP**	

Comentado [HM34]: Not sure if the camera can focus on the Tags.

Comentado [HM35]: Not sure if the camera can focus on the Tags.

Comentado [HM36]: Not sure if the camera can focus on the Tags.

GILLNET INFORMATION[10]



Gillnet: A vertical panel(s) of netting suspended in the water column which may be attached to free floating buoys and/or a high flier at one end, and tied off to the vessel at the other end. Large mesh netting is stretched between a floatline at the top and a leadline at the bottom, and supported by vertical endlines, or up and down lines on each end. Panels of netting may be separated by a space or escape panel.

Net: A string of panels sewn together. The entire string may be referred to as "the net".

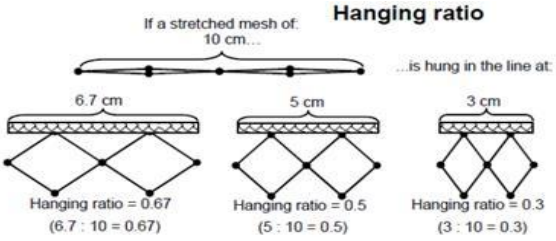
Panel: A section of continuous netting of exactly the same characteristics between two endlines (up and down lines).

Source: Scott.Fish.Inf.Pamp. Fig.30, p.40

Gear specifications

Data field name	Data field description	Rep. Req.
SPECIAL EQUIPMENT OR MACHINERY		
Net drum/hauler	Indicate Yes if on board No if not sighted. Vessels are normally equipped with a hydraulic net hauler; However they can also use net drums to both haul and store the net.	**MR**
GILLNET ATTRIBUTES Detail the specifications of each gillnet present on-board during the observed trip.		
Gillnet sequential number	Specify gillnet sequential number. Note: a unique sequential number is allocated to link each gillnet to its specifications. Any changes to individual gillnet specifications are to be considered a change of gillnet and the "new" gillnet will need to be characterised accordingly.	**MR**
Total number of panels	Record the number of panels making up the net.	**MR**

[10] To be completed as soon as EM pilots from Regional Observer Project are available

Panels stacked	Indicate Yes or No if there are any panels stacked. Note: stacked panels is defined as two or more panels of netting sewn together vertically, one on top of the other, to intentionally fish "double deep".	**MR**
Net length	Record the net string length. Usually calculated by multiplying the panel average length by the number of panels used in the net. Note: specify units (preferably kilometres)	**MR**
Net depth	Record the vertical height of the net (depth). Usually obtained by measuring the length of the end-line, or up and down line, on the end of a net where the meshes are attached. This information may be used to cross check information provided by the crew. Note: specify units (preferably metres)	**---**
Net material	Record the material of the net webbing (Table 18).	**---**
Stretched mesh size(s)	Record the mesh average stretched lengths (knot to knot) and range. Usually calculated by measuring at least 10 meshes from 5 panels in different areas of the net. Note: specify units (preferably millimetres)	**MR**
Mesh count, vertical	Record the number of vertical meshes of a net in this gear. Usually obtained by counting the number of meshes of the end-line, or up and down line, on the end of a net where the meshes are attached. This information may be used to cross check information provided by the crew.	**---**
Hanging ratio (%)	Record the ratio between the length of the float line and the length of the stretched mesh hanging on the float line. Usually obtained by the following process: 1) counting 10 or 12 meshes horizontally, 2) multiplying the number of counted meshes by average stretched mesh length; 3) measuring the length of the floatline they are attached to, 3) dividing the length of the floatline the meshes are attached to by the length of the stretched meshes counted (see e.g. below). 	**MR**
Net web colour	The colour(s) of the net webbing (Table 19). Note: Different net colours can have an impact on cetacean and turtle bycatch as some colours are more visible than others. [Consistent with SC16.24 (para. 53)].	**MR**
Float type	Record the type of buoyancy aid that is attached to the head-rope (Table 20).	**---**
Float number	Record an approximate total number of floats used on this gillnet. This number must include the number of floats across a space that may occur at the bridle at the end of a net. This information may be obtained from the crew.	**---**
Distance between floats	Record the average distance (measured along the head-rope) between the floats used on this gillnet.	**---**

	Note: specify units (preferably metres).	
Droplines used	Indicate Yes if droplines are used in this gillnet and No if not.	---
Droplines length	If droplines are used in this gillnet, record the length of the droplines. Usually obtained by measuring the distance from the floats (at the water's surface) to the float-line. This information may be used to cross check information provided by the crew. Note: specify units (preferably metres).	---
Sinker type	Record the sinker type (defined accordingly to the material they are made of) attached to the footrope (Table 21).	---
Sinker Number	Record an approximate total number of sinkers attached to footrope. If more than one type of sinker is used, record approximate total number of sinkers/weights per sinker type. This information may be obtained from the crew.	---
Sinker average weight	Record sinker average weight. If more than one type of sinker is used, record sinker average weight per sinker type. Note: specify units (preferably kilograms).	---

Fishing event

Data field name	Data field description	Rep. Req.
Set number	Record set number. This should be a four digit numerical code beginning 0001. Set numbers should be consecutive from the start of the first line set to the last line set of the observed trip. A unique number is to be allocated to each individual set.	**MR**
Gillnet sequential number	Specify gillnet used on this set by recording its sequential number. Note: a unique sequential number is allocated to link each gillnets to its specifications.	**MR**
SETTING OPERATIONS		
Start setting date and time	Record the date and the time that first panel enters the water (i.e. start of the setting of the net). Note: specify units (preferably hh:mm and YYYY/MM/DD).	**MR**
Start setting position	Record the position in latitude and longitude for the start of the setting operation. Note: latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	**MR**
End setting date and time	Record the date and the time the gillnet is secured to the vessel, to an anchoring device, or completely deployed (i.e. end of net setting). Gillnet vessels often set dusk and the setting operation may continue beyond midnight and into the following day. Note: specify units (preferably hh:mm and YYYY/MM/DD).	**MR**
End setting position	Record the position in latitude and longitude for the end of the setting operation Note: latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	---
Vessel speed	Record the vessel's average speed in knots during setting. Note: Collect vessel speed from the GPS several times during the	---

	operation and take the average.	
Vertical set	Indicate the level the gillnet is set at vertically in the water column, i.e., if the net is set at the surface or sub-surface (Table 27).	**MR**
Setting strategy	Indicate how the gillnet was set (Table 29).	**MR**
Setting shape	Indicate the spatial configuration in which the gillnet was set (Table 28). Note: gillnets can be set in a range of configurations such as pulled straight, in a semi-circle or v-shape as well as many others.	**---**
Mitigation measures		
Mitigation measures	Indicate Yes or No if any bycatch mitigation devices were used during the set.	**MR**
Mitigation devices	Record any mitigation device(s) used during the set (Table 38).	**---**
HAULING OPERATIONS		
Start hauling date and time	Record the date and time at the start of net hauling. This is the time when the hauling equipment is put into gear or when the net starts being hauled. Vessels often haul nets in the early morning after a night soak period. Note: specify units (preferably hh:mm and YYYY/MM/DD).	**MR**
Start hauling position	Record the position in latitude and longitude for the start of the hauling operation. Note: latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	**MR**
End hauling date and time	Record the date and time at the end of net hauling. This is the time when the gillnet is completely retrieved and onboard the vessel. Note: specify units (preferably hh:mm and YYYY/MM/DD).	**---**
End hauling position	Record the position in latitude and longitude for the end of the hauling operation. Note: latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	**---**
Net condition	Indicate the condition of the net at haul-back, even if the condition was the same at setting (Table 26).	**MR**
Number of net panels retrieved	Record the total number of net panels retrieved at haul.	**MR**
Number of net panels observed	Record the total number of hauled net panels that are observed.	**MR**
Sampling protocol	Indicate sampling protocol followed by the observer to select which net panels to observe (Table 39).	**MR**
CATCH DETAILS		
Set number	Unique within a specific trip	**MR**
Catch detail number	Unique within a specific set	**MR**

Species	Record the species code for each specimen observed using FAO three figure alpha codes (Table 1, Table 2, Table 3, Table 4, Table 5, Table 6 and Table 7). If species FAO code is not available, the species scientific name. Note: Record "unknown" for species that cannot be positively identified and give it a reference number. 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.	**MR**
Fate	Specify the fate which includes whether it was retained or discarded and the reason, e.g. "Discarded – too small" (Table 41).	**MR**
Sampling methods for obtaining total catch estimates per species	Indicate the sampling method used to obtain total catch estimates per species (Table 40).	**MR**
Number	Record the number of individuals per species for each specified fate. If weight is recorded, insert NA here (for large fish, record number of individuals).	**MR**
Weight	Record the weight corresponding to the specified species and fate category. If number of individuals is recorded, insert NA here (for small fish, record weight). Note: specify units (preferably tons).	**MR**
Weight estimation method	Indicate the weight estimation method used to collect weight (Table 43). Note: If number of individuals is recorded, insert NA here.	**MR**
Weight code	Record the type of processing the species underwent prior to weighing (Table 44). If the species has not been processed, record the code for unprocessed (or round, whole, live) weight (i.e. RD). Note: If number of individuals is recorded, insert NA here.	**MR**
Depredation details		
Depredation source	For depredated specimens, indicate the depredation source based on depredation scar characteristics (Table 45). For non-depredated specimens record NA.	**MR**
Predator Observed	For depredated specimens, record the predator species directly observed and identified (FAO spp. 3-alpha code). If the predator was not observed record UNK (unknown). For non-depredated specimens record NA. Note: 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.	**MR**
SPECIMEN INFORMATION		
Set number	Unique within a specific trip	**MR**
Catch detail number	Unique within a specific set	**MR**
Specimen number	Unique within a specific catch detail	**MR**
Additional details on non-	Catch details on non-target species to be collected where possible and reported to the IOTC Secretariat as recommended by the Scientific Committee.	

target spp.		
Condition at capture	State the condition of the specimen at capture (Table 46).	**OR**
Condition at release	State the condition of the specimen at the time of release (Table 46).	**OR**
Additional catch details on SSIs	Additional catch details on Species of Special Interest (Table 47) to be collected where possible and reported to the IOTC Secretariat as recommended by the Scientific Committee.	
Gear interaction	For SSI only, specify the interaction of the specimen with the fishing gear (Table 48).	**OR**
Brought on board	Indicate Yes or No, if the specimen was brought on board. [Consistent with IOTC Resolutions 13/04; 13/05; 12/04; 12/06; 12/09]	**OR**
Hauling method	Specify how the specimen was brought on-board (Table 49). [Consistent with IOTC Res 12-04]	**OR**
Resuscitation (for turtles only)	For turtles indicate Yes if the release took place with resuscitation and No if not.	---
Photo ID	If a photo is taken, record photo number/code so that it can be linked back to the specimen for onshore examination.	**---**
BIOMETRIC INFORMATION Details concerning any extra biometric measurements, sex, maturity and the collection of samples.		
Sampling methods for the collection of biological information	Indicate the sampling method used for the collection of biological sub-sample (Table 42).	**MR**
Length code 1	Specify the length code used for the measurement (Table 53).	**MR**
Length 1	Record the length corresponding to the length type taken rounded to the lower centimetre.	**MR**
Length code 2	When an additional length measurement is taken, the corresponding length code should be recorded (Table 53).	**OR**
Length 2	When an additional length measurement is taken, the corresponding length should be recorded rounded to the lower centimetre.	**OR**
Weight	Record the weight corresponding to the specified species and fate category. If number of individuals is recorded, insert NA here (for small fish, record weight). Note: specify units (preferably tons).	**OR**
Weight estimation method	Indicate the weight estimation method used to collect weight (Table 43). Note: If number of individuals is recorded, insert NA here.	**OR**
Weight code	Record the type of processing the species underwent prior to weighing (Table 44). If the species has not been processed, record the code for unprocessed (or round, whole, live) weight (i.e. RD). Note: If number of individuals is recorded, insert NA here.	**OR**
Sex	Record the sex of the sampled fish specimen (Table 51).	**OR**

Maturity stage[11]	Record the stage of maturity of the sampled fish specimen according to standard maturity scales approved by the IOTC. If unknown record UNK.	**OR**
Sample collected	Record the following details on the collection of samples: *d)* type (e.g. otoliths, spine clippings, and genetic samples) *e)* preservation method (e.g. alcohol, frozen, etc.) f) destination (i.e. location to be sent/stored)	**OR**
TAG DETAILS Note that all tagged specimens are to be identified to species level and to be sampled for length. Elasmobranches and turtles are also to be sexed and ascertained for maturity.		
Tag release	Indicate Yes or No, whether this individual was re-released with a tag attached.	**MR**
Tag recovery	Indicate Yes or No, whether a tag was recovered from this individual.	**MR**
Tag number	Provide the tag number. If a turtle, provide both tag numbers (right and left flipper).	**MR**
Tag type	Record the type of tag used (Table 52).	**MR**
Tag finder	Record the name and contact details of the person who recovered the tag.	**MR**

PURSE-SEINE INFORMATION

Gear specifications

Data field name	Data field description	Reporting	EM	Source
SPECIAL EQUIPMENT OR MACHINERY				
Power block	Indicate Yes if on board No if not sighted.	**MR**	**R1**	**AG**
Purse winch	Indicate Yes if on board No if not sighted.	**MR**	**R1**	**AG**
GENERAL GEAR ATTRIBUTES				
Maximum length of the net	Record the maximum length of the net according to the net specifications. This corresponds to the length of the topline. Note: specify units (preferably metres)	**MR**	**P1**	**POST**
Maximum depth of the net	Record the maximum fishing depth according to the net specifications. Note: specify units (preferably metres)	**MR**	**P1**	**POST**
Bag stretched mesh size	Record the mesh average stretched lengths (knot to knot) of the bag of the net. Usually calculated by measuring 3 stretched mesh lengths and calculating the average. Note: specify units (preferably centimetres)	**MR**	**P1**	**POST**
Mid-net stretched mesh size	Record the mesh average stretched lengths (knot to knot) of the mid-net. Usually calculated by measuring 3 stretched mesh lengths and calculating the average. Note: specify units (preferably centimetres)	**MR**	**P1**	**POST**
Maximum Brail	Record the maximum weight capacity of a full brail in metric	**MR**	**R1**	**SETUP/**

[11] Until a standard maturity stage has been approved by the Scientific Commitee, record both stage and scale used.

Capacity	tonnes (Mt).			**PRE**
Skiff Power	Record the skiff engine power. Note: specify units (HP, KW).	**---**	**P1**	**POST**

Fishing event

Data field name	Data field description	Reporting	EM	Source
Set number	Record set number. This should be a four digit numerical code beginning 0001. Set numbers should be consecutive from the start of the first line set to the last line set of the observed trip. A unique number is to be allocated to each individual set.	**MR**	**R1**	**AG**
OPERATIONS				
Set type[12]	Free school set, FAD set, etc. (table 34)	**MR**	**R1**	**AG**
Start setting date and time	Record the date and time the skiff is launched to start the setting operation. Note: specify units (preferably hh:mm and YYYY/MM/DD).	**MR**	**R1**	**AG**
Start setting position	Record the position in latitude and longitude for the start of the setting operation. Note: latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	**MR**	**R1**	**AG**
Beaufort	Record the force of the wind according to the Beaufort scale (Table 37).	---	**R1**	**AG**
School sighting cue and school type	Report up to the first three cues which lead the vessel to detect the presence of the tuna school and specify the type of tuna school detected (Table 35).	**MR**	**NP/R4**[13]	**EM-A**
First detection method	Record how the vessel first detects the tuna school, floating object or birds (Table 30). If more than one method is used record only what first made the vessel change course.	**---**	**NP**	
School size	Provide an estimation of the size of the tuna school being targeted (in tonnes). This information can be requested from the bridge officers.	**---**	**NP**	
Time net pursed	Record the time (hh:mm) when the net is fully pursed. All rings are up.	**MR**	**R1**	**AG**
Time start brailing	Record the time that brailing starts (hh:mm).	**---**	**R1**	**AG**
Time end brailing	Record the time that brailing ends (hh:mm).	**---**	**R1**	**AG**
Time skiff onboard	Record the time when the skiff comes on board and the set is over (hh:mm).	**---**	**R1**	**AG**
Maximum closing net depth (m)	Record the real, measured, closed net depth (m). To be recorded only if depth gauge is used. Use information from middle gauge if more than one gauge is present.	**---**	**NP**	

[12] This is included in the ROS Minimum Data Requirements collectively with "school sighting cue" (see below) data field name but it would be better to identify the school type separatedly from the "school sighting cue".
[13] Could be inferred from post-hoc analysis of speed, direction, and ancilliary information from EM System collected data.

Object Details	For sets conducted on FADs (natural or artificial), the following detailed information should be collected where possible and reported to the IOTC Secretariat.			
Buoy ID	For every activity involving artificial or a natural FADs equipped with a buoy report BUOY ID (i.e. Buoy marking or any information allowing identifying the owner). [Consistent with IOTC Res 18/08]	**OR**	**NP/P2**	
Buoy equipped with artificial lights	Report if devices equipped with artificial lights are deployed and/or recovered. [Consistent with IOTC Res 16/07]	**OR**	**R3/R4**	
Artificial FAD design	Characterize artificial FAD design using codes provided to describe raft (floating part) and tail (underwater hanging structure) materials (Table 36). [Consistent with IOTC Res. 12/04 and Res 18/08]	**OR**	**R1/R2**	**AG**
Cetaceans and whale sharks sightings during setting	Details on cetaceans and whale sharks sightings during purse-seine setting are to be collected where possible and reported to the IOTC Secretariat. [Consistent with IOTC Res 13/04 and 13/05]			
Sighting occurred before setting	Indicate YES if the sighting occurred before setting or NO if it occurred after.	**OR**	**NP**	
Species	The species code for the sighted specimen/s (FAO spp. 3-alpha code). If species FAO code is not available, the species scientific name.	**OR**	**NP**	
N° sighted	The number of individuals sighted per species.	**OR**	**NP**	
Caught inside the net	Indicate YES or NO whether sighted specimen/s was/were caught inside the net once the purse line was closed.	**OR**	**R1**	**AG**
Support vessel details	Details on support vessel/s present/participating to the observed fishing set.			
Support vessel presence	Record if a supply vessel is present during the observed set.	---	**NP**	
Support vessel name	Record the name of the support vessel present during the observed set.	---	**NP**	
Support vessel participation	Support vessel participation: Record if the Supply Vessel takes part in the setting operation (YES/NO). If YES, describe it (e.g. acting as floating objet, etc.).	---	**NP**	
Details on the current	Details on sea current that might influence set performance.			
Current direction	Record current direction using cardinal points (E, W, SW, SSW, etc.). This information is to be requested from bridge officers.	---	**NP**	
Current speed	Record current speed in knots. This information is to be requested from bridge officers.	---	**NP**	
Current depth	Record current depth in metres. This information is to be requested from bridge officers.	---	**NP**	
CATCH DETAILS				
Set number	Unique within a specific set	**MR**	**R1**	**AG**
Catch detail	Unique within a specific catch detail	**MR**	**R1**	**AG**

number				
Species	Record the species code for each specimen observed using FAO three figure alpha codes (Table 1, Table 2, Table 3, Table 4, Table 5, Table 6 and Table 7). If species FAO code is not available, the species scientific name. Note: Record "unknown" for species that cannot be positively identified and give it a reference number. 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.	**MR**	**R1/R3**	**AG**
Fate	Specify the species fate which includes whether it was retained or discarded and the reason, e.g. "Discarded – too small" (Table 41).	**MR**	**R1**	**AG**
Sampling methods for obtaining total catch estimates per species	Indicate the sampling method used to obtain total catch estimates per species for the catch detail (Table 40).	**MR**	**R1**	**EM-A**
Number	Record the number of individuals per species for each specified fate. If weight is recorded, insert NA here (for large fish, record number of individuals).	**MR**	**R1**	**AG**
Weight	Record the weight corresponding to the specified species and fate category. If number of individuals is recorded, insert NA here (for small fish, record weight). Note: specify units (preferably tons).	**MR**	**R1**	**AG**
Weight estimation method	Indicate the weight estimation method used to collect weight (Table 43). Note: If number of individuals is recorded, insert NA here.	**MR**	**R1**	**EM-A**
Weight code	The code corresponding to the type of processing the specimen underwent prior to weighing (Table 44). If the fish has not been processed, record code for unprocessed (or round, whole, live) weight (i.e. RD). Note: If number of individuals is recorded, insert NA here.	**MR**	**R1**	**EM-A**
Additional details on non-target spp.	Catch details on non-target species to be collected where possible and reported to the IOTC Secretariat as recommended by the Scientific Committee.			
Condition at capture	State the condition of the specimens at capture (Table 46).	**OR**	**R1**	**AG**
Condition at release	State the condition of the specimens at the time of release (Table 46).	**OR**	**R1**	**AG**
SPECIMEN INFORMATION				
Set number	Unique within a specific trip	**MR**	**R1**	**AG**
Catch detail number	Unique within a specific set	**MR**	**R1**	**AG**
Specimen number	Unique within a specific catch detail	**MR**	**R1**	**AG**
Additional details on non-target spp.	Catch details on non-target species to be collected where possible and reported to the IOTC Secretariat as recommended by the Scientific Committee.			

Condition at capture	State the condition of the specimen at capture (Table 46).	**OR**	**R1**	**AG**
Condition at release	State the condition of the specimen at the time of release (Table 46).	**OR**	**R1**	**AG**
Additional catch details on SSIs	Additional catch details on Species of Special Interest (Table 47) to be collected where possible and reported to the IOTC Secretariat as recommended by the Scientific Committee.			
Gear interaction	For SSI only, specify the interaction of the specimen with the fishing gear (Table 48).	**OR**	**R1**	**AG**
Brought on board	Indicate Yes or No, if the specimen was brought on board. [Consistent with IOTC Resolutions 13/04; 13/05; 12/04; 12/06; 12/09]	**OR**	**R1**	**AG**
Hauling method	Specify how the specimen was brought on-board (Table 49). [Consistent with IOTC Res 12-04]	**OR**	**R1**	**AG**
Resuscitation (for turtles only)	For turtles indicate Yes if the release took place with resuscitation and No if not.	---	**R1**	**AG**
Photo ID	If a photo is taken, record photo number/code so that it can be linked back to the specimen for onshore examination.	**---**	**R1**	**AG**
BIOMETRIC INFORMATION Details concerning any extra biometric measurements, sex, maturity and the collection of samples.				
Sampling methods for the collection of biological information	Indicate the sampling method used for the collection of biological sub-sample (Table 42).	**MR**	**NP**	
Length code 1	Specify the length code used for the measurement (Table 53).	**MR**	**R3/R4**	
Length 1	Record the length corresponding to the length type taken rounded to the lower centimetre.	**MR**	**R3/R4**	
Length code 2	When an additional length measurement is taken, the corresponding length code should be recorded (Table 53).	**OR**	**R3/R4**	
Length 2	When an additional length measurement is taken, the corresponding length should be recorded rounded to the lower centimetre.	**OR**	**R3/R4**	
Weight code	Record the code corresponding to the type of processing the specimen underwent prior to weighing (Table 44).	**OR**	**R3/R4**	
Weight	Record the specimen's weight (in kilograms) corresponding to the specified product type recorded in 'weight code'. If the fish has not been processed, record the unprocessed (or round, whole, live) weight (i.e. RD).	**OR**	**R3/R4**	
Weight estimation method	Specify the weight estimation method used to obtain the weight (Table 43).	**OR**	**R1**	**EM-A**
Sex	Record the sex of the sampled fish specimen (Table 51).	**OR**	**NP/R3**[14]	

[14] NP for target tuna species and other fish bycatch but it could be ready (R2) for some bycatch species such as sharks

Maturity stage	Record the stage of maturity of the sampled fish specimen according to standard maturity scales approved by the IOTC. If unknown record UNK.	**OR**	**NP**	
Sample collected	Record the following details on the collection of samples: *g)* type (e.g. otoliths, spine clippings, and genetic samples) *h)* preservation method (e.g. alcohol, frozen, etc.) i) destination (i.e. location to be sent/stored)	**OR**	**NP**	
TAG DETAILS Note that all tagged specimens are to be identified to species level and to be sampled for length. Elasmobranches and turtles are also to be sexed and ascertained for maturity.				
Tag release	Indicate Yes or No, whether this individual was re-released with a tag attached.	**MR**	**R2**	**AG**
Tag recovery	Indicate Yes or No, whether a tag was recovered from this individual.	**MR**	**R2**	**AG**
Tag number	Provide the tag number. If a turtle make sure to provide both tag numbers (right and left flipper).	**MR**	**NP**	
Tag type	Record the type of tag used (Table 52).	**MR**	**R2**	**AG**
Tag finder	Record the name and contact details of the person who recovered the tag.	**MR**	**NP**	
Well	The well number from which the tagged fish has been recovered, if the fish is recovered during shifting, transhipping or unloading. (Note: this information will allow tracing back tagged fish to the location where it was caught).	**MR**	**NP**	

Purse-seine vessel daily activity information

The following information is to be collected on a daily basis for every fishing set and at every 2 hours (from sunrise to sunset) to allow to reconstruct vessel route and for every fishing set.

Data field name	Data field description	Reporting	EM	Source
Date	Record the date. Note: specify units (preferably YYYY/MM/DD).	---	R1	AG
Time	Record time at the start of every fishing activity and every two hours from sunrise to sunset. Note: specify units (preferably hh:mm).	---	R1	AG
Position	Record vessel position at the start of every fishing activity and every two hours from sunrise to sunset. Note: latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	---	R1	AG
Activity	Record vessel activity at the start of every fishing activity and every two hours from sunrise to sunset (Table 33).	---	R1/NP [15]	AG
Comments	Record short commentaries on exceptional events that could not be described by the previous data fields.	---	NP	

Purse-seine FAD activities

[15] Not all activites from Table 33 could be recorded by EM

The following information is not included in the ROS Minimum Data Requirements but are requested under FAD related IOTC Data Requirements (Resolution 15/02, 19/01 and 19/02). ROS Minimum Data Requirements could also be updated to request observer to collect these data, whenever possible.

Data field name	Data field description	Reporting	EM	Source
Set number	As above	MR	R1	AG
Type	Type of floating object (flotsam, natural object, FAD)	---	R1	AG
Floating structure: dimensions	Length, width and height of the floating structure		R1	AG
Submerged structure: shape			R2	AG
Submerged structure: depth			R2	AG
Components when encountered	Components of floating and submerged structures when encountered		R2	AG
Components when left	Components of floating and submerged structures when left		R2	AG
Object encounter	Date, time, position		R1	AG
FAD activity: deployment	Date, time, position		R1	AG
FAD activity: visit	Date, time, position		R1	AG
FAD activity: hauling	Date, time, position		R1	AG
FAD activity: retrieving/removed	Date, time, position		R1	AG
FAD ID	If FAD is marked		NP	
Buoy ID	Serial number of satellite buoy		NP	
Origin	Origin of object (e.g. FAD ownership)		P2	
Operational buoys followed by vessel			NP	
Operational buoy lost by vessel			NP	

POLE AND LINE INFORMATION[16]

Gear specifications

Data field name	Data field description	Reporting	EM	Source
SPECIAL EQUIPMENT OR MACHINERY				
Live bait tanks capacity	Record the total volume of the tanks used to keep the live bait, in cubic metres (m3).	**MR**	**NP**	**SETUP /PRE**
Number of automatic poles	Record the total number of automatic poles that are fixed on a vessel.	**MR**	**NP**	**SETUP /PRE**

[16] To be completed as soon as EM pilots from Regional Observer Project are available

GENERAL GEAR ATTRIBUTES				
Number of anglers	Record the maximum number of anglers observed during the trip.	**MR**	**R1**	***EM-A***
Pole material	Specify the material the pole is made of: bamboo, fibre glass or carbon. If made of another material, describe it.	**MR**	**NP**	**SETUP /PRE**
Hook type	Indicate the type of hooks used for the observed trip (Table 17).	**MR**	**NP**	**SETUP /PRE**
Type of lures used	Record Yes if the vessel uses lures or jiggers during the observed trip and No if it doesn't. If Yes, record lures or jiggers type, make (brand) and hook type (Table 17).	**---**	**NP**	**SETUP /PRE**

Fishing event

Tuna fishing event

Data field name	Data field description	Reporting	EM	Source
Event number	Record event 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. Note: Each time the vessel activates its sprayers, starts chumming and/or actively catching fish, the observer should record this as event even if no fish is caught.	**MR**	**R1**	***EM-A***
TUNA FISHING OPERATIONS				
Event date and time	Record the data and time that the first line enters the water. Note: specify units (preferably hh:mm and YYYY/MM/DD).	**MR**	**R1**	***AG-A***
Event start position	Record the position in latitude and longitude at the start of the fishing event. Note: latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	**MR**	**R1**	***AG-A***
Beaufort	Record the force of the wind according to the Beaufort scale (Table 37).	---	**NULL**	
Event end time	The time when the last line comes out of the water. Note: If the vessel stops fishing for a period of at least 10 minutes then it should be considered that the fishing event ended, even if fishing is to restart shortly after wards on the same school.	**MR**	**R1**	***AG-A***
School sighting cue and school type	Record up to the first three cues which leads the vessel to detect the presence of a tuna school and the type of school detected (Table 30).	**MR**	**NP**	
Target Species	Record the species in the school being targeted using FAO three figure alpha codes (Table 1).	**---**	**R1**	***EM-A***
Maximum lines fishing at the same time	Record maximum number of lines fishing at the same time. These should include lines deployed from manual and automatic poles. Specify if other lines are deployed and include them in the total count. Note: This should be one count taken when the fishing activity is well established (not right at the beginning or right at the end).	**MR**	**R1**	***EM-A***
Bait used	Indicate Yes or No regarding whether any bait was used during the fishing event.	**MR**	**R1**	***EM-A***
Bait type	Specify the bait type/condition used during the fishing event (Table 25).	**MR**	**R3**	***PRE/EM-A***

Bait species	Record the species of bait used during the fishing event using FAO three figure alpha codes (Table 8).	**MR**	**NP**	
Number of hooks lost	Record the total number of hooks lost during the poling operation.	**MR**	**NP**	
Weight of bait used	Record the estimated quantity of bait used in the poling operation (in kg). If no bait was used record zero (0). Note: Request this information from the fishers in charge of live bait.	**---**	**NP**	
Object ID	For every activity involving artificial FAD (DFAD/AFAD) report FAD identifier (i.e. FAD marking or beacon ID or any information allowing identifying the owner).	**OR**	**NP**	
Buoys equipped with artificial lights	For every activity involving FADs (natural and/or artificial) report if device is equipped with artificial lights.	**OR**	**NP**	
Sampling protocol	Indicate sampling protocol followed by the observer to select which lines to observe (Table 39).	**MR**	**R1**	
CATCH DETAILS				
Event number	Unique within a specific observed trip	**MR**	**R1**	***AG-A***
Catch detail number	Unique within a specific event	**MR**	**R1**	***AG-A***
Species	Record the species code for each specimen observed using FAO three figure alpha codes (Table 1, Table 2, Table 3, Table 4, Table 5, Table 6 and Table 7). If species FAO code is not available, the species scientific name. Note: Record "unknown" for species that cannot be positively identified and give it a reference number. 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.	**MR**	**R1**	***EM-A***
Fate	Specify the fate which includes whether it was retained or discarded and the reason, e.g. "Discarded – too small" (Table 41).	**MR**	**R1**	***EM-A***
Sampling methods for obtaining total catch estimates per species	Indicate the sampling method used to obtain total catch estimates per species for the observed set (Table 40).	**MR**	**R1**	
Number	Record the number of individuals per species for each specified fate. If weight is recorded, insert NA here (for large fish, record number of individuals).	**MR**	**R1**	***EM-A***
Weight	Record the weight corresponding to the specified species and fate category. If number of individuals is recorded, insert NA here (for small fish, record weight). Note: specify units (preferably tons).	**MR**	**R1**	**CF**
Weight estimation method	Indicate the method used to estimate weight (Table 43). Note: If number of individuals is recorded, insert NA here.	**MR**	**R1**	**EM-A**
Weight code	The code corresponding to the type of processing the specimen underwent prior to weighing (Table 44). If the fish has not been processed, record code for unprocessed (or round, whole, live) weight (i.e. RD).	**MR**	**R1**	**EM-A**

	Note: If number of individuals is recorded, insert NA here.			
Depredation details	[In agreement with SC18.16 (para. 53)]			
Depredation source	For depredated specimens, indicate the depredation source based on depredation scar characteristics (Table 45). For non-depredated specimens record NA.	**MR**	**NP**	
Predator Observed	For depredated specimens, record the predator species directly observed and identified (FAO spp. 3-alpha code). If the predator was not observed record UNK (unknown). For non-depredated specimens record NA. Note: 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.	**MR**	**NP**	
SPECIMEN INFORMATION				
Additional details on non-target spp.	Catch details on non-target species to be collected where possible and reported to the IOTC Secretariat as recommended by the Scientific Committee.			
Condition at capture	State the condition of the specimen at capture (Table 46).	**OR**	**R1**	***EM-A***
Condition at release	State the condition of the specimen at the time of release (Table 46).	**OR**	**R1**	***EM-A***
Additional catch details on SSIs	Additional catch details on Species of Special Interest (Table 47) to be collected where possible and reported to the IOTC Secretariat as recommended by the Scientific Committee.			
Gear interaction	For SSI only, specify the interaction of the specimen with the fishing gear (Table 48).	**OR**	**R1**	***EM-A***
Brought on board	Indicate Yes or No, if the specimen was brought on board. [Consistent with IOTC Resolutions 13/04; 13/05; 12/04; 12/06; 12/09]	**OR**	**R1**	***EM-A***
Hauling method	Specify how the specimen was brought on-board (Table 49). [Consistent with IOTC Res 12-04]	**OR**	**R1**	***EM-A***
Resuscitation (for turtles only)	For turtles indicate Yes if the release took place with resuscitation and No if not.	---	**NULL**	
Photo ID	If a photo is taken, record photo number/code so that it can be linked back to the specimen for onshore examination.	**---**	**NP**	
BIOMETRIC INFORMATION Details concerning possible extra biometric measurements, sex, maturity and the collection of samples.				
Sampling methods for the collection of biological information	Indicate the sampling method used for the collection of biological sub-sample (Table 42).	**MR**	**R1**	***EM-A***
Length code 1	Specify the length code used for the measurement (Table 53).	**MR**	**R1**	***EM-A***
Length 1	Record the length corresponding to the length type taken rounded to the lower centimetre.	**MR**	**R1**	***AG-A***
Length code 2	When an additional length measurement is taken, the corresponding length code should be recorded (Table 53).	**OR**	**R1**	
Length 2	When an additional length measurement is taken, the corresponding length should be recorded rounded to the lower centimetre.	**OR**	**R1**	***AG-A***

Weight code	Record the code corresponding to the type of processing the specimen underwent prior to weighing (Table 44).	**OR**	**R1**	
Weight	Record the specimen's weight (in kilograms) corresponding to the specified product type recorded in 'weight code'. If the fish has not been processed, record the unprocessed (or round, whole, live) weight (i.e. RD).	**OR**	**R1**	***CF***
Weight estimation method	Specify the weight estimation method used to obtain the weight (Table 43).	**OR**	**R1**	***EM-A***
Sex	Record the sex of the sampled fish specimen (Table 51).	**OR**	**NP**	
Maturity stage[17]	Record the stage of maturity of the sampled fish specimen according to standard maturity scales approved by the IOTC. If unknown record UNK.	**OR**	**NP**	
Sample collected	Record the following details on the collection of samples: *j)* type (e.g. otoliths, spine clippings, and genetic samples) *k)* preservation method (e.g. alcohol, frozen, etc.) l) destination (i.e. location to be sent/stored)	**OR**	**NP**	
TAG DETAILS Note that all tagged specimens are to be identified to species level and to be sampled for length. Elasmobranches and turtles are also to be sexed and ascertained for maturity.				
Tag release	Indicate Yes or No, whether this individual was re-released with a tag attached.	**MR**	**R1**	**AG**
Tag recovery	Indicate Yes or No, whether a tag was recovered from this individual.	**MR**	**R2**	**AG**
Tag number	Provide the tag number. If a turtle make sure to provide both tag numbers (right and left flipper).	**MR**	**NP**	
Tag type	Record the type of tag used (Table 52).	**MR**	**R2**	**AG**
Tag finder	Record the name and contact details of the person who recovered the tag.	**MR**	**NP**	

Bait fishing event

Data field name	Data field description	Reporting	EM	Source
Event number	Record event 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.	**MR**	**R1**	***EM-A-AG***
Event start date and time	Record the data and time when chumming for bait starts. Note: specify units (preferably hh:mm and YYYY/MM/DD).	**MR**	**R1**	***EM-A-AG***
Event start position	Record the position in latitude and longitude at the start of the fishing event. Note: latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	**MR**	**R1**	***EM-A-AG***
Event end date and time	Record the data and time at the end of the bait fishing event, when the last brail is scooped from the net. Note: specify units (preferably hh:mm and YYYY/MM/DD).	**---**	**R1**	***EM-A-AG***

[17] Until a standard maturity stage has been approved by the Scientific Commitee, record both stage and scale used.

Event depth	Record the depth of the place where the net is being deployed. Note: specify units (preferably metres).	**MR**	**NP**	
Distance from the coast	Record the distance from the coast to which the bait fishing is being carried out. Note: specify units (preferably nautical miles).	**---**	**R1**	***CF***
Beaufort	Record the force of the wind according to the Beaufort scale (Table 37).	**---**	**NP**	
School sighting cue and school type	Record up to the first three cues which leads the vessel to detect the presence of a tuna school and type of school detected (Table 30).	**MR**	**R1**	***EM-A***
Detection method	Select the detection method/s used to detect bait fish school (Table 31).	**---**	**R1**	***PRE***
Fishing method	Indicate the fishing method during the specific bait fishing event (Table 32).	**---**	**R1**	***EM-A***
N° of fishers	Number of fishers that participate to the bait fishing event.	**---**	**R1**	***EM-A***
Object ID	For every activity involving artificial FAD (DFAD/AFAD) report FAD identifier (i.e. FAD marking or beacon ID or any information allowing identifying the owner).	**OR**	**NP**	
Buoys equipped with artificial lights	For every activity involving FADs (natural and/or artificial) report if device is equipped with artificial lights.	**OR**	**NP**	
Sampling protocol	Indicate sampling protocol followed by the observer to select which lines to observe (Table 39).	**MR**	**NULL**	
CATCH DETAILS				
Event number	Unique within a specified trip	**MR**	**R1**	***EM-A-AG***
Catch detail number	Unique within a specified event	**MR**	**R1**	***EM-A-AG***
Species	Record the species code for each specimen observed using FAO three figure alpha codes (Table 1, Table 2, Table 3, Table 4, Table 5, Table 6, Table 7 and Table 8). If species FAO code is not available, the species scientific name. Note: Record "unknown" for species that cannot be positively identified and give it a reference number. 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.	**MR**	**R1**	***EM-A***
Fate	Specify the species fate which includes whether it was retained or discarded and the reason, e.g. "Discarded – too small" (Table 41).	**MR**	***R1***	***EM-A***
Sampling methods for obtaining total catch estimates per species	Indicate the sampling method used to obtain total catch estimates per species for the observed set (Table 40).	**MR**	***R1***	***EM-A***
Number	Record the number of individuals per species for each specified fate. If weight is recorded, insert NA here (for large individuals, record numbers).	**MR**	**NULL**	
Weight	Record the weight corresponding to the specified species and fate	**MR**	***R1***	***EM-A***

	category. If number of individuals is recorded, insert NA here (for small fish, record weight). Note: specify units.			
Weight estimation method	Indicate the method used to estimate weight (Table 43). Note: If number of individuals is recorded, insert NA here.	**MR**	**R1**	***EM-A***
SPECIMEN INFORMATION				
Event number	Unique within a specified trip	**MR**	***R1***	***EM-A-AG***
Catch detail number	Unique within a specified event	**MR**	***R1***	***EM-A-AG***
Specimen number	Unique within a specified catch detail	**MR**	***R1***	***EM-A-AG***
Additional details on non-target spp.	Catch details on non-target species to be collected where possible and reported to the IOTC Secretariat as recommended by the Scientific Committee.			
Condition at capture	State the condition of the specimen at capture (Table 46).	**OR**	**R1**	***EM-A-AG***
Condition at release	State the condition of the specimen at the time of release (Table 46).	**OR**	**R1**	***EM-A-AG***
Additional catch details on SSIs	Additional catch details on Species of Special Interest (Table 47) to be collected where possible and reported to the IOTC Secretariat as recommended by the Scientific Committee.			
Gear interaction	For SSI only, specify the interaction of the specimen with the fishing gear (Table 48).	**OR**	**R3**	***EM-A***
Brought on board	Indicate Yes or No, if the specimen was brought on board. [Consistent with IOTC Resolutions 13/04; 13/05; 12/04; 12/06; 12/09]	**OR**	**R3**	***EM-A***
Hauling method	Specify how the specimen was brought on-board (Table 49). [Consistent with IOTC Res 12-04]	**OR**	**R3**	***EM-A***
Resuscitation (for turtles only)	For turtles indicate Yes if the release took place with resuscitation and No if not.	---	**NULL**	
Photo ID	If a photo is taken, record photo number/code so that it can be linked back to the specimen for onshore examination.	**---**	**NP**	
BIOMETRIC INFORMATION Details concerning any extra biometric measurements, sex, maturity and the collection of samples.				
Sampling methods for the collection of biological information	Indicate the sampling method used for the collection of biological sub-sample (Table 42).	**OR**	**NP**	
Length code 1	Specify the length code used for the measurement (Table 53).	**OR**	**NP**	
Length 1	Record the length corresponding to the length type taken rounded to the lower centimetre.	**OR**	**NP**	
Length code 2	When an additional length measurement is taken, the corresponding length code should be recorded (Table 53).	**OR**	**NP**	
Length 2	When an additional length measurement is taken, the corresponding length should be recorded rounded to the lower centimetre.	**OR**	**NP**	

Weight code	Record the code corresponding to the type of processing the specimen underwent prior to weighing (Table 44).	**OR**	**NP**	
Weight	Record the specimen's weight (in kilograms) corresponding to the specified product type recorded in 'weight code'. If the fish has not been processed, record the unprocessed (or round, whole, live) weight (i.e. RD).	**OR**	**NP**	
Weight estimation method	Specify the weight estimation method used to obtain the weight (Table 43).	**OR**	**NP**	
Sex	Record the sex of the sampled fish specimen (Table 51).	**OR**	**NP**	
Maturity stage	Record the stage of maturity of the sampled fish specimen according to standard maturity scales approved by the IOTC. If unknown record UNK.	**OR**	**NP**	
Sample collected	Record the following details on the collection of samples: *m)* type (e.g. otoliths, spine clippings, and genetic samples) *n)* preservation method (e.g. alcohol, frozen, etc.) o) destination (i.e. location to be sent/stored)	**OR**	**NP**	
TAG DETAILS Note that all tagged specimens are to be identified to species level and to be sampled for length. Elasmobranches and turtles are also to be sexed.				
Tag release	Indicate Yes or No, whether this individual was re-released with a tag attached.	**OR**	**NULL**	
Tag recovery	Indicate Yes or No, whether a tag was recovered from this individual.	**OR**	**NULL**	
Tag number	Provide the tag number. If a turtle make sure to provide both tag numbers (right and left flipper).	**OR**	**NULL**	
Tag type	Record the type of tag used (Table 52).	**OR**	**NULL**	
Tag finder	Record the name and contact details of the person who recovered the tag.	**OR**	**NULL**	

Pole and line vessel daily activity information

The following information is to be collected on a daily basis for every fishing event and every 2 hours (from sunrise to sunset)

Data field name	Data field description	Reporting	EM	Source
Date	Record the date. Note: specify units (preferably YYYY/MM/DD).	**MR**	**R1**	**AG**
Time	Record the time every two hours (from sunrise to sunset) and at the start of every fishing activity. Note: specify units (preferably hh:mm).	**MR**	**R1**	**AG**
Position	Record vessel position every two hours (from sunrise to sunset) and at the start of every fishing activity. Note: latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	**MR**	**R1**	**AG**
Activity	Record vessel activity every two hours (from sunrise to sunset) and at the start of every fishing activity (Table 33).	**MR**	**R1/NP** [18]	**AG**
Comments	Record short commentaries on exceptional events that could not be described by the previous data fields.	---	**R4**	

[18] Not all activites from Table 33 could be recorded by EM

VESSEL TRANSHIPMENT INFORMATION[19]

Information on all transhipments that take place during the trip should be collected. Most commonly this will entail transhipping processed catch to a carrier vessel or another fishing vessel. If fish or fish products are move to or from another vessel (carrier or fishing vessel), observers must record details of the transhipment.

Bear in mind that the collecting this information is not necessary if an observer is present on a carrier vessel monitoring the transhipment for the IOTC Regional Observer Program (ROP)[20].

Data field name	Data field description	Reporting	EM	Source
Date	Record the date the transhipment takes place. Note: specify units (preferably YYYY/MM/DD).	---	**R1**	**EM-A-AG**
Start time	Record the time the transhipment of fish starts. Note: specify units (preferably hh:mm).	---	**R1**	**EM-A-AG**
End time	Record the time the transhipment of fish ends. Stores, bait or fuel may also be transhipped. The time and details of this must not be confused with the time that fish or fish products are being transhipped. Note: specify units (preferably hh:mm).	---	**R1**	**EM-A-AG**
Position	Record the position of your vessel, during transhipment. Note: latitude and longitude to be recorded mentioning if collected South or North of the equator and specifying units (preferably ±(d)dd.dddd°).	---	**R1**	**EM-A-AG**
Category	Record if your vessel is transhipping to or from, (i.e. receiving fish from) another vessel (carrier/fishing vessel) or if loading or allowing to load fish from the net (this may occur if a purse seiner has pursed more fish than its present loading capacity).	---	**R1**	**EM-A-AG**
Product transhipped	Observers deployed on-board a purse-seine, pole and line or gillnet vessel are to record the quantity of fish products transhipped (per species) using FAO spp.3-Alpha and IOTC "Product" categories (Table 44). Observers deployed on-board longline vessels are only to request to their vessel Captain a copy of the signed declaration form, which will have all the required information. Note: specify units (preferably tonnes).	---	**R1/P2**[21] **NP**	
Name of carrier/fishing vessel	Observers deployed on-board a purse-seine, pole and line or gillnet vessel are to record the name and registration details of the carrier/fishing vessel they are transhipping to/from (i.e. name, national registration number, port of registry, flag and call sign). Observers deployed on-board longline vessels are only to request to their vessel Captain a copy of the signed declaration form, which will have all the required information.	---	**R4/P1**	

[19] Information designed to capture information on all transhipments that take place during the trip.
[20] As per SC14 (para. 104)
[21] R1: total weight transshiped and P2: total weight transhipped by species