Report

Second Regional Electronic Monitoring Process Standards Workshop

20 to 24 November 2017

Nouméa, New Caledonia

Introduction

Mr Moses Amos (Director FAME, SPC) opened the Second Regional E-Monitoring Process Standards Workshop. Mr Harold Vilia (Solomon Islands) led the prayer. The meeting was co-chaired by Mr Peter Williams (SPC) and Mr Neville Smith (SPC) with sessions on development of the longline and purse seine process standards facilitated by Dr Ian Knuckey (Fishwell Consulting). The agenda was adopted and is attached as Annex I.

Overview

Organised by the Pacific Community (SPC) and Pacific Islands Forum Fisheries Agency (FFA), the Electronic Monitoring Process Standards took place at the SPC headquarters in Noumea between the 20th and 24th of November 2017. The workshop brought together experts currently involved in the use of electronic monitoring systems from Pacific Island national fisheries offices, regional and sub-regional fishery management organisations, non-government organisations and electronic monitoring service providers (a full participant list is provided in Annex II).

Electronic Monitoring (EM) has been defined as a closed monitoring system that enhances existing vessel monitoring systems (VMS) through the use of cameras, GPS capacity and gear sensors to monitor fishing activity. In the Western and Central Pacific Fisheries Commission's (WCPFC) Convention Area, EM is now, after a number of years of testing, an established method of collecting data from tuna fishing activities (e.g., VMS has been approved for some time). The capture of fisheries data through electronic tools has the powerful potential to enhance existing data collection systems and improve data deficiencies — the loss of data through misinformation or under-reporting. Such data loss from licensed vessels was identified as the major contributor to IUU fishing in the region[1]. Additionally, EM along with electronic reporting (ER) has the capacity to deliver real-time data and significantly improve the reliability of logsheet data, thus enhancing the value of stock assessments and various other technical analyses. EM systems also have value in providing compliance specific information. The ability to monitor the security of personnel on board is another valued feature.

Prior to the first Regional E-Monitoring Process Standards Workshop the longline fleet had been identified as having the more immediate needs in terms of EM data specifications (as full observer coverage was already a requirement for the WCPFC purse-seine fishery) as the longline fleet had substantively more vessels, many of which remain at sea for extended periods, and offers a more challenging environment for observer placements. For this second Regional E-Monitoring Process Standards Workshop, additional work on the longline standards was needed and work on purse seine standards and transhipment standards begun.

[1] MRAG Asia Pacific (2016). Towards the Quantification of Illegal, Unreported and Unregulated (IUU) Fishing in the Pacific Islands Region. 101pp.

Workshop Purpose

The workshop's main aims were to enhance the draft longline EM process standards for observer data developed in 2016[2], and to develop draft purse seine EM process standards for observer data. This work is focused on the detailed data standards for EM by defining the data fields and describing the business requirements in relation to those data fields (increasingly sought by EM service providers). The workshop focussed on the full range of Data Collection Committee (DCC) standards which FFA/SPC members utilise, recognising that the WCPFC Regional Observer Programme (ROP) minimum data field standards are what is mandatory for WCPFC members.

The purpose of establishing the process standards for E-Monitoring is to provide guidance on how the agreed standard observer data fields could be collected using EM. At this stage, it is important to note that what is to be collected by observers is mandatory. Although a clear list of data fields that must be collected by observers exist (e.g. the DCC forms and the WCPFC ROP minimum data standards), but how these same or additional data fields could be collected using E-Monitoring is evolving.

The workshop sought to draft revised and new EM process standards for longline, transhipment and purse seine respectively at this stage, provided as a best practice guide. It is intended that through a variety of fora they be refined and made available to FFA member countries and EM service providers and to the WCPFC Electronic Reporting and Electronic Monitoring Working Group for its use.

Workshop Approach

The workshop was a technical meeting. The positive response to the workshop invitation from a diverse and knowledgeable group provided a solid environment to investigate the validity of data fields with respect to the current and near future capabilities of EM technologies and the current technical capacity in the region. New in this second workshop, the key reference tool that proved particularly helpful to the workshop was the reports from members on their experiences with implementing electronic monitoring in their fisheries.

The workshop approached each agenda item with a combination of presentations, reference documents, small working groups and full workshop discussions. The workshop explored issues such as what is and what isn't possible in an EM environment. For each item the outputs were technical papers for future reference, further development and discussion in other regional fora. Where the group made specific recommendations, these were agreed and are reported below.

[2] See https://www.wcpfc.int/node/27441

E-Monitoring Programme Design Standards for Compliance and Management Requirements

A proposal for regional E-monitoring programme design and the development of programme standards was presented, noting that the key needs are robust comprehensive data and enforceability. The group discussed the proposal for the processes and data flows that would be required within a functional e-monitoring programme for longline fisheries. Key issues included:

- The need for legislative frameworks to allow implementation, in particular legal processes needed to prosecute any infringements reported by EM;
- That EM is one tool in a broader fisheries monitoring framework, including for CDS;
- The need for regional standards to support co-ordination between members on implementations schedules and costs to ensure that national licencing requirements support – as much as possible – vessels avoiding fisheries monitoring by fishing in countries that don't require EM;
- From a technical service providers' perspective, most of the technology is possible to satisfy the proposed MCS required data but there does need to be continuation of testing and evaluation;
- E-Monitoring has the potential to contribute the compliance case information;
- The need for a variety of EM standards to be developed to support member implementation; and
- The need for management frameworks to support implementation (e.g. licensing requirements, and cost recovery).

The proposal was revised by participants (Annex III) and the workshop recommended:

- The proposal be further revised post-workshop and submitted to the 2018 DCC and MCSWG meetings for further consideration.

E-Monitoring in the Longline Fishery

The group considered the use to date of EM within longline fisheries in the WCPO, and the implications for process standards through a series of presentations and discussions. The draft 2016 E-Monitoring process standards for longline provided a basis for the discussions. The key issues arising included:

- The need to incorporate new data fields reflecting changes in regional science requirements;
- Creating scalable systems to provide coverage;
- ER and EM systems need to be implemented and coexist as cross validating tools;
- Systems be developed to monitor high seas transhipments;
- Data flow and independence of EM analysis for high seas longliners;
- Recognition that EM can provide much higher resolution for some data fields; and
- The importance of the role of the DCC in development of EM data standards.

The draft 2016 E-Monitoring process standards for longline were substantially revised based on input from participants and a revised draft 2017 E-Monitoring process standards for longline prepared (Annex IV).

As part of this review, the workshop participants recognised that the initial categorisation of EM potential for each field could be more detailed than was achieved at the 2016 workshop. The 2016 and 2017 categorisations are shown in Table 1 below.

Table 1: Categories of EM potential for each data field as used in 2016 and 2017 assessments.

2016 Categories	2017 Categories	
EM ready	EM-R1	EM Ready 1 - operational now
	EM-R2	EM Ready 2 - requires significant crew support
	EM-R3	EM Ready 3 - requires additional dedicated camera / sensor
	EM-R4	EM Ready 4 - but inefficient / costly
EM with work	EM-P1	EM Possible - with minor work
	EM-P2	EM Possible - with major work
EM not likely	EM-NP	EM Not possible
	*	Data better collected by PS onboard observer
EM Natural Key	EM-Nat	EM Natural Key
EM new field	EM-New	EM new field
EM redundant	Null	Null field

In addition to these categorisations, the workshop participants highlighted whether development of EM capability had been achieved for a particular field or was a “High”, “Medium” or “Low” priority for future EM development.

Similar to the 2016 process, the source from which each field could be collected (or not) was identified. These were coded as shown in Table 2 below. For clarity, the term “office observer” used in the 2016 draft standard was changed to EM Analyst for the 2017 draft standard.

Table 2: The source from which each data field may be collected.

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;
CF	—	A calculated field arithmetically generated from one or more of the above field types.

The workshop endorsed the draft 2017 E-Monitoring process standards for longline and recommended:

- These draft standards are used as guidelines by SPC/FFA member countries embarking on any new E-Monitoring initiatives;
- Further post-workshop refinement of the categorisation of EM capabilities should be conducted by SPC and the consultant;
- Development of priority areas be incorporated into the draft standards to focus future EM R&D in line with science and MCS needs; and
- With the above change incorporated, the draft 2017 E-Monitoring process standards for longline be submitted to the 2018 WCPFC EREM WG for its consideration and use as the WCPFC develops its approach to regional standards.

Debriefing and E-Monitoring

A concept paper defining the premises of Electronic Monitoring debriefing (EM Debriefing) in the context of tuna fisheries monitoring in the WCPO was presented, noting that debriefing EM data is as critical as debriefing observer data. The group discussed the concept of EM Debriefing and key issues included:

- The need for regional EM Debriefing standards;
- The need to clearly define key terms, especially to avoid confusion with observer debriefing processes;
- That the debriefing process includes a second person reviewing a proportion of the records collected;
- The need for aspects of debriefing to be conducted by people independent of the service provider;
- The need for the development of automated range checks based on realistic ranges;
- The identification of verification formats;
- Integrating other data sources for validation; and
- Developing output formats to facilitate first and second person data review.

The concept was revised based on input from participants (Annex V) and the workshop recommended:

- Regional EM Debriefing standards be developed as a priority;
- Standardise an appropriate name and definition for the processes; and
- EM training, including debriefing, be incorporated into the PIRFO framework with consideration for how such standards could also apply to the broader WCPFC membership.

E-Monitoring in the Purse Seine Fishery

An outline draft E-Monitoring process standards for purse seine was reviewed by the group. The new EM categorisation codes were used together with a ranking of EM priority and source. In reviewing the outline the group identified:

- The purse seine EM process standard differed fundamentally from the longline EM process standard in the assumption that an observer would always be present onboard the purse seine vessel and accordingly EM was a tool to complement and augment existing observer data collection for a variety of needs;
- Given the potential for EM systems to provide robust data to support observers in purse seine, and potentially latent capacity with EM systems on board a purse seine vessel, additional approaches to obtaining fisheries monitoring value from purse seine EM systems should be considered (e.g. for transhipment and CDS);
- The ability for EM to address other MCS issues onboard purse seine vessels;
- The need to prioritise the use of EM on purse seine such as to monitor observer safety;
- Estimates of catch and catch composition may obtain significant benefits from EM because an EM-Analyst can stop, pause, rewind and review footage to observe most of the catch activities, whereas an observer may not observe actions occurring elsewhere, and accordingly may need to completely rethink the catch composition and length frequency sampling protocols for EM processes;
- Areas where EM could be developed to provide most benefit to existing data collection by observers include:
    - Observer occupational health and safety issues;
    - Set-level estimates of catch by tuna species;
    - Additional capability to detect and verify the following;
        - SSI landings and SSI Interactions (particularly marine mammals);
        - Well transfers;
        - FAD associated set or not;
        - The occurrence of fishing activity;
        - Transhipment;
    - Verification / validation of observer data;
- Consideration of who has authority and access to EM Purse seine data;
- Clear sampling requirements (which may be different to the current observer requirements) are required to advise EM providers on how catch sampling data can be captured; and
- Previous trials have shown that identifying FAD or Free School sets is possible, that with more work brail and set detection is possible, but that identifying bycatch is more difficult than for target species.

The outline E-Monitoring process standards for purse seine were substantially revised based on input from participants and a draft 2017 E-Monitoring process standards for purse seine prepared (Annex VI).

The workshop endorsed the draft 2017 E-Monitoring process standards for purse seine and recommended:

- Observer safety was identified as the highest priority for E-Monitoring by FFA and PNA member countries;
- Research, development and trials directed to the potential for E-Monitoring to resolve the current issues in collection of data to accurately determine purse seine tuna species catch composition was identified as the highest priority from a scientific perspective; and
- The draft 2017 E-Monitoring process standards for purse seine be submitted to the 2018 WCPFC EREM WG for its consideration and use as the WCPFC develops its approach to regional standards.

E-Monitoring of Transhipment

As an additional agenda item, the group considered the use of EM to monitor transhipments (noting that in general this applies to activity on the high seas). During the workshop the existing WCPFC draft standards for the E-reporting of high seas transhipment declarations (WCPFC14-2017-21) were developed into a concept E-Monitoring process standard for transhipment as a basis for the discussions. The key issues arising included:

- The potential for EM on transhipment vessels was a priority for detecting transhipment events;
- That EM on longline and purse seine vessels may also support the detection of transhipment events; and
- There would be value in developing EM methods for collecting more accurate estimates of the quantity (particularly weight) of transhipped product.

A draft 2017 E-Monitoring process standards for transhipment was developed based on input from participants (Annex VII). The workshop endorsed the draft 2017 E-Monitoring process standards for transhipment and recommended:

- Development of complementary EM process standards for SPC/FFA Regional Longline Unloading Destination, and, Purse Seine and Pole and Line Unloading forms; and
- With the above change incorporated, the draft 2017 E-Monitoring process standards for transhipment be submitted to the 2018 WCPFC EREM WG for its consideration and use as the WCPFC develops its approach to regional standards.

E-Monitoring of Unloads

Based on the potential value of EM for transhipment as highlighted above, some additional work was done by Dr Ian Knuckey following the workshop to make a preliminary assessment of the potential for EM to record the data collected in the SPC/FFA Regional Unloading Form

for Purse Seine and Pole-and-Line Vessels and for the SPC/FFA Regional Unloading Form for Longline Vessels. This preliminary work has not been viewed or endorsed by workshop participants but is provided in Annex VIII.

Overarching issues

During the meeting a range of overarching issues for developing EM in the region were identified, including:

- There may be multiples reviews of one trip for different purposes. We assume this is the actual data collection process for export;
- There are likely to be overlapping observer trips and EM trips and there needs to be a high level data link between the two;
- There appears to be a need for an EM events classifier that can occur anywhere throughout a trip;
- There are a number of Calculated Fields that could be removed from EM databases in the future as the necessary raw data are already stored (e.g. calculations can be remade from the raw data as needed);
- There are a range of species composition fields at the set level that can be visually estimated by the EM Analyst. These fields could also potentially be calculated from data collected at the sample level given sufficient sample size. While methods of (automated) EM recording at the catch sample level are being developed, there is a need to continue with both EM-Analyst SET level visual estimates and sample level estimates. When sample estimates are within a pre-set tolerance level between the two estimation methods, it may then be possible to drop out the EM Analyst SET level visual estimates**;**
- Many of the fields have multiple EM methods of estimation/calculation and this needs to be captured in the metadata;
- In some data fields where both EM Analyst and Observer collect data there maybe situations where one or the other or a combination of both would provide the better data, and the debriefing process may be a good area where this can be decided;
- For a number of fields, the current database form and structure has evolved to reflect hardcopy forms designed for onboard observers, and there is the opportunity in a dedicated EM system database in future to enrich and/or improve the quality and quantity of the data in these fields;
- Definitions for the new EM language and processes need to be put in place, and where necessary, these definitions need to clearly differentiate between observer language and processes;
- A priority area for development of EM Technology is the capacity for species recognition and weight estimation during unloading and transhipment activities; and
- The standards will need to include a list of minimum data fields for science and compliance. Fields should be put into priority categories, noting that this would allow costing of EM Analysts time to be attributed to field inclusion based on

minimum standards and priority fields for each member (as part of cost-benefit analyses of adopting a range of approaches to EM implementation);

- Requirements for E-Monitoring on a national basis are likely to need to be tailored to domestic requirements, including being more comprehensive than requirements on a regional basis;
- E-monitoring has the potential to assist in validating whether an observer-reported incident is, or is not, a compliance issue requiring further investigation;
- The benefits of a regional E-Monitoring review centre need to be further considered;
- The fisheries monitoring long-term goal of integrating EM, ER and VMS on vessels based on which method best collects each data field (e.g. an EM system being approved as meeting or exceeding requirements for regional VMS superseding the need for two systems onboard); and
- EM ready does not mean that the data collection is EM efficient.

E-Monitoring potential for observer safety

An agenda item looking at the potential of E-Monitoring to enhance observer safety was also added and discussed. Several data fields collected in the OBS_TRIPMON table already dealt with observer safety. The key issues raised were:

- Observer harassment can occur anywhere on the vessel and for that reason, it is unlikely the EM cameras could cover all areas where this may occur;
- Instead a personal camera could be considered but issues of privacy would come into play;
- Personal devices such as Delorme units can be used to ensure observer safety in some instances. There may be potential for other types of personal devices (e.g. e-wristbands, personal cameras) to alert the vessel crew when the observer takes off the device or when it moves beyond the vessel; and
- Noting the current mandatory requirement for a two-way communication device independent of vessel systems and including a PLB function, and any EM associated system would need to meet the same standard.

Future Work

Additional work is required to further develop the regional EM Process Standards, and to develop the EM technology. Moving forward, the group recognised that consideration of EM issues would increasingly become part of everyday fisheries monitoring work rather than a separate and distinct task. Until such time as EM is normalised in the fisheries monitoring system, additional targeted research and meetings will be required.

Some key areas of research and development include:

- A study to compare length measurements obtained by observers and those obtained by EM;

- For longline the highest priority work for EM analysis is the automation of float count and the hook number of the catch event;
- For transhipment, trials of motion compensating scales with a view to incorporating such sensors into a variety of EM systems in future; and
- For transhipment, trials to detect transhipment events at-sea using EM systems independent of sensors on transhipment vessels.

With respect to developing broader programme standards for EM, in particular for longline, future work is highlighted in the proposal at Annex III.

In summary, the workshop agreed that:

(1) The contractor, SPC and FFA work to ensure the draft Electronic Monitoring Process Standards for Longline, Purse Seine and transhipment be edited as needed to ensure they are ready for consideration by the WCPFC EREM WG in 2018;
(2) Members, regional and sub-regional agencies should consider developing broader programme standards for EM;
(3) An annual forum be developed for members to share experiences with the implementation of EM in fisheries monitoring and utilise that experience to provide input on revision of regional Electronic Monitoring Process Standards; and
(4) That SPC and FFA continue to progress work on EM Process Standards through the DCC and MCSWG.

Workshop website

The entire workshop's working documents and other relevant materials can be accessed online at:

http://www.spc.int/oceanfish/en/meetingsworkshops/e-reporting-a-e-monitoring/474-second-em-workshop-11-2017.

Funding and support

The workshop was funded by SPC and by FFA, with SPC receiving support from the International Seafood Sustainability Foundation (ISSF) and with FFA receiving support from the World Bank and the Global Environmental Facility.

Annexes

ANNEX I – Agenda

ANNEX II – Workshop Participant List

ANNEX III – Proposal on E-Monitoring Programme Design Standards for Compliance and Management Requirements in Longline Fisheries

ANNEX IV – Draft 2017 E-Monitoring Process Standards for Longline

ANNEX V – E-Debriefing Concept Paper

ANNEX VI – Draft 2017 E-Monitoring Process Standards for Purse Seine

ANNEX VII – Draft 2017 E-Monitoring Process Standards for Transhipment

ANNEX VIII – Preliminary assessment of E-Monitoring Process Standards for SPC/FFA Unloading forms

ANNEX I – ANNOTATED AGENDA

Second Regional E-Monitoring Process Standards Workshop

20–24 November 2017
Noumea, New Caledonia

ANNOTATED AGENDA

AGENDA ITEM 1 - OPENING OF THE WORKSHOP

1.1 Welcome address – Moses Amos *Director, FAME*
1.2 Prayer – Harold Vilia
1.3 Adoption of agenda – *NS*
1.4 Workshop arrangements - *NS*
1.5 Workshop Objectives - *PW*

AGENDA ITEM 2 - A PROPOSAL FOR E-MONITORING PROGRAMME DESIGN STANDARDS FOR COMPLIANCE AND MANAGEMENT REQUIREMENTS

2.1 A proposal for E-monitoring programme design and the development of programme standards – *NS-> DP, VF*

In the first session, FFA will provide a proposal for the processes and data flows that would be required within a functional e-monitoring programme (20 min). The second session on day two will propose e-monitoring programme compliance standards for longline and consider coverage rates, analysis rates, information reports to managers and compliance officers, and feedback to the boat (1 hour). The outcome of this session is expected to be recommendations on programme design elements to achieve effective equivalency between programmes and effective data flows to key users including fishery managers, compliance officers and vessel masters.

2.2 Review of potential compliance and MCS data fields to be collected through E-Monitoring – NS-> *DP, VF*

FFA will lead this item through sessions to review the potential of E-Monitoring to collect compliance data fields including monitoring of transshipments at sea. This agenda item will be split into two broad sessions over day one and two, including a final session used to summarise the discussions, and review the outcomes and formulation of recommendations for taking to other fora. The outcome of this agenda item is expected to be a defined list of compliance and MCS data fields that can be verified through e-monitoring, reporting procedures to ensure that national compliance officers receive information on transshipments in a timely manner, and a standard compliance report that E-Monitoring analysts provide to compliance officers at the end of completing a trip's analysis.

2.3 How EM can be a useful tool in implementing eCDS –NS-> *DP, VF*

FFA will lead discussion on the latest developments in CDS and the potential for E-Monitoring to be used as a tool in implementing eCDS. The outcome of this agenda item is expected to be a set of recommendations on how E-Monitoring data and analysis outputs can support and enable the development of e-CDS.

AGENDA ITEM 3 - E-MONITORING IN THE LONGLINE FISHERY

3.1 Introduction – *PW*

The co-chair will provide a brief introduction, including reference to the previous E-Monitoring process standards workshop, which will lead into the following agenda items. The desired outcome for agenda item three is to advance the current (scientific data) E-Monitoring process standards and include process standards for acquiring compliance and MCS data fields.

3.2 Use of EM within longline fisheries in the WCPO, implications for data collection

Dr. Tim Emery (ABARES/Australia) will provide a presentation on their draft manuscript on this subject.

3.3 New data fields to be considered for E-Monitoring for longline fisheries - *DB, PW, EMSP*

The co-chair will present a list of the new longline observer data fields adopted since the last workshop that will need to be considered at this workshop under the next agenda item. This includes data fields which 18 months ago could not be collected but now can be collected as EM technology has progressed. Input from E-Monitoring service providers in this discussion will be necessary.

3.4 Review of draft E-Monitoring LL standards – *PW*

The co-chair and consultant will provide an overview of the current draft E-Monitoring LL standards and highlight the suggested changes to these standards for the workshop's consideration and will include the formulation of recommendations for having the updates adopted at national and regional levels. This agenda item is expected to require approximately 4 hours. The outcome of this agenda item will be a revised draft E-Monitoring LL process standards document to be endorsed at the end of the workshop for being presented at the next ER and EM WG and/or other relevant fora with the aim of recognition of these standards at the regional level in 2018.

AGENDA ITEM 4 - DEBRIEFING AND E-MONITORING

4.1. How debriefing can work in an E-Monitoring environment – *NS-> TP, DB, SF, MH*

SPC will lead discussion on how debriefing can work in an E-Monitoring Environment. This session is expected to last about 1.5hrs and will begin by an introduction followed by a workshop session where four groups will gather before participants convene to summarize findings. This work is extremely important for ensuring equivalency and integrity in the data across multiple national E-Monitoring programmes. It forms part of the proposed programme standards and the outcome is to ensure that there is equivalent training standards, analysis procedures and cross checking of E-Monitoring analysis results. It is proposed that EM Debriefing development be led under the PIRFO Programme.

AGENDA ITEM 5 - E-MONITORING IN THE PURSE SEINE FISHERY

5.1 Introduction - *PW*

The co-chair will provide a brief introduction.

5.2 How can EM be used to support existing Purse Seine monitoring programmes - *PW*

Co-chair will facilitate discussion, which will be an introduction to the following agenda item. Discussions will consider, inter alia (i) views from member countries, regional and sub regional oragnisations about how EM can be used as a complimentary tool to onboard observers; (ii) lessons learnt in PS E-Monitoring trials conducted to date - two EM service providers will each provide a 10min presentation summarizing past, current and future EM projects. The outcome of this agenda item will be a document defining how E-Monitoring implementation is envisaged at the regional level as a complementary tool to existing PS monitoring programmes.

5.3 Review of draft E-Monitoring Purse Seine standards – *PW, IK*

The consultant will lead the workshop through the proposed draft E-Monitoring PS standards. This agenda item is expected to require more than 2 days to complete. The outcome of this agenda item will be an endorsement of the draft E-Monitoring PS standards, including recommendations for having the standards adopted at national and regional levels.

AGENDA ITEM 6 - WRAP-UP

6.1 Recommendations – *PW, NS*

The co-chairs will facilitate the adoption of recommendations from the workshop and the fora where these recommendations should be taken up.

6.2 Close – *PW, NS*

The co-chairs will cover any other items for taking the work forward, including proposals for next workshop, reference to other regional, sub-regional workshops on ER and EM, etc.

Personnel Acronyms	Name
NS	Neville Smith
PW	Peter William
TP	Timothy Park
DB	Deirdre Brogan
SF	Siosifa Fukofuka
MH	Malo Hosken
DP	David Power
VF	Vivian Fernandez
IK	Ian Knuckey

ANNEX II – LIST OF PARTICIPANTS

Countries

Australia

Kerry Smith
Australia Fisheries Management Authority
International Compliance
Senior Manager
Email: kerry.smith@afma.gov.au

Dr. Timothy Emery
Australian Bureau of Agricultural and Resource Economics
Fisheries, Forestry and Quantitative Sciences
Fisheries Scientist
Email: Timothy.Emery@agriculture.gov.au

Cook Islands

Manasseh Avicks
Ministry of Marine Resources
Offshore Division
Electronic Monitoring Officer
Email: M.Avicks@mmr.gov.ck

Fiji Islands

Netani Tavaga
Ministry of Fisheries
Offshore Fisheries Division
ABNJ - TP Coordinator
Seconded - Senior Fisheries Officer [Services]
Email: tavaga.netani@gmail.com

Nasoni Tora
Ministry of Fisheries
Offshore Fisheries Division
Electronic Monitoring Analyst
Email: Tora.Nasoni@gmail.com

Rupeni Dranivesi
Ministry of Fisheries
Offshore Fisheries Division
Fisheries Officer
Email: dranivesi.rupeni@gmail.com

Federated States of Micronesia

Mavrick Adolf
National Oceanic Resources Management Authority
Electronic Monitoring Analyst
Email: adfmav1987@gmail.com

Kiribati

Tiura Jacob (Mrs)
Ministry of Fisheries and Marine Resources Development
Licensing and Enforcement Unit
Vessel Monitoring System Officer
Email: tiuraj@mfmrd.gov.ki

Republic of the Marshall Islands

Eunice Borero
Marshall Islands Marine Resources Authority
Oceanic Affairs
ER and EM Coordinator
Email: eborero@mimra.com

Nauru

Monte Depaune
Nauru Fisheries and Marine Resources Authority
Coastal Fisheries Manager
Email: monstartuna@gmail.com

Kazz Olsson
Nauru Fisheries and Marine Resources Authority
VMS/VDS Officer
Email: kazz.olsson@gmail.com

Palau

McQuiston Temol
Bureau of Marine Resources
ER and EM Coordinator
Email: mcquiston.temol@gmail.com

Papua New Guinea

Johnson Rewan
National Fisheries Authority
ER and EM Officer
Email: jrewan@fisheries.gov.pg

Joseph Porau
National Fisheries Authority
ER and EM Officer
Email: jporau@fisheries.gov.pg

Nigel Emmanuel
National Fisheries Authority
ER and EM Officer
Email: nemmanuel@fisheries.gov.pg

Samoa

Moli Amosa Iakopo
Ministry of Agriculture
Samoa Fisheries Division
Offshore Section
Fisheries Officer
Email: moli.iakopo@maf.gov.ws

Solomon Islands

Derrick Tagosia
Ministry of Fisheries and Marine Resources
Offshore Division
ER and EM Coordinator
Email: DTagosia@fisheries.gov.sb

Harold Vilia
Ministry of Fisheries and Marine Resources
Offshore Division
Observer Coordinator
Email: HVilia@fisheries.gov.sb

Tonga

Malakai Faletau
Ministry of Fisheries
Compliance division
VMS and Observer assistant
Email: malakai771@gmail.com

Tuvalu

Laitailiu Seono
Ministry of Natural Resources, Energy and Environment
Longline Licensing Officer
Email: slaitailiu@gmail.com

Vanuatu

Tony Taleo
Ministry of Live stock, Agriculture, Forestry and Fisheries and Bio security
Vanuatu Fisheries Department
Principal Data Officer
Email: ttaleo@vanuatu.gov.vu

John Mahit
Ministry of Live stock, Agriculture, Forestry and Fisheries and Bio security
Vanuatu Fisheries Department
Observer Coordinator
Email: jmahit@gmail.com

Mackenly Tari
Vanuatu Police Force
Vanuatu Police Maritime
Surveillance Officer

Electronic Monitoring Service Providers

Archipelago Asia Pacific

Andrew Fedoruk
Director
Email: Andrew.Fedoruk@archipelago-ap.com.au

Digital Observer Services

Gonzalo Legorburu Marcos
Director
Email: glm@digitalobserver.org

Marine Instruments

Oscar Gonzalez
Electronic Monitoring
Project Manager
Email: ogonzalez@marineinstruments.es

Saltwater Inc.

Jared Fuller
Electronic Monitoring
Chief Technology Officer
Email: jared.fuller@saltwaterinc.com

Satlink

Tomas Galan Gomez Obregon
Electronic Monitoring
R&D Manager
Email: tpg@satlink.es

Non-Governmental Organisations

Pacific Community

Neville Smith
Fisheries, Aquaculture and Marine Ecosystems
Oceanic Fisheries Programme
Fisheries and Ecosystem Monitoring and Analysis
Principal Fisheries Scientist
Email: nevilles@spc.int

Peter Williams
Fisheries, Aquaculture and Marine Ecosystems
Oceanic Fisheries Programme
Data Management
Principal Fisheries Scientist
Email: peterw@spc.int

Malo Hosken
Fisheries, Aquaculture and Marine Ecosystems
Oceanic Fisheries Programme
Fisheries and Ecosystem Monitoring and Analysis
Regional ER and EM Coordinator
Email: maloh@spc.int

Timothy Park
Fisheries, Aquaculture and Marine Ecosystems
Oceanic Fisheries Programme
Fisheries and Ecosystem Monitoring and Analysis
Observer Programme Adviser
Email: timothyp@spc.int

Deirdre Brogan
Fisheries, Aquaculture and Marine Ecosystems
Oceanic Fisheries Programme
Fisheries and Ecosystem Monitoring and Analysis
Regional Monitoring Coordinator
Email: DeirdreB@spc.int

Siosifa Fukofuka
Fisheries, Aquaculture and Marine Ecosystems
Oceanic Fisheries Programme
Fisheries and Ecosystem Monitoring and Analysis
Observer Programme Trainer
Email: SiosifaF@spc.int

Eparama Loganimoce
Fisheries, Aquaculture and Marine Ecosystems
Oceanic Fisheries Programme
Data Management
Technical ER and EM Coordinator
Email: EparamaL@spc.int

Emmanuel Schneiter
Fisheries, Aquaculture and Marine Ecosystems
Oceanic Fisheries Programme
Data Management
Regional Data Manager
Email: EmmanuelS@spc.int

Pacific Islands Fisheries Forum Agency

David Power
Fisheries Management Adviser
Email: david.power@ffa.int

Philip Lens
Observer Programme Manager
Email: philip.lens@ffa.int

Vivian Fernandes
Compliance Policy Adviser
Email: philip.lens@ffa.int

Parties to the Nauru Agreement

Dr. Sangaa Clark
Policy Adviser
Email: sangaa@pnatuna.com

Richard Banks
Adviser
Email: richard@pnatuna.com

Penihulo Lopati
VMS and VDS Officer
Email: penihulo@pnatuna.com

International Seafood Sustainability Foundation

Claire Van de Geest
Policy Adviser
Email: cvandergeest@iss-foundation.org

The Nature Conservancy

Craig Heberer
Indo-Pacific Tuna Program
Deputy Director
Email: craig.heberer@tnc.org

Western and Central Pacific Fisheries Commission

Lara Manarangi-Trott
Compliance Manager
Email: Lara.Manarangi-Trott@wcpfc.int

Karl Staisch
Regional Observer Programme Manager
Email: Karl.Staisch@wcpfc.int

Observer Service Providers

MRAG Asia Pacific

Shane McGraft
Email: smcgrath@mragasiapacific.com.au

Independent Consultants

Fishwell Consulting Pty Ltd

Ian Knuckey
Director
Email: ian@fishwell.com.au

ANNEX III – DRAFT FRAMEWORK FOR E-MONITORING PROGRAM STANDARDS

DRAFT framework for the development of E-monitoring program standards for FFA member longline fisheries

Explanatory Note:
This document has been prepared for FFA/PNA/SPC members to support the development of program standards for e-monitoring onboard longline vessels licenced to FFA members. The content has been developed based on presentations and discussions at the 2nd E-monitoring process standards workshop supported by SPC and FFA in Nov 2017.

It is envisaged that with further development and consultation, this document can be developed into longline program standards that reflect areas of common ground between FFA members. In particular this focuses on using e-monitoring as a complementary tool to improve reliability of data, improve enforcement capabilities and promote responsible fishing through port-to-port monitoring between members. Standards developed through this process will guide the development of harmonised minimum terms and conditions on ER and EM for FFA members.

This document is separate to program standards that are being developed through the EMandER WG for consideration at the WCPFC.

There will also need be to be similar and separate PNA/FFA program standard developed for the use of e-monitoring on purse seine.

Table 1 - E-monitoring terms and definitions – draft based on workshop discussions

Term	Definition
Approved E-monitoring system	Electronic equipment installed on a vessel that records e-monitoring records and is approved by an e-monitoring certifier.
Catch Area	Area within the WCPFC area of competence (WCPF Convention Area) that designates High Seas or CCMs' EEZ and FAO Marine Area
Catch Documentation Scheme	A system with the primary purpose of helping determine throughout the supply chain whether fish originate from catches taken consistent with applicable national, regional and international conservation and management measures, established in accordance with relevant international obligations, hereinafter referred to as "CDS"
E-monitoring Analyst	A person qualified to analyse e-monitoring records and record e-monitoring data in accordance with the [PIRFO/EM standard and analysis procedures]
E-monitoring record	Imagery and sensor data recorded by an e-monitoring system that can be analysed to record e-monitoring data.
E-monitoring data	Data produced through analysis of e-monitoring records that confirms with the data standards specified by [paragraph x of this document]
E-monitoring coverage	**E-monitoring coverage** in is the proportion of vessels licenced to fish in a zone (EEZ) that have an e-monitoring system installed and operational
E-monitoring analysis rate	**E-monitoring analysis rate** is the proportion of e-monitoring records that are analysed
E-monitoring debriefing [or quality control]	E-monitoring debriefing is a process for quality control of generating e-monitoring data that includes…
E-monitoring Contact Officer	Person appointed by a CCM whose details have been provided to the WCPFC Secretariat and who is responsible for: • Communicating data to the WCPFC Secretariat (Standard 4); • Providing e-CDS user access to other persons as required; Point of contact to clarify any issues
E-monitoring Certifier	An individual or organisation which has been accredited by the [Fisheries regulator / WCPFC] to inspect and approve e-monitoring systems for use.
E-monitoring programme	A process administered by a national fisheries regulator that includes the use of e-monitoring systems on vessels to independently collect and verify fisheries data and information [to support scientific assessment management and compliance].
Data review centre	Office facility used to analyse e-monitoring records and record e-monitoring data.
Fish	All species of wild capture living aquatic resources, whether processed or not
Fishing Trip	The start of a trip occurs when a vessel transits to a fishing area after unloading part or all the catch, regardless of whether the unloading took place in port or at sea. The end of a trip occurs when a vessel unloads any part of the catch, regardless of whether the unloading

	took place in port or at sea.
Fishing Trip ID	Unique identification of a fishing trip, which contains or is able to acquire the key data elements: [flag country code, fishing vessel unique ID, trip number for year, start of trip, end of trip, area of catch]
PIRFO/EM training and analysis procedures	Regional training standards and analysis procedures approved by [WCPFC / FFA/ National authorities]
IUU product	Product or catch which is determined by the relevant competent authorities along the supply chain to originate from any activities set out in paragraph 3 of the 2001 FAO International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing.

Introduction

The 2nd workshop on longline e-monitoring standards was held in Noumea during November 2017 and considered longline data standards along with programme design elements to achieve equivalency between e-monitoring programmes and effective data flows to all key users of the data. The purpose of this document is to support the development of draft longline e-monitoring programme standard based on the outcomes of discussion at the workshop that can be used by FFA members.

The process for defining e-monitoring data standards so far has focused on the existing observer data fields collected through the regional observer program and defining which observer fields e-monitoring can cover. During this workshop, discussions were expanded to also consider the broad issues, drivers and data needs for using e-monitoring to support scientific assessment, fisheries management and enforcement.

It was noted that the key drivers behind the use of e-monitoring are:

- low levels of independent monitoring in the longline fishery (<5% observer coverage);
- unreliable reporting of catch and effort data in logsheets compromises assessment and management; and
- high levels of IUU activity (quantified impact of $390 million USD per year).

With the IUU components it was noted that around 89% of IUU issues in longline fisheries assessed in the FFA IUU quantification study were due to misreporting, illegal transhipment and other compliance breaches occurring on-board licenced fishing vessels.

In response to these issues it was noted that fisheries monitoring in the longline fisheries needs to be improved and the key priorities are to:

- ensure there is a reliable measure of catch and effort data;
- enable enforceability through measuring the level of misreporting in logsheets, detecting transhipment and detecting compliance breaches;
- promote active compliance and responsible fishing by industry.

In the purse seine sector this is achieved through the use of observers onboard all fishing trips. However, 100% observer coverage is not considered cost effective or safe for the longline sector and e-monitoring is increasingly being used to complement observers, port samplers and other MCS activities to address these needs.

As the use of e-monitoring expands at the national level, it is important that there is some level of consistency in both the program design and what data is collected. Several countries noted that they have oats which fish across multiple zones and they need to ensure there is full port to port monitoring. Developing regional standards amongst FFA members will support this and enable the development of regional data review centres t support analysis as well as ensuring data outputs are reliable across programs.

Programme design

E-monitoring principles

The development of these programme standards is based on the following needs and principles:

- Ensure countries have reliable catch effort data from all longliners fishing in their EEZ
- Ensure vessels with e-monitoring licenced to FFA countries keep their e-monitoring systems operational on the high seas to enable full port to port monitoring
- Enable enforceability of management measures through measuring the level of misreporting in logsheets, detecting transhipment and detecting compliance breaches
- Support development of information sharing arrangements that enable analysis of e-monitoring records from other countries e-monitoring programs at regional data review centres where needed
- Ongoing costs of e-monitoring systems and programme management should be paid by industry on a cost recovery basis
- Promote active compliance

E-monitoring coverage

The proportion of vessels licenced to fish in a zone (EEZ) that are required to have e-monitoring currently (e-monitoring coverage) varies significantly as e-monitoring is trialled and programs are developed. Several countries have already committed to progressively implementing e-monitoring so that all longline vessels are required to have an operational e-monitoring system when licenced to fish. Full coverage with e-monitoring systems ensures that all vessels are held to the same standard to ensure there is reliable data from across the fleet and enable the detection of compliance issues on every vessel.

Fiji, Solomon Islands, New Zealand and PNG have all indicated they intend make e-monitoring mandatory for all vessels and they are progressively expanding implementation. Australia has already implemented e-monitoring on all vessels. One of the challenges experienced by the early adopters in the Pacific Islands, is that some foreign flagged vessels may chose not to fish in certain countries EEZ as the standards are raised and e-monitoring becomes mandatory. However, by working together and developing common standards and laws, FFA members can reduce this impact and increase the control over their longline fisheries.

It was recommended in the workshop that the level of e-monitoring coverage would be a national decision based on assessment of needs, risks and priorities.

Analysis rates of e-monitoring records for boats with e-monitoring

The proportion of e-monitoring records analysed can vary depending on the proportion of boats that have e-monitoring and the needs and objectives of a national program.

The workshop recommended that at a minimum complete analysis should be conducted at the set level.

Observer coverage

The current recommendation from the SC is for 20% of total effort to be monitored by an observer. However, the current mandatory requirement is 5% observer coverage and the level of monitoring hasn't been reviewed by the SC in the context of e-monitoring.

E-monitoring is a complimentary tool to the use of on-board observers and port sampling to ensure that data needs are met and that the data is reliable. Observer coverage will continue to be required and there is no proposal to reduce or remove the 5% ROP target. The only case where an FFA members has reduced on board observer coverage is for Australia, where they have a large port sampling program that ensures the required biological data is still collected.

Cost recovery arrangements

The workshop noted It is important to consider payment structure for the installation of e-monitoring systems that incentivises industry to maintain systems and maximise their operating life.

This can be achieved through the following cost recovery arrangements:

1. Industry pay capital cost and installation – except during initial start-up phase where subsidies and donor funding can assist with the initial burden for first adopters
2. Ongoing program management can be cost recovered from industry through licence fees and direct bills in the same format as observer costs

Pre-departure requirements

Pre-departure requirements include the process for verifying that an e-monitoring system meets the approved data standards, is certified by national authority and fully operational.

Approved installation

Before an e-monitoring system can considered operational, it needs to be inspected and approved by an e-monitoring certifier. The standards for certifying e-monitoring systems could include:

1. Equipment installed to a standard that can meet the prescribed e-monitoring data standards
2. E-monitoring system approved/certified by national authority

During approval there is also the opportunity to independently check and record vessel and gear characteristic data. Standards for data collected at approval could include:

1. Collect vessel and gear characteristics data
    a. Collected by independent party and entered in database to be available when post trip analysis occurs
    b. Opportunity to align with EM system tests

Pre-departure checklist that system is operational

Pre-departure checks are important to ensure e-monitoring systems are fully operational before use.

Standards for pre-departure checks could include:

1. Report that System fully operational
2. Sufficient storage for intended trip duration

2 - Data standards and data needs

Data standards

A table of all data collected by observers that EM can report on and how it is transmitted is provided at **Attachment A**. This document is the key output from the SPC EM process standards workshop and is valuable for defining what the data fields can be collected with e-monitoring and how they can be recorded.

It is proposed that this list be used as the central list of e-monitoring data standards and expended on as needed.

However, this does not list what data is needed from e-monitoring programs to meet objectives and ensure consistency and equivalency across programs. None of these fields are considered

mandatory and we need to separately consider what the core standard data needs are for e-monitoring in FFA members and in the broader WCPO. A separate process for how this can be developed is outlined under data needs below.

Data needs

When assessing what is needed and can be cost effectively collected by e-monitoring it is important to consider your data needs and how e-monitoring can work alongside the use of logsheets, port sampling, observers and other data reporting.

For existing e-monitoring programs and trials, the data needs have been defined at the national level to guide what data is collected and reported on by e-monitoring. However, at the regional level this needs to be reviewed for FFA members to define what the key needs are and recommend common standards and data needs.

The FFA MCSWG considered this at their 2017 meeting and a list of the key compliance issues for verification are included in **attachment B**. Suggestions on how these compliance needs can be met with e-monitoring are outlined in part 3 and include reporting of some data in ear real time from the vessel at sea and reporting of compliance breaches and misreporting levels detected through analysis of e-monitoring footage.

Proposed action for the first half of 2018:

- It is proposed that FFA, PNAO and SPC work with members and the Data collection committee and MCSWG to consider data needs from longline e-monitoring. This will include defining key data needs for using e-monitoring as a complimentary tool to logsheets and observers, and recommending a minimum/core set of data that e-monitoring needs to be able to collect and verify to support science and MCS.

3 - Analysis requirements and procedures

This section includes an overview of the standard analysis functions that are conducted to ensure the data is in useable format for scientific analysis, and to support compliance functions through identifying non-compliance.

Automated reporting process at sea

While the vessel is at sea, all EM records are recorded to the storage drive and certain data is transmitted in near real time. The data transmitted from the boat typically includes vessel location, gear sensor data and systems status information. The need to detect and report on transhipments in near real time has been identified as a priority.

Standards for data and reports transmitted from the vessel could include:

1. EMS System alerts
    a. System malfunction
    b. System tampering
    c. Quality of imagery enables species ID
    d. Near real time reports on vessel activity and compliance checks
        i. Vessel position track – can link with existing asset tracking systems at PNA and FFA – define poll rate
        ii. When fishing gear is deployed in prohibited area
        iii. Transhipment or bunkering - Trigger activates camera with wide angle view to record imagery of vessels alongside boat and a transhipment alert is sent

1. Transhipment alert could include notification of suspected activity and the ability to transmit images to national authorities on request
2. Transhipment triggers could include:
    a. Data link with RFSC to use existing vessel proximity tool
    b. Gear/winch sensors
    c. Vessel speed drops below certain speed
    d. Proximity sensors

Analysis and reporting procedures at Data Review Centre

The bulk of data generated through e-monitoring is produced through analysis of e-monitoring records in the data review centre after the storage drive has been retrieved from the vessel and can be analysed. It is important that there are consistent standards for training analysers and conducting analysis to ensure the data is reliable and consistent between programs.

The data standards referenced in part 2 refer to what data can be collected by e-monitoring and it does include a list of the GEN 3 compliance reports that observers report on. However, for e-monitoring there is a need for standards around how compliance issues are recorded, and reported to relevant compliance managers for further investigation. It is also important that there is feedback to the vessel and to fishery managers following analysis of e-monitoring records.

This list includes a summary of where standards are needed for training, analysis and reporting of e-monitoring data:

1. Training procedures and standards linked to PIRFO standard
    a. Use standard e-monitoring image library for assessing ID competency
    b. **Action** – These need to be drafted.
2. Analysis procedures for e-monitoring analyst to review imagery and record specified data fields (Part 2)
    a. **Action** – Need to draft standard analysis procedures
3. Industry report to vessel master
    a. E-Monitoring analyst produces report at the end of trip analysis to provide feedback on what is working well, and what needs to be improved
    b. Quality of imagery and any system issues
    c. Match of EM data with logbook reports – this can be automatically generated from database by comparing e-log with E-monitoring data
        i. Percentage based discrepancy - E.g. within 3% ok
        ii. Provide incentive for active compliance and good reporting
4. Compliance report to Compliance officers and director
    a. E-monitoring analyst produces summary report on compliance issues detected during analysis of a trip.
        i. Standard GEN 3 report and any identified non-compliance issues (**attachment B**)
        ii. Can be expanded as needed – we can ID minimum list
    b. Match of EM data with required logbook reports
        i. This can be automatically generated from database by comparing e-log with E-monitoring data
        ii. Identify threshold level where misreporting will result in warnings and compliance action
        iii. (Tuna species, bycatch, SSI, transhipment and bunkering)
        iv. E.g. if discrepancy is greater than:

1. [5%] for tuna (Yellowfin, Bigeye, Albacore, Skipjack]
2. [10%] for other bycatch
3. [1%] for species of special interest

v.

5. E-monitoring record storage
    a. Consider a standard for the minimum time that e-monitoring records (imagery) will be stored and procedures for identifying and retaining segments of imagery for compliance purposes. This will need to follow established chain of custody procedures.

4 - Quality control (validation, verification 'debriefing')

E-monitoring debriefing is the process for ensuring quality control. This is explored more in a separate paper and the recommendations can be included in the programme standard.

Performance measures/indicators/targets for e-monitoring program

It is useful to have performance measures that can be compared across all e-monitoring programs and enable direct comparison

- Analysis time per set/haul
- Time taken between receiving the hard drive completing prescribed analysis for that trip
- Level of precision for e-monitoring analysts in detecting tuna and SSIs

Other Considerations and recommendation to support development of e-monitoring programs

- E-monitoring will work most effectively when utilised in conjunction with e-reporting of all data (logsheet, notifications, observer) from the vessel. This ensures data can be matched and is available for analysis.
- Legislative changes are required to support e-reporting and e-monitoring. Need harmonised minimum terms and conditions to support e-reporting and e-monitoring for FFA members.
- Support legal provisions to require port to port monitoring for vessels with e-monitoring
- Need sub-regional data centres to facilitate analysis of data from multi zone trips. This will require agreements to share information and ideally allow complete analysis at the data review centre in the unload state, with the analysed data provided to all states where the vessel fished.
- Consider how FFA members can work with other CCMs through the commission and other channels to require equivalent monitoring standards for high seas only vessels.
- Note challenges with some vessels licenced to FFA countries that do not unload in ports and consider options for managing e-monitoring and retrieving data

Attachment A. Observer data fields required under the ROP that have been reviewed to determine if they are capable of being collected by e-monitoring

Attachment B. This table is a response to MCSWG tasking – It is not a complete list of data for compliance purposes but does identify the priority issues. There is an opportunity to review all fields and any additional fields if needed through the data collection committee a

MCS Data Needs	Comments & examples of relevant existing Data Collection Forms
Detect transshipments, bunkering and any occasion when another vessel pulls alongside a fishing vessel	GEN 1 – Form (VESSEL AND AIRCRAFT SIGHTINGS / FISH, BUNKERING and OTHER TRANSFERS LOGS)
Identify mis-reporting of catch, including failure to report discards and bycatch;	GEN 3 – LC a, b, c, d, e, f (Logsheet recording)
Identifying inappropriate handling of protected species;	GEN 2 – SSI Vessel Interactions
Failure to comply with mandatory release requirements;	GEN 3 – SSIs, WC – c (WCPFC CMMs) GEN 2 – SSI Observer journal & written report
Deploying fishing equipment in a prohibited/closed area or timeframe;	GEN 3 – NR a (fish in areas not permitted to fish), WC c (fish in FAD during FAD closure),
Deployment of regulated fishing gear, or lack of deployment of required fishing gear, such as bycatch mitigation	GEN 3 – NR c, WC a
MARPOL offences	GEN 6 (Pollution Report) GEN 3: PN – a, b, c, d (Pollution)
Observer safety	GEN 3 – RS a, b, d (Observer rights/ social behaviour)
FAD set/non FAD set	PS-2 (Daily Log) GEN 5 GEN 3 – WC – c (WCPFC CMMs) Information also possibly contained in Observer Journal
Use of prohibited gear	GEN 3, NR-c, Use a fishing method other than the method the vessel was designed or licensed
Criminal behaviour	*Note: Includes a range of activities depending on national laws e.g. assault, drug trafficking.*
• Assaults and mistreatment of crew or observers	GEN 3 – RS c (mistreat other crew) GEN 3 – RS a (assault, obstruct, resist, delay, refuse boarding ..etc with observer), RS d (failure to provide officer level standards)
• Drug trafficking	No specific form, but could be noted in Observer Journal (however, this may expose observer to unacceptable risk).
Retrieving gear from another fishing vessel	GEN 1 (Vessel and aircraft sightings / fish, bunkering and other transfer logs) PS 2 (Daily Log) Information also possibly contained in Observer Journal
Weight of fish transferred to carrier vessels (where possible e.g. on purse seine) – detect transfer between fishing vessels.	GEN 1 – (Vessel and aircraft sightings / fish, bunkering and other transfer logs)
Ensure fishing gear is stowed and not used in prohibited areas	GEN 3 – NR - g
Identify any transfer of people between boats	GEN 1 – (Vessel and aircraft sightings / fish, bunkering and other transfer logs) Possibly collected in Observer Journal

Identify other vessels in the area that should not be there (potentially difficult)	GEN 1 – (Vessel and aircraft sightings / fish, bunkering and other transfer logs)
Identify observer misconduct	Vessel Report on Observer

ANNEX IV – DRAFT LONGLINE OBSERVER E-MONITORING PROCESS STANDARDS

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIP

"The start of a trip is defined to occur when a vessel (a) leaves port after unloading part or all of the catch to transit to a fishing area or (b) recommences fishing operations or transits to a fishing area after transshipping part or all of the catch at sea (when this occurs in accordance with the terms and conditions of article 4 of Annex III of the Convention, subject to specific exemptions as per article 29 of the Convention)."

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC FIELD	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
obsprg_code	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	AG	Char (4)	Observer programme code must be must valid country. Refer to valid ISO two-letter Country Codes - ISO 3166	<obsprg_code>	Y	Achieved	EM-R1	This should be Observer program code for the person responsible for reviewing the video and compiling ROP information. Will this always be a country code if a third party is providing the EM reading service? Consider use of another code instead of "OB" to be specific that data was EM collected.(e.g. "PGEM") Needs to be reviewed by DCC WCPFC
staff_code	EM-A NAME CODE. This will be unique and link. Currently generated by SPC currently	EM-A	VarChar (5)	Staff code must exist in the regional Observer (FIELD_STAFF) Name Table. The unique 5-letter staff codes are generated and maintained by SPC/FFA.	<staff_code>	Y	Achieved	EM-R1	This should be staff name code for the person responsible for reviewing the video and compiling ROP information (EM-Analyst) Does this field need to be modified to include a fifth character "V" for vessel observer and "O" for EM-Analyst? Or should this be a completely separate field OBSTYPE?
staff_code_2	Additional staff NAME CODE. This will be unique and link to information kept at the regional level including Staff Name, Nationality of staff, Staff provider. Such additional staff may include port data collection officer that collects the PRE and POST data.	EM-A					Achieved	EM-R1	Identifies additional staff *Needs to be reviewed / agreed by DCC WCPFC*

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIP

"The start of a trip is defined to occur when a vessel (a) leaves port after unloading part or all of the catch to transit to a fishing area or (b) recommences fishing operations or transits to a fishing area after transshipping part or all of the catch at sea (when this occurs in accordance with the terms and conditions of article 4 of Annex III of the Convention, subject to specific exemptions as per article 29 of the Convention)."

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC FIELD	Priority for EM R&D	Category	Notes
Provider_code	Identifies the service provider	AG					Achieved	EM-R1	Identifies the service provider *Needs to be reviewed / agreed by DCC WCPFC*
Software_vers_A	Identifies the data analysis software version	AG					High	EM-New	*Needs to be reviewed / agreed by DCC WCPFC* Provide the link to the specific versions metadata
Software_vers_B	Identifies the EM equipment software version	AG					High	EM-New	*Needs to be reviewed / agreed by DCC WCPFC* Provide the link to the equipment software versions
Hardware_vers	EM Hardware components						High	EM-New	*Needs to be reviewed / agreed by DCC WCPFC* Provide the link to the specific hardware versions
Analysis_Duration	Analysis Duration time						High	EM-New	*Needs to be reviewed / agreed by DCC WCPFC*
Data_Export_Time	Date-time that date was exported						High	EM-New	*Needs to be reviewed / agreed by DCC WCPFC*
tripno	Unique TRIPNO for each observer in a given year (Regional Standard) Use the last two digits of the trip year followed by a dash and increment number for each trip in a year FOR THAT OBSERVER. YY-XX, for example, '14-01' would represent the first trip for an observer in the calendar year 2014		Char (5)	Must adhere to the regional standard	<tripno>	N	N/A	Null	Can be easily generated if necessary. Does this assume that the EM-Analyst must start and finish a Trip before the next one? If they have multiple trips, then this should be sequential based on which trip was started first. This can be uniquely identified through combination of vessel, Dep_date and Staff Incremental increase in trip numbers for an observer should include EM trips reviewed – The alternative is to have a code of EM collected data – which might be needed anyway?

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIP

"The start of a trip is defined to occur when a vessel (a) leaves port after unloading part or all of the catch to transit to a fishing area or (b) recommences fishing operations or transits to a fishing area after transshipping part or all of the catch at sea (when this occurs in accordance with the terms and conditions of article 4 of Annex III of the Convention, subject to specific exemptions as per article 29 of the Convention)."

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC FIELD	Priority for EM R&D	Category	Notes
tripno_internal	TRIPNO as allocated and used by the respective Observer service provider. (If this system is different from the regional standard (e.g. the US PS MLT observer programme trip number uses the format '24LP/xxx')		VarChar (15)		<tripno_INT>	N	N/A	Null	This field might provide an opportunity for marking as an EM trip This can be uniquely identified through combination of vessel, Dep_date and Staff
DATE and TIME OF DEPARTURE	Depart DATE/TIME for the observer trip (Observer's departure) Obtained from other sources of data (e.g. VMS) Automatically generated by the vessel leaving a defined port box geofence. May be identified by EM Analyst Recorded during a pre-trip inspection	AG EM-A PRE	REFER TO APPENDIX A1	Use UTC DATE for the departure date. Should this be ships date and time? Must adhere to the ISO 8601 format in Appendix A1	<dep_date>	Y	Achieved	EM-R1	Transhipment at sea is an issue A standard is required defining a database of each port and a geofence. *Needs to be reviewed / agreed by DCC / WCPFC* *This may need to refer to start of trip (that can include transhipment) rather than return to port. Need to be reviewed by DCC / WCPFC.*
DATE AND TIME OF ARRIVAL IN PORT	Return DATE/TIME for the observer trip (from the observer's point of view) Obtained from other sources of data (e.g. VMS) Automatically generated by the vessel leaving a defined port box geofence. May be identified by EM Analyst Recorded during a pre-trip inspection	AG EM-A POST	REFER TO APPENDIX A1	Use UTC DATE for the return date. Should this be ships date and time? Must adhere to the ISO 8601 format in Appendix A1	<ret_date>	Y	Achieved	EM-R1	This may need to refer to end of trip (that can include transhipment) rather than return to port. A standard is required defining a database of each port and a geofence. *Needs tobe reviewed / agreed by DCC / WCPFC*

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIP

"The start of a trip is defined to occur when a vessel (a) leaves port after unloading part or all of the catch to transit to a fishing area or (b) recommences fishing operations or transits to a fishing area after transshipping part or all of the catch at sea (when this occurs in accordance with the terms and conditions of article 4 of Annex III of the Convention, subject to specific exemptions as per article 29 of the Convention)."

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC FIELD	Priority for EM R&D	Category	Notes
gear_code	Link to ref_gears table Selected by the EM Analyst Could be determine by pre-trip vessel inspection or licencing information Automatically generarated from the vessel identifier and hardwired into the software	AG SETUP	Char (1)	Must be a valid GEAR: 'L' – Longline; 'S' – Purse seine; 'P' – Pole-and-line	<gear_code>	Y	Achieved	EM-R1	In future it will almost certainly be derived from the vessel identfier automatically
FISHING PERMIT/LICENSE NUMBERS	PROVIDE License/Permit number that the vessel holds for the period of the TRIP.		CHAR(40)	Where possible, include validation to ensure the Permit format relevant to the agreement (national or sub-regional) complies to the required format.	<License_NO>	N	Achieved	EM-R1	All that is needed is the vessel identifier and time preiod of the trip to link to licencing data The need for this with EM is questionable and the data is not used or accurate Review by DCC and WCPFC
VESSEL IDENIFIER	REFER TO APPENDIX A4	SETUP					Achieved	EM-R1	Ideally this would be UVI and programmed into the software during setup The service provider needs to have access to this data and vessel names
versn_id	Data standards version This is version of the hardcopy form		Int		<versn_id>	N	Achieved	EM-R1	
XML_version_id		SETUP		Refer to valid ISO two-letter Country Codes - ISO 3166			High	EM-New	*Needs to be reviewed / agreed by DCC / WCPFC*
country_code	Two letter COUNTRY CODE for the country who organise the trip		Char (2)	Refer to valid ISO two-letter Country Codes - ISO 3166	<country_code>	Y	Achieved	EM-R1	*This is identical to the first two letter of OBSPRG* *Review by the DCC / WCPFC*

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIP

"The start of a trip is defined to occur when a vessel (a) leaves port after unloading part or all of the catch to transit to a fishing area or (b) recommences fishing operations or transits to a fishing area after transshipping part or all of the catch at sea (when this occurs in accordance with the terms and conditions of article 4 of Annex III of the Convention, subject to specific exemptions as per article 29 of the Convention)."

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC FIELD	Priority for EM R&D	Category	Notes
PORT OF DEPARTURE	PROVIDE the Port of Departure Obtained from other sources of data (e.g. VMS) Automatically generated by the vessel leaving a defined port box geofence. May be identified by EM Analyst Recorded during a pre-trip inspection	AG EM-A PRE	REFER TO APPENDIX A3	Must be valid United Nations - Code for Trade and Transport Locations (UN/LOCODE) – see http://www.unece.org/cefact/locode/service/location Not mandatory?	<DEP_PORT>	Y	Achieved	EM-R1	EM data actually automatically generates Lat and Long. Converting this to a "Port" name field reduces resolution. A standard is required defining a database of each port and a geofence for VMS. *Needs to be reviewed / agreed by DCC / WCPFC* Automatically generated from VMS / GPS
PORT OF RETURN	PROVIDE the Port of Return for Unloading Obtained from other sources of data (e.g. VMS) Automatically generated by the vessel leaving a defined port box geofence. May be identified by EM Analyst Recorded during a post-trip inspection	AG EM-A POST	REFER TO APPENDIX A3	Must be valid United Nations - Code for Trade and Transport Locations (UN/LOCODE) Not mandatory?	<RET_PORT>	Y	Achieved	EM-R1	A standard is required defining a database of each port and a geofence. *Needs to be reviewed / agreed by DCC / WCPFC* Automatically recorded from VMS / GPS

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIP

"The start of a trip is defined to occur when a vessel (a) leaves port after unloading part or all of the catch to transit to a fishing area or (b) recommences fishing operations or transits to a fishing area after transshipping part or all of the catch at sea (when this occurs in accordance with the terms and conditions of article 4 of Annex III of the Convention, subject to specific exemptions as per article 29 of the Convention)."

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC FIELD	Priority for EM R&D	Category	Notes
dep_lat	The actual depart LAT position for the trip (if departing AT SEA) Obtained from other sources of data (e.g. VMS) Automatically generated by the vessel leaving a defined port box geofence. May be identified by EM Analyst Recorded during a pre-trip inspection	AG EM-A PRE	REFER TO APPENDIX A2	Must adhere to the ISO 6709 – Positions Degrees and minutes to 3 decimal places Not mandatory?	<dep_lat>	Y	Achieved	EM-R1	A standard is required defining a database of each port and a geofence. *Needs to be reviewed / agreed by DCC / WCPFC* Automatically recorded from VMS / GPS
dep_lon	The actual depart LON position for the trip (if departing AT SEA) Obtained from other sources of data (e.g. VMS) Automatically generated by the vessel leaving a defined port box geofence. May be identified by EM Analyst Recorded during a pre-trip inspection	AG EM-A PRE	REFER TO APPENDIX A2	Must adhere to the ISO 6709 – Positions Degrees and minutes to 3 decimal places Not mandatory?	<dep_lon>	Y	Achieved	EM-R1	A standard is required defining a database of each port and a geofence. *Needs to be reviewed / agreed by DCC / WCPFC* Automatically recorded from VMS / GPS
ret_lat	The actual return LAT position for the trip (if departing AT SEA) Obtained from other sources of data (e.g. VMS) Automatically generated by the vessel leaving a defined port box geofence. May be identified by EM Analyst Recorded during a pre-trip inspection	AG EM-A POST	REFER TO APPENDIX A2	Must adhere to the ISO 6709 – Positions Degrees and minutes to 3 decimal places Not mandatory?	<ret_lat>	Y	Achieved	EM-R1	A standard is required defining a database of each port and a geofence. *Needs to be reviewed / agreed by DCC / WCPFC* Automatically recorded from VMS / GPS

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIP

"The start of a trip is defined to occur when a vessel (a) leaves port after unloading part or all of the catch to transit to a fishing area or (b) recommences fishing operations or transits to a fishing area after transshipping part or all of the catch at sea (when this occurs in accordance with the terms and conditions of article 4 of Annex III of the Convention, subject to specific exemptions as per article 29 of the Convention)."

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC FIELD	Priority for EM R&D	Category	Notes
ret_lon	The actual return LON position for the trip (if departing AT SEA) Obtained from other sources of data (e.g. VMS) Automatically generated by the vessel leaving a defined port box geofence. May be identified by EM Analyst Recorded during a pre-trip inspection	AG EM-A POST	REFER TO APPENDIX A2	Must adhere to the ISO 6709 – Positions Degrees and minutes to 3 decimal places Not mandatory?	<ret_lon>	Y	Achieved	EM-R1	A standard is required defining a database of each port and a geofence. *Needs to be reviewed / agreed by DCC / WCPFC* Automatically recorded from VMS / GPS
vesowner	NAME of the vessel owner	PRE	NVarChar (50)	Name and contact if possible of the owner of the vessel, if it is owned by a company, then use the company name.	<vesowner>	Y	N/A	EM-NP *	
vescaptain	NAME of the captain of the vessel	PRE	NVarChar (50)		<vescaptain>	Y	N/A	EM-NP *	
VESCAPT_NATION	NATIONALITY of the captain of the vessel Two letter COUNTRY CODE for the country who organise the trip	PRE	Char (2)	Refer to valid ISO two-letter Country Codes - ISO 3166 For example, refer to http://en.wikipedia.org/wiki/ISO_3166-1	<vescapt_CO_CODE>	Y	N/A	EM-NP *	
VESCAPT_ID_DOC	Captain's Document ID	PRE	NVarChar (20)		<VESCAPT_ID_DOC>	Y	N/A	EM-NP *	
vesmaster	NAME of the fishing master	PRE	NVarChar (50)	Is there a annual list? (I doubt it)	<vesmaster>		N/A	EM-NP *	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIP

"The start of a trip is defined to occur when a vessel (a) leaves port after unloading part or all of the catch to transit to a fishing area or (b) recommences fishing operations or transits to a fishing area after transshipping part or all of the catch at sea (when this occurs in accordance with the terms and conditions of article 4 of Annex III of the Convention, subject to specific exemptions as per article 29 of the Convention)."

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC FIELD	Priority for EM R&D	Category	Notes
VESMAST_NATION	NATIONALITY of the vessel MASTER Two letter COUNTRY CODE for the country who organise the trip	PRE	Char (2)	Refer to valid ISO two-letter Country Codes - ISO 3166 For example, refer to http://en.wikipedia.org/wiki/ISO_3166-1	<vescapt_CO_CODE>	Y	N/A	EM-NP *	
VESMAST_ID_DOC	FISHING MASTERS's Document ID	PRE	NVarChar (20)		<VESCAPT_ID_DOC>	Y	N/A	EM-NP *	
crew_number	Total number of CREW onboard during the trip	PRE	Int		<crew_number>	Y	N/A	EM-NP *	Recorded by the port data collection officer on FORM LL-1 and then entered into data capture screen
spill	FLAG to indicated the trip was a SPILL SAMPLE trip		Bit		<spill>	N	N/A	EM-NP *	Don't think this is relevant to LL
cadet	FLAG to indicated whether the trip was observed by a CADET observer		Bit		<cadet>	N	N/A	EM-NP *	This could relate to the EM Analyst What credentials would indicate that officer observer is no longer a "cadet"
sharktarget	FLAG to indicate a trip has targeted SHARKS (LONGLINE trips only)		Bit		<sharktarget>	N	N/A	Null	
comments	General comments about the trip	EM-A	NText		<comments>	N	Achieved	EM-R1	Needs some guidance about what comments are required General comments
EM comments	General comments about EM the trip	EM-A	NText		<comments>	N	Med	EM-New	Maybe should be overridden by a EM performance Comments specifically regarding quality of EM information *Needs to be reviewed / agreed by DCC / WCPFC*

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

VES_CREW

PROVIDE the summary details of VESSEL CREW by NATIONALITY on this TRIP.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC			Issues
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
CREW IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + COUNTRY_CODE	CF			<V_CREW_ID>	Y	Achieved	EM-Nat	
country_code	Nationality of the CREW	PRE POST	Char (2)	Refer to valid ISO two-letter Country Codes - ISO 3166 For example, refer to http://en.wikipedia.org/wiki/ISO_3166-1	<country_code>	Y	N/A	EM-NP	Will require interview with skipper. If done at setup, Field values may change prior to any given trip.
crewcount	Total number of crew on board during the trip for this COUNTRY OF NATIONALITY	PRE POST	SmallInt		<crewcount>	Y	N/A	EM-NP	Will require interview with skipper. If done at setup, Field values may change prior to any given trip.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

VES_ELEC

PROVIDE information on the standard Marine Electronic devices.

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
TRIP/VESSEL DEVICE IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<V_DEVICE_ID>	Y	Achieved	EM-Nat	
device_id	Marine Device CODE.	PRE SETUP	Int	Refer to APPENDIX 20 - the DEVICES should only be available according to the respective gear code (e.g. "S" for purse seine or "L" for longline is in the GEAR LIST CODES column)	<device_id>	Y	N/A	EM-NP	Will require pre-inspection interview with skipper and tour of wheelhouse.
ONBOARD_code	Is this DEVICE SIGHTED ONBOARD ?	PRE SETUP	Char (1)	'Y' or 'N'	<ONBOARD_code>	Y	N/A	EM-NP	As above
usage_code	Is this DEVICE USED ?	EM-A	Char (3)	Refer to APPENDIX 21	<usage_code>	N	Low	EM-R3	Use of cameras in the wheelhouse to capture use of vessel electrics is possible but may invade privacy. May be able to be automatically generated from electrical monitoring of wheelhouse devices (other than cameras) e.g.sensors?
make_desc	Description of Make	PRE SETUP	NVarChar (30)	Dropdown List?	<make_desc>	N	N/A	EM-NP	
model_desc	Description of Model	PRE SETUP	NVarChar (30)	Dropdown List - Child of Make?	<model_desc>	N	N/A	EM-NP	
comments	Comments	PRE EM-A	NText	Free text	<comments>	N	Low	EM-R1	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_GEAR

PROVIDE information on the LONGLINE GEAR on the vessel.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
LL GEAR IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<L_GEAR_ID>	Y	Achieved	EM-Nat	
mlinehaul_ans	Mainline hauler (Y/N)		Char (1)	Must be 'Y', 'N' or 'X' (observer did not respond to this question)	<mlinehaul_ans>	Y	Achieved	EM-R3	A camera should be dedicated to observe gear setting equipment. Can be recorded by the EM-A only if in field of view of a camera.
mlinehaul_usage_code	Link to ref_usage table	EM-A	Char (3)	REFER TO APPENDIX 21	<mlinehaul_usage_code>	Y	Achieved	EM-R3	Can be recorded by the EM-A only if in field of view of a camera during setting.
mlinehaul_comments	Comments on Mainline Hauler	EM-A	NVarChar (50)		<mlinehaul_comments>	N	Achieved	EM-R1	
blinehaul_ans	Branchline hauler (Y/N)	SETUP PRE EM-A	Char (1)	Must be 'Y', 'N' or 'X' (observer did not respond to this question)	<blinehaul_ans>	Y	Achieved	EM-R3	A camera should be dedicated to observe gear setting equipment. Can be recorded by the EM-A only if in field of view of a camera.
blinehaul_usage_code	Link to ref_usage table	EM-A	Char (3)	REFER TO APPENDIX 21	<blinehaul_usage_code>	Y	Achieved	EM-R3	Can be recorded by the EM-A only if in field of view of a camera during setting.
blinehaul_comments	Comments on Branchline Hauler	EM-A	NVarChar (50)		<blinehaul_comments>	N	Achieved	EM-R1	
lshoot_ans	Line shooter (Y/N)	SETUP PRE EM-A	Char (1)	Must be 'Y', 'N' or 'X' (observer did not respond to this question)	<lshoot_ans>	Y	Achieved	EM-R3	A camera should be dedicated to observe gear setting equipment. Can be recorded by the EM-A only if in field of view of a camera.
lshoot_usage_code	Link to ref_usage table	EM-A	Char (3)	REFER TO APPENDIX 21	<lshoot_usage_code>	Y	Achieved	EM-R3	Can be recorded by the EM-A only if in field of view of a camera during setting.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_GEAR

PROVIDE information on the LONGLINE GEAR on the vessel.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
lshoot_comments	Comments on Line shooter	EM-A	NVarChar (50)		<lshoot_comments>	N	Achieved	EM-R1	
baitthr_ans	Automatic bait thrower (Y/N)	SETUP PRE EM-A	Char (1)	Must be 'Y', 'N' or 'X' (observer did not respond to this question)	<baitthr_ans>	Y	Achieved	EM-R3	A camera should be dedicated to observe gear setting equipment. Can be recorded by the EM-A only if in field of view of a camera.
baitthr_usage_code	Link to ref_usage table	EM-A	Char (3)	REFER TO APPENDIX 21	<baitthr_usage_code>	Y	Achieved	EM-R3	Can be recorded by the EM-A only if in field of view of a camera during setting.
baitthr_comments	Comments on Automatic Bait thrower	EM-A	NVarChar (50)		<baitthr_comments>	N	Achieved	EM-R1	
branchatt_ans	Automatic branchline attacher (Y/N)	SETUP PRE EM-A	Char (1)	Must be 'Y', 'N' or 'X' (observer did not respond to this question)	<branchatt_ans>	Y	Achieved	EM-R3	A camera should be dedicated to observe gear setting equipment. Can be recorded by the EM-A only if in field of view of a camera.
branchatt_usage_code	Link to ref_usage table	EM-A	Char (3)	REFER TO APPENDIX 21	<branchatt_usage_code>	Y	Achieved	EM-R3	Can be recorded by the EM-A only if in field of view of a camera during setting.
branchatt_comments	Comments on Automatic Branchline attacher	EM-A	NVarChar (50)		<branchatt_comments>	N	Achieved	EM-R1	
wT_Sca_ans	Weighing scales (Y/N)	SETUP PRE EM-A	Char (1)	Must be 'Y', 'N' or 'X' (observer did not respond to this question)	<WT_SCA_ANS>	N	Achieved	EM-R3	A camera should be dedicated to observe gear setting equipment. Can be recorded by the EM-A only if in field of view of a camera.
wT_Sca_usage_code	Weighing scales USAGE	EM-A	Char (3)	REFER TO APPENDIX 21	<WT_SCA_USAGE_CODE>	N	Achieved	EM-R3	Can be recorded by the EM-A only if in field of view of a camera during setting.
wT_sca_comments	Comments on Automatic B Weighing scales	EM-A	NVarChar (50)		<WT_SCA_COMMENTS>	N	Achieved	EM-R1	
mline_comp	Composition of mainline	SETUP PRE	NText		<mline_comp>	Y	N/A	EM-NP	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_GEAR

PROVIDE information on the LONGLINE GEAR on the vessel.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
bline_comp	Composition of branchlines	SETUP PRE	NText		<bline_comp>	Y	N/A	EM-NP	
mline_mat	Mainline material	SETUP PRE	NVarChar (15)		<mline_mat>	Y	N/A	EM-NP	
mline_mat_desc	Mainline material description	SETUP PRE	NVarChar (50)		<mline_mat_desc>	Y	N/A	EM-NP	
mline_len	Mainline length (nm) Recorded by the EM system after being flagged by the EM Analyst	EM-A AG CF	Decimal (5,1)		<mline_len>	Y	High	EM-P2	This may be able to be calculated automatically using float markers and position
mline_diam	Mainline diameter (mm)	SETUP PRE	Decimal (4,1)		<mline_diam>	Y	N/A	EM-NP	
bline_mat1	Composition of branchlines (Material #1)	SETUP PRE	NVarChar (40)		<bline_mat1>	Y	N/A	EM-NP	
bline_mat1_desc	Branchlines (Material #1) description	SETUP PRE	NVarChar (50)		<bline_mat1_desc>	Y	N/A	EM-NP	
bline_mat2	Composition of branchlines (Material #2)	SETUP PRE	NVarChar (40)		<bline_mat2>	Y	N/A	EM-NP	
bline_mat2_desc	Branchlines (Material #2) description	SETUP PRE	NVarChar (50)		<bline_mat2_desc>	Y	N/A	EM-NP	
bline_mat3	Composition of branchlines (Material #3)	SETUP PRE	NVarChar (40)		<bline_mat3>	Y	N/A	EM-NP	
bline_mat3_desc	Branchlines (Material #3) description	SETUP PRE	NVarChar (50)		<bline_mat3_desc>	Y	N/A	EM-NP	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_GEAR

PROVIDE information on the LONGLINE GEAR on the vessel.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
wiretrace_ans	Presence of wire trace (Y/N)	SETUP PRE EM-A	Char (1)	Must be 'Y', 'N' or 'X' (observer did not respond to this question)	<wiretrace_ans>	Y	Achieved	Em-R1	Should be able to be detected by EM-A if sufficient clarity / definition. Vessels in some countries may be completely changing gear between sets - possible not an issue in most of Pacific. Final part of branch line is wire where connected to the hook.
seawater_ans	Refrigeration method - Sea water ?	SETUP PRE	Char (1)	Must be 'Y', 'N' or 'X' (observer did not respond to this question)	<seawater_ans>	Y	N/A	EM-NP	
blastfreezer_ans	Refrigeration method - blast freezer ?	SETUP PRE	Char (1)	Must be 'Y', 'N' or 'X' (observer did not respond to this question)	<blastfreezer_ans>	Y	N/A	EM-NP	
ice_ans	Refrigeration method - Ice ?	SETUP PRE	Char (1)	Must be 'Y', 'N' or 'X' (observer did not respond to this question)	<ice_ans>	Y	N/A	EM-NP	
chilledseawater_ans	Refrigeration method - Chilled Sea water ?	SETUP PRE	Char (1)	Must be 'Y', 'N' or 'X' (observer did not respond to this question)	<chilledseawater_ans>	Y	N/A	EM-NP	
otherstorage_ans	Refrigeration method - other ?	SETUP PRE	Char (1)	Must be 'Y', 'N' or 'X' (observer did not respond to this question)	<otherstorage_ans>	Y	N/A	EM-NP	
otherstorage_desc	Refrigeration method – other description	SETUP PRE	NVarChar (50)		<otherstorage_desc>	Y	N/A	EM-NP	
hksjapan_size	Japanese hook size	SETUP PRE	NVarChar (50)		<hksjapan_size>	Y	N/A	EM-NP	
hksjapan_perc	% of Japanese hook	SETUP PRE	TinyInt		<hksjapan_perc>	N	N/A	EM-NP	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_GEAR

PROVIDE information on the LONGLINE GEAR on the vessel.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
hksjapan_ors	Japanese hook original size	SETUP PRE	NVarChar (5)		<hksjapan_ors>	Y	N/A	EM-NP	
hkscircle_size	Circle hook size	SETUP PRE	NVarChar (50)		<hkscircle_size>	Y	N/A	EM-NP	
hkscircle_perc	% of Circle hook	SETUP PRE	TinyInt		<hkscircle_perc>	N	N/A	EM-NP	
hkscircle_ors	Circle hook original size	SETUP PRE	NVarChar (5)		<hkscircle_ors>	Y	N/A	EM-NP	
hksj_size	J hook size	SETUP PRE	NVarChar (50)		<hksj_size>	Y	N/A	EM-NP	
hksj_perc	% of J hook size	SETUP PRE	TinyInt		<hksj_perc>	N	N/A	EM-NP	
hksj_ors	J hook original size	SETUP PRE	NVarChar (5)		<hksj_ors>	Y	N/A	EM-NP	
hksoth_type	Other hook types description	SETUP PRE	NVarChar (50)		<hksoth_type>	Y	N/A	EM-NP	
hksoth_size	Other hook type size	SETUP PRE	NVarChar (50)		<hksoth_size>	Y	N/A	EM-NP	
hksoth_perc	% of Other hook types	SETUP PRE	TinyInt		<hksoth_perc>	N	N/A	EM-NP	
hksoth_ors	Others types of hook original size	SETUP PRE	NVarChar (5)		<hksoth_ors>	Y	N/A	EM-NP	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_GEAR

PROVIDE information on the LONGLINE GEAR on the vessel.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
bline_mat1_diam	Branchlines (Material #1) diameter	SETUP PRE	Decimal (4,1)		<bline_mat1_diam>	Y	N/A	EM-NP	
bline_mat2_diam	Branchlines (Material #2) diameter	SETUP PRE	Decimal (4,1)		<bline_mat2_diam>	Y	N/A	EM-NP	

NEW FIELDS

is_offal_disposal	Flag if strategic offal disposal is carried out at trip level. Description also required. (See disposal fields at set level.)	EM-A				Y	High	EM-R3	Would be obvious if in the field of view of the camera. In manner that would avoid SSI (opposite side and not throwing during setting)
distance_lineweighthook	Distance between branchline weight and the eye of the hook. At the trip level 'bline_comp' Composition of branchline. LL GEAR-10					Y	N/A	EM-NP	WCPFC requested that the distance from where the bottom of the weight to the eye of the hook. Units are meters. DCC units are in centimeters.
lineweight	Weight in grams of any weight added to the branchline. See 'bline_comp'.					Y	N/A	EM-NP	DCC 2014. WCPFC9. Branchline weights. Total weight of , if y to weighted branchlines. In grams.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_OBS_SET

The observer must PROVIDE the following information for EACH FISHING SET/HAUL during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
SET IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + SET START DATE + SET START TIME	CF			<L_SET_ID>	Y	Achieved	EM-Nat	
set_number	Unique # for the SET in this trip Can be filled out by an office observew viewing footage or automatically generated from a variety of the EM system components	EM-A AG	Int		<set_number>	N	Achieved	EM-R1	Increases sequentially throughout the trip in the order that they happen. Set number will normally be the same as the vessel's set number.
observed_yn	Flag to indicate whether set was observed or not. Were all the start and end positions observed directly	EM-A	Bit		<observed_yn>	N	Achieved	EM-R1	This is not a clear/appropriate definition for the EM process. *Needs to be reviewed by DCC / WCPFC.*
set_date	Start Date/time for set. Date/time when the first bouy is thrown into the water (radio bouy or normal bouy) Can be filled out by an office observew viewing images or automatically generated from a variety of the EM system components	EM-A AG	REFER TO APPENDIX A1	Use UTC DATE/TIME. Ship's date was the standard for hardcopy forms Must adhere to the ISO 8601 format in Appendix A1 Must be after Date and time of departure from port and before date and time of return to port	<set_date>	Y	Achieved	EM-R1	Recorded by the EM system when flagged by the EM Analyst (or is this flagged by the gear sensors?). Inherent in most EM systems using EM-A visual or combination of camera / sensor / GPS Position is also a requirement but captured elsewhere

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_OBS_SET

The observer must PROVIDE the following information for EACH FISHING SET/HAUL during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
hk_bt_flt	Number of hooks between floats Method is highly dependent on what equipment is available on the vessel EM Analyst interprets from images. Determine whether it is more efficient / accuate done on set or haul. Could be evaluated by total hooks per basket and then total floats per basket. Longer term there is potential for AG through serial interface connection with Linemaster or electronic tagging of hooks and floats	EM-A CF Possible AG	SmallInt	Must be 1-60, or -1 for no information.	<hk_bt_flt>	Y	Achieved	EM-R4 for EM-A	This was an issue in the Sol Is trial. EM Analyst s frequently lost count. They found this was the “most difficult to compile based issues identified in the comparison between the data collected by the on-board and EM Analyst s”. It was also one of the most time consuming fields to fill out.
							High	EM-P2 for AG	Float and hook counts could be built into the EM systems if to ensure accurate and time efficient data collection. Tool provides a way to recognise hooks and baskets and there is a metric for calculating number of hooks/basket. Often hooks/basket is set by captain and is usually very consistent. EM-A analyses several baskets and the end number is exported. In the future it might be an actual count rather than an estimate. Potential for use of EM equipment to count hooks exists but there is a trade-off with costs. It is also time intensive for EM-A to record from visual A standard approach for EM-A is required for this field (without constraining development).
bask_set	Number of baskets set. EM Analyst interprets from images. Can be calculated as the total number of floats - 1	EM-A Possible AG	SmallInt		<bask_set>	Y	Achieved	EM-R1	Not as big an issue, but as for HK_BT_FLT
							High	EM-P2	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_OBS_SET

The observer must PROVIDE the following information for EACH FISHING SET/HAUL during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
bask_observed	Number of baskets observed (bottom of form, Nov 07 version) EM Analyst interpret from images. The intent is to monitor the entire haul of a set (not a subset of baskets)	EM-A CF AG	SmallInt		<bask_observed>	Y	Achieved	EM-R1	Field is critical for CPUE This can be different from above due to tangles / equipment malfunction. The EM Analyst should record the number of baskets observed.
hook_set	Total number of hooks set. EM Analyst interpret from images. Determine whether it is more efficient / accuate done on set or haul. Could be calculated by hooks per basket x no. of baskets Longer term there is potential for AG through serial interface connection with Linemaster or electronic tagging of hooks and floats	CF Possible AG	SmallInt	If no information (-1) in HK_BT_FLT or BASK_SET, then HEM-AK_SET = -1	<hook_set>	Y	Achieved	EM-R1	Automatically calculated from the number of hooks between baskets x the number of baskets. That is how its calculated for the datasheet, and there is no point the observer doing the calculation.
hook_observed	Number of hooks observed and data recorded. Could be calculated from HK_BT_FLT x bask_observed	EM-A CF AG	SmallInt		<hook_observed>	Y	Achieved	EM-R1	This could be calculated from HK_BT_FLT x bask_observed
float_length	Length of floatline (m) Very difficult to monitor	PRE	SmallInt		<float_length>	Y	Low	EM-P2	Recorded by the port data collection officer on FORM LL-2/3 and then entered into data capture screen
lspeed	Line setting speed. Can be calculated from rotational speed of roller on shooter Possisbly CF from speed of vessel	AG CF?	Decimal (5,1)	If no information (-1) in HK_BT_FLT or BRANCH_DIST or HEM-AK_SET, then LSPEED = -1	<lspeed>	Y	Low	EM-R3	Observers only record this when there is a line shooter onboard with a visible line setting guide, otherwise they indicate its absence with a "-".
lspeed_unit_id	Link to ref_ids table	AG	CHAR(1)	Must be 'M' for metres/second or 'K' for knots	<lspeed_unit_id>	Y	Achieved	EM-R1	If this was calculated as above, the units should always be m/s DCC (2016) retired knots as a unit of measurement.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_OBS_SET

The observer must PROVIDE the following information for EACH FISHING SET/HAUL during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
branch_intvl	Time interval (secs.) between branchline sets. Use timestamp for sequential branchlines Serial interface with linemaster (AG) Total time beacon to beacon and number of branchline sets Use audio beeps	EM-A CF AG	SmallInt		<branch_intvl>	Y	Achieved	EM-R1	In accordance with the LL Observer Guide, they should calculate the average time between when two branchlines are attached over at least three baskets. Although this could be calculated by the EM syster
branch_dist	Mainline distance between branchlines (m).	CF	Decimal (4,1)	If no information (-1) in LSPEED or BRANCH_INTVL, then BRANCH_DIST = -1	<branch_dist>	Y	Achieved	EM-R3	Automatically calculated from LSPEED (m/s) x BRANCH_INTVL
vessel_SET_speed	Vessel setting Speed (Knots). Automatically generated from EM system components (VMS, GPS) Calculated from waypoints / time	AG CF	Decimal (5,1)		<vessel_SET_speed>	N	Achieved	EM-R1	This should be available from the VMS / GPS. The LL Observer Guide is fairly loose about what the average vessel speed is "Use the GPS to record the average vessel setting speed in knots. It is best to watch the GPS for several seconds at a time and also to check it a number of times during setting" Average vessel speed could be calculated by the EM system as the average speed between start_set and end_set time?

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_OBS_SET

The observer must PROVIDE the following information for EACH FISHING SET/HAUL during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
lightsticks	Number of lightsticks used Very difficult to monitor Use PRE to identify presence / absence. Compare this field with targeting field.	PRE EM-A	SmallInt		<lightsticks>	Y	Achieved	EM-R4 for EM-A	The EM Analyst should record the number of light sticks between one basket per set. This could be automatically multiplied by the number of baskets with the addition of another field in the EM system "LIGHTSTICKS_BASKET" which is for data entry of the number of light sticks used in one basket. That field is then not picked up by the data loaded for the TUBS system.
TDRs	Number of Time Depth recorders used Very difficult to monitor Use PRE to identify presence / absence. Compare this field with targeting field.	PRE EM-A	SmallInt	There should be something in here that requires a value so that you know a 0 means none were used.	<TDRs>	Y	N/A	Null	Field not used for approx last 10-20 years and maybe should now be made redundant pending agreement through WCPFC process (for both observer and EM). This is in line with DCC recommendation.
branch_length	Length of branchline (m) (If all are of a consistent length, otherwise use next set of fields). SEE FLOATLINE Potential use of colour-coded branchlines	PRE	Decimal (4,1)		<branch_length>	Y	N/A	EM-NP	Sub-sampling may not be appropriate for accuracy. Full monitoring may be required
branch_0_20	Number of branchlines between successive floats that are < 20 m.	-	SmallInt		<branch_0_20>	Y	N/A	EM-NP	
branch_20_34	Number of branchlines between successive floats that are 20-35 m.	-	SmallInt		<branch_20_34>	Y	N/A	EM-NP	The Sol Is report suggests that "The existence of TDRs and light-sticks can be checked prior to the trip and so it is not necessary to attempt to obtain
branch_35_50	Number of branchlines between successive floats that are 35-50 m.	-	SmallInt		<branch_35_50>	Y	N/A	EM-NP	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_OBS_SET

The observer must PROVIDE the following information for EACH FISHING SET/HAUL during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
branch_50_99	Number of branchlines between successive floats that are > 50 m.	-	SmallInt		<branch_50_99>	Y	N/A	EM-NP	The observer Guide says “If the vessel is using light sticks, count the total number of light sticks used during the set. Generally, they are not placed on
FLOAT_hook_n	The total number of hooks that have been hung directly from the floatline for this set. INCLUDE FLOAT HEM-AK LENGTH AS NEW FIELD	EM-A	SmallInt		<FLOAT_hook_n>	Y	Achieved	EM-R1	The EM Analyst should record the shark lines observed being attached to floats during setting. Assume this is the “SHARK LINES on floats (Hook No.99s)” on the datasheet.
FLOAT_hook_l					<FLOAT_hook_l>				This needs to be checked was not in observer ER
tar_sp_code	Target Species id recorded on the form for this set (refer to the SPECIES table) DCC 2016 retired sharks as a longline target species. Few or none currently licensed by PICTs. Check if 'Oth - Other species' is included under Appendix 8. WCPFC requires type of species targeted to be recorded and gives species type examples which include sharks.	EM-A	Char (3)	REFER TO APPENDIX 8.	<tar_sp_code>	Y	Achieved	EM-R1	Because it is an "intention" might be difficult unless it can be determined by the configuration of the gear The Sol Is reported noted “Target species” at the set level should be determined from a combination of setting attributes (e.g. gear configuration and bait). Otherwise, the main target species should be known prior to and after the trip (e.g. examination of species composition of the catch).” Will need to be inferred by the EM-A from the gear.
target_tun_yn	ADDITIONAL FLAG indication for MULTIPLE targeting	EM-A	Bit		<target_tun_yn>	Y	Achieved	EM-R1	A combination of information from the pre-inspection and the gear configuration in the video, with the final decision made by the EM Analyst .
target_swo_yn	ADDITIONAL FLAG indication for MULTIPLE targeting	EM-A	Bit		<target_swo_yn>	Y	Achieved	EM-R1	As above
target_skh_yn	ADDITIONAL FLAG indication for MULTIPLE targeting	EM-A	Bit		<target_skh_yn>	Y	Achieved	EM-R1	As above

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_OBS_SET

The observer must PROVIDE the following information for EACH FISHING SET/HAUL during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
target_other	ADDITIONAL FLAG indication for MULTIPLE targeting	EM-A	Bit		<target_other>???	Y	Achieved	EM-R1	NEW FIELD (2016) As above ADDITIONAL FLAG indication for MULTIPLE targeting
setdetails	General notes on the setting procedures. Any comments relating to the setting strategy. For example has there been any specific targetting of shark in this set.	EM-A	NText		<setdetails>	N	Achieved	EM-R1	The EM Analyst should record the general comments of set details.
bait1_sp_code	Bait species id. # 1	PRE EM-A	Char (3)	REFER TO APPENDIX 8.	<bait1_sp_code>	Y	Achieved	EM-R3	The EM Analyst should record the bait species. Camera position and resolution needs to enable this identification
bait2_sp_code	Bait species id. # 2	PRE EM-A	Char (3)	REFER TO APPENDIX 8.	<bait2_sp_code>	Y	Achieved	EM-R3	As above
bait3_sp_code	Bait species id. # 3	PRE EM-A	Char (3)	REFER TO APPENDIX 8.	<bait3_sp_code>	Y	Achieved	EM-R3	As above
bait4_sp_code	Bait species id. # 4	PRE EM-A	Char (3)	REFER TO APPENDIX 8.	<bait4_sp_code>	Y	Achieved	EM-R3	As above
bait5_sp_code	Bait species id. # 5	PRE EM-A	Char (3)	REFER TO APPENDIX 8.	<bait5_sp_code>	Y	Achieved	EM-R3	As above
bait1_w	Weight of bait species #1 used, (kg) Determined by camera placement and view during setting. May be difficult	EM-A? CF	SmallInt		<bait1_w>	N	Achieved	EM-R3	Camera will need to be positioned so that it can view the baiter. Possible but unlikely to be cost effective at this stage. Easier to calculate through number of hooks than number of boxes (as observer does).
bait2_w	Weight of bait species #2 used, (kg)	EM-A? CF	SmallInt		<bait2_w>	N	Achieved	EM-R3	As above
bait3_w	Weight of bait species #3 used, (kg)	EM-A? CF	SmallInt		<bait3_w>	N	Achieved	EM-R3	As above

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_OBS_SET

The observer must PROVIDE the following information for EACH FISHING SET/HAUL during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
bait4_w	Weight of bait species #4 used, (kg)	EM-A? CF	SmallInt		<bait4_w>	N	Achieved	EM-R3	As above
bait5_w	Weight of bait species #5 used, (kg)	EM-A? CF	SmallInt		<bait5_w>	N	Achieved	EM-R3	As above
bait1_h	Hook number(s) in basket that Bait 1 was placed	EM-A?	NVarChar (25)	(Hook numbers separated by commas)	<bait1_h>	N	Achieved	EM-R4	The EM Analyst should record the hook numbers for each bait type.
bait2_h	Hook number(s) in basket that Bait 2 was placed	EM-A?	NVarChar (25)	(Hook numbers separated by commas)	<bait2_h>	N	Achieved	EM-R4	As above
bait3_h	Hook number(s) in basket that Bait 3 was placed	EM-A?	NVarChar (25)	(Hook numbers separated by commas)	<bait3_h>	N	Achieved	EM-R4	As above
bait4_h	Hook number(s) in basket that Bait 4 was placed	EM-A?	NVarChar (25)	(Hook numbers separated by commas)	<bait4_h>	N	Achieved	EM-R4	As above
bait5_h	Hook number(s) in basket that Bait 5 was placed	EM-A?	NVarChar (25)	(Hook numbers separated by commas)	<bait5_h>	N	Achieved	EM-R4	As above
bait1_dyed_yn	FLAG indication on dyed on bait #1	PRE EM-A	SmallInt		<bait1_dyed_yn>	Y	Achieved	Em-R1	
bait2_dyed_yn	FLAG indication on dyed on bait #2	PRE EM-A	SmallInt		<bait2_dyed_yn>	Y	Achieved	Em-R1	
bait3_dyed_yn	FLAG indication on dyed on bait #3	PRE EM-A	SmallInt		<bait3_dyed_yn>	Y	Achieved	Em-R1	
bait4_dyed_yn	FLAG indication on dyed on bait #4	PRE EM-A	SmallInt		<bait4_dyed_yn>	Y	Achieved	Em-R1	
bait5_dyed_yn	FLAG indication on dyed on bait #5	PRE EM-A	SmallInt		<bait5_dyed_yn>	Y	Achieved	Em-R1	
tori_poles_yn	FLAG indication on tori poles used	PRE EM-A	SmallInt		<tori_poles_yn>	Y	NA	Null	**Field** retired by WCPFC and DCC. Replaced by number of tori lines.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_OBS_SET

The observer must PROVIDE the following information for EACH FISHING SET/HAUL during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
no._tori_lines_used	FLAG indication on tori poles used	PRE EM-A	SmallInt		<tori_poles_yn>	Y	Achieved	EM-R3	Presence should be determined from pre-inspection but use should be verified for each set by the EM Analyst Camera will need to be positioned so that it can view the extent of the tori line
bird_curtain_yn	PRE to determine whether they are onboard EM-A to determine whether they are used if yes for above	PRE EM-A	SmallInt		<bird_curtain_yn>	Y	Achieved	EM-R3	Presence should be determined from pre-inspection but use should be verified for each set by the EM Analyst Camera will need to be positioned so that it can view both bird curtains while deployed.
wT_lines_yn	FLAG indication on weighted lines used Difficult to detect if weight is away from the hook	EM-A	SmallInt		<wT_lines_yn>	Y	Achieved	EM-R3	Presence should be determined from pre-inspection but use should be verified for each set by the EM Analyst . Likely difficult to detect in core weighted lines - not as distinct.
uW_chute_yn	FLAG indication on underwater chute used	PRE EM-A	SmallInt		<uW_chute_yn>	Y	Low	EM-P2	Although the presence of an underwater chute might be recorded from pre inspection, it can not be assumed that this will always be used. Could be hard to see with a camera.

NEW

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_OBS_SET

The observer must PROVIDE the following information for EACH FISHING SET/HAUL during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
offal discharged_yn	Known strategic offal disposal method. Was offal discharged during setting or hauling? At set level.	EM-A				Y	High	EM-R3	DCC 2016 enhanced their requirement by adding the word "strategic" in front of 'offal disposal' at trip level. A description is also required. The WCPFC requires a description of the strategic waste disposal method at the trip level, and the management of fish offal at the set level. Would be obvious if in the field of view of the camera. In manner that would avoid SSI (opposite side and not throwing during setting)
offal discharged_yn	Known mitigation method. Visual check of offal disposal location in reference to the gear.	EM-A				Y	High	EM-R3	DCC 2016 enhanced their requirement by adding the word "strategic" in front of 'offal disposal' at trip level. A description is also required. The WCPFC requires a description of the strategic waste disposal method at the trip level, and the management of fish offal at the set level. Would be obvious if in the field of view of the camera. In manner that would avoid SSI (opposite side and not throwing during setting)
hook_changes_ yn	Flag to indicate any deliberate changes to the hook type or size at set level.	EM-A				Y	High	EM-R3	DCC 2016 . Indicate if delibrate changes have been made to hooks between sets. WCPFC12 Instruction changed from a trip level to set level record.
SetDetails	Description of any deliberate changes to the type and size of hook used since last set. Should refer to Terminal Gear Guide.	EM-A				Y	High	EM-R3	DCC 2016. WCPFC12 instruction change for set level record. Should record any changes in hook size or type between sets. Suggestion to use Terminal Gear Guide found at http://www.spc.int/coastfish/en/publications/technical-manuals/fishing-techniques.html

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_SETHAULLOG

The E-Reporting system must PROVIDE the following log information for EACH SET/HAUL during the period of the trip, typically on a 60-minute basis

FIELD	Notes on Data Collection Guidelines	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
SET IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + SET START DATE + SET START TIME	CF			<L_SET_ID>	Y	Achieved	EM-Nat	
SETHAUL LOG IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + SET START DATE + SET START TIME + LOG DATE + LOG TIME	CF			<L_SETHAULOG_ID>	Y	Achieved	EM-Nat	
log_date	Date/TIME of log reading The date/time of the beginning of haul	EM-A -> AG	REFER TO APPENDIX A1	Must adhere to the ISO 8601 format in Appendix A1	<log_date>	Y	Achieved	EM-R1	In accordance with instructions on the back of logsheet FORM LL2/3, this could be set to automatically record details every half or 1 hour.
sethaul	Status of gear at this logged date/time : Set (S) Haul (H), Soak (K) or Float retrieved (F)	AG	Char (4)	Must be either 'S', 'H', 'K' or 'F'	<sethaul>	Y	Achieved	EM-R1	Datasheets and Observer Guide only ask for the haul log on hauling. But this could easily be recorded by the EM-A *Now redundant due to field below - DCC / WCPFC tro review*
	Indicator for status of the SET-HAUL						Achieved	EM-R1	
	83 – First log record for the SET (start of SET information)	EM-A AG					Achieved	EM-R1	This could easily be recorded by the EM-A.
	84 – Last log record for the SET (end of SET information)	EM-A AG					Achieved	EM-R1	Need to date/time each float retreived is being reviewed
	85 – First log record for the HAUL (start of HAUL information)	EM-A AG					Achieved	EM-R1	Can be calculated after the event

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_SETHAULLOG

The E-Reporting system must PROVIDE the following log information for EACH SET/HAUL during the period of the trip, typically on a 60-minute basis

FIELD	Notes on Data Collection Guidelines	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
stend_id	86 – Last log record for the HAUL (end of HAUL information)	EM-A AG	Int	Must be 83, 84, 85, 86, 91 or NULL	<stend_id>	Y	Achieved	EM-R1	For EM-A - only needs to record Start_Set End_Set Start_Haul End_Haul. Time period may be changed in future from 60 minutes All events are timestamp and position Should match VMS At this stage we don't know exactly how this will be done Should we just mark float set and float haul events. If floats are electronically tagged then this will be AG.
	87 - Location during setting per time period	CF					Achieved	EM-R1	
	88 – Location during haul per time period	CF					Achieved	EM-R1	
	91 – Float retrieval	EM-A AG					Achieved	EM-R1	
	Potential additions for review by DCC / WCPFC - Line Breaks - Line retrieval - Line tangles - Line rehaul - and others						Achieved	EM-R1	
lat		AG	REFER TO APPENDIX A2	Must adhere to the ISO 6709 format in Appendix A2	<lat>	Y	Achieved	EM-R1	This could be set to automatically record details at a finer timescale
lon		AG	REFER TO APPENDIX A2	Must adhere to the ISO 6709 format in Appendix A2	<lon>	Y	Achieved	EM-R1	This could be set to automatically record details at a finer timescale
comments	EM Analyst records any comments	EM-A	NText		<comments>	N	Achieved	EM-R1	Recorded by the EM Analyst .
FLOAT_ID	Unique identifier for the Float retrieved Could be sequential or Timestamp In future could use tagged bouys (RFID for example)	EM-A AG	NVARCHAR(15)	Only used when Float retrieved (STEND_ID = 91) E-Monitoring ONLY	<FLOAT_ID>	N	Achieved	EM-R1	Recorded whenever a float comes onboard, the observer flags it " Float retrieved", and each float is given a sequential number from 1 to … or just a timestamp Additional field the observer is not necessarily required to collect. EM records every float. Review by DCC or WCPFC

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_SETHAULLOG

The E-Reporting system must PROVIDE the following log information for EACH SET/HAUL during the period of the trip, typically on a 60-minute basis

FIELD	Notes on Data Collection Guidelines	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
HK_BT_FLT	Hooks between this float retrieved and the next float Collect through the timestamp	EM-A AG	SmallInt	Must be 1-60, or -1 for no information. Only used when Float retrieved (STEND_ID = 91)	<hk_bt_flt> Maybe needs to be re - named so as not to conflict <log_hk_bt_flt>	N	Achieved	EM-R1	Recorded by the EM-A. If this could be done then this field could be used for the LL_OBS_SET

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_OBS_CATCH

The observer must PROVIDE the following CATCH DETAILS for EACH FISHING HAUL for the period of the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
SET IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + SET START DATE + SET START TIME	CF			<L_SET_ID>	Y	Achieved	EM-Nat	
CATCH IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + SET START DATE + SET START TIME + CATCH EVENT DATE + CATCH EVENT TIME	CF			<L_CATCH_ID>	Y	Achieved	EM-Nat	
CATCH_date	Date/TIME of individual catch event Recorded by the EM system after being flagged by the EM Analyst . Possible AG through video recognition software of catch events	EM-A -> AG AG	REFER TO APPENDIX A1	Must adhere to the ISO 8601 format in Appendix A1	<catch_date>	Y	Achieved	EM-R1	
lat	Latitude (long format) Recorded by the EM system after being flagged by the EM Analyst .	EM-A -> AG AG	REFER TO APPENDIX A2	Position of each catch event E-Monitoring ONLY	<lat>	N	Achieved	EM-R1	
lon	Longitude (long format) Recorded by the EM system after being flagged by the EM Analyst .	EM-A -> AG AG	REFER TO APPENDIX A2	Position of each catch event E-Monitoring ONLY Must adhere to the ISO 6709 format in Appendix A2	<lon>	N	Achieved	EM-R1	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_OBS_CATCH

The observer must PROVIDE the following CATCH DETAILS for EACH FISHING HAUL for the period of the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
hook_no	Hook number (since the last float). Hook number=99 represents catch on a hook hanging directly from the floatline. Counted by the EM Analyst . Can also be counted as the 'No. of hooks per basket' minus the count of hooks until the next float. Automatically generated possible if Smart Hooks/Clips or rotation of line coiler. Could also use timestamp of catch event (down to second) against float event as a calculated field.	EM-A CF Possible AG	SmallInt		<hook_no>	Y	Achieved	EM-R4	Recorded by the EM Analyst but difficult and time consuming If smarthooks then this field can link to set_haul log automatically
							High	EM-P2	Can be automatically calculated by interpolatin of catch times betweenfloats. Need a process standard for when catch is time-stamped for EM-A. EM Analyst no longer counts hooks on haul Time of each float retrieval must be recorded (to nearest second) Investigate better models to estimate hook number of catch event Consider RFIDs on FLOATS to automate counting and date/time stamps on setting/hauling (and remove need for EM Analyst to flag FLOAT retrievals) Usually when fish comes through the gate or is struck off. More accurate estimate of hook number is when fish is first sighted by EM-A. Maybe increase empirical evidence and analyses prior to transition.
SP_CODE	Link to species table. Can be visually identified by EM-A. Future work and image training could make image recognition of catch possible	EM-A AG	Char (3)	REFER TO APPENDIX 8.	<SP_CODE>	Y	Achieved	EM-R1 by EM-A	In some situations a clear view of the entire individual fish may not be possible. This may also require some level of cooperation of the crew. Automatically generated with image recognition.
							High	EM P2 by Image recognition	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_OBS_CATCH

The observer must PROVIDE the following CATCH DETAILS for EACH FISHING HAUL for the period of the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
fate_code	FATE of this catch. This indicates whether it was RETAINED, DISCARDED or ESCAPED, and any specific processing. EM Analyst to use range of cameras to determine the fate.	EM-A	Char (3)	REFER TO APPENDIX 9 Only shark species can have a FATE as 'RFR' and 'DFR'. NEW fate code DDH - "Discarded-de-hooked"	<fate_code>	Y	Achieved	EM-R1 if landed EM-R3 if not landed	Cameras based where discarding occurs would be useful. Recorded by EM-Analyst but need to ensure that all positions on deck can be observed for the fate DCC added new fate code to existing list of fate codes. Related to SSI Treatment and WCPFC handling guidelines. DDH - Discarded dehooking device. This paticular fate code is not required by WCPFC
cond_code	CONDITION of this catch on LANDING. Relevant for the Species of Special Interest. Identified by EM Analyst	EM-A	Char (2)	REFER TO APPENDIX 10	<cond_code>	Y	Achieved	EM-R1 if landed EM-R3 if not landed	Can be difficult with EM. Need to ensure consistency in the collection of condition (life status) information. This might be difficult, especially with small animals.
cond_REL_code	CONDITION of this catch on RELEASE/DISCARD. Relevant for the Species of Special Interest. Identified by EM Analyst	EM-A	Char (2)	REFER TO APPENDIX 10	<cond_REL_code>	Y	Achieved	EM-R1 if landed EM-R3 if not landed	Can be difficult with EM. Need to ensure consistency in the collection of condition (life status) information. This might be difficult, especially with small animals.
LEN	Length (cm). Can be visually measured by EM-A using EM Tool.	EM-A AG	SmallInt	Expectation that that the following measurements have been taken by the observers, as instructed.	<LEN>	Y	Achieved	EM-R1 by EM-A	In some situations a clear view of the entire individual fish may not be possible. This may also require some level of cooperation of the crew. SOP for length sampling by EM-A needs to be developed. Automatically generated with image recognition?
							High	EM-P2 by Image recognition	
							Achieved	EM-R1 by EM-A	Could be automatically generated if the same length code is used for all

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_OBS_CATCH

The observer must PROVIDE the following CATCH DETAILS for EACH FISHING HAUL for the period of the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
LEN_CODE	Record measurement methods given in codes	EM-A AG	CHAR(2)	REFER TO APPENDIX A11	<MEASURE_CODE>	Y	High	EM-P2 by Image recognition	measurements of a species. DCC 2016 added a new length code to the existing list of length codes. Proposed due to increasing interest in birds. For dead birds only (noting risk to un-trained observers taking measurments from live birds). BL - bill length {(BL) already iin use} and WL - tip of wing to wrist.
wt	Weight (kgs) – must be measured weight and not a visual estimate		Decimal (5,1)		<wt>	N	Low	EM-P2	Image (or serial connection) of weight from motion compensated scales Potential to calculate it from a length-weight relationship.
wt_code	Weight code. If it was calculated it would always be whole weight.		Char (2)	REFER TO APPENDIX 22	<wt_code>	N	N/A	Null	DCC 2016 retired this data field as weighing scales rarely available on vessels. It is not a WCPFC requirement. May be collected by WCPFC Project 90.
sex_code	SEX of fish Identified by EM Analyst where possible	EM-A	Char (1)	REFER TO APPENDEX 12	<sex_code>	Y	Low	EM-R2	Will not cover all species. EM capable only for certain species and/or when fish are mature. Juveniles require abdominal analysis observer. Crew help required if EM-A to view underside of sharks and rays. Investigate how to improve the consistency in the collection of sex information, if possible. The Observer Guide shows some examples of fish species where there are external differences in sex: Shark, Mahi mahi, Opah
gstage_CODE	GONAD STAGE CODE		Char (1)	REFER TO APPENDIX 23	<gstage_CODE>	N	N/A	EM-NP	
comments	Record if tag fish encountered. Endeavour to complete tag recovery information	EM-A	NVarChar (40)		<comments>	N	Achieved	EM-R1	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_OBS_CATCH

The observer must PROVIDE the following CATCH DETAILS for EACH FISHING HAUL for the period of the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
NEW FIELDS									
calibrate_this_set_yn	Flag to indicate if measuring instrument was calibrated before every set.						N/A	EM-NP	DCC 2016. Indicates if observer callibrated their measuring instrument before each haul. Solid measuring instruments may be affected by rough sea conditons. Is there an EM equivalent?
calibration in mm	The calibration reading (+/-) in mm.						N/A	EM-NP	DCC 2016. A record of the callibration error in millimeters. Is there an EM equivalent?

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIPMON

PROVIDE the details of the OBSERVER GEN-3 "OBSERVER VESSEL TRIP MONITORING FORM". One record per question.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Issues
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
TRIP MONITORING IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<TRIPMON_ID>	Y	Achieved	EM-Nat	
	Unique CODE for each question in GEN3								
	RS-A: Did the operator or any crew member assault, obstruct, resist, delay, refuse boarding to, intimidate or interefere with observers in the performance of their duties.	EM-A				Y	Achieved	EM-R3	Are cameras required in "high risk" area to observers? To this end, a camera in the wheelhouse is required - this could present a privacy issue. Four areas: galley, bridge, deck area where crew work, observer cabin. Verbal, psychological abuse will not be able to be collected. Observer body camera?? Lots of associated issues with privacy. Does necessarily guarantee security. If an observer incident has been detected - what does it trigger over what timeframe? Need an incident SOP. EM Equivalent: Was there any damage / tampering of the equipment? Other mischief?

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	* Data better collected by PS onboard observer	
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

OBS_TRIPMON

PROVIDE the details of the OBSERVER GEN-3 "OBSERVER VESSEL TRIP MONITORING FORM". One record per question.

FIELD	Data Collection Instructions		Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Issues
	RS-A-EM	EM Equivalent: Was there any damage / tampering of the equipment? Other mischief?	EM-A AG				Y	High	EM-New	Are cameras required in "high risk" area to observers? To this end, a camera in the wheelhouse is required - this could present a privacy issue. Four areas: galley, bridge, deck area where crew work, observer cabin. Verbal, psychological abuse will not be able to be collected. Observer body camera?? Lots of associated issues with privacy. Does necessarily guarantee security. If an observer incident has been detected - what does it trigger over what timeframe? Need an incident SOP.
	RS-B	Request that an event not be reported by the observer					Y	N/A	Null	N/A Interim obstruction? High level request of service provider?
	RS-C	Mistreat other crew	EM-A				N	N/A	Null	Only in the visible field of the cameras
	RS-D	Did operator fail to provide observer with food, accommodation, etc.					Y	N/A	Null	N/A
	RS-D_EM	EM Equivalent: Was the equipment maintained as required	EM-A Post				Y	High	EM-New	N/A
	NR-A	Fish in areas where the vessel is not permitted to fish	PRE EM-A				Y	Achieved	EM-P2	Position is easily generated but permitted areas are very difficult to determine for each trip. More accurate if AG but requires geofence pre-populated in the software to achieve AG. Can change over time. Unlikely.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIPMON

PROVIDE the details of the OBSERVER GEN-3 "OBSERVER VESSEL TRIP MONITORING FORM". One record per question.

FIELD	Data Collection Instructions		Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Issues
question_code	NR-B	Target species other than those they are licenced to target	EM-A	Char (4)	REFER TO APPENDIX 16	<question_code>	N	Achieved	EM-R1	EM Analyst can recognise
	NR-C	Use a fishing method other than the method the vessel was designed or licensed	EM-A				Y	Achieved	EM-R1	EM Analyst can recognise if in field of view
	NR-D	Not display or present a valid (and current) licence document onboard	PRE POST				N	N/A	EM-NP	
	NR-E	Transfer or transship fish from or to another vessel	EM-A AG				Y	Critical	EM-R1	Likely to be able to be detected by EM-Analyst EM system could detect this to automatically generate
	NR-F	Was involved in bunkering activities	EM-A AG				N	Critical	EM-R1	Likely to be able to be detected by EM-Analyst EM system could detect this to automatically generate
	NR-G	Fail to stow fishing gear when entering areas where vessel is not authorised to fish	EM-A				Y	Low	EM-P2	Activity is easy to observe on board but authorised areas are difficult to be built in to EM software. Could get cameras to switch on with geo-fencing (beware accuracy +/- 3nm)
	WC-A	Fail to comply with any Commission Conservation and Management Measures (CMMs)	EM-A AG				Y	Low	EM-R1	Some CMMs may be able to be detected by EM-Analyst. Requires that the EM-A has a good understanding of the full range of CMMs. Some could be calculated from other data entry fields (ie. Catch of SSI).

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIPMON

PROVIDE the details of the OBSERVER GEN-3 "OBSERVER VESSEL TRIP MONITORING FORM". One record per question.

FIELD	Data Collection Instructions		Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Issues
	WC-B	Discarding of tuna catch	AG				Y	High	EM-R1	AG from PS_OBS_CATCH or other forms
	WC-C	Fish on FAD during FAD Closure	EM-A AG				N	Low	EM-P2	Fishing next to a FAD may easily be detected by EM but the FAD closure rules would be difficult to incorporate into the software.
	LP-A	Inaccurately record vessel position on vessel log sheets for sets, hauling and catch	Post AG				Y	Achieved	EM-R1	Reconcile EM data with logsheet data. The comparison could be done automatically post trip if ER data is in digital form.
	LP-B	Fail to report vessel positions to countries where required	Post AG				Y	Achieved	EM-R1	Reconcile EM-Analyst data with logsheet data. Automatically generated with E-Reports
	LC-A	Inaccurately record retained 'Target Species' in the Vessel logs [or weekly reports]	Post AG				Y	Achieved	EM-R1	Reconcile EM-Analyst data with logsheet data. Automatically generated with E-Reports
	LC-B	Inaccurately record 'Target Species' Discards	Post AG				Y	Achieved	EM-R1	Reconcile EM-Analyst data with logsheet data. Automatically generated with E-Reports
	LC-C	Record target species inaccurately [eg. combine bigeye/yellowfin/skipjack catch]	Post AG				Y	Achieved	EM-R1	Reconcile EM-Analyst data with logsheet data. Automatically generated with E-Reports
	LC-D	Not record bycatch discards	Post AG				N	Achieved	EM-R1	Reconcile EM-Analyst data with logsheet data. Automatically generated with E-Reports
	LC-E	Inaccurately record retained bycatch Species	Post AG				Y	Achieved	EM-R1	Reconcile EM-Analyst data with logsheet data. Automatically generated with E-Reports

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIPMON

PROVIDE the details of the OBSERVER GEN-3 "OBSERVER VESSEL TRIP MONITORING FORM". One record per question.

FIELD	Data Collection Instructions		Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Issues
	LC-F	Inaccurately record discarded bycatch species	Post AG				Y	Achieved	EM-R1	Reconcile EM-Analyst data with logsheet data. Automatically generated with E-Reports
	SI-A	Land on deck Species of Special Interest (SSIs)	Post AG				N	Achieved	EM-R1	AG from PS_OBS_CATCH
	SI-B	Interact (not land) with SSIs	Post AG				Y	Achieved	EM-R1	AG from PS_OBS_CATCH
	PN-A	Dispose of any metals, plastics, chemicals or old fishing gear	AG				Y	Achieved	EM-R1	AG from PS_POLLUTION
	PN-B	Discharge any oil	AG				Y	Achieved	EM-R1	AG from PS_POLLUTION
	PN-C	Lose any fishing gear	AG				Y	Achieved	EM-R1	AG from PS_POLLUTION
	PN-D	Abandon any fishing gear	AG				Y	Achieved	EM-R1	AG from PS_POLLUTION
	PN-E	Fail to report any abandoned gear	AG				Y	Achieved	EM-R1	AG from PS_POLLUTION
	SS-A	Fail to monitor international safety frequencies					Y	N/A	EM-NP	
	SS-B	Carry out-of-date safety equipment					N	N/A	EM-NP	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIPMON

PROVIDE the details of the OBSERVER GEN-3 "OBSERVER VESSEL TRIP MONITORING FORM". One record per question.

FIELD	Data Collection Instructions	Entry Source: SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Issues
answer	Record the Answer to each question. There is also an indicator whether this has been answered or NOT		Char (1)	MUST BE 'Y', 'N' or 'X'-not answered	<answer>	Y	Achieved	Em-R1	
journal_page	Additional explanation and information for any YES response (including reference to the journal page)		NText		<journal_page>	Y	N/A	Null	

NEW FIELD

debriefstatus	Flags the debriefing status. Status may change.						N/A	Null	The status of the debriefing on the data should be noted. It can be - not debriefed, debriefed, or pre-debriefed. Status can change over-time. Is there an EM debriefing?

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIPMON_COMMENTS

PROVIDE the details of the OBSERVER GEN-3 "OBSERVER VESSEL TRIP MONITORING FORM". One record per day of trip monitoring reported event/incident.

FIELD	Data Collection Instructions	Entry Source	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Issues
		SETUP PRE EM-A POST AG CF							
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
TRIP MONITORING COMMENTS IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<TRIPMON_DET_ID>	Y	Achieved	EM R1	
gen3_date	Date of the incident on GEN3	AG	REFER TO APPENDIX A1	Must adhere to the ISO 8601 format in Appendix A1	<gen3_date>	N	Achieved	EM-R1	
comments	Detail description of the incident	EM-A	NText		<comments>	N	Achieved	EM-R1	A list of events is required that the EM-Analyst needs to note depending on the camera?

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

VES_AIR_SIGHT

2. PROVIDE the details on the GEN-1 form -- VESSEL AND AIRCRAFT SIGHTINGS / FISH, BUNKERING and OTHER TRANSFERS LOGS

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
SIGHTING IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + SIGHT_DATE_TIME	CF			<sight_ID>	Y	Achieved	EM-Nat	
sight_date_TIME	Date/Time of sighting		REFER TO APPENDIX A1	Must adhere to the ISO 8601 format in Appendix A1	<sighting_date>	Y	N/A	EM-NP	It is very unlikely that EM will be able to be used effectively to monitor aircraft sightings.
lat	Latitude of SIGHTING		REFER TO APPENDIX A2	Must adhere to the ISO 6709 format in Appendix A2	<lat>	Y	N/A	EM-NP	As above.
lon	Longitude of SIGHTING		REFER TO APPENDIX A2	Must adhere to the ISO 6709 format in Appendix A2	<lon>	Y	N/A	EM-NP	As above.
VESSEL IDENIFIER	PROVIDE the WCPFC VID for the VESSEL sighted (if this is possible)		REFER TO APPENDIX A4			N	N/A	EM-NP	As above.
vatyp_id	Vessel / Aircraft type		Int	REFER TO APPENDIX 17	<vatyp_id>	Y	N/A	EM-NP *	As above.
bearing_dir	Bearing (0-360 degrees)		SmallInt		<bearing_dir>	Y	N/A	EM-NP *	As above.
distance	Record estimated distance from observers vessels to sighted vessel		Decimal (7,3)		<distance>	Y	N/A	EM-NP *	As above.
dist_unit	Units of Distance		INT	1 = Metres; 2 = kilometres; 3 = Nautical miles	<dist_unit>	Y	N/A	EM-NP *	As above.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

VES_AIR_SIGHT

2. PROVIDE the details on the GEN-1 form -- VESSEL AND AIRCRAFT SIGHTINGS / FISH, BUNKERING and OTHER TRANSFERS LOGS

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
action_code	Action of Vessel/Aircraft sighted		Char (2)	REFER TO APPENDIX 18 for Vessel/Aircraft sightings only – only allow actions where FORM USED = 'GEN-1'	<action_code>	Y	N/A	EM-NP *	As above.
comments	Comments		NText		<comments>	Y	N/A	EM-NP *	As above.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_POLLUTION

PROVIDE information any Pollution observed during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	**Achieved**	**EM-Nat**	
POLLUTION EVENT IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<POLL_ID>	Y	**Achieved**	**EM-Nat**	
INC_DATE	DATE & TIME of the incident	EM-A	REFER TO APPENDIX A1	**Must adhere to the ISO 8601 format in Appendix A1.**	<INC_DTIME>	N	Achieved	EM-R1	**Can be recorded by the EM-Analyst only if in field of view of a camera.** **The Sol Is report stated on page 15 that "monitoring of marine pollution was possible with E-Monitoring", but acknowledged that it is restricted to the viewing range of the cameras.**
lat	Latitude where incident occurred	EM-A AG	REFER TO APPENDIX A2	**Must adhere to the ISO 6709 Appendix A2.**	<lat>	N	Achieved	EM-R1	
lon	Longitude where incident occurred	EM-A AG	REFER TO APPENDIX A2	**Must adhere to the ISO 6709 in Appendix A2.**	<lon>	N	Achieved	EM-R1	
port_id	If the vessel is in port, PORT where incident occurred	EM-A AG	REFER TO APPENDIX A3	**Must adhere to the UN/LOCODE standard UN/LOCODE standard Appendix A3.**	<port_id>	N	Achieved	EM-R1	**Refer to trip**
activ_id	Activity when event occurred	EM-A	REFER TO APPENDIX A5		<activ_id>	N	Low	EM-R1	
VESSEL IDENIFIER	Refers to another vessel	EM-A	REFER TO APPENDIX A4			N	Low	EM-R1	**Can be recorded by the EM-Analyst only if other vessel is in field of view of a camera.**
vatyp_id	Vessel / Aircraft type	Em-A	Int	REFER TO APPENDIX 17	<vatyp_id>	N	N/A	EM-NP	**It is very unlikely that EM will be able to be used effectively to monitor pollution by other vessels. Opportunistic.**
bearing_dir	Compass Bearing to offending vessel	AG	SmallInt		<bearing_dir>	N	Low	**EM-P2**	**As above**

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_POLLUTION

PROVIDE information any Pollution observed during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
distance	Distance to offending vessel		Decimal (7,3)		<distance>	N	Low	EM-P2	As above
comments	Additional comments	EM-A	NText		<comments>	N	Low	EM-R1	As above
stickers_ans	Response to "Stickers" question. "Were there any stickers/ posters displayed to remind the vessel about MARPOL Regulations?"	POST	Char (1)	'Y' or 'N'	<stickers_ans>	N	N/A	EM-NP	As the GEN-6 form is completed after the port visit, if this field is required then it should be reported for each trip by the PDCO.
aware_ans	Response to "MARPOL" question	POST	Char (1)	'Y' or 'N'	<aware_ans>	N	N/A	EM-NP	As the GEN-6 form is completed after the port visit, if this field is required then it should be reported for each trip by the PDCO
advised_ans	Response to "INFRINGEMENTS" question	POST	Char (1)	'Y' or 'N'	<advised_ans>	N	N/A	EM-NP	This is not applicable – the question is "If there were any infringements to the MARPOL Regulations did you advise the Captain of these infringements?"
photos_ans	Response to "PHOTOS" question	EM-A	Char (1)	'Y' or 'N'	<photos_ans>	N	Low	EM-R1	Recorded by the EM-Analyst from EM video, but GEN6 completed post trip.
photo_numbers	Timestamp and position of image		NVarChar (50)		<photo_numbers>	N	N/A	Null	Redundant with EM as every image has datetime stamp and position.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_POLLUTION_DETAILS

PROVIDE information on any Pollution details observed during the trip.

FIELD	Data Collection Instructions	Entry Source (SETUP PRE EM-A POST AG CF)	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
POLLUTION EVENT IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<POLL_ID>	Y	Achieved	EM-Nat	
pollutiontype_id	Pollution type code	EM-A	REFER TO APPENDIX A31	Some, but not all codes in listed in the relevant APPENDICES are WCPFC required fields. For example, Disposal of OFFAL MANAGEMENT is a WCFPC required field.	<pollutiontype_id>	N	Low	EM-R1 vessel EM-R3 other	Can be recorded by the EM-Analyst only if incident is in field of view of a camera. More easily recorded on the monitotrf vessel rathen than another vessel.
material_id	Pollution Materials code	EM-A	REFER TO APPENDIX A29		<material_id>	N	Low	EM-R1 vessel EM-R3 other	As above
POLL_GEAR_ID	Pollution Gear code	EM-A	REFER TO APPENDIX A28		<POLL_GEAR_ID>	N	Low	EM-R1 vessel EM-R3 other	As above
POLL_SRC_ID	Pollution Source code	EM-A	REFER TO APPENDIX A30		<POLL_SRC_ID>	N	Low	EM-R1 vessel EM-R3 other	As above
poll_desc	Description of pollution type	EM-A	NText		<poll_desc>	N	Low	EM-R1 vessel EM-R3 other	As above
poll_qty	Description of pollution quantity	EM-A	NText		<poll_qty>	N	Low	EM-R1 vessel EM-R3 other	As above

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_SSI

The observer must PROVIDE the following SPECIES OF SPECIAL INTEREST CATCH DETAILS for EACH FISHING SET for the period of the trip. There may be one or many records for each SSI record in PS_OBS_CATCH. When SIGHTED only, then this table is linked to the OBS_TRIP database table.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
SET IDENTIFIER – LL	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + SET START DATE + SET START TIME	CF		To be used to link to LL OBS SET when relevant Must be consistent with PS_OBS_ACTIVITY record where S_ACTIV_ID = 1 (A fishing set).	<L_SET_ID>	Y	Achieved	EM-Nat	
CATCH IDENTIFIER – LL	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + SET START DATE + SET START TIME + SPECIES CODE + FATE CODE	CF		To be used to link to LL OBS CATCH when relevant Must be a link to the corresponding PS_OBS_CATCH record for this SSI	<L_CATCH_ID>	Y	Achieved	EM-Nat	
SSI CATCH IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + DAY LOG + SIGHTING TIME + SPECIES CODE + FATE CODE	CF			<SSI_ID>	Y	Achieved	EM-Nat	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_SSI_DETAILS

The observer must PROVIDE the following SPECIES OF SPECIAL INTEREST CATCH DETAILS for EACH FISHING SET for the period of the trip. The specific detail of each interaction needs to be recorded/stored here.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
SSI CATCH IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF		Link to OBS_SSI table	<SSI_ID>	Y	Achieved	EM-Nat	
SSI DETAILS IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + DAY LOG + SIGHTING TIME + SPECIES CODE + FATE CODE	CF			<SSI_DET_ID>	Y	Achieved	EM-Nat	
start_end	Indication of “START” or “END” of interaction Recorded by the EM system after being flagged by the EM Analyst .	EM-A	Char (1)	Must be either ‘S’ for START or ‘E’ for END	<START_END>	N	Achieved	EM-R1	
SSI_number	Number of animals interacted Counted by the EM Analyst	EM-A	Int		<SSI_NUMBER>	N	Achieved	EM-R1	Need good definitions of interactions to maintain consistnecy between EM-A and observers. EM-A can only count what is in the field of view.
cond_code	CONDITION at the point of recording (either START or END)	EM-A	Char (2)	REFER TO APPENDIX 10	<COND_CODE>	N	Low	EM-R3	This differs from landed_cond_code from the previous table in that it can be an interaction with the vessel or gear before the animal is landed on deck. This could be difficult to determine by the EM-A
description	Descriptions of the interaction Recorded by the EM Analyst	EM-A	VarChar (100)		<DESCRIPTION>	N	Achieved	EM-R1	For example fin caught in net.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
	sible - with major work		
	possible		

* Data better collected by PS onboard observer

OBS_JOURNAL

PROVIDE a description of the day's activities in a daily journal record for the trip.

FIELD	Data Collection Instructions	Entry Source	Field format notes	Validation rules	XML TAG	WCPFC			Issues
		SETUP PRE EM-A POST AG CF				FIELD			
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	N			
DAILY JOURNAL IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBS_JRNL_ID>	N			
JRNL_date	DATE of Journal entry	EM-A AG	REFER TO APPENDIX A1	Must adhere to the ISO 8601 format in Appendix A1	<JRNL_date>	N	Achieved	EM-R1	Recorded by the EM-Analyst or automatically generated.
JRNL_TEXT	Daily journal entry	EM-A	NText		<JRNL_TEXT>	N	Achieved	EM-R1	Is this required for EM? Recorded by the EM-Analyst.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in http://www.spc.int/OceanFish/en/publications/doc_download/1318-2014-ll-trip-report

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	N	Achieved	EM-Nat	The current hardcopy Trip Report has been designed with a focus on onboard observers. *The fields required in an EM trip report needs to be reviewed by DCC / WCPFC.*
1_BACKGROUND	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	AG EM-A	NText		<1_BACKGROUND>	N	Achieved	EM-R1	Note that the front page of the Trip Report could be automatically generated from various fields already completed by the EM-A. EM-A can not comment on placement meetings, briefing etc.
2_0_CRUISE_SUMMARY	(Refer to relevant section in link above)	AG EM-A	NText		<2_0_CRUISE_SUMMARY>	N	Achieved	EM-R1	Most of the information in this section could be automatically generated from various fields already completed by the EM-A. Rest could be filled in by EM-A.
2_1_AREA_FISHED	(Refer to relevant section in link above)	EM-A AG	NText		<2_1_AREA_FISHED>	N	Achieved	EM-R1	The following can be populated from data already recorded: - Range of latitudes and longitudes - Or region / 5 degree blocks Fishing Areas could be calculated from these.
2_2_END_OF_TRIP	(Refer to relevant section in link above)	EM-A AG CF	NText		<2_2_END_OF_TRIP>	N	Achieved	EM-R1	The following can be populated from data already recorded: - Port of return - Date and time of return The following can be calculated from data already recorded: - total number of fishing operations made by the vessel - catch by species
3_0_DATA_COLLECTED	(Refer to relevant section in link above)	PRE POST	NText		<3_0_DATA_COLLECTED>	N	N/A	Null	
3_1_OTHER_DATA_COLL	(Refer to relevant section in link above)	PRE POST	NText		<3_1_OTHER_DATA_COLL>	N	N/A	Null	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in http://www.spc.int/OceanFish/en/publications/doc_download/1318-2014-ll-trip-report

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
4_0_COC	Refer to relevant section in link above)	PRE EM-A POST	NText		<6_0_COC>	N	N/A	EM-NP	Recorded by the EM-Analyst and Pre- and Post-inspections. This might be redundant unless the people doing the pre- and post-trip inspections are invloved in witnessing catch for CDS
5_1_VESS_INFO	Refer to relevant section in link above)	PRE EM-A POST	NText		<5_1_VESS_INFO>	N	N/A	EM-NP	Recorded using Pre- and Post-inspections. Vessel details could be automatically populated from the vessel register (https://www.wcpfc.int/record-fishing-vessel-database) including: - Owner - Tonnage - Length - Freezer capacity
5_2_CREW_NATION	Refer to relevant section in link above)	PRE POST	NText		<5_2_CREW_NATION>	N	N/A	EM-NP	Recorded Pre- and Post-inspections.
5_2_1_PIC	Refer to relevant section in link above)	PRE POST	NText		<5_2_1_PIC>	N	N/A	EM-NP	Recorded Pre- and Post-inspections.
5_3_ELEC	Refer to relevant section in link above)	PRE POST	NText		<5_3_ELEC>	N	N/A	EM-NP	Recorded Pre- and Post-inspections.
5_3_1_RADIO_BUOYS	Refer to relevant section in link above)	PRE POST	NText		<5_3_1_RADIO_BUOYS>	N	N/A	EM-NP	Recorded Pre- and Post-inspections.
5_4_FISHING_GEAR	Refer to relevant section in link above)	EM-A	NText		<5_4_FISHING_GEAR>	N	Achieved	EM-R1	Recorded Pre- and Post-inspections.
5_4_1_MAINLINE	Refer to relevant section in link above)	EM-A	NText		<5_4_1_MAINLINE>	N	Achieved	EM-R1	Recorded by the EM Analyst

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in http://www.spc.int/OceanFish/en/publications/doc_download/1318-2014-ll-trip-report

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
5_4_2_BRANCHLINES	Refer to relevant section in link above)	EM-A	NText		<5_4_2_BRANCHLINES>	N	Achieved	EM-R1	Recorded by the EM Analyst The following can be calculated from data already recorded: - Average branchline length for trip - Average branchline length per set - Average number of branchlines used - Average number of sharklines per set from sum(FLOAT_HEM-AK_N) / number of sets
5_4_3_FLOATLINES	Refer to relevant section in link above)	EM-A	NText		<5_4_3_FLOATLINES>	N	Achieved	EM-R1	Recorded by the EM Analyst The following can be calculated from data already recorded: - Average float line (FLOAT_LENGTH) - Average float line per set (FLOAT_LENGTH)
5_4_4_BLINE_WTS	Refer to relevant section in link above)	EM-A	NText		<5_4_4_BLINE_WTS>	N	Achieved	EM-R1	Recorded by the EM Analyst
5_4_5_FISH_HEM-AKS	Refer to relevant section in link above)	PRE EM-A POST	NText		<5_4_5_FISH_HEM-AKS>	N	Med	EM-R4	May be difficult for the EM Analyst to record. The following can be calculated from data already recorded: - Total number and percentage of hooks per set by hook type - Total number and percentage of hooks per trip by hook type
5_5_SAFETY_EQ	Refer to relevant section in link above)	PRE POST	NText		<5_5_SAFETY_EQ>	N	N/A	EM-NP	
5_6_REGRIG	Refer to relevant section in link above)		NText		<5_6_REGRIG>	N	N/A	EM-NP	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in http://www.spc.int/OceanFish/en/publications/doc_download/1318-2014-ll-trip-report

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
5_7_OTHER_GEAR	Refer to relevant section in link above)	PRE POST	NText		<5_7_OTHER_GEAR>	N	Achieved	EM-R1	Recorded by the EM Analyst if seen
6_0_FISH_STRATEGY	Refer to relevant section in link above)	EM-A POST	NText		<6_0_FISH_STRATEGY>	N	Low	EM-R3	Section 5 fields could be recorded by EM-A but may require extra cameras.
6_1_FISHERY_INFO	Refer to relevant section in link above)		NText		<6_1_FISHERY_INFO>	N	N/A	EM-NP	
6_2_OCEAN_FEATURES	Refer to relevant section in link above)		NText		<6_2_OCEAN_FEATURES>	N	N/A	EM-NP	
6_3_SET_HAUL	Refer to relevant section in link above)	EM-A AG	NText		<6_3_SET_HAUL>	N	Achieved	EM-R1	Recorded by the EM Analyst A summary table could be automatically generated from the data already recorded for each set: - Start set time - Set duration - Start haul time - Haul duration - Average number of hooks per basket
6_4_TARGET_DEPTH	Refer to relevant section in link above)	EM-A	NText		<6_4_TARGET_DEPTH>	N	N/A	EM-NP	May be difficult for EM-A to infer from deck operations and footage
6_5_BAITING	Refer to relevant section in link above)	EM-A	NText		<6_5_BAITING>	N	Med	EM-R3	Recorded by the EM Analyst Bait sequence could be automatically summarised from data provided in LL-2/3 for each set.
6_6_MITIGATION	Refer to relevant section in link above)	EM-A	NText		<6_6_MITIGATION>	N	Med	EM-R3	Recorded by the EM Analyst A list of mitigation methods automatically summarised from data provided in LL-2/3 for each set.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in http://www.spc.int/OceanFish/en/publications/doc_download/1318-2014-ll-trip-report

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
6_6_1_FISH_OFFAL	Refer to relevant section in link above)	EM-A	NText		<6_6_1_FISH_OFFAL>	N	Med	EM-R3	Recorded by the EM Analyst The Sol Is report stated that "This information can only be collected onboard the fishing vessel during the trip. It would require the video to adequately identify the vessel's practice with respect to disposal of offal."
6_7_HAUL_PROCESS	Refer to relevant section in link above)	EM-A	NText		<6_7_HAUL_PROCESS>	N	Achieved	EM-R1	Recorded by the EM Analyst and Pre- and Post-inspections.
6_8_UNUSUAL_SET	Refer to relevant section in link above)	EM-A	NText		<6_8_UNUSUAL_SET>	N	Achieved	EM-R1	Recorded by the EM-A.
6_9_CHANGES_SETS	Refer to relevant section in link above)	EM-A	NText		<6_9_CHANGES_SETS>	N	Achieved	EM-R1	Recorded by the EM-A. Summary tables of select set characteristics could be automatically generated.
7_1_WEATHER	Refer to relevant section in link above)	EM-A	NText		<7_1_WEATHER>	N	N/A	EM-NP	Only some details could be recorded by EM-A
7_2_SEA_COND	Refer to relevant section in link above)	EM-A	NText		<7_2_SEA_COND>	N	N/A	EM-NP	Only some details could be recorded by EM-A
7_3_MEM-AN_PHASE	Refer to relevant section in link above)	AG	NText		<7_3_MEM-AN_PHASE>	N	High	EM-P1	Recorded by the PDCO from interviews and moon phase table / calculation. Summary graph of catch by species against moon phase could be automatically produced.
8_1_TARGET_CATCH	Refer to relevant section in link above)	AG EM-A	NText		<8_1_TARGET_CATCH>	N	Achieved	EM-R1	Summary table of all target species could be automatically generated for the trip showing - target species weight/number by species

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in http://www.spc.int/OceanFish/en/publications/doc_download/1318-2014-ll-trip-report

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
8_1_1_TARGET_PROC	Refer to relevant section in link above)	EM-A	NText		<8_1_1_TARGET_PROC>	N	Achieved	EM-R3	Recorded by the EM Analyst and Pre- and Post-inspections. The quality of this information could depend on wheter there is a camera over the area of processing.
8_1_2_TARGET _DISC	Refer to relevant section in link above)	AG EM-A	NText		<8_1_2_TARGET _DISC>	N	Achieved	EM-R3	The quality of this information could depend on wheter there is a camera over the area of discarding. Summary table of all target discard species could be automatically generated for the trip showing - target species weight/number by species
8_1_3_TARGET_DAMAGE	Refer to relevant section in link above)	AG EM-A	NText		<8_1_3_TARGET_DAMAGE>	N	Achieved	EM-R4	Recorded by the EM-A. Summary table could be automatically produced for the trip showing: - Target species (common name followed by the scientific name and FAO code) retained or discarded for each “damage” fate category
8_2_1_OTHER_TUN_BILL	Refer to relevant section in link above)	AG EM-A	NText		<8_2_1_OTHER_TUN_BILL>	N	Achieved	EM-R1	Summary table of all non-target tuna and billfish could be automatically generated for the trip showing: - BILLFISH and other tuna weight/number by species to compare with logsheet
8_2_2_SHARKS_RAYS	Refer to relevant section in link above)	AG EM-A	NText		<8_2_2_SHARKS_RAYS>	N	Achieved	EM-R1	Summary table of all sharks and rays could be automatically generated for the trip showing: - Shark and Ray species (common name followed by the scientific name and FAO code) catch number

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in http://www.spc.int/OceanFish/en/publications/doc_download/1318-2014-ll-trip-report

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
8_2_3_OTHER_BY-CATCH	Refer to relevant section in link above)	AG EM-A	NText		<8_2_3_OTHER_BY-CATCH>	N	Achieved	EM-R2	Recorded by the EM Analyst and Pre- and Post-inspections. (for processing is not visible to EM). Summary table of all other bycatch species could be automatically produced for the trip showing: - Species (common name followed by the scientific name and FAO code) - Summary details listed Appendix 2
8_3_UNSPEC_SP_CODES	Refer to relevant section in link above)	EM-A	NText		<8_3_UNSPEC_SP_CODES>	N	Achieved	EM-R1	Recorded by the EM-Analyst. Opportunity to add image field.
8_4_1_SSI_LAND	Refer to relevant section in link above)	AG EM-A	NText		<8_4_1_SSI_LAND>	N	Achieved	EM-R1	Recorded by the EM-Analyst. Table of all SSIs that were sighted automatically generated from OBS_SSI for the trip showing: - Species (common name followed by the scientific name and FAO code) - Gender - Size - Description of interaction (including prior sighting, treatment, problems with ID) - Condition when landed - Condition when released Opportunity to add image field.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in http://www.spc.int/OceanFish/en/publications/doc_download/1318-2014-ll-trip-report

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
8_4_2_SSI_INTERACT	Refer to relevant section in link above)	AG EM-A	NText		<8_4_2_SSI_INTERACT>	N	Achieved	EM-R3	Recorded by the EM-Analyst but limited by field of view. Table of all SSIs that were sighted automatically generated from OBS_SSI for the trip showing: - Species (common name followed by the scientific name and FAO code) - Condition at start of interaction - Condition at end of interaction Opportunity to add image field.
8_4_3_SSI_MAM	Refer to relevant section in link above)	PRE EM-A POST	NText		<8_4_3_SSI_MAM>	N	Achieved	EM-R3	Recorded by the EM-Analyst but limited by field of view. Table of all SSIs that were sighted automatically generated from OBS_SSI for the trip showing: - Species (common name followed by the scientific name and FAO code) - Condition at start of interaction - Condition at end of interaction Opportunity to add image field.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in http://www.spc.int/OceanFish/en/publications/doc_download/1318-2014-ll-trip-report

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
8_4_4_SSI_SIGHT	Refer to relevant section in link above)	PRE EM-A POST	NText		<8_4_4_SSI_SIGHT>	N	Achieved	EM-R3	Recorded by the EM-Analyst but limited by field of view. Table of all SSIs that were sighted automatically generated from OBS_SSI for the trip showing: - Species (common name followed by the scientific name and FAO code) - Condition at start of interaction - Condition at end of interaction Opportunity to add image field.
9_0_TRANS	Refer to relevant section in link above)	PRE EM-A POST	NText		<9_0_TRANS>	N	Achieved	EM-R3	Recorded by the EM Analyst and Pre- and Post-inspections. Some mention of EM being hooked up to cranes to collect transhipment data.
10_1_TAGS	Refer to relevant section in link above)		NText		<10_1_TAGS>	N	N/A	EM-NP	Not applicable unless industry tag animals.
10_2_STOMACH	Refer to relevant section in link above)		NText		<10_2_STOMACH>	N	N/A	EM-NP	Not applicable unless industry take stomach samples.
10_3_OTHER	Refer to relevant section in link above)		NText		<10_3_OTHER>	N	N/A	EM-NP	Not applicable unless industry take data for other projects.
11_0_ TRIP_MON	Refer to relevant section in link above)	EM-A AG	NText		11_0_ TRIP_MON	N	Achieved	EM-R1	Recorded by the EM-Analyst.
11_1_CLARIFY	Refer to relevant section in link above)	PRE EM-A POST	NText		11_1_CLARIFY	N	N/A	EM-NP	Recorded by the EM-Analyst and Pre- and Post-inspections.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in http://www.spc.int/OceanFish/en/publications/doc_download/1318-2014-ll-trip-report

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
11_2_RECOMMEND	Refer to relevant section in link above)	PRE POST	NText		11_2_RECOMMEND	N	N/A	EM-NP	Recorded by the EM-Analyst and Pre- and Post-inspections.
11_3_CREW_INFO	Refer to relevant section in link above)	PRE POST	NText		11_3_CREW_INFO	N	N/A	EM-NP	Recorded from Pre- and Post-inspections.
11_4_MEDICAL	Refer to relevant section in link above)	PRE POST	NText		11_4_MEDICAL	N	N/A	EM-NP	Recorded from Pre- and Post-inspections.
11_5_PHOTOS	Refer to relevant section in link above)	PRE EM-A POST	NText		11_5_PHOTOS	N	Achieved	EM-R1	If in field of view.
11_6_OTHER INFO	Refer to relevant section in link above)	PRE EM-A POST	NText		11_6_OTHER INFO	N	N/A	Null	Recorded by the EM-Analyst and Pre- and Post-inspections.
12_0_VESS _DATA	Refer to relevant section in link above)	PRE POST	NText		<12_0_VESS _DATA>	N	N/A	EM-NP	Recorded from Pre- and Post-inspections.
13_0_GENERAL	Refer to relevant section in link above)	PRE EM-A POST	NText		<13_0_GENERAL>	N	Achieved	EM-R1	Recorded by the EM Analyst and Pre- and Post-inspections. This could include problems with the EM system including location and angle of cameras.
14_0_PROBS	Refer to relevant section in link above)	PRE EM-A POST	NText		14_0_PROBS	N	Achieved	EM-R1	May be two sections of monitoring problems and EM problems
14_1_FORM_CH_RECS	Refer to relevant section in link above)	PRE EM-A POST	NText		14_1_FORM_CH_RECS	N	N/A	Null	Recorded by the EM-Analyst and Pre- and Post-inspections.
15_0_CONCL	Refer to relevant section in link above)	PRE EM-A POST	NText		15_0_CONCL	N	Achieved	EM-R1	Recorded by the EM-Analyst and Pre- and Post-inspections.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

LL_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in http://www.spc.int/OceanFish/en/publications/doc_download/1318-2014-ll-trip-report

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
16_0_ACKS	Refer to relevant section in link above)	PRE EM-A POST	NText		16_0_ACKS	N	N/A	Null	Recorded by the EM-Analyst and Pre- and Post-inspections.

ANNEX V – EM DEBRIEFING CONCEPT NOTE

Second Regional E-Monitoring Process Standards Workshop

20–24 November 2017
Noumea, New Caledonia

Concept Note on: Electronic Monitoring Debriefing

Introduction

During the Second Regional E-monitoring Process Standards Workshop it became apparent that since the first EM trial in 2014, now 57 longline vessels and two purse seine vessels are today equipped with Camera EM Systems in PICTS. Further adoption of EM systems will proceed as a monitoring tool complimentary to observers and other monitoring tools already implemented. However, other than automated range checks in review software,standardised data quality assurance processes are not yet established.

The importance of observer debriefing is that observers work on board the vessel in situ, but remotely and without direct supervision. Debriefing by a qualified expert at the end of an observer's trip is the principal quality assurance process to ensure that the data are complete, collected following established protocols and are accurate. This utilises the written (or electronic) record of the observer, his memory and the skill of the debriefer to verify events recorded

In contrast, EM Data Review Centres involve EM Analysts interpreting a set of imagery and sensor records from a vessel trip in an office environment. Interpretation of the records into data formats does require skills learned in training and so a quality assurance process is required to validate the data generated by EM Analysts from analysis of the EM records. These EM records are permanent and so can be reviewed by more than one Analyst and under supervision. This environment also allows for supervising EM analysts can periodically throughout the analysis of EM records or at the end of an analysis.

The similar need for quality assurance, but applied to a different method of data capture requires a distinct approach to how EM data are assessed. The objective being to ensure that EM data is accurate, structured and formatted to comply with regional EM Data Process Standards, and to facilitate EM data to flow readily to national and regional database systems.

The PIRFO Programme is a framework of regional accreditation standards for observers, debriefers, trainers, assessors and managers. It does include a separate endorsement unit of qualification in EM monitoring for experienced observers. The PIRFO Debriefing Policy (2010) outlines the pre-requisites and process for qualification of observer debriefers, which has the prerequisites of being a qualified PIRFO observer with minimum sea-time and data quality requirements based on fishing gear-type.

This paper also recognises the work on *ERDebriefing* carried out by PNA IFIMS on observer electronically reported data debriefing and the need to integrate this work into an overarching regional Electronic Data Debriefing Standard.

Rationale

he rationale on how to approach quality assurance of EM data captured is that it is implemented complimentarily among other monitoring tools where the strengths of each tool is used to validate other tools and that best practices are a guarantee that robust data are available for use by scientists, compliance officers and managers.

Essentially, this quality assurance assessment can be separated into two processes: **Verification and Validation**. We expand on proposed definitions of these processes below as the basis for developing EM Debriefing Standards.

EM Verification: A process of evaluating the completeness and compliance of a collected data set against the required data fields, format, protocols and normal range of expected results.

Verification Types

Independent human (although algorithms should be developed to support this process) verification of data through checking:

- Completeness of data fields and formats;
- Critical incident assessment;
- Truth of unusual events;
- Technique of established protocols followed;
- Logic pathways; and
- A second expert reader.

AI (algorithm based) checks include:

- Range checks e.g. length ranges by species;
- Allowed character check e.g. alpha or numeric;
- Batch totals – e.g. LL4 summaries;
- Cardinality checks PS4 length data have a corresponding PS3 catch and a PS2 activity;
- Check digits (number of decimal places);
- Consistency checks e.g. bycatch relates to a FAD set;
- Control totals;
- Cross system consistency checks;
- Data type checks;
- File existence check;
- Logic check e.g. inspect floating object prior to recording an associated set;
- Presence check e.g. vessel ID;
- Uniqueness check e.g. Trip ID.

EM Verification Approach

EM systems benefit the data verification and validation processes as imagery or sensor recording and GPS position recording give a permanent record that may be analysed more than once.

The issue is that while EM technology allows for multiple analysis of the EM records, the analysis of EM records is not an in-situ interpretation of events. It appears best to use the strengths of EM to validate its weaknesses. So while there is not the observer Journal to refer to, the strength of EM are the 'permanent' recordings.

1. There is an obvious balance between authenticating data and cost effectiveness. Based on the importance of the data collected (we need this to be further defined by all users) EM dataverification techniques could involve:

1. Utilising innate redundancy of the EM Analyst summarising his/her data such as in the same format as the observer Trip Report.
2. Pre-debriefing as an interview of the Analyst with the data generated as an initial verification. This could follow established observer debriefing process to assess completeness, critical incidents, unusual events and protocols.
3. Automated checks provide summaries to pre debriefer after first pass of data.
4. Third party review of EM recordings:

a. Full rereading of data by a third party debriefer or observer (not the pre-debriefer).
b. Partial readings (50%, 20%, 10%, 5%) of some/all trips?
    i) How would the debriefing coverage of the reread be applied? Would it be trip based, 'form' based, or field based?Trip base = Random section of trip
    ii) Field-based = e.g. 20% of set, 50% of catch, all incidents, 100% SSIs. This needs to be clearly defined as a protocol as this method is likely to be directed the changing focus of regional requirements (CMMs).

5. Further verification may include:
6. A supervising analyst confirms specimens identification only for a selected section of the footage (e.g. big rush on deck, low light, camera lens dirty etc.) or for a random section of the footage. This can occur at regular intervals during the analysis, at the end of analysis or both. A combination is likely to allow quality data to be generated from the onset and avoid major errors at the start which would be time consuming to correct when the analysis if finished.

EM Validation: A process to assess accuracy of a set of data using analogous but independently collected sources to substantiate the veracity of data and information.

EM Validation Processes

This is the process where the strengths of each monitoring tool is used as a cross checking of EM data with:

- On-board observer;
- VMS;
- Logsheet;
- Unloadings;
- Boarding or port inspections;
- Automated AI analysis (e.g. positions with VMS); and.
- Other EM data sets for the same EM records.

Events may be validated by using independent EM systems such as imagery data versus sensor data.

EM Validation Tools

Comparison with:

1. On-board observer.

Observer collected data provides a directly comparative but independent validating tool for EM data.

2. Integrated data systems

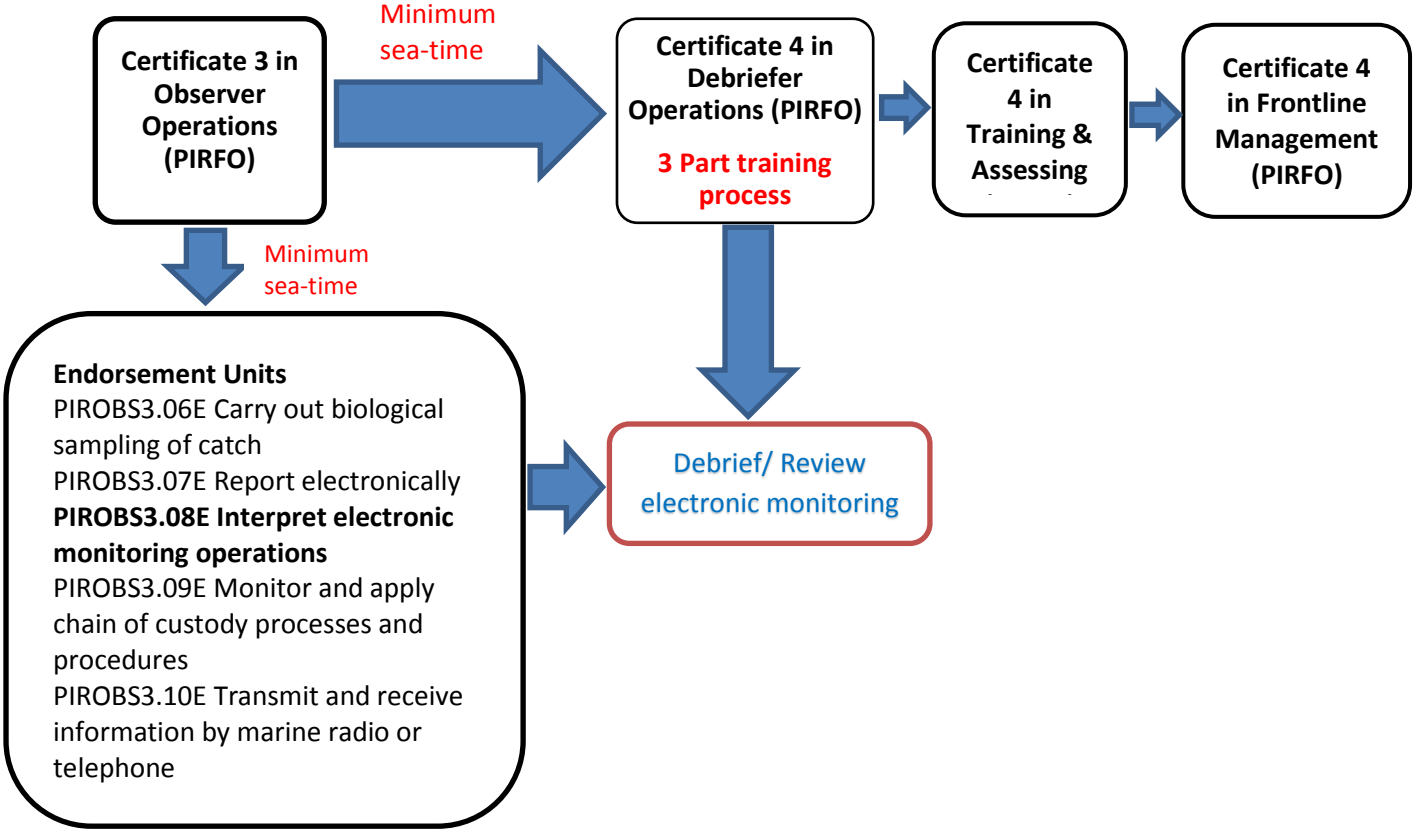
Integration of data collected by other systems such as VMS, port and boarding inspection, unloading, CDS, and any automated data collection (e.g. winch sensors) will facilitate and possibly automate validation of EM (and other) data.

Providing feedback to EM analysts

Providing feedback to EM analysts on their performance is also an important ongoing training process. The EM verification review process described above would suit this. However this would also require the development of appropriate reports in the EM analysis systems. Examples of standard queries could be: number and types of trips analysed, number and species analysed, time metrics (time per set, time between receiving a storage device and completing analysis), reporting compliance or unusual events. This meta-data should be generated from standardised data at the Data Review Centres' trip level.

PIRFO Certification Development

The PIRFO competency-based accreditation framework includes **PIROBS3.08E Interpret electronic monitoring operations,** which is designed as a specialist endorsement PIRFO Observer skill set for experienced PIRFO Observers. A PIRFO Certificate 4 in Debriefer Operations qualification also requires PIRFO Observer qualification and minimum sea-days experience in the relevant gear type. There is currently no qualification for EM Reviewing, though there is a clear need. Its incorporation into the PIRFO framework would logically include both the *Debriefer Operations* qualification and *Interpret electronic monitoring operations* skill set as pre-requisites as well as a determined level of EM experience.



Observer Experience

The PIRFO Debriefer Policy requires observer debriefers to make at least one observer trip per year to ensure they maintain their skills. Similarly, EM Analysts should have a similar regime of also doing observer trips to ensure they maintain their skills and are aware of technology or operational changes.

General Comments

In considering the process of EM records analysis, factors that determine the level of analysis needed may include:

- The EM Analysts' experience, e.g. number of trips as an EM Analyst, and as an observer with sea days on specific gear type fishing vessels;
- Individual EM Analyst diligence;
- Computer literacy;
- Length of trip to be analysed, i.e., a longline trip on a 'on ice' vessel (10-15 days at sea), a longline trip on a 'freezer' vessel (30 to 90 days at sea);
- IUU risk e.g. a purse seine trip during the FAD closure season; and
- The Data Review Centre's capacity and resources. This may even lead to some countries specialising in analysis or certain areas of analysis. This could include rapid analyses focusing on verifying catch of target species or bycatch, analyses focusing only on compliance related events, etc.

Workshop derived priorities for EM reviewing

The workshop recommended the following priority areas for advancement:

- Regional EM Reviewing standards be developed as a priority;
- Standardise an appropriate name and definition for the process of verifying and validating EM data (EM Debriefing; EM Review; EM Data Quality Verification?);
- EM Analyst training is incorporated into the PIRFO framework.

ANNEX VI – DRAFT PURS SEINE OBSERVER E-MONITORING PROCESS STANDARDS

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	* Data better collected by PS onboard observer	
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

OBS_TRIP

"The start of a trip is defined to occur when a vessel (a) leaves port after unloading part or all of the catch to transit to a fishing area or (b) recommences fishing operations or transits to a fishing area after transshipping part or all of the catch at sea (when this occurs in accordance with the terms and conditions of article 4 of Annex III of the Convention, subject to specific exemptions as per article 29 of the Convention)."

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC FIELD	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	AG			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
obsprg_code	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	AG	Char (4)	Observer programme code must be must valid country. Refer to valid ISO two-letter Country Codes - ISO 3166	<obsprg_code>	Y	Achieved	EM-R1	This should be Observer program code for the person responsible for reviewing the video and compiling ROP information. Will this always be a country code if a third party is providing the EM reading service? Consider use of another code instead of "OB" to be specific that data was EM collected.(e.g. "PGEM") Needs to be reviewed by DCC WCPFC
staff_code	EM-A NAME CODE. This will be unique and link. Currently generated by SPC currently	EM-A	VarChar (5)	Staff code must exist in the regional Observer (FIELD_STAFF) Name Table. The unique 5-letter staff codes are generated and maintained by SPC/FFA.	<staff_code>	Y	Achieved	EM-R1	This should be staff name code for the person responsible for reviewing the video and compiling ROP information (EM-Analyst) Does this field need to be modified to include a fifth character "V" for vessel observer and "O" for EM-Analyst? Or should this be a completely separate field OBSTYPE?
staff_code_2	Additional staff NAME CODE. This will be unique and link to information kept at the regional level including Staff Name, Nationality of staff, Staff provider. Such additional staff may include port data collection officer that collects the PRE and POST data.	EM-A					Achieved	EM-R1	Identifies additional staff *Needs to be reviewed / agreed by DCC WCPFC*
Provider_code	Identifies the service provider	AG					Achieved	EM-R1	Identifies the service provider *Needs to be reviewed / agreed by DCC WCPFC*
Software_vers_A	Identifies the data analysis software version	AG					High	EM-New	*Needs to be reviewed / agreed by DCC WCPFC* Provide the link to the specific versions metadata
Software_vers_B	Identifies the EM equipment software version	AG					High	EM-New	*Needs to be reviewed / agreed by DCC WCPFC* Provide the link to the equipment software versions

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIP

"The start of a trip is defined to occur when a vessel (a) leaves port after unloading part or all of the catch to transit to a fishing area or (b) recommences fishing operations or transits to a fishing area after transshipping part or all of the catch at sea (when this occurs in accordance with the terms and conditions of article 4 of Annex III of the Convention, subject to specific exemptions as per article 29 of the Convention)."

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC FIELD	Priority for EM R&D	Category	Notes
Hardware_vers	EM Hardware components						High	EM-New	*Needs to be reviewed / agreed by DCC WCPFC* Provide the link to the specific hardware versions
Analysis_Duration	Analysis Duration time						High	EM-New	*Needs to be reviewed / agreed by DCC WCPFC*
Data_Export_Time	Date-time that date was exported						High	EM-New	*Needs to be reviewed / agreed by DCC WCPFC*
tripno	Unique TRIPNO for each observer in a given year (Regional Standard) Use the last two digits of the trip year followed by a dash and increment number for each trip in a year FOR THAT OBSERVER. YY-XX, for example, '14-01' would represent the first trip for an observer in the calendar year 2014		Char (5)	Must adhere to the regional standard	<tripno>	N	N/A	Null	Can be easily generated if necessary. Does this assume that the EM-Analyst must start and finish a Trip before the next one? If they have multiple trips, then this should be sequential based on which trip was started first. This can be uniquely identified through combination of vessel, Dep_date and Staff Incremental increase in trip numbers for an observer should include EM trips reviewed – The alternative is to have a code of EM collected data – which might be needed anyway?
tripno_internal	TRIPNO as allocated and used by the respective Observer service provider. (If this system is different from the regional standard (e.g. the US PS MLT observer programme trip number uses the format '24LP/xxx')		VarChar (15)		<tripno_INT>	N	N/A	Null	This field might provide an opportunity for marking as an EM trip This can be uniquely identified through combination of vessel, Dep_date and Staff
DATE and TIME OF DEPARTURE from PORT	Depart DATE/TIME the vessel leaves a port to start its fishing campaign Obtained from other sources of data (e.g. VMS) Automatically generated by the vessel leaving a defined port box geofence May be identified by EM-Analyst Recorded during a pre-trip inspection	EM-A, AG	REFER TO APPENDIX A1	Use UTC DATE for the departure date. Must adhere to the ISO 8601 format in Appendix A1	<DATE_DEP_PORT>	Y	Achieved	EM-R1	Transhipment at sea is an issue A standard is required defining a database of each port and a geofence. *Needs to be reviewed / agreed by DCC / WCPFC* *This may need to refer to start of trip (that can include transhipment) rather than return to port. Need to be reviewed by DCC / WCPFC.*

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIP

"The start of a trip is defined to occur when a vessel (a) leaves port after unloading part or all of the catch to transit to a fishing area or (b) recommences fishing operations or transits to a fishing area after transshipping part or all of the catch at sea (when this occurs in accordance with the terms and conditions of article 4 of Annex III of the Convention, subject to specific exemptions as per article 29 of the Convention)."

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC FIELD	Priority for EM R&D	Category	Notes
DATE and TIME OF EMBARKATION	DATE/TIME the observer leaves the port (departs or embarks) to start their observer trip. If embarking at sea, this will be different from the DATE/TIME of Vessel departure from port. Obtained from other sources of data (e.g. VMS) Automatically generated by the vessel leaving a defined port box geofence. May be identified by EM-Analyst Recorded during a pre-trip inspection		REFER TO APPENDIX A1	Use UTC DATE for the departure date. Must adhere to the ISO 8601 format in Appendix A1	<DATE_EMBARK>	Y	N/A	Null	Transhipment at sea is an issue A standard is required defining a database of each port and a geofence. *Needs to be reviewed / agreed by DCC / WCPFC*
DATE AND TIME OF RETURN IN PORT	DATE/TIME for the vessel to return to port	EM-A, AG	REFER TO APPENDIX A1	Data should be reported in UTC DATE/TIME. Must adhere to the ISO 8601 format in Appendix A1	<ret_date>	Y	Achieved	EM-R1	This may need to refer to end of trip (that can include transhipment) rather than return to port. A standard is required defining a database of each port and a geofence. *Needs tobe reviewed / agreed by DCC / WCPFC*
DATE AND TIME OF DISEMBARKATION	DATE/TIME the observer disembarks from the vessel to end the observer trip. May be identified by EM-Analyst Recorded during a pre-trip inspection		REFER TO APPENDIX A1	Data should be reported in UTC DATE/TIME. Must adhere to the ISO 8601 format in Appendix A1	<DATE_DISEMBARK>	Y	N/A	Null	This may need to refer to end of trip (that can include transhipment) rather than return to port. A standard is required defining a database of each port and a geofence. *Needs to be reviewed / agreed by DCC / WCPFC* *This could be date and time that EM data is retreived.*
GEAR_TYPE	Link to ref_gears table Selected by the EM-Analyst Could be determine by pre-trip vessel inspection or licencing information Automatically generarated from the vessel identifier and hardwired into the software	PRE, AG	Char (1)	Must be a valid GEAR: 'L' – Longline; 'S' – Purse seine; 'P' – Pole-and-line	<GEAR_TYPE>	Y	Achieved	EM-R1	In future it will almost certainly be derived from the vessel identfier automatically

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	* Data better collected by PS onboard observer	
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

OBS_TRIP

"The start of a trip is defined to occur when a vessel (a) leaves port after unloading part or all of the catch to transit to a fishing area or (b) recommences fishing operations or transits to a fishing area after transshipping part or all of the catch at sea (when this occurs in accordance with the terms and conditions of article 4 of Annex III of the Convention, subject to specific exemptions as per article 29 of the Convention)."

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC FIELD	Priority for EM R&D	Category	Notes
FISHING PERMIT/LICENSE NUMBERS	PROVIDE License/Permit number that the vessel holds for the period of the TRIP.	PRE, Post	CHAR(40)	Where possible, include validation to ensure the Permit format relevant to the agreement (national or sub-regional) complies to the required format.	<License_NO>	N	Achieved	EM-R1	All that is needed is the vessel identifier and time preiod of the trip to link to licencing data The need for this with EM is questionable and the data is not used or accurate Review by DCC and WCPFC
VESSEL IDENTIFIER	REFER TO APPENDIX A4	EM-A, PRE, Post					Achieved	EM-R1	Ideally this would be UVI and programmed into the software during setup The service provider needs to have access to this data and vessel names
versn_id	WCPFC ER and EM standards version Potentially a concatenated field	AG, EM-A	Int		<versn_id>	N	Achieved	EM-R1	
XML_version_id	Not established standard yet	AG, EM-A					High	EM-New	*Needs to be reviewed / agreed by DCC / WCPFC*
country_code	Two letter COUNTRY CODE for the country who organise the trip	AG EM-A	Char (2)	Refer to valid ISO two-letter Country Codes - ISO 3166	<country_code>	N	Achieved	EM-R1	*This is identical to the first two letter of OBSPRG* *Review by the DCC / WCPFC*
PORT OF DEPARTURE	PROVIDE the Port of Departure Obtained from other sources of data (e.g. VMS) Automatically generated by the vessel leaving a defined port box geofence. May be identified by EM-Analyst Recorded during a pre-trip inspection	AG EM-A PRE	REFER TO APPENDIX A3	Must be valid United Nations - Code for Trade and Transport Locations (UN/LOCODE) – see http://www.unece.org/cefact/locode/service/location Not mandatory?	<DEP_PORT>	Y	Achieved	EM-R1	EM data actually automatically generates Lat and Long. Converting this to a "Port" name field reduces resolution. A standard is required defining a database of each port and a geofence for VMS. *Needs to be reviewed / agreed by DCC / WCPFC* Automatically generated from VMS / GPS

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIP

"The start of a trip is defined to occur when a vessel (a) leaves port after unloading part or all of the catch to transit to a fishing area or (b) recommences fishing operations or transits to a fishing area after transshipping part or all of the catch at sea (when this occurs in accordance with the terms and conditions of article 4 of Annex III of the Convention, subject to specific exemptions as per article 29 of the Convention)."

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC FIELD	Priority for EM R&D	Category	Notes
PORT OF RETURN	PROVIDE the Port of Return for Unloading Obtained from other sources of data (e.g. VMS) Automatically generated by the vessel leaving a defined port box geofence. May be identified by EM-Analyst Recorded during a post-trip inspection	AG EM-A POST	REFER TO APPENDIX A3	Must be valid United Nations - Code for Trade and Transport Locations (UN/LOCODE) Not mandatory?	<RET_PORT>	Y	Achieved	EM-R1	A standard is required defining a database of each port and a geofence. *Needs to be reviewed / agreed by DCC / WCPFC* Automatically recorded from VMS / GPS
EMBARK_LAT	The actual depart LAT position for the trip (if departing AT SEA)		REFER TO APPENDIX A2	Must adhere to the ISO 6709 – Positions Degrees and minutes to 3 decimal places	<EMBARK_LAT>	Y	N/A	Null	Redundant Not needed as the EM wont disembark at sea
EMBARK_LON	The actual depart LON position for the trip (if departing AT SEA)		REFER TO APPENDIX A2	Must adhere to the ISO 6709 – Positions Degrees and minutes to 3 decimal places	<EMBARK_LON>	Y	N/A	Null	Redundant Not needed as the EM wont disembark at sea
DISEMBARK_LAT	The actual return LAT position for the trip (if departing AT SEA)		REFER TO APPENDIX A2	Must adhere to the ISO 6709 – Positions Degrees and minutes to 3 decimal places	<DISEMBARK_LAT>	Y	N/A	Null	Redundant Not needed as the EM wont disembark at sea
DISEMBARK _LON	The actual return LON position for the trip (if departing AT SEA)		REFER TO APPENDIX A2	Must adhere to the ISO 6709 – Positions Degrees and minutes to 3 decimal places	<DISEMBARK_LON>	Y	N/A	Null	Redundant Not needed as the EM wont disembark at sea
vesowner	NAME of the vessel owner	PRE	NVarChar (50)	Name and contact if possible of the owner of the vessel, if it is owned by a company, then use the company name.	<vesowner>	Y	N/A	EM-NP *	
HULL MARKINGS	Check compliance with CMM2004-03 and its successor measures	PRE		The hull markings should be consistent with CMM2014-03 and its successor measures; these are virtually the same as the FAO standards on vessel markings except that a few letters disallowed in the FAO standards are permitted in CMM2004-03 and its successor measures.	<HULL_MARKINFS>	Y	N/A	EM-NP *	No format supplied for this. Check spelling of XML Tag

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_TRIP

"The start of a trip is defined to occur when a vessel (a) leaves port after unloading part or all of the catch to transit to a fishing area or (b) recommences fishing operations or transits to a fishing area after transshipping part or all of the catch at sea (when this occurs in accordance with the terms and conditions of article 4 of Annex III of the Convention, subject to specific exemptions as per article 29 of the Convention)."

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC FIELD	Priority for EM R&D	Category	Notes
WIN MARKINGS	Check compliance with CMM2004-03 and its successor measures	PRE			<WIN_MARKINFS>	Y	N/A	EM-NP *	No format supplied for this. Check spelling of XML Tag
VESCAPT_NAME	NAME of the captain of the vessel	PRE	NVarChar (50)		<vescaptain>	Y	N/A	EM-NP *	
VESCAPT_NATION	NATIONALITY of the captain of the vessel Two letter COUNTRY CODE for the country who organise the trip	PRE	Char (2)	Refer to valid ISO two-letter Country Codes - ISO 3166 For example, refer to http://en.wikipedia.org/wiki/ISO_3166-1	<vescapt_CO_CODE>	Y	N/A	EM-NP *	The EM standard includes hull markings, win markings
VESCAPT_ID_DOC	The Document that confirms nationality of the captain.	PRE	NVarChar (20)		<VESCAPT_ID_DOC>	Y	N/A	EM-NP *	
vesmaster	NAME of the fishing master	PRE	NVarChar (50)	Is there a annual list? (I doubt it)	<vesmaster>		N/A	EM-NP *	the"WCPFC field" is not there in the ERDS.
VESMAST_NATION	NATIONALITY of the vessel MASTER Two letter COUNTRY CODE for the country who organise the trip	PRE	Char (2)	Refer to valid ISO two-letter Country Codes - ISO 3166 For example, refer to http://en.wikipedia.org/wiki/ISO_3166-1	<vescapt_CO_CODE>	Y	N/A	EM-NP *	
VESMAST_ID_DOC	FISHING MASTERS's Document ID	PRE	NVarChar (20)		<VESCAPT_ID_DOC>	Y	N/A	EM-NP *	
CREW_TOTAL	Total number of CREW on-board, including captain and officers, during the trip (does not include observer).	PRE	Int		<crew_number>	Y	N/A	EM-NP *	Recorded by the port data collection officer on FORM LL-1 and then entered into data capture screen
CREW_OTHERS	Total number of the crews excluding captain and fishing master.	PRE	Int		<CREW_OTHERS>	Y	N/A	EM-NP *	Recorded by the port data collection officer on FORM LL-1 and then entered into data capture screen
BOARD_NATION	Nationality of any boarding vessel. When at sea indicate if any patrol vessels made a boarding name and nationality of the vessel making the boarding	POST	Char (2)	Refer to valid WCPFC alpha-2 two-letter Country Codes For example, refer to WCPFC Codes web page	<CAPT_CO_CODE>	Y	N/A	EM-NP *	Would need to be obtained from skipper in post trip interview. Im not sure if this is right? The description doent match the name
spill	FLAG to indicated the trip was a SPILL SAMPLE trip	PRE	Bit		<spill>	N	N/A	EM-NP *	

OBS_TRIP

"The start of a trip is defined to occur when a vessel (a) leaves port after unloading part or all of the catch to transit to a fishing area or (b) recommences fishing operations or transits to a fishing area after transshipping part or all of the catch at sea (when this occurs in accordance with the terms and conditions of article 4 of Annex III of the Convention, subject to specific exemptions as per article 29 of the Convention)."

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC FIELD	Priority for EM R&D	Category	Notes
cadet	FLAG to indicated whether the trip was observed by a CADET observer	PRE	Bit		<cadet>	N	N/A	EM-NP *	
sharktarget	FLAG to indicate a trip has targeted SHARKS (LONGLINE trips only)		Bit		<sharktarget>	N	N/A	Null	
comments	General comments about the trip - particularly about new technology or gear etc	EM-A	NText		<comments>	N	Achieved	EM-R1	Needs some guidance about what comments are required General comments
EM comments	General comments about EM during the trip	EM-A	NText		<comments>	N	Med	EM-New	Maybe should be overridden by a EM performance Comments specifically regarding quality of EM information *Needs to be reviewed / agreed by DCC / WCPFC*

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_CREW

PROVIDE the details of each PURSE SEINE CREW member on this TRIP.

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Issues
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
CREW IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<V_CREW_ID>	Y	Achieved	EM-Nat	
VSJOB_ID	CREW JOB TYPE	PRE SETUP POST	INT REFER TO APPENDIX 19	Must be a valid CREW JOB code	<VSJOB_ID>	N	N/A	EM-NP *	Will require interview with skipper. If done at setup, Field values may change prior to any given trip.
NAME	Name of the person in this position	PRE SETUP POST	NVarChar (50)		<NAME>	N	N/A	EM-NP *	Will require interview with skipper. If done at setup, Field values may change prior to any given trip.
country_code	Nationality of the person in this position	PRE SETUP POST	Char (2)	Refer to valid ISO two-letter Country Codes - ISO 3166 http://en.wikipedia.org/wiki/ISO_3166-1	<country_code>	N	N/A	EM-NP *	Will require interview with skipper. If done at setup, Field values may change prior to any given trip.
EXP_YR	Experience in Years	PRE SETUP POST	SmallInt		<EXP_YR>	N	N/A	EM-NP *	Will require interview with skipper. If done at setup, Field values may change prior to any given trip.
EXP_MO	Experience in months	PRE SETUP POST	SmallInt		<EXP_MO>	N	N/A	EM-NP *	Will require interview with skipper. If done at setup, Field values may change prior to any given trip.
Comments	Comments	PRE SETUP POST	NText		<comments>	N	N/A	EM-NP *	Will require interview with skipper. If done at setup, Field values may change prior to any given trip.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

VES_ELEC

PROVIDE information on the standard Marine Electronic devices.

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
TRIP/VESSEL DEVICE IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<V_DEVICE_ID>	Y	Achieved	EM-Nat	
device_id	Marine Device CODE.	PRE SETUP	Int	Refer to APPENDIX 20 - the DEVICES should only be available according to the respective gear code (e.g. "S" for purse seine or "L" for longline is in the GEAR LIST CODES column)	<device_id>	Y	N/A	EM-NP *	Will require pre-inspection interview with skipper and tour of wheelhouse.
ONBOARD_code	Is this DEVICE SIGHTED ONBOARD ?	PRE SETUP	Char (1)	'Y' or 'N'	<ONBOARD_code>	Y	N/A	EM-NP *	As above
usage_code	Is this DEVICE USED ?	EM-A	Char (3)	Refer to APPENDIX 21	<usage_code>	N	Low	EM-R3 *	Use of cameras in the wheelhouse to capture use of vessel electrics is possible but may invade privacy. May be able to be automatically generated from electrical monitoring of wheelhouse devices (other than cameras) e.g.sensors?
make_desc	Description of Make	PRE SETUP	NVarChar (30)	Dropdown List?	<make_desc>	N	N/A	EM-NP *	
model_desc	Description of Model	PRE SETUP	NVarChar (30)	Dropdown List - Child of Make?	<model_desc>	N	N/A	EM-NP *	
comments	Comments	PRE EM-A	NText	Free text	<comments>	N	Low	EM-R1 *	

PS_GEA+A1:N13R

PROVIDE information on the PURSE SEINE GEAR on the vessel.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

FIELD	Data Collection Instructions	Entry Source (SETUP PRE EM-A POST AG CF)	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
PS GEAR IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<S_GEAR_ID>	Y	Achieved	EM-Nat	
PB_MAKE	Power block make	SETUP PRE	NVarChar (20)		<PB_MAKE>	N	N/A	EM-NP *	
PB_MODEL	Power block model	SETUP PRE	NVarChar (20)		<PB_MODEL>	N	N/A	EM-NP *	
PW_MAKE	Purse winch make	SETUP PRE	NVarChar (20)		<PW_MAKE>	N	N/A	EM-NP *	
PW_MODEL	Purse winch model	SETUP PRE	NVarChar (20)		<PW_MODEL>	N	N/A	EM-NP *	
NET_DEPTH	Max depth of the net	SETUP PRE AG	SmallInt		<NET_DEPTH>	Y	Low	EM-R3 *	Could be recorded with a sensors on the bottom of the net during operation?
NET_DEPTH_UNIT_ID	Net Depth unit of measurement M – metres; Y- Yards; F-Fathoms	SETUP PRE AG	Int	Must be M, Y, F or blank	<NET_DEPTH_UNIT_ID>	Y	Low	EM-R3 *	Automatically generated from above
NET_LENGTH	Max length of the net	SETUP PRE AG	SmallInt		<NET_LENGTH>	Y	Low	EM-R3 *	Could be recorded with a sensors on the headline of the net during operation?
NET_LENGTH_UNIT_ID	Net Length unit of measurement M – metres; Y- Yards; F-Fathoms	SETUP PRE AG	Int	Must be M, Y, F or blank	<NET_LENGTH_UNIT_ID>	Y	Low	EM-R3 *	Automatically generated from above
NET_STRIPS	Number of net strips	SETUP PRE EM-A	SmallInt		<NET_STRIPS>	N	N/A	EM-NP *	Each net is made up of strips of netting sewn together to create the depth of the net. Can be recorded by the EM-Analyst only if in field of view of a camera.

PS_GEA+A1:N13R

PROVIDE information on the PURSE SEINE GEAR on the vessel.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		* Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
NET_HANG_RATIO	Max net hang ratio	SETUP PRE	SmallInt		<NET_HANG_RATIO>	N	N/A	EM-NP *	
MESH_MAIN	Main Mesh size	SETUP PRE	SmallInt		<MESH_MAIN>	Y	N/A	EM-NP *	
MESH_MAIN_UNIT_ID	Main mesh size unit of measurement C – centimetres; I - Inches	SETUP PRE	Int	Must be M, Y, F or blank	<MESH_MAIN_UNIT_ID>	Y	N/A	EM-NP *	
BRAIL_SIZE1	Brail #1 Capacity	PRE EM-A	Decimal (5,1)		<BRAIL_SIZE1>	Y	Med	EM-R3 *	
BRAIL_SIZE2	Brail #2 Capacity	PRE EM-A	Decimal (5,1)		<BRAIL_SIZE2>	Y	Med	EM-R3 *	
BRAIL_TYPE	Brailing Type Description	SETUP PRE EM-A	Ntext		<BRAIL_TYPE>	N	Low	EM-R1 *	Can be recorded by the EM-Analyst only if in field of view of a camera.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		* Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_OBS_ACTIVITY

The observer must PROVIDE a record of EACH change in ACTIVITY for EACH DAY AT SEA for the period of the trip. This is effectively the OBSERVER's ACTIVITY LOG

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
ACTIVITY LOG IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<S_LOG_ID>	Y	Achieved	EM-Nat	
DAY_start	Local/Ship's Date and time at the start of daily activities.		REFER TO APPENDIX A1	(Identical to field in PS_OBS_DAY)	<start_date>	N	N/A	Null	Recorded when flagged by the EM-Analyst
UTC_DAY_START	UTC equivalent of DAY_START	EM-A AG	REFER TO APPENDIX A1	(Identical to field in PS_OBS_DAY)	<UTC_start_date>	N	Achieved	EM-R1	Recorded when flagged by the EM-Analyst
act_TIME	Record ships time for each activity as indicated on the activity code table.		SmallInt	Must be consistent with the start of DAY log DATE. The combined DATE/TIME may be provided in this field.	<act_TIME>	Y	N/A	Null	Can be obtained from field above
UTC_act_TIME	UTC equivalent of ACT_TIME	EM-A AG	SmallInt	Must be consistent with the start of DAY log UTC DATE. The combined UTC DATE/TIME may be provided in this field.	<UTC_ACT_TIME>	N	Achieved	EM-R1	Recorded when flagged by the EM-Analyst
lat	Latitude at which this ACTIVITY LOG recorded	EM-A AG	REFER TO APPENDIX A2	Must adhere to the ISO 6709 format in Appendix A2	<lat>	Y	Achieved	EM-R1	Recorded when flagged by the EM-Analyst
lon	Longitude at which this ACTIVITY LOG recorded.	EM-A AG	REFER TO APPENDIX A2	Must adhere to the ISO 6709 format in Appendix A2	<lon>	Y	Achieved	EM-R1	Recorded when flagged by the EM-Analyst
s_activ_id	Purse seine activity code.	EM-A SENSOR	REFER TO APPENDIX A5		<s_activ_id>	Y	High	EM R3/4 *	It is possible (to different degrees for different codes). May be worthwhile EM working towards detection of FAD association? Cameras will observe if the FAD is on the deck but likely to need 1-2 extra cameras for detection of FAD investigation by vessel.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	* Data better collected by PS onboard observer	
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_OBS_ACTIVITY

The observer must PROVIDE a record of EACH change in ACTIVITY for EACH DAY AT SEA for the period of the trip. This is effectively the OBSERVER's ACTIVITY LOG

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
schas_id	School association code.	EM-A SENSOR	REFER TO APPENDIX A6		<schas_id>	Y	High	EM R3/4 *	Can EM can potentially interpret a combination of vessel behaviour, catch composition and evidence of a FAD to successfully estimate Set type
deton_id	Provide method of detection of fish. Use Detection id. code. Must be 1-6 or 0 for no information.		REFER TO APPENDIX A7		<deton_id>	Y	N/A	EM-NP *	
beacon	Beacon number where available. (there may be a regional standard numbering system in the future).		NVarChar (20)	Can only be recorded where an activity is related to an event for investigating, deploying, retrieving or setting on a floating object. REFER TO APPENDIX A5	<beacon>	N	N/A	EM-NP *	May be addressed by a FAD registration system in the future
comments	Observer comments related to this activity	EM-A	NText		<comments>	N	N/A	Null	Unless the fields above are actually turned on then this field is not applicable.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	* Data better collected by PS onboard observer	
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_OBS_SET

The observer must PROVIDE the following information for EACH FISHING SET/HAUL during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
SET IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF		Must be consistent with PS_OBS_ACTIVITY record where S_ACTIV_ID = 1 (A fishing set).	<S_SET_ID>	Y	Achieved	EM-Nat	
set_number	Unique # for the SET in this trip Can be filled out by an EM analyst viewing footage or automatically generated from a variety of the EM system components	EM-A AG	Int		<set_number>	N	Achieved	EM-R1	Increases sequentially throughout the trip in the order that they happen. Set number will normally be the same as the vessel's set number.
observed_yn	Flag to indicate whether set was observed or not. Were all the start and end positions observed directly	EM-A	Bit		<observed_yn>		Achieved	EM-R1	This is not a clear/appropriate definition for the EM process. *Needs to be reviewed by DCC / WCPFC.*
SKIFFOFF_TIME	LOCAL DATE/TIME for the START OF SET. Automatically generated from UTC DEFINED as the START of SET – Local DATE/Time when net skiff off with net	AG	REFER TO APPENDIX A1	Use local DATE/TIME. Must adhere to the ISO 8601 format in Appendix A1	<SKIFFOFF_TIME>	Y	N/A	Null	Ship's date was the standard for hardcopy forms. Information captured below for UTC
SKIFFOFF_UTC	UTC DATE/TIME for the START OF SET. Can be filled out by an EM-A viewing images or automatically generated from a variety of the EM system components Depending on camera frame can see the skiff released or the rope on the skiff released.	EM-A AG	REFER TO APPENDIX A1	Use UTC DATE/TIME. Must be aligned to skiffoff_time Must adhere to the ISO 8601 format in Appendix A1	<SKIFFOFF_UTC>	N	Achieved	EM-R1	Inherent in most EM systems using EM-Analyst visual or combination of camera / sensor /
WINCHON_TIME	LOCAL DATE/TIME when winches start to haul the net.		REFER TO APPENDIX A1	Must adhere to the ISO 8601 format in Appendix A1	<WINCHON_TIME>	N	N/A	Null	Ship's date was the standard for hardcopy forms. Information captured below for UTC

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	* Data better collected by PS onboard observer	
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_OBS_SET

The observer must PROVIDE the following information for EACH FISHING SET/HAUL during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
WINCHON_UTC	UTC DATE/TIME when winches start to haul the net. Camera needs to be above the winch or use of sensors on the winch could automatically generate this field. Camera very high would also see the skiff passing the cable. Can be filled out by an EM-A viewing images or automatically generated from a variety of the EM system components	EM-A AG	REFER TO APPENDIX A1	Use UTC DATE/TIME. Must be aligned to winchon_time Must adhere to the ISO 8601 format in Appendix A1	<WINCHON_UTC>	N	Achieved	EM-R1	Recorded by the EM system when flagged by the EM-A or detected by sensor. Inherent in most EM systems using EM-Analyst visual or combination of camera / sensor.
RINGUP_TIME	LOCAL DATE/TIME when purse ring is raised from the water.	EM-A -> AG AG	REFER TO APPENDIX A1	Use LOCAL DATE/TIME. Must adhere to the ISO 8601 format in Appendix A1	<RINGUP_TIME>	N	N/A	Null	Ship's date was the standard for hardcopy forms. Information captured below for UTC
RINGUP_UTC	UTC DATE & TIME when purse ring is raised from the water. EM Analysist can see when all of the rings are up. Sensors on the hydraulic winch would drop out.	EM-A AG	REFER TO APPENDIX A1	Use UTC DATE/TIME. Must be aligned to ringup_time Must adhere to the ISO 8601 format in Appendix A1	<RINGUP_UTC>	N	Critical	EM-R1	Recorded by the EM system when flagged by the office observer (or is this flagged by the gear sensors?). Inherent in most EM systems using EM-Analyst visual or combination of camera / sensor / GPS Position is also a requirement but captured elsewhere
SBRAIL_TIME	LOCAL DATE/TIME when brailing begins.	EM-A -> AG AG	REFER TO APPENDIX A1	Use LOCAL DATE/TIME. Must adhere to the ISO 8601 format in Appendix A1	<SBRAIL_TIME>	N	N/A	Null	Ship's date was the standard for hardcopy forms. Information captured below for UTC
SBRAIL_UTC	UTC DATE/TIME when brailing begins. Observed by EM-A when the first brail is deployed (clipped to the rope). Potential for sensor on the brail winch hydraulics. If a no brail set and fish taken from the sack then considered as a 1 brail set. No fish - no brail record.	EM-A AG	REFER TO APPENDIX A1	Use UTC DATE/TIME. Must be aligned to sbrail_time Must adhere to the ISO 8601 format in Appendix A1	<SBRAIL_UTC>	N	Achieved	EM-R1	Recorded by the EM system when flagged by the EM-A or detected by sensor. Inherent in most EM systems using EM-Analyst visual or combination of camera / sensor.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	* Data better collected by PS onboard observer	
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_OBS_SET

The observer must PROVIDE the following information for EACH FISHING SET/HAUL during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
EBRAIL_TIME	LOCAL DATE/TIME when brailing ends.	EM-A -> AG AG	REFER TO APPENDIX A1	Use LOCAL DATE/TIME. Must adhere to the ISO 8601 format in Appendix A1	<EBRAIL_TIME>	N	N/A	Null	Ship's date was the standard for hardcopy forms. Information captured below for UTC
EBRAIL_UTC	UTC DATE & TIME when brailing ends. Observed by EM-A when the last brail has finished deployment (clipped off the rope). Potential for sensor on the brail winch hydraulics. If there was no brailing record the time the sack was lifted onto the deck.	EM-A AG	REFER TO APPENDIX A1	Use UTC DATE/TIME. Must be aligned to ebrail_time Must adhere to the ISO 8601 format in Appendix A1	<EBRAIL_UTC>	N	Achieved	EM-R1	Recorded by the EM system when flagged by the EM-A or detected by sensor. Inherent in most EM systems using EM-Analyst visual or combination of camera / sensor.
STOP_TIME	LOCAL DATE/TIME for the END of SET - Time when net skiff comes on-board i.e. end of set.	EM-A -> AG AG	REFER TO APPENDIX A1	Use LOCAL DATE/TIME. Must adhere to the ISO 8601 format in Appendix A1	<STOP_TIME>	Y	N/A	Null	Ship's date was the standard for hardcopy forms. Information captured below for UTC
STOP_UTC	UTC DATE & TIME – Date &Time when net skiff comes on-board i.e. end of set. Can be filled out by an EM-A viewing images or automatically generated from a variety of the EM system components Depending on camera frame can see the skiff returned or the rope on the skiff tightened.	EM-A AG	REFER TO APPENDIX A1	Use UTC DATE/TIME. Must be aligned to stop_time Must adhere to the ISO 8601 format in Appendix A1	<STOP_UTC>	N	Achieved	EM-R1	Recorded by the EM system when flagged by the EM-A or detected by sensor. Inherent in most EM systems using EM-Analyst visual or combination of camera / sensor.
LD_BRAILS	Sum of all brails After calculating the total number of brails on the PS-LFSAMPLE form (for the same set) transfer result here.	AG	Decimal (8,3)		<LD_BRAILS>	N	Achieved	EM-R1	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_OBS_SET

The observer must PROVIDE the following information for EACH FISHING SET/HAUL during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
LD_BRAILS2	Sum of brails (#2)- only where a second type of brailer was used. After calculating the total number of brails on the PS-LFSAMPLE form (for the same set) transfer result here.	AG	Decimal (8,3)		<LD_BRAILS2>	N	Achieved	EM-R1	
MTTOTAL_OBS	Total observed catch (TUNA and BYCATCH) (mt). Calculated field derived from the PS-LFSAMPLE form from summing number of brails and brail capacity.	CF	Decimal (8,3)		<MTTOTAL_OBS>	N	Achieved	EM-R1	
MTTUNA_OBS	TOTAL amount of TUNA observed (mt) Calculated field derived from the PS-LFSAMPLE and PS-OBSCATCH form from subtracting bycatch from total catch.	EM-A CF	Decimal (8,3)	Derived from and consistent with MTTOTAL_OBS minus all the bycatch (mt) listed under PS_OBS_CATCH for this SET	<MTTUNA_OBS>	N	Achieved	EM-R1	Calculated from MTTOTAL_OBS- all bycatch
TOTSKJ_ANS	FLAG to indicate whether SKJ is presence in the set catch. Visual observation by the EM-A based on footage of brailing activity. Could be automatically generated from information in OBS_CATCH.	EM-A AG	Char (1)	Must be either "Y" or "N"	<TOTSKJ_ANS>	N	Achieved	EM-R1	
PERC_SKJ	% of SKJ in the set catch. Visual estimate by the EM-A based on footage of brailing activity.	EM-A	Int		<PERC_SKJ>	N	Achieved	EM-R1	
MTSKJ_OBS	Metric Tonnes of SKJ in the set catch. Calculated field based on % estimate and MTTUNA_OBS field.	EM-A CF	Decimal (8,3)	Determined from MTTUNA_OBS and PERC_SKJ fields	<MTSKJ_OBS>	N	Achieved	EM-R1	Calculated from MTTUNA_OBS and PERC_SKJ

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

PS_OBS_SET

The observer must PROVIDE the following information for EACH FISHING SET/HAUL during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TOTYFT_ANS	FLAG to indicate whether YFT is presence in the set catch. Visual observation by the EM-A based on footage of brailing activity. Could be automatically generated from information in OBS_CATCH.	EM-A AG	Char (1)	Must be either "Y" or "N"	<TOTYFT_ANS>	N	Achieved	EM-R1	
PERC_YFT	% of YFT in the set catch. Visual estimate by the EM-A based on footage of brailing activity.	EM-A	Int		<PERC_YFT>	N	Achieved	EM-R1	
MTYFT_OBS	Metric Tonnes of YFT in the set catch. Calculated field based on % estimate and MTTUNA_OBS field.	EM-A CF	Decimal (8,3)	Determined from MTTUNA_OBS and PERC_YFT fields	<MTYFT_OBS>	N	Achieved	EM-R1	Calculated from MTTUNA_OBS and PERC_YFT
LARGEYFT_ANS	FLAG to indicate LARGE (> 75 cm) YFT in the set catch	EM-A	Char (1)	Must be either "Y" or "N"	<LARGE_YFT_ANS>	N	Achieved	EM-R1	
PERC_LARGE_YFT	% of large YFT in the set catch. Visual estimate by the EM-A based on footage of brailing activity. N.B.: % of small (or large) YFT (or BET) is the % of TOTAL TUNA ! NOT % of that species of tuna.	EM-A	Int		<PERC_LARGE_YFT>	N	Achieved	EM-R1	
NB_LARGE_YFT	# of large YFT in the set catch (9-10kg) If a good estimate (counts) is not easy, dash the 'number' field. Do not make a rough estimate !	EM-A	Int		<NB_LARGE_YFT>	N	Achieved	EM-R1	Requires EM species and length identification or estimation by EM-A
TOTBET_ANS	FLAG to indicate whether BET is presence in the set catch	EM-A	Char (1)	Must be either "Y" or "N"	<TOTBET_ANS>	N	Achieved	EM-R1	
PERC_BET	% of BET in the set catch	EM-A	Int		<PERC_BET>	N	Achieved	EM-R1	
MTBET_OBS	Metric Tonnes of BET in the set catch	CF	Decimal (8,3)	Determined from MTTUNA_OBS and PERC_BET fields	<MTBET_OBS>	N	Achieved	EM-R1	Calculated from MTTUNA_OBS and PERC_BET
LARGEBET_ANS	FLAG to indicate BET in the set catch LARGE (> 75 cm)	EM-A	Char (1)	Must be either "Y" or "N"	<LARGE_BET_ANS>	N	Achieved	EM-R1	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_OBS_SET

The observer must PROVIDE the following information for EACH FISHING SET/HAUL during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
PERC_LARGE_BET	% of large BET in the set catch N.B.: % of small (or large) BET (or BET) is the % of TOTAL TUNA ! NOT % of that species of tuna.	EM-A	Int		<PERC_LARGE_BET>	N	Achieved	EM-R1	
NB_LARGE_BET	# of large BET in the set catch If there are not many large BET or BET and good estimate of number can be made record number of large BET (or BET) If a good estimate (counts) is not easy, dash the 'number' field. Do not make a rough estimate !	EM-A	Int		<NB_LARGE_BET>	N	Achieved	EM-R1	Requires EM species and length identification or estimation by EM-A
COMMENTS	comments	EM-A	Ntext		<COMMENTS>	N	Achieved	EM-R1	Comments by EM-A
B_NBTAGS	Record as much information as possible on any Tags recovered		SmallInt ???		<B_NBTAGS>	Y	N/A	EM-NP	It is unlikely these will be seen on EM, and will need to be collected by the crew , with the shot details recorded. Other data (date, location) can then be obtained from the EM-Analyst data. Not sure if SmallInt is right for this?

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		* Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_OBS_CATCH

The observer must PROVIDE the following CATCH DETAILS for EACH FISHING HAUL for the period of the trip.

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	Needs to be recorded for each instance of species and fate
SET IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF		Must be consistent with PS_OBS_ACTIVITY record where S_ACTIV_ID = 1 (A fishing set).	<S_SET_ID>	Y	Achieved	EM-Nat	
CATCH IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + SET START DATE + SET START TIME + CATCH EVENT DATE + CATCH EVENT TIME	CF			<S_CATCH_ID>	Y	Achieved	EM-Nat	
sp_code	Species code. Visual observation by EM Analyst.	EM-A Possible AG	Char (3)	REFER TO APPENDIX 8.	<sp_code>	Y	Achieved	EM R1 EM R3 for species not landed	Camera lens position and clarity is important. There may be instances for species that are not landed on deck (turtles / sharks).
RET_DISC	Use 'R' for Retained or 'D' for Discarded	EM-A	Char (1)	Must be 'R' or 'D'	<RET_DISC>	Y	Achieved	EM R1 EM R3 for species not landed	
FATE_CODE	FATE of this catch. This field provides more detail on FATE and indicates whether it was RETAINED, DISCARDED or ESCAPED, and any specific processing. EM-A to use range of cameras to determine the fate.	EM-A	Char (3)	REFER TO APPENDIX 9	<FATE_CODE>	N	Achieved	EM R1 EM R3 for species not landed *	Cameras based where discarding occurs would be useful. Recorded by EM-Analyst but need to ensure that all positions on deck can be observed for the fate
COND_CODE	CONDITION of this catch. Relevant for the Species of Special Interest.	EM-A	Char (3)	REFER TO APPENDIX 10	<COND_CODE>	N	Achieved	EM R1 EM R3 for species not landed *	Can be difficult with EM. Need to ensure consistency in the collection of condition (life status) information. This might be difficult, especially with small animals.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_OBS_CATCH

The observer must PROVIDE the following CATCH DETAILS for EACH FISHING HAUL for the period of the trip.

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
OBS_MT	Observer's visual estimate of TOTAL Species catch in metric tonnes for each retained/discard/fate/condition code combination. Should be consistent with the visual estimate of tuna catches in the table PS_OBS_SET. For BYCATCH species, this is the visual estimate, where relevant.	EM-A	Decimal (8,3)	The field RET_DET indicates whether this represents retention or discard of this species.	<OBS_MT>	Y	Achieved	EM R1 EM R3 for species not landed *	In future, these fields may be best determined by a combination of both EM and Observer data. Fate (e.g. crew consumption) would be impossible for EM-A.
OBS_N	Species catch (in numbers). OBTAINED from the visual estimate, which may be relevant for DISCARDs of TUNA, the discards/retained catch of BILLFISH and most other bycatch species. Entry into this field is mandatory for any Species of Special interest.	EM-A	Int	For Species of Special interest (Mammals, Turtles, Birds and Sharks) there must be a corresponding set of records in the Species of Special interest table.	<OBS_N>	N	Achieved	EM R1 EM R3 for species not landed *	
comments	Are there any comments for this species catch ? (Y/N)	EM-A	Ntext		<comments>	N	Achieved	EM-R1	
gear_interaction_code	Only applies for SSI	EM-A					Achieved	EM-R3 *	
SSI_Treatment	Only applies for SSI	EM-A					Achieved	EM-R3 *	
Condition on landing	Only applies for SSI	EM-A					Achieved	EM-R3 *	
Condition on release	Only applies for SSI	EM-A					Achieved	EM-R3 *	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	* Data better collected by PS onboard observer	
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

OBS_TRIPMON

PROVIDE the details of the OBSERVER GEN-3 "OBSERVER VESSEL TRIP MONITORING FORM". One record per question.

FIELD	Data Collection Instructions	Entry Source (SETUP PRE EM-A POST AG CF)	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Issues
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
TRIP MONITORING IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<TRIPMON_ID>	Y	Achieved	EM-Nat	
	Unique CODE for each question in GEN3								
RS-A	Did the operator or any crew member assault, obstruct, resist, delay, refuse boarding to, intimidate or interefere with observers in the performance of their duties.	EM-A				Y	Achieved	EM-R3	Are cameras required in "high risk" area to observers? To this end, a camera in the wheelhouse is required - this could present a privacy issue. Four areas: galley, bridge, deck area where crew work, observer cabin. Verbal, psychological abuse will not be able to be collected. Observer body camera?? Lots of associated issues with privacy. Does necessarily guarantee security. If an observer incident has been detected - what does it trigger over what timeframe? Need an incident SOP. EM Equivalent: Was there any damage / tampering of the equipment? Other mischief?

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

OBS_TRIPMON

PROVIDE the details of the OBSERVER GEN-3 "OBSERVER VESSEL TRIP MONITORING FORM". One record per question.

FIELD	Data Collection Instructions		Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Issues
	RS-A-EM	EM Equivalent: Was there any damage / tampering of the equipment? Other mischief?	EM-A AG				Y	High	EM-New	Are cameras required in "high risk" area to observers? To this end, a camera in the wheelhouse is required - this could present a privacy issue. Four areas: galley, bridge, deck area where crew work, observer cabin. Verbal, psychological abuse will not be able to be collected. Observer body camera?? Lots of associated issues with privacy. Does necessarily guarantee security. If an observer incident has been detected - what does it trigger over what timeframe? Need an incident SOP.
	RS-B	Request that an event not be reported by the observer					Y	N/A	Null	N/A Interim obstruction? High level request of service provider?
	RS-C	Mistreat other crew	EM-A				N	N/A	Null	Only in the visible field of the cameras
	RS-D	Did operator fail to provide observer with food, accommodation, etc.					Y	N/A	Null	N/A
	RS-D_EM	EM Equivalent: Was the equipment maintained as required	EM-A Post				Y	High	EM-New	N/A
	NR-A	Fish in areas where the vessel is not permitted to fish	PRE EM-A				Y	Achieved	EM-P2 *	Position is easily generated but permitted areas are very difficult to determine for each trip. More accurate if AG but requires geofence pre-populated in the software to achieve AG. Can change over time. Unlikely.
	NR-B	Target species other than those they are licenced to target	EM-A				N	Achieved	EM-R1	EM Analyst can recognise
	NR-C	Use a fishing method other than the method the vessel was designed or licensed	EM-A				Y	Achieved	EM-R1 *	EM Analyst can recognise if in field of view

OBS_TRIPMON

PROVIDE the details of the OBSERVER GEN-3 "OBSERVER VESSEL TRIP MONITORING FORM". One record per question.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

FIELD	Data Collection Instructions		Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Issues
question_code	NR-D	Not display or present a valid (and current) licence document onboard	PRE POST	Char (4)	REFER TO APPENDIX 16	<question_code>	N	N/A	EM-NP *	
	NR-E	Transfer or transship fish from or to another vessel	EM-A AG				Y	Critical	EM-R1	Likely to be able to be detected by EM-Analyst EM system could detect this to automatically generate
	NR-F	Was involved in bunkering activities	EM-A AG				N	Critical	EM-R1	Likely to be able to be detected by EM-Analyst EM system could detect this to automatically generate
	NR-G	Fail to stow fishing gear when entering areas where vessel is not authorised to fish	EM-A				Y	Low	EM-P2 *	Activity is easy to observe on board but authorised areas are difficult to be built in to EM software. Could get cameras to switch on with geo-fencing (beware accuracy +/- 3nm)
	WC-A	Fail to comply with any Commission Conservation and Management Measures (CMMs)	EM-A AG				Y	Low	EM-R1 *	Some CMMs may be able to be detected by EM-Analyst. Requires that the EM-A has a good understanding of the full range of CMMs. Some could be calculated from other data entry fields (ie. Catch of SSI).
	WC-B	Discarding of tuna catch	AG				Y	High	EM-R1	AG from PS_OBS_CATCH or other forms
	WC-C	Fish on FAD during FAD Closure	EM-A AG				N	Low	EM-P2 *	Fishing next to a FAD may easily be detected by EM but the FAD closure rules would be difficult to incorporate into the software.
	LP-A	Inaccurately record vessel position on vessel log sheets for sets, hauling and catch	Post AG				Y	Achieved	EM-R1 *	Reconcile EM data with logsheet data. The comparison could be done automatically post trip if ER data is in digital form.
	LP-B	Fail to report vessel positions to countries where required	Post AG				Y	Achieved	EM-R1 *	Reconcile EM-Analyst data with logsheet data. Automatically generated with E-Reports

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

OBS_TRIPMON

PROVIDE the details of the OBSERVER GEN-3 "OBSERVER VESSEL TRIP MONITORING FORM". One record per question.

FIELD	Data Collection Instructions		Entry Source (SETUP PRE EM-A POST AG CF)	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Issues
	LC-A	Inaccurately record retained 'Target Species' in the Vessel logs [or weekly reports]	Post AG				Y	Achieved	EM-R1 *	Reconcile EM-Analyst data with logsheet data. Automatically generated with E-Reports
	LC-B	Inaccurately record 'Target Species' Discards	Post AG				Y	Achieved	EM-R1 *	Reconcile EM-Analyst data with logsheet data. Automatically generated with E-Reports
	LC-C	Record target species inaccurately [eg. combine bigeye/yellowfin/skipjack catch]	Post AG				Y	Achieved	EM-R1 *	Reconcile EM-Analyst data with logsheet data. Automatically generated with E-Reports
	LC-D	Not record bycatch discards	Post AG				N	Achieved	EM-R1 *	Reconcile EM-Analyst data with logsheet data. Automatically generated with E-Reports
	LC-E	Inaccurately record retained bycatch Species	Post AG				Y	Achieved	EM-R1 *	Reconcile EM-Analyst data with logsheet data. Automatically generated with E-Reports
	LC-F	Inaccurately record discarded bycatch species	Post AG				Y	Achieved	EM-R1 *	Reconcile EM-Analyst data with logsheet data. Automatically generated with E-Reports
	SI-A	Land on deck Species of Special Interest (SSIs)	Post AG				N	Achieved	Em-R1	AG from PS_OBS_CATCH
	SI-B	Interact (not land) with SSIs	Post AG				Y	Achieved	Em-R1	AG from PS_OBS_CATCH
	PN-A	Dispose of any metals, plastics, chemicals or old fishing gear	AG				Y	Achieved	Em-R1	AG from PS_POLLUTION
	PN-B	Discharge any oil	AG				Y	Achieved	Em-R1	AG from PS_POLLUTION
	PN-C	Lose any fishing gear	AG				Y	Achieved	Em-R1	AG from PS_POLLUTION

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		* Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

OBS_TRIPMON

PROVIDE the details of the OBSERVER GEN-3 "OBSERVER VESSEL TRIP MONITORING FORM". One record per question.

FIELD	Data Collection Instructions		Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Issues
	PN-D	Abandon any fishing gear	AG				Y	Achieved	Em-R1	AG from PS_POLLUTION
	PN-E	Fail to report any abandoned gear	AG				Y	Achieved	Em-R1	AG from PS_POLLUTION
	SS-A	Fail to monitor international safety frequencies					Y	N/A	EM-NP *	
	SS-B	Carry out-of-date safety equipment					N	N/A	EM-NP *	
answer	Record the Answer to each question. There is also an indicator whether this has been answered or NOT			Char (1)	MUST BE 'Y', 'N' or 'X'-not answered	<answer>	Y	Achieved	Em-R1	
journal_page	Additional explanation and information for any YES response (including reference to the journal page)			NText		<journal_page>	Y	N/A	Null	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

OBS_TRIPMON_COMMENTS

PROVIDE the details of the OBSERVER GEN-3 "OBSERVER VESSEL TRIP MONITORING FORM". One record per day of trip monitoring reported event/incident.

FIELD	Data Collection Instructions	Entry Source	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Issues
		SETUP PRE EM-A POST AG CF							
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
TRIP MONITORING COMMENTS IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<TRIPMON_DET_ID>	Y	Achieved	EM R1	
gen3_date	Date of the incident on GEN3	AG	REFER TO APPENDIX A1	Must adhere to the ISO 8601 format in Appendix A1	<gen3_date>	N	Achieved	EM-R1	
comments	Detail description of the incident	EM-A	NText		<comments>	N	Achieved	EM-R1	A list of events is required that the EM-Analyst needs to note depending on the camera?

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		* Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

VES_AIR_SIGHT

PROVIDE the details on the GEN-1 form -- VESSEL AND AIRCRAFT SIGHTINGS / FISH, BUNKERING and OTHER TRANSFERS LOGS

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
SIGHTING IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<sight_ID>	Y	Achieved	EM-Nat	
sight_date_TIME	Date/Time of sighting		REFER TO APPENDIX A1	Must adhere to the ISO 8601 format in Appendix A1	<sighting_date>	Y	N/A	EM-NP *	It is very unlikely that EM will be able to be used effectively to monitor aircraft sightings.
lat	Latitude of SIGHTING		REFER TO APPENDIX A2	Must adhere to the ISO 6709 format in Appendix A2	<lat>	Y	N/A	EM-NP *	As above.
lon	Longitude of SIGHTING		REFER TO APPENDIX A2	Must adhere to the ISO 6709 format in Appendix A2	<lon>	Y	N/A	EM-NP *	As above.
VESSEL IDENIFIER	PROVIDE the WCPFC VID for the VESSEL sighted (if this is possible)		REFER TO APPENDIX A4	Record VID if the vessel can be identified on the WCPFC RFV	<VID>	N	N/A	EM-NP *	As above.
S_NAME	Record sighted vessel or aircraft name, where possible			Record VID if the vessel can be identified on the WCPFC RFV	<S_NAME>	Y	N/A	EM-NP *	As above.
S_IRCS	Record sighted vessel or aircraft call-sign, where possible			Record VID if the vessel can be identified on the WCPFC RFV	<S_IRCS>	Y	N/A	EM-NP *	As above.
S_FLAG	Record flag of sight vessel, if possible			Record VID if the vessel can be identified on the WCPFC RFV	<S_FLAG>	Y	N/A	EM-NP *	As above.
S_OTHER-MARKING	Record other vessel markings, if possible			Record VID if the vessel can be identified on the WCPFC RFV	<S_MARK>	Y	N/A	EM-NP *	As above.
vatyp_id	Vessel / Aircraft type		Int	REFER TO APPENDIX 17	<vatyp_id>	Y	N/A	EM-NP *	As above.
bearing_dir	Bearing (0-360 degrees)		SmallInt		<bearing_dir>	Y	N/A	EM-NP *	As above.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

VES_AIR_SIGHT

PROVIDE the details on the GEN-1 form -- VESSEL AND AIRCRAFT SIGHTINGS / FISH, BUNKERING and OTHER TRANSFERS LOGS

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
distance	Record estimated distance from observers vessels to sighted vessel		Decimal (7,3)	Check the sighting on the radar and use the distance indicated, f not available use your estimate.	<distance>	Y	N/A	EM-NP *	As above.
dist_unit	Units of Distance		INT	1 = Metres; 2 = kilometres; 3 = Nautical miles	<dist_unit>	Y	N/A	EM-NP *	As above.
action_code	Action of Vessel/Aircraft sighted		Char (2)	REFER TO APPENDIX 18 for Vessel/Aircraft sightings only – only allow actions where FORM USED = 'GEN-1'	<action_code>	Y	N/A	EM-NP *	As above.
comments	Comments		NText		<comments>	Y	N/A	EM-NP *	As above.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_POLLUTION

PROVIDE information any Pollution observed during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	**Achieved**	**EM-Nat**	
POLLUTION EVENT IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<POLL_ID>	Y	**Achieved**	**EM-Nat**	
INC_DATE	DATE & TIME of the incident	EM-A	REFER TO APPENDIX A1	**Must adhere to the ISO 8601 format in Appendix A1.**	<INC_DTIME>	N	Achieved	EM-R1	**Can be recorded by the EM-Analyst only if in field of view of a camera.** **The Sol Is report stated on page 15 that "monitoring of marine pollution was possible with E-Monitoring", but acknowledged that it is restricted to the viewing range of the cameras.**
lat	Latitude where incident occurred	EM-A AG	REFER TO APPENDIX A2	**Must adhere to the ISO 6709 Appendix A2.**	<lat>	N	Achieved	EM-R1	
lon	Longitude where incident occurred	EM-A AG	REFER TO APPENDIX A2	**Must adhere to the ISO 6709 in Appendix A2.**	<lon>	N	Achieved	EM-R1	
port_id	If the vessel is in port, PORT where incident occurred	EM-A AG	REFER TO APPENDIX A3	**Must adhere to the UN/LOCODE standard UN/LOCODE standard Appendix A3.**	<port_id>	N	Achieved	EM-R1	**Refer to trip**
activ_id	Activity when event occurred	EM-A	REFER TO APPENDIX A5		<activ_id>	N	Low	EM-R1 *	
VESSEL IDENIFIER	Refers to another vessel	EM-A	REFER TO APPENDIX A4			N	Low	EM-R1 *	**Can be recorded by the EM-Analyst only if other vessel is in field of view of a camera.**
vatyp_id	Vessel / Aircraft type	Em-A	Int	REFER TO APPENDIX 17	<vatyp_id>	N	N/A	EM-NP *	**It is very unlikely that EM will be able to be used effectively to monitor pollution by other vessels. Opportunistic.**
bearing_dir	Compass Bearing to offending vessel	AG	SmallInt		<bearing_dir>	N	Low	**EM-P2 ***	**As above**
distance	Distance to offending vessel		Decimal (7,3)		<distance>	N	Low	**EM-P2 ***	**As above**

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		* Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

OBS_POLLUTION

PROVIDE information any Pollution observed during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
comments	Additional comments	EM-A	NText		<comments>	N	Low	EM-R1	**As above**
stickers_ans	Response to "Stickers" question. "Were there any stickers/ posters displayed to remind the vessel about MARPOL Regulations?"	POST	Char (1)	'Y' or 'N'	<stickers_ans>	N	N/A	EM-NP *	**As the GEN-6 form is completed after the port visit, if this field is required then it should be reported for each trip by the PDCO.**
aware_ans	Response to "MARPOL" question	POST	Char (1)	'Y' or 'N'	<aware_ans>	N	N/A	EM-NP *	**As the GEN-6 form is completed after the port visit, if this field is required then it should be reported for each trip by the PDCO**
advised_ans	Response to "INFRINGEMENTS" question	POST	Char (1)	'Y' or 'N'	<advised_ans>	N	N/A	EM-NP *	**This is not applicable – the question is "If there were any infringements to the MARPOL Regulations did you advise the Captain of these infringements?"**
photos_ans	Response to "PHOTOS" question	EM-A	Char (1)	'Y' or 'N'	<photos_ans>	N	Low	EM-R1	**Recorded by the EM-Analyst from EM video, but GEN6 completed post trip.**
photo_numbers	Timestamp and position of image		NVarChar (50)		<photo_numbers>	N	N/A	Null	**Redundant with EM as every image has datetime stamp and position.**

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		* Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

OBS_POLLUTION_DETAILS

PROVIDE information on any Pollution details observed during the trip.

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
POLLUTION EVENT IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<POLL_ID>	Y	Achieved	EM-Nat	
pollutiontype_id	Pollution type code	EM-A	REFER TO APPENDIX A31	Some, but not all codes in listed in the relevant APPENDICES are WCPFC required fields. For example, Disposal of OFFAL MANAGEMENT is a WCFPC required field.	<pollutiontype_id>	N	Low	EM-R1 vessel EM-R3 other *	Can be recorded by the EM-Analyst only if incident is in field of view of a camera. More easily recorded on the monitotrf vessel rathen than another vessel.
material_id	Pollution Materials code	EM-A	REFER TO APPENDIX A29		<material_id>	N	Low	EM-R1 vessel EM-R3 other *	As above
POLL_GEAR_ID	Pollution Gear code	EM-A	REFER TO APPENDIX A28		<POLL_GEAR_ID>	N	Low	EM-R1 vessel EM-R3 other *	As above
POLL_SRC_ID	Pollution Source code	EM-A	REFER TO APPENDIX A30		<POLL_SRC_ID>	N	Low	EM-R1 vessel EM-R3 other *	As above
poll_desc	Description of pollution type	EM-A	NText		<poll_desc>	N	Low	EM-R1 vessel EM-R3 other *	As above
poll_qty	Description of pollution quantity	EM-A	NText		<poll_qty>	N	Low	EM-R1 vessel EM-R3 other *	As above

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_SSI

The observer must PROVIDE the following SPECIES OF SPECIAL INTEREST CATCH DETAILS for EACH FISHING SET for the period of the trip. There may be one or many records for each SSI record in PS_OBS_CATCH. When SIGHTED only, then this table is linked to the OBS_TRIP database table.

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
SET IDENTIFIER - PS	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF		To be used to link to PS OBS SET when relevant Must be consistent with PS OBS ACTIVITY record where S ACTIV ID = 1 (A fishing set).	<S_SET_ID>	Y	Achieved	EM-Nat	
CATCH IDENTIFIER - PS	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + SET START DATE + SET START TIME + SPECIES CODE + FATE CODE	CF		To be used to link to PS OBS CATCH when relevant Must be a link to the corresponding PS OBS CATCH record for this SSI	<S_CATCH_ID>	Y	Achieved	EM-Nat	
SSI CATCH IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + DAY LOG + SIGHTING TIME + SPECIES CODE + FATE CODE	CF			<SSI_ID>	Y	Achieved	EM-Nat	
sgtype	Type of Interaction : 'L' - Landed; "S"- Sighted; "I" - Interacted with Gear Recorded by the EM Analyst. Needs to be restricted to only landings and interactions with the gear during fishing. Required appropriate placement of cameras focussed towards gear entering exiting water.	EM-A	Char (1)	Must be 'L' - Landed; "S"- Sighted; "I" - Interacted with Gear	<sgtype>	Y	High	EM-R1	High priority and relatively easy to detect when within the field of view of the cameras. Capture of SSI indicents that occur outside the catch-based camera placements and timing will at least require extra cameras.
							Low	EM-R3/4 *	
SSI_date	Record ships date and time of interaction. Generated automaticall by EM when flagged by the EM Analyst.	EM-A AG	REFER TO APPENDIX A1	When SGTYPE = 'L' or 'I' Must be consistent with PS_OBS_ACTIVITY record – ACT_DATE Must adhere to the ISO 8601 format in Appendix A1	<SSI_date>	Y	N/A	Null	
UTC_SSI_DATE	UTC equivalent of SSI_DATE Generated by EM when flagged by the EM Analyst.	EM-A AG	REFER TO APPENDIX A1	When SGTYPE = 'L' or 'I' Must be consistent with PS_OBS_ACTIVITY record – UTC_ACT_DATE	<UTC_SSI_DATE>	N	Achieved	EM-R1	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_SSI

The observer must PROVIDE the following SPECIES OF SPECIAL INTEREST CATCH DETAILS for EACH FISHING SET for the period of the trip. There may be one or many records for each SSI record in PS_OBS_CATCH. When SIGHTED only, then this table is linked to the OBS_TRIP database table.

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
lat	Latitude at which this SSI was encountered	EM-A AG	REFER TO APPENDIX A2	When SGTYPE = 'L' or 'I' Must be consistent with PS_OBS_ACTIVITY record – LAT Must adhere to the ISO 6709 format in Appendix A2	<lat>	Y	Achieved	EM-R1	
lon	Longitude at which this SSI was encountered	EM-A AG	REFER TO APPENDIX A2	When SGTYPE = 'L' or 'I' Must be consistent with PS_OBS_ACTIVITY record – LON Must adhere to the ISO 6709 format in Appendix A2	<lon>	Y	Achieved	EM-R1	
SP_CODE	Link to species table. Can be visually identified by EM-A. Future work and image training could make image recognition of catch possible	EM-A AG	Char (3)	REFER TO APPENDIX 8.	<SP_CODE>	Y	Achieved High	EM-R1 R2 R3 by EM-A EM-P2 by Image recognition	In some situations a clear view of the entire individual may not be possible - particularly if not landed. This may also require some level of cooperation of the crew. Potential for automatically generated species with image recognition.
sp_desc	Extended Species Description Recorded by the EM Analyst.	EM-A	NText		<sp_desc>	N	Achieved	EM-R1	
landed_cond_code	Condition when landed on Deck or at start of interaction with vessel's gear Condition code on LANDING Recorded by the EM Analyst.	EM-A	Char (2)	REFER TO APPENDIX 10	<landed_cond_code>	Y	Achieved	EM-R1	Work to improve the consistency in the collection of condition (life status) information Potentially redundant if OBS_CATCH has correct codes. DCC / WCPFC need to review codes for consistency and relevance to the field
landed_cond_desc	Description of Condition on Landing or at start of interaction with vessel's gear Recorded by the EM Analyst.	EM-A	NText		<landed_cond_desc>	N	Achieved	EM-R1	Work to improve the consistency in the collection of condition (life status) information

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_SSI

The observer must PROVIDE the following SPECIES OF SPECIAL INTEREST CATCH DETAILS for EACH FISHING SET for the period of the trip. There may be one or many records for each SSI record in PS_OBS_CATCH. When SIGHTED only, then this table is linked to the OBS_TRIP database table.

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
landed_handling	Description of handling on landing Recorded by the EM Analyst.	EM-A	NText		<landed_handling>	N	Achieved	EM-R1	Work to improve the consistency in the collection of condition (life status) information
landed_len	Length of landed species	EM-A	Decimal (5,1)		<landed_len>	Y	Achieved	EM-R1 / R2 by EM-A	In some situations a clear view of the entire individual may not be possible - particularly if not landed. This may also require some level of cooperation of the crew. Potential for automatically generated lengths with image recognition.
							High	EM-P2 by Image recognition	
len_code	Length code of the individual	EM-A	Char (2)	REFER TO APPENDIX 11	<len_code>	Y	Achieved	EM-R1	
GENDER	Sex code of the individual	EM-A	Char (1)	REFER TO APPENDIX 12	<landed_sex_code>	Y	Achieved	EM-R1	In some situations a clear view of the entire individual may not be possible. Sex may not be apparent. This may also require some level of cooperation of the crew. Possibly automatically generated with image recognition for some species (sharks and rays).
RELEASE_COND_CODE	Condition on RELEASE/DISCARD, or at the END of interaction with vessel's gear. Condition code on RELEASE/DISCARD, or at the END of interaction with vessel's gear	EM-A	Char (2)	REFER TO APPENDIX 10	<REL_COND_CODE>	Y	Achieved	EM-R1	Recorded by the EM-Analyst if in field of view.
RELEASE_COND_DESC	Description of Condition on RELEASE/DISCARD, or at the END of interaction with vessel's gear	EM-A	NText		<REL_COND_DESC>	N	Achieved	EM-R1	Recorded by the EM-Analyst if in field of view.
SP_GR_CODE	Species/Gear interaction	AG	Char (3)	APPENDIX A32 – SPECIES/GEAR INTERACTION CODES	<SP_GR_CODE>	N	Achieved	EM-R1	Automatically generated for PS as "G01 Entangled". Although this won't always be the best description. Another code for "Caught in net" would be better.
shk_fin_wt_kgs	Estimated SHARK FIN WEIGHT (kgs)		Decimal (5,0)		<SHK_FIN_WT_KGS>	Y	N/A	EM-NP *	Alternate sampling means (e.g. sampling elsewhere) to ensure the requirements are met.
shk_fin_body_kgs	Estimated SHARK CARCASS WEIGHT (kgs)		Decimal (5,0)		<SHK_FIN_BODY_KGS>	Y	N/A	EM-NP *	
tag_ret_no	Tag Number recovered from animal Record if tag fish encountered. Endeavour to complete tag recovery information	POST -> EM-A	NVarChar (7)		<tag_ret_no>	Y	N/A	EM-NP *	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

OBS_SSI

The observer must PROVIDE the following SPECIES OF SPECIAL INTEREST CATCH DETAILS for EACH FISHING SET for the period of the trip. There may be one or many records for each SSI record in PS_OBS_CATCH. When SIGHTED only, then this table is linked to the OBS_TRIP database table.

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
tag_ret_type	Type of Tag recovered from animal EM Analyst record the tag type	POST	NVarChar (5)		<tag_ret_type>	N	N/A	EM-NP *	
tag_ret_org	Origin of Tag recovered from animal (Organisation)	POST	NVarChar (10)		<tag_ret_org>	N	N/A	EM-NP	
tag_place_no	Tag number placed on animal		NVarChar (14)		<tag_place_no>	N	N/A	Null	
tag_place_type	Type of Tag placed on animal		NVarChar (8)		<tag_place_type>	Y	N/A	Null	Not applicable
tag_place_org	Origin of Tag placed on animal (Organisation)		NVarChar (10)		<tag_place_org>	Y	N/A	Null	Not applicable
intact_id	Vessel activity when INTERACTION occurs Observation by EM-A	EM-A CF	Int	REFER TO APPENDIX 13	<intact_id>	Y	Achieved	EM-R1	Provided when in field of view
intact_other	Other types of interaction Recorded by the EM Analyst.	EM-A	NVarChar (20)		<intact_other>	N	N/A	EM-NP	Maybe not applicable if EM-A detection is limited to only setting and hauling Unlikely this would be used with EM
int_describe	Description of the interaction Recorded by the EM Analyst.	EM-A	NText		<int_describe>	Y	Achieved	EM-R1	Provided when in field of view
sgact_id	Vessel activity when SIGHTING occurs		Int	REFER TO APPENDIX 13	<sgact_id>	N	N/A	EM-NP *	Generally EM-A not suitable for "sighting" information
sgact_other	Indicates "other" Vessel Activity		NVarChar (20)		<sgact_other>	N	N/A	EM-NP *	
sight_n	Number of individuals sighted		SmallInt		<sight_n>	Y	N/A	EM-NP *	
sight_adult_n	Number of adults sighted		SmallInt		<sight_adult_n>	N	N/A	EM-NP *	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

OBS_SSI

The observer must PROVIDE the following SPECIES OF SPECIAL INTEREST CATCH DETAILS for EACH FISHING SET for the period of the trip. There may be one or many records for each SSI record in PS_OBS_CATCH. When SIGHTED only, then this table is linked to the OBS_TRIP database table.

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
sight_juv_n	Number of juveniles sighted		SmallInt		<sight_juv_n>	N	N/A	EM-NP *	
sight_len	Estimated overall length (Average if more than one individual)		NText		<sight_len>	N	N/A	EM-NP *	
sight_dist	Distance of sighted animals from vessel		Decimal (7,3)		<sight_dist>	N	N/A	EM-NP *	
sight_dist_unit	Units used for SIGHT_DIST		INT	1 = Metres; 2 = kilometres; 3 = Nautical miles	<sight_dist_unit>	N	N/A	EM-NP *	
sight_dist_nm	Distance in nautical miles		Decimal (10,4)		<sight_dist_nm>	N	N/A	EM-NP *	
sight_behav	Description of behaviour of Sighted animals		NText		<sight_behav>	N	N/A	EM-NP *	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

OBS_SSI_DETAILS

The observer must PROVIDE the following SPECIES OF SPECIAL INTEREST CATCH DETAILS for EACH FISHING SET for the period of the trip. The specific detail of each interaction needs to be recorded/stored here.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
SSI CATCH IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF		Link to OBS_SSI table	<SSI_ID>	Y	Achieved	EM-Nat	
SSI DETAILS IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + DAY LOG + SIGHTING TIME + SPECIES CODE + FATE CODE	CF			<SSI_DET_ID>	Y	Achieved	EM-Nat	
start_end	Indication of “START” or “END” of interaction Recorded by the EM system after being flagged by the EM Analyst.	EM-A	Char (1)	Must be either ‘S’ for START or ‘E’ for END	<start_end>	N	Achieved	EM-R1	
SSI_number	Number of animals interacted Counted by the EM Analyst	EM-A	Int		<SSI_number>	N	Achieved	EM-R1	Need good definitions of interactions to maintain consistnecy between EM-A and observers. EM-A can only count what is in the field of view.
cond_code	CONDITION at the point of recording (either START or END)	EM-A	Char (2)	REFER TO APPENDIX 10	<cond_code>	N	Low	EM-R3	This differs from landed_cond_code from the previous table in that it can be an interaction with the vessel or gear before the animal is landed on deck. This could be difficult to determine by the EM-A
description	Descriptions of the interaction Recorded by the EM Analyst	EM-A	VarChar (100)		<description>	N	Achieved	EM-R1	For example fin caught in net.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

WELL_TRANSFER

PROVIDE information for each transfer to/from storage WELLs during the trip.
This may become mandatory WCPFC data collection related to CDS.

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	N	Achieved	EM-Nat	
WELL TRANSFER IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<S_WELL_TRX_ID>	N	Achieved	EM-Nat	
TRX_DATE	DATE and TIME of fish transfer	EM-A	REFER TO APPENDIX A1		<TRX_DATE>	N	High	EM-R3	May need camera on wells just below the hopper. Recorded by the EM system when flagged by the EM-Analyst (or is this flagged by the gear sensors?).
ACTION_CODE	WELL TRANSFER ACTION CODE	EM-A	Char (2)	REFER TO APPENDIX 18 for Well transfers only – only allow actions where FORM USED = 'PS-5	<ACTION_CODE>	N	Achieved	EM-R1	Recorded by the EM-Analyst. Camera/sensor on ship's derrick?
SOURCE	Fish transfer source Can be the 'NET' and valid well number or a VESSEL	EM-A	VarChar (80)	Can be the 'NET' and valid well number or a VESSEL	<SOURCE>	N	Achieved	EM-R1	Camera/sensor on ship's derrick?
DESTINATION	Description of the transfer destination Can be Well No., vessel, SHORE or DISCARD	EM-A	VarChar (80)	Can be Well No., vessel, SHORE or DISCARD	<DESTINATION>	N	Achieved	EM-R1	Camera/sensor on ship's derrick?
WELL_MT	Weight of the fish transfer	EM-A AG	Decimal (8,3)		<WELL_MT>	N	Achieved High	EM-R1 for EM-A EM-P2 for AG	Depends on the vessel and method of transfer to the well. Initial fill of well could be AG from OBS_CATCH. Estimated by EM-A for subsequent transfers. AG could be aided by sensor on cranes. Camera/sensor on ship's derrick?
CHANGE	Change of transfer – add or remove	EM-A	Char (1)	Must be either '+', '-' or '0' (for no change)	<CHANGE>	N	Achieved	EM-R1	
NEW_TOTAL	New cumulative total for the transfer	AG	Decimal (8,3)		<NEW_TOTAL>	N	Low	EM-R1	
ON_LOGSHEET	FLAG to indicate the transfer has been stated on the logsheet		Char (1)		<ON_LOGSHEET>	N	Low	EM-NP *	
COMMENTS	Comments made on the fish transfer	EM-A	NText		<COMMENTS>	N	Low	EM-R1	Recorded by EM-Analyst and the port inspection officer at end of trip from logsheet.

PS_VESS_SUPPORT

PROVIDE information on the PURSE SEINE VESSEL SUPPORT information.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
PS VESS SUPPORT IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<S_VESSUP_ID>	Y	Achieved	EM-Nat	
SPEEDBOATS_N	Number of Speedboats	PRE EM-A POST	SmallInt		<SPEEDBOATS_N>	Y	Low	EM-R1 *	Likely to be detected by the EM-A
TOW_N	Number of Tow boats	PRE EM-A POST	SmallInt		<TOW_N>	Y	Low	EM-R1 *	Likely to be detected by the EM-A
AUXBOATS_N	Number of Auxiliary boats	PRE POST	SmallInt		<AUXBOATS_N>	Y	Low	EM-NP *	
LIGHT_N	Number of light boats	PRE EM-A POST	SmallInt		<LIGHT_N>	Y	Low	EM-R1 *	Likely to be detected by the EM-A
TENDERBOATS_YN	Do other tender boats work with Catcher ?	PRE EM-A POST	Char(1)		<TENDERBOATS_YN>	N	Low	EM-R1 *	Likely to be detected by the EM-A
SKIFF_MAKE	Make of SKIFF	PRE POST	Varchar(20)	Must be M, Y, F or blank	<SKIFF_MAKE>	N	Low	EM-NP *	
SKIFF_HP	Horsepower of SKIFF	PRE POST	Int		<SKIFF_HP>	N	Low	EM-NP *	
HELI_MAKE	Make of Helicopter	PRE POST	Varchar(20)		<HELI_MAKE>	Y	Low	EM-NP *	
HELI_MODEL	Model of helicopter	PRE POST	Varchar(20)		<HELI_MODEL>	Y	Low	EM-NP *	
HELI_REG_NO	Helicopter registration number	PRE POST	Varchar(20)		<HELI_REG_NO>	Y	Low	EM-NP *	
HELI_RANGE	Range of Helicopter (see HELI_RANGE_UNIT)	PRE POST	Int	Must be C, I or blank	<HELI_RANGE>	Y	Low	EM-NP *	
HELI_RANGE_UNIT	Unit of distance for range of Helicopter	PRE POST	Char(1)	'K' in kms ; 'N' in nautical miles	<HELI_RANGE_UNIT>	Y	Low	EM-NP *	

PS_VESS_SUPPORT

PROVIDE information on the PURSE SEINE VESSEL SUPPORT information.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
HELI_COLOUR	Colour of Helicopter	PRE POST	Varchar(20))		<HELI_COLOUR>	Y	Low	EM-NP *	
HELI_SERVICES_N	No. of vessels that this helicopter services	PRE POST	SmallInt		<HELI_SERVICES_N>	N	Low	EM-NP *	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

PS_FAD_MATERIAL

PROVIDE information on the FAD MATERIAL observed during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
FAD EVENT IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<FAD_ID>	Y	Achieved	EM-Nat	
FAD_EVENT_DATE	DATE/TIME of the FAD sighting (observation event).	AG	REFER TO APPENDIX A1		<FAD_EVENT_DATE>	Y	Achieved	EM-R1	AG from OBS_ACTIVITY
OBJECT_NUMBER	Number allocated for the object. (related to "FAD Markings or numbers")		SmallInt		<OBJECT_NUMBER>	Y	Low	EM-NP *	
ORIGIN_CODE	Original CODE of the FAD		REFER TO APPENDIX A24	Code 5 or 6 used for FADs with radio buoy attached	<ORIGIN_CODE>	Y	Low	EM-NP *	As above.
FAD_DET_CODE	FAD Detection CODE		SmallInt		<FAD_DET_CODE>	Y	Low	EM-NP *	As above.
DEPLOYMENT_DATE	Date of FAD deployment		REFER TO APPENDIX A1		<DEPLOYMENT_DATE>	N	Low	EM-NP *	Only can be achieved if your vessel deploys the FAD.
LAT	LAT position of deployment		REFER TO APPENDIX A2		<LAT>	Y	Low	EM-NP *	As above.
LON	LON position of deployment		REFER TO APPENDIX A2		<LON>	Y	Low	EM-NP *	As above.
SSI_TRAPPED	FLAG to indicate whether any SSI are trapped on the FAD	EM-A	Char (1)		<SSI_TRAPPED>	N	Achieved	EM-R3 *	May need another camera
AS_FOUND_CODE	CODE to indicate whether the FAD "as Found"	EM-A	Int		<AS_FOUND_CODE>	N	Achieved	EM-R3 *	As above.
AS_LEFT_CODE	CODE to indicate whether the FAD "as Left"	EM-A	Int		<AS_LEFT_CODE>	N	Achieved	EM-R3 *	As above.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_FAD_MATERIAL

PROVIDE information on the FAD MATERIAL observed during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
MAX_DEPTH_M	Max DEPTH of the FAD in metres		Decimal (5,1)		<MAX_DEPTH_M>	Y	Low	EM-NP *	Possible by EM-A if FAD constructed on board.
LENGTH_M	Max LENGTH of the FAD in metres	EM-A	Decimal (5,1)		<LENGTH_M>	Y	Low	EM-R3 *	As above.
WIDTH_M	Max WIDTH of the FAD in metres	EM-A	Decimal (5,1)		<WIDTH_M>	Y	Low	EM-R3 *	As above.
BUOY_NUMBER	Buoy number stated on the FAD		NVarChar (20)		<BUOY_NUMBER>	Y	Low	EM-NP *	As above.
MARKINGS	Markings on the FAD		NVarChar (50)		<MARKINGS>	Y	Low	EM-NP *	As above.
COMMENTS	Comments made by the observer about the FAD	EM-A	Ntext		<COMMENTS>	Y	Achieved	EM-R1 *	As above.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_FAD_MATERIAL_DETAIL

PROVIDE information on the FAD MATERIAL DETAIL observed during the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	**Achieved**	**EM-Nat**	
FAD EVENT IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<FAD_ID>	Y	**Achieved**	**EM-Nat**	
MATERIAL_CODE	FAD Material CODE	**EM-A**	REFER TO APPENDIX A26	**Material Code must exist in the ref_ids table**	<MATERIAL_CODE>	Y	Low	**EM-R3 ***	**May need addition cameras for FAD investigations. Possible by EM-A if FAD constructed on board.**
IS_ATTACHMENT	FLAG to indicate if there is an attachment to the FAD	**EM-A**	Char (1)	'Y' or 'N'	<IS_ATTACHMENT>	Y	Low	**EM-R3 ***	**May need addition cameras for FAD investigations. Possible by EM-A if FAD constructed on board.**

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	* Data better collected by PS onboard observer	
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_BRAIL

Identificaiton of each brail and its weight

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
SET IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<S_SET_ID>	Y	Achieved	EM-Nat	
LF SAMPLE IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + DAY LOG + SET START DATE + SET START TIME + SAMPLE_TYPE_ID	CF			<S_LFSAMP _ID>	Y	Achieved	EM-Nat	
LF MEASURE IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + DAY LOG + SET START DATE + SET START TIME + SAMPLE_TYPE + SEQ_NUMBER	CF			<S_LFMEAS_ID>	Y	Achieved	EM-Nat	
BRAIL_SEQ_NUMBER		AG	Int		<SEQ_NUMBER>	N	Achieved	EM-R1	
BRAIL_DATETIME		EM-A AG	Date time code	REFER TO APPENDIX 8.			Achieved	EM-New	Will be unique and could be used instead of sequence number above.
FULLNESS	EM-A can estiamte fullness of brail	EM-A	Char (3)	REFER TO APPENDIX 8.		Y	Achieved	EM-R1	
BRAIL_WGT	Sensor could be used on the brail winch to measure actual brail weight	EM-A AG?		REFER TO APPENDIX 8.			High	EM-NEW EM-P2	AG from weigt sensor on the brail winch

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	* Data better collected by PS onboard observer	
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_LFSAMPLE

PROVIDE the information related to the size (length) and species composition SAMPLE from each FISHING SET.

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	**Achieved**	**EM-Nat**	
SET IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<S_SET_ID>	Y	**Achieved**	**EM-Nat**	
LF SAMPLE IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + DAY LOG + SET START DATE + SET START TIME + SAMPLETYPE_ID	CF			<S_LFSAMP _ID>	Y	**Achieved**	**EM-Nat**	
SAMPLETYPE_ID	Sample Type Observer method is taken from Appendix A14 size and species composition sample protocol. Requires a list of EM sampling codes that could be differentiated by the EM-Analyst.	**EM-A**	CHAR(1)	**REFER TO APPENDIX 14**	<SAMPLETYPE_ID>	N	High	EM R1	**EM can do various types of visual subsampling via cameras on conveyor or chute. An EM SOP is needed, which would either specify a method that would always be used, or otherwise a range of new-EM coded options that could be differentiated by the EM-Analyst.**
OTHER_DESC	Description other sampling type	**EM-A**	Ntext	DA - all discards DT - only discarded tunas BS - bycatch - select species (one or more different species but not all species) SS - Species of special interest. Include the sex with the length eg. "male" 26cm = M 26, "unknown" 56cm = U 56 LB - Live-fish Brailing - separate the samples on different pages if live fish brailing is used prior to standard brailing.	<OTHER_DESC>	N	High	EM R1	**An SOP would be needed, which would either specify a method that would always be used, or otherwise a range of options that could be differentiated by the EM-Analyst. If there is only one option, then this could be autoatically populated during setup.**
FISH_PER_BRAIL	Target # of fish for sampling	**EM-A**	SmallInt	For GRAB samples only	<FISH_PER_BRAIL>	N	N/A	Null	**Again this would need to be in the SOP, but recorded by the EM-Analyst.**
EM_SAMPLE_NO	Target # of fish for sampling. May be determined based on sampling method or catch size. Needs to be difined at a later date	**EM-A**	SmallInt	For GRAB samples only	<FISH_PER_BRAIL>	N	High	EM-New	**Again this would need to be in the SOP, but recorded by the EM-Analyst.**

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_LFSAMPLE

PROVIDE the information related to the size (length) and species composition SAMPLE from each FISHING SET.

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
MEASURE_CODE	MEASURING INSTRUMENT Requires new codes for EM instrument	EM-A	CHAR(1)	REFER TO APPENDIX 15	<MEASURE_CODE>	N	High	EM-P1	This would need a new measuring instrument code called something like "EM GRID", and it would always be the same.
COMMENTS	Comments about the sampling	EM-A	Ntext		<COMMENTS>	N	Achieved	EM-R1	
BRAIL_FULL_N	# of Full brail count	EM-A	SmallInt		<BRAIL_FULL_N>	N	Achieved	EM-R1	Brail fullness fields are more relevant to the OBS_SET form. Using LFBRAIL would make all of these fields redundant
BRAIL_78_N	# of Seven eighths brail count	EM-A	SmallInt		<BRAIL_78_N>	N	Achieved	EM-R1	
BRAIL_34_N	# of Three quarter brail count	EM-A	SmallInt		<BRAIL_34_N>	N	Achieved	EM-R1	
BRAIL_23_N	# of Two third brail count	EM-A	SmallInt		<BRAIL_23_N>	N	Achieved	EM-R1	
BRAIL_12_N	# of Half brail count	EM-A	SmallInt		<BRAIL_12_N>	N	Achieved	EM-R1	
BRAIL_13_N	# of One third brail count	EM-A	SmallInt		<BRAIL_13_N>	N	Achieved	EM-R1	
BRAIL_14_N	# of One quarter brail count	EM-A	SmallInt		<BRAIL_14_N>	N	Achieved	EM-R1	
BRAIL_18_N	# of One eighth brail count	EM-A	SmallInt		<BRAIL_18_N>	N	Achieved	EM-R1	
BRAIL_N	Total number of brails	CF	SmallInt		<BRAIL_N>	N	Achieved	EM-R1	Calculate from the sum of the numbers of different filled brails.
SUM BRAILS	Sum of All Brails	CF	Decimal (7,2)		<SUM_BRAILS>	N	Achieved	EM-R1	Calculate from the sum of the numbers of different filled brails multiplied by the fraction of fullness..

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	* Data better collected by PS onboard observer	
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_LFSAMPLE

PROVIDE the information related to the size (length) and species composition SAMPLE from each FISHING SET.

FIELD	Data Collection Instructions	Future Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
SAMPLED_BRAIL_NUM	# of sampled brails	EM-A	Int		<SAMPLED_BRAIL_NUM>	N	Achieved	EM-R1	If alternate methods are developed to sample length frequencies from chute or conveyor, brail may not be important.
MEASURED_N	# of samples measured	CF	Int		<MEASURED_N>	N	Achieved	EM-R1	Calculated from the count of length massurements

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	* Data better collected by PS onboard observer	
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_LFMEAS

PROVIDE the individual fish measurements from the SAMPLE from each FISHING SET.

FIELD	Data Collection Instructions	Entry Source (SETUP PRE EM-A POST AG CF)	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	
SET IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<S_SET_ID>	Y	Achieved	EM-Nat	
LF SAMPLE IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + DAY LOG + SET START DATE + SET START TIME + SAMPLE_TYPE_ID	CF			<S_LFSAMP _ID>	Y	Achieved	EM-Nat	
LF MEASURE IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + DAY LOG + SET START DATE + SET START TIME + SAMPLE_TYPE + SEQ_NUMBER	CF			<S_LFMEAS_ID>	Y	Achieved	EM-Nat	
SEQ_NUMBER	Measurement number. Needs to be determined if this is required for EM sampling protocol	AG	Int		<SEQ_NUMBER>	N	High	EM R1	An SOP would be needed, which would either specify a method that would always be used, or otherwise a range of options that could be differentiated by the EM-Analyst. If there is only one option, then this could be automatically populated during setup.
SP_CODE	Link to species table. Can be visually identified by EM-A. Future work and image training could make image recognition of catch possible	EM-A AG	Char (3)	REFER TO APPENDIX 8.	<SP_CODE>	Y	Achieved / High	EM R1 by EM-A / EM P2 by Image recognition	In some situations a clear view of the entire individual fish may not be possible. This may also require some level of cooperation of the crew. Automatically generated with image recognition.
LEN	Length (cm). Can be visually measured by EM-A using EM Tool.	EM-A AG	SmallInt	Expectation that that the following measurements have been taken by the observers, as instructed. TUNA SPECIES - Upper jaw to fork length; LEN_CODE = 'UF' SHARK SPECIES - total length; LEN_CODE = 'TL' BILLFISH SPECIES - Lower	<LEN>	Y	Achieved	EM R1 by EM-A	In some situations a clear view of the entire individual fish may not be possible. This may also require some level of cooperation of the crew. SOP for length sampling by EM-A needs to be developed. Automatically generated with image

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_LFMEAS

PROVIDE the individual fish measurements from the SAMPLE from each FISHING SET.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
				BILLFISH SPECIES - Lower jaw to fork length for billfish. LEN_CODE = 'LF'			High	EM P2 by Image recognition	recognition?
LEN_CODE	Record measurement methods given in codes	EM-A AG	CHAR(2)	REFER TO APPENDIX A11	<MEASURE_CODE>	Y	Achieved	EM R1 by EM-A	Could be automatically generated if the same length code is used for all measurements of a species.
							High	EM P2 by Image recognition	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

OBS_JOURNAL

PROVIDE a description of the day's activities in a daily journal record for the trip.

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	N	Achieved	EM-Nat	
DAILY JOURNAL IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<OBS_JRNL_ID>	N	Achieved	EM-Nat	
JRNL_date	DATE of Journal entry	EM-A AG	REFER TO APPENDIX A1	Must adhere to the ISO 8601 format in Appendix A1	<JRNL_date>	N	Achieved	EM-R1	Recorded by the EM-Analyst or automatically generated.
JRNL_TEXT	Daily journal entry	EM-A	NText		<JRNL_TEXT>	N	Achieved	EM-R1	Is this required for EM? Recorded by the EM-Analyst.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in in http://www.spc.int/OceanFish/en/publications/doc_download/1334-2014-ps-trip-report-

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	N	Achieved	EM-Nat	The current hardcopy Trip Report has been designed with a focus on onboard observers. *The fields required in an EM trip report needs to be reviewed by DCC / WCPFC.*
1_BACKGROUND	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	AG EM-A	NText		<1_BACKGROUND>	N	Achieved	EM-R1	Note that the front page of the Trip Report could be automatically generated from various fields already completed by the EM-A. EM-A can not comment on placement meetings, briefing etc.
2_0_CRUISE_SUMMARY	(Refer to relevant section in link above)	AG EM-A	NText		<2_0_CRUISE_SUMMARY>	N	Achieved	EM-R1	Most of the information in this section could be automatically generated from various fields already completed by the EM-A. Rest could be filled in by EM-A.
2_1_Area_FISHED	(Refer to relevant section in link above)	EM-A AG	NText		<2_1_Area_FISHED>	N	Achieved	EM-R1	The following can be populated from data already recorded: - Range of latitudes and longitudes - Or region / 5 degree blocks Fishing Areas could be calculated from these.
2_2_END_OF_TRIP	(Refer to relevant section in link above)	EM-A AG CF	NText		<2_2_END_OF_TRIP>	N	Achieved	EM-R1	The following can be populated from data already recorded: - Port of return - Date and time of return The following can be calculated from data already recorded: - total number of fishing operations made by the vessel - catch by species
3_0_DATA_COLLECTED	(Refer to relevant section in link above)	PRE EM-A POST AG	NText		<3_0_DATA_COLLECTED>	N	N/A	Null	
4_0_VESSEL_CREW	Refer to relevant section in link above)	PRE POST	NText		<4_0_VESSEL_CREW>	N	N/A	EM-NP *	Section 4 fields unlikely to be well recorded by EM-A. Require an onboard observer.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

PS_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in in http://www.spc.int/OceanFish/en/publications/doc_download/1334-2014-ps-trip-report-

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
4_1_VESS_INFO	Refer to relevant section in link above)	PRE POST	NText		<4_1_VESS_INFO>	N	N/A	EM-NP *	
4_2_CREW_NATION	Refer to relevant section in link above)	PRE POST	NText		<4_2_CREW_NATION>	N	N/A	EM-NP *	Recorded Pre- and Post-inspections.
4_2_1_PIC	Refer to relevant section in link above)	PRE POST	NText		<4_2_1_PIC>	N	N/A	EM-NP *	Recorded Pre- and Post-inspections.
4_3_FISHING_GEAR	Refer to relevant section in link above)	PRE POST	NText		<4_3_FISHING_GEAR>	N	N/A	EM-NP *	Recorded Pre- and Post-inspections.
4_3_1_BRAIL	Refer to relevant section in link above)	PRE POST	NText		<4_3_1_BRAIL>	N	N/A	EM-NP *	Recorded Pre- and Post-inspections.
4_3_2 NET	Refer to relevant section in link above)	PRE POST	NText		<4_3_2 NET>	N	N/A	EM-NP *	Recorded Pre- and Post-inspections. Could be an opportunity here to add and image field for drawing of the net
4_4_ELEC	Refer to relevant section in link above)	PRE POST	NText		<4_3_ELEC>	N	N/A	EM-NP *	
4_5_safety_eq	Refer to relevant section in link above)	PRE POST	NText		<4_5_safety_eq>	N	N/A	EM-NP *	
4_6_OTHER_GEAR	Refer to relevant section in link above)	EM-A POST	NText		<4_6_OTHER_GEAR>	N	N/A	EM-NP *	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

PS_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in in http://www.spc.int/OceanFish/en/publications/doc_download/1334-2014-ps-trip-report-

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
4_7_WASTE_DISPOSAL	Refer to relevant section in link above)	EM-A AG	NText			N	N/A	EM-NP *	
5_0_FISH_STRATEGY	Refer to relevant section in link above)	EM-A POST	NText		<5_0_fISH_STRATEGY>	N	Low	EM-R3 *	Section 5 fields could be recorded by EM-A but may require extra cameras. Generaly better recorded by an onboard observer.
5_1_1_FLOAT_SCHS_FADS	Refer to relevant section in link above)	EM-A AG	NText		<5_1_FLOAT_SCHS_FADS>	N	Low	EM-R3 *	
5_1_2_FLOAT_SCHS_LOGS	Refer to relevant section in link above)	EM-A AG	NText		<5_1_FLOAT_SCHS_LOGS>	N	Low	EM-R3 *	
5_1_3_FLOAT_SCHS_ANIMAL	Refer to relevant section in link above)	EM-A AG	NText		<5_1_FLOAT_SCHS_ANIMAL>	N	Low	EM-R3 *	
5_2_FREE_SCHS	Refer to relevant section in link above)	EM-A AG	NText		<5_2_FREE_SCHS>	N	Low	EM-R3 *	
5_3_SET_TECH	Refer to relevant section in link above)	EM-A AG	NText		<5_3_SET_TECH>	N	Low	EM-R3 *	
5_4_1_VESS_ADV_SETS	Refer to relevant section in link above)	EM-A AG	NText		<5_4_VESS_ADV_SETS>	N	Low	EM-R3 *	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in in http://www.spc.int/OceanFish/en/publications/doc_download/1334-2014-ps-trip-report-

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
5_4_2_VESS_ADV_ASSIS	Refer to relevant section in link above)	EM-A	NText		<5_4_VESS_ADV_ASSIS>	N	Low	EM-R3 *	
5_5_HELICOPTER	Refer to relevant section in link above)	EM-A POST	NText		<5_5_HELICOPTER>	N	Low	EM-R3 *	Recorded by the EM-Analyst and Pre- and Post-inspections.
5_6_FISH_SUCC	Refer to relevant section in link above)	CF	NText		<5_6_FISH_SUCC>	N	Low	EM-R1	Recorded by the EM-Analyst Could populate with catch rate by fishing area but reasons could not really be determined.
5_7_FISH_INFO	Refer to relevant section in link above)	PRE EM-A POST	NText		<5_7_FISH_INFO>	N	N/A	EM-NP *	Recorded by the EM-Analyst and Pre- and Post-inspections. There is potential to integrate with some sensors and/or weather service
6_0_COC	Refer to relevant section in link above)	PRE EM-A POST	NText		<6_0_COC>	N	N/A	EM-NP *	Recorded by the EM-Analyst and Pre- and Post-inspections. This might be redundant unless the people doing the pre- and post-trip inspections are invloved in witnessing catch for CDS
7_0_ENVIRON		PRE EM-A POST	NText		<7_0_ENVIRON>	N	N/A	EM-NP *	Recorded by the EM-Analyst and Pre- and Post-inspections. There is potential to integrate with some sensors and/or weather service
8_1_TARGET_RET	Refer to relevant section in link above)	AG EM-A	NText		<8_1_TARGET_RET>	N	Achieved	EM-R1	Summary table of all target species could be automatically generated for the trip showing - target species weight/number by species

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

PS_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in in http://www.spc.int/OceanFish/en/publications/doc_download/1334-2014-ps-trip-report-

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
8_2_TARGET_DISC	Refer to relevant section in link above)	AG EM-A	NText		<8_2_TARGET_DISC>	N	Achieved	EM-R3	The quality of this information could depend on wheter there is a camera over the area of discarding. Summary table of all target discard species could be automatically generated for the trip showing - target species weight/number by species
8_3_TARGET _LOG	Refer to relevant section in link above)	POST	NText		<8_3_TARGET _LOG>	N	N/A	EM-NP *	Recorded by the EM-Analyst (discards) and Pre- and Post-inspections. Summary table could be automatically generated for the trip showing: - Total catch by species for comparison with vessel logsheet data
8_4_BYCATCH	Refer to relevant section in link above)	AG EM-A	NText		<8_4_BYCATCH>	N		EM-R3	Recorded by the EM-Analyst (discards).
8_4_1_BYC_LOG_COMP	Refer to relevant section in link above)	POST CF	NText		<8_4_1_BYC_LOG_COMP>	N	N/A	EM-NP *	
8_4_2_BILL	Refer to relevant section in link above)	AG EM-A	NText		<8_4_2_BILL>	N	Achieved	EM-R1	Summary table of all non-target tuna and billfish could be automatically generated for the trip showing: - BILLFISH weight/number by species to compare with logsheet

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

PS_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in in http://www.spc.int/OceanFish/en/publications/doc_download/1334-2014-ps-trip-report-

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
8_4_3_SHARKS_RAYS	Refer to relevant section in link above)	AG EM-A	NText		<8_4_3_SHARKS_RAYS>	N	Achieved	EM-R1	Summary table of all sharks and rays could be automatically generated for the trip showing: - Shark and Ray species (common name followed by the scientific name and FAO code) catch number
8_4_4_OTHER_BY-CATCH	Refer to relevant section in link above)	AG EM-A	NText		<8_4_4_OTHER_BY-CATCH>	N	Achieved	EM-R1	Summary table of all other bycatch species could be automatically generatedfor the trip - Summary details listed Appendix 2
8_4_5_Unspec_sp_codes	Refer to relevant section in link above)	AG EM-A	NText		<8_4_5_Unspec_sp_codes>	N	Achieved	EM-R1	Recorded by the EM-Analyst. Opportunity to add image field.
8_4_6_SSI_LAND	Refer to relevant section in link above)	EM-A POST CF	NText		<8_4_6_SSI_LAND>	N	Achieved	EM-R1	Recorded by the EM-Analyst. Table of all SSIs that were sighted automatically generated from OBS_SSI for the trip showing: - Species (common name followed by the scientific name and FAO code) - Gender - Size - Description of interaction (including prior sighting, treatment, problems with ID) - Condition when landed - Condition when released Opportunity to add image field.
8_4_7_SSI_INTERACT	Refer to relevant section in link above)	EM-A CF	NText		<8_4_7_SSI_INTERACT>	N	Achieved	EM-R3 *	Recorded by the EM-Analyst but limited by field of view. Table of all SSIs that were sighted automatically generated from OBS_SSI for the trip showing: - Species (common name followed by the scientific name and FAO code) - Condition at start of interaction - Condition at end of interaction Opportunity to add image field.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

PS_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in in http://www.spc.int/OceanFish/en/publications/doc_download/1334-2014-ps-trip-report-

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
8_4_8_SSI_SIGHT	Refer to relevant section in link above)	EM-A CF	NText		<8_4_8_SSI_SIGHT>	N	Achieved	EM-R3 *	Recorded by the EM-Analyst but limited by field of view. Table of all SSIs that were sighted automatically generated from OBS_SSI for the trip showing: - Species (common name followed by the scientific name and FAO code) - Condition at start of interaction - Condition at end of interaction Opportunity to add image field.
9_0_SAMPLING	Refer to relevant section in link above)	AG	NText		<9_0_SAMPLING>	N	Achieved	EM-R1	EM can do various types of visual subsampling via cameras on conveyor or chute. An EM SOP is needed, which would either specify a method that would always be used, or otherwise a range of new-EM coded options that could be differentiated by the EM-Analyst.
9_1_GRAB	Refer to relevant section in link above)	PRE POST	NText		<9_1_GRAB>	N	N/A	Null	Recorded by the EM-Analyst and Pre- and Post-inspections.
9_2_SPILL	Refer to relevant section in link above)	PRE POST	NText		<9_2_SPILL>	N	N/A	Null	Recorded by the EM-Analyst and Pre- and Post-inspections.
9_3_OTHER	Refer to relevant section in link above)	PRE POST	NText		<9_3_OTHER>	N	N/A	Null	Not applicable unless industry take data for other projects.
10_0_OTHER_PROJ	Refer to relevant section in link above)		NText		<10_0_OTHER_PROJ>	N	N/A	Null	Not applicable unless industry take data for other projects.
11_0_WELL_LOAD	Refer to relevant section in link above)		NText		<10_2_Stomach>	N	Achieved	EM-R3 *	Requires cameras on wells
12_0_ VESS_DATA	Refer to relevant section in link above)	PRE POST	NText		<12_0_ VESS_DATA>	N	N/A	EM-NP *	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in in http://www.spc.int/OceanFish/en/publications/doc_download/1334-2014-ps-trip-report-

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
13_0_GENERAL	Refer to relevant section in link above)	PRE EM-A POST	NText		<13_0_ TRIP_MON>	N	Achieved	EM-R1	Although wont relate to "life on board"
14_0_ TRIP_MON	Refer to relevant section in link above)	EM-A AG	NText		<14_0_ TRIP_MON>	N	Achieved	EM-R1	Recorded by the EM-Analyst.
14_1_Clarify	Refer to relevant section in link above)	PRE EM-A POST	NText		<14_1_Clarify>	N	N/A	EM-NP *	Recorded by the EM-Analyst and Pre- and Post-inspections.
14_2_Recommend	Refer to relevant section in link above)	PRE POST	NText		<14_2_Recommend>	N	N/A	EM-NP *	Recorded by the EM-Analyst and Pre- and Post-inspections. This should be under 13 - General
14_3_Crew_info	Refer to relevant section in link above)	PRE POST	NText		<14_3_Crew_info>	N	N/A	EM-NP *	Recorded from Pre- and Post-inspections.
14_4_Medical	Refer to relevant section in link above)	PRE POST	NText		<14_4_Medical>	N	N/A	EM-NP *	Recorded from Pre- and Post-inspections.
14_5_Photos	Refer to relevant section in link above)	PRE EM-A POST	NText		<14_5_Photos>	N	Achieved	EM-R1	If in field of view.
14_6_other info	Refer to relevant section in link above)	PRE EM-A POST	NText		<14_6_other info>	N	N/A	Null	Recorded by the EM-Analyst and Pre- and Post-inspections.
15_0_PROBs	Refer to relevant section in link above)	PRE EM-A POST	NText		<15_0_PROBs>	N	Achieved	EM-R1	May be two sections of monitoring problems and EM problems
15_1_FORM_CH_RECS	Refer to relevant section in link above)	PRE EM-A POST	NText		<15_1_FORM_CH_RECS>	N	N/A	Null	Recorded by the EM-Analyst and Pre- and Post-inspections.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	* Data better collected by PS onboard observer	
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_TRIP_REPORT

PROVIDE descriptive information on the trip.
Refer to the relevant sections in in http://www.spc.int/OceanFish/en/publications/doc_download/1334-2014-ps-trip-report-

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
16_0_CONCL	Refer to relevant section in link above)	PRE EM-A POST	NText		<16_0_CONCL>	N	Achieved	EM-R1	Recorded by the EM-Analyst and Pre- and Post-inspections.
17_0_ACKs	Refer to relevant section in link above)	PRE EM-A POST	NText		<16_7_ACKs>	N	N/A	Null	Recorded by the EM-Analyst and Pre- and Post-inspections.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		* Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

PS_OBS_DAY

The observer must provide the information in this table (daily logged DAY) for EACH DAY AT SEA for the period of the trip

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	Validation rules	XML TAG	WCPFC Field	Priority for EM R&D	Category	Notes
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF			<OBSTRIP_ID>	Y	Achieved	EM-Nat	For EM, it is likely that table would not be sent through. All of this information is populated at OBS_ACTIVITY level.
DAY LOG IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE + LOCAL DAY LOG DATE	CF			<S_DEVICE_ID>	Y	Achieved	EM-Nat	
DAY_start	Local/Ship's Date and time at the start of daily activities.	AG	REFER TO APPENDIX A1	Use ships DATE/TIME. Must adhere to the ISO 8601 format in Appendix A1	<start_date>	N	N/A	Null	Redundant for EM. This field is populated at OBS_ACTIVITY level.
UTC_DAY_START	"UTC DATE & TIME – Date &Time when net skiff comes on-board i.e. end of set. Can be filled out by an office observew viewing images or automatically generated from a variety of the EM system components"	AG	REFER TO APPENDIX A1	Use UTC DATE/TIME. Must adhere to the ISO 8601 format in Appendix A1	<UTC_start_date>	N	N/A	Null	As above
log_nofish_n	Provide the Number of logs sighted but no schools association.	AG	SmallInt		<log_nofish_n>	N	N/A	Null	As above
log_fish_n	Provide the Number of log associated schools sighted.	AG	SmallInt		<log_fish_n>	N	N/A	Null	As above
sch_fish_n	Provide the numbers of school sighted at that day.	AG	SmallInt		<sch_fish_n>	Y	N/A	Null	As above
fad_fish_n	Provide the Number of anchored FADs sighted.	AG	SmallInt		<fad_fish_n>	N	N/A	Null	As above
fad_nofish_n	Provide the Number of anchored FADS sighted but no schools association.	AG	SmallInt		<fad_nofish_n>	N	N/A	Null	As above
gen3today_ans	For the entire logged day, provide the FLAG to indicate that incident has occurred on GEN3.	AG	Char (1)	Must be consistent with the GEN-3 data.	<gen3today_ans>	N	N/A	Null	As above
diarypage	Journal page # which has detail explanations of the incident	AG	VarChar (50)		<diarypage>	N	N/A	Null	As above

ANNEX VII – DRAFT TRANSHIPMENT OBSERVER E-MONITORING PROCESS STANDARDS

EM Categories			
EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		* Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

RECORD NAME: ***td_offloading_vessel***

Based on WCPFC Draft Standards for the E-reporting of Transhipment Declarations and Transhipment Notices, 13 November 2017

All fields listed below are required in each record. No field may be missing or null.

Any Offloading Vessel Transhipment Declaration must be able to be uniquely identified by concatenating:
- **the vessel's WCPFC WIN number; and**
- **the date and time that the notice was submitted.**

The td_ov_product records for a single transhipment, must be able to be logically linked to the td_offloading_vessel record for the same transhipment, using the concatenated vessel's WIN number and declaration datetime.

Information Required	Field Name	Field Format	Entry Source SETUP PRE EM-A POST AG CF	Priority	Category	EM Workshop Comments	Notes
The Offloading Vessel's WCPFC Identification Number (WIN)	*off_win*	VARCHAR(16) Example: ABC1234	SETUP	Achieved	EM-R1	Ideally this would be UVI and programmed into the software during setup The service provider needs to have access to this data and vessel names	Reference: CMM2009-06, annex 1, para 2. Validation: Must be a valid WIN, on the date of transhipment, in the WCPFC Record of Fishing Vessels.
The Offloading Vessel's Name	*off_vessel*	VARCHAR(64) Example: Lucky Fisher III	CF	Achieved	EM-R1	Calculated from WIN Is it necessary if WIN is available?	Reference: CMM2009-06, annex 1, para 2. Validation: Must be the vessel name which, in the WCPFC Record of Fishing Vessels, corresponds to the off_win provided.
The Receiving Vessel's WCPFC Identification Number (WIN)	*rec_win*	VARCHAR(16) Example: DEF5678	EM-A	Achieved	EM-R3	Requires dedicated cameras for EM-A to observe or digital recognition of WIN by camera. Some combination of geofencing and vessel detection/speed to switch the camera on.	Reference: CMM2009-06, annex 1, para 2. Validation: Must be a valid WIN, on the date of transhipment, in the WCPFC Record of Fishing Vessels.
			AG	High	EM P1	Possible to generate through VMS tracks or transhipment pre-notification (may not be available to service provider). If both vessels have EM then maybe able to connect through RF and identify each other.	
The Receiving Vessel's name	*rec_vessel*	VARCHAR(64) Example: Super Hauler 2	CF	Achieved	EM-R1	Calculated from WIN Is it necessary if WIN is available?	Reference: CMM2009-06, annex 1, para 3. Validation: Must be the vessel name which, in the WCPFC Record of Fishing Vessels, corresponds to the rec_win provided.
The fishing gear used to take the fish	*fishing_gear*	VARCHAR(16), Uppercase If more than one type of gear was used, then separate the list using dashes. Example: LLS-LLD	AG	High	EM-R1		Reference: CMM2009-06, annex 1, para 4. Validation: Must be a valid fishing gear code as found in Appendix 1, or list of fishing gear codes separated by dashes.
The date on which the transhipment started	*trans_date*	VARCHAR(11) ISO8601 – Date only format. See Appendix 2. Example: 2016-11-25	EM-A AG	High	EM-R1	Flagged by the EM Analyst. Could be automatically generated from use of sensors on cranes / winches	Reference: CMM2009-06, annex 1, para 9. Validation: Must be a date in the recent past.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

The location at which the transhipment started	*trans_loc*	VARCHAR(8), Uppercase Example: WCPFC-HS	AG	High	EM-R1	Automatically generated based on longitude and latitude	Reference: CMM2009-06, annex 1, para 9. Validation: Must be a valid location code as found in Appendix 3.
The latitude at which the transhipment started	*trans_latitude*	CHAR(5) ISO6709, to the nearest 0.1 degree ±DDD.D Example for Pohnpei Airport: +07.0	EM-A AG	High	EM-R1	Flagged by the EM Analyst. Could be automatically generated from use of sensors on cranes / winches	Reference: CMM2009-06, annex 1, para 9. Validation: Must be a valid latitude.
The longitude at which the transhipment started	*trans_longitude*	CHAR(6) ISO6709, to the nearest 0.1 degree ±DDD.D Example for Pohnpei Airport: +158.2	EM-A AG	High	EM-R1	Flagged by the EM Analyst. Could be automatically generated from use of sensors on cranes / winches	Reference: CMM2009-06, annex 1, para 9. Validation: (1) Must be a valid longitude and (2) Should, when considered along with the trans_latitude, represent a location that is at sea and within the trans_loc.
The name of the WCPFC observer	*obs_name*	VARCHAR(64)		N/A	Null		Reference: CMM2009-06, annex 1, para 10. Validation: Must not be blank. Use "No Observer" where no observer was present.
Whether this is a new transhipment declaration, or an amendment to a previous transhipment declaration	*trans_id*	CHAR(16) Example: New-Transhipment	AG	High	EM-R1	Could be automatically generated based on whether previous matching data has been submitted.	NEW - Rationale: Needed to allow already submitted transhipment declarations to be amended. Validation: In the case of new transhipment declarations, must be "New-Transhipment". In the case of amendments to a previous transhipment declaration, must be the Transhipment ID that the WCPFC sent to the contact email address when confirming receipt of the declaration.
The date and time that the declaration was submitted	*submit_time*	VARCHAR(17) ISO 8601 – Date and time without seconds. See Appendix 2. Example: 2016-11-25T14:46	AG	High	EM-R1	Could be automatically generated by the submitters computer system at the moment that the declaration was sent.	NEW - Rationale: Needed (along with the *off_win* field) to allow *td_offloading_vessel* records and *td_ov_product* records to be correctly linked. Validation: Must be a recent earlier date/time.
The number of transhipped product records that are being submitted	*product_count*	INTEGER Example: 25 Must be 0 if no product was transhipped.	AG	High	EM-R1	Note: Could be automatically generated by the submitters computer system at the moment that the declaration was sent.	NEW - Rationale: Needed to ensure that product transhipped records have not been lost or duplicated in transmission.
A contact email address	*contact_email*	VARCHAR(50) Example: a.fisher@gmail.com		N/A	Null		NEW - Rationale: An email address that WCPFC should use to (1) confirm receipt of this declaration and (2) contact if there are any problems with the quality / completeness of this declaration. Validation: Must be a valid email address.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

RECORD NAME: ***td_receiving_vessel***

Based on WCPFC Draft Standards for the E-reporting of Transhipment Declarations and Transhipment Notices, 13 November 2017

All fields listed below are required in each record. No field may be missing or null.

Any Receiving Vessel Transhipment Declaration must be able to be uniquely identified by concatenating:
- **the vessel's WCPFC WIN number; and**
- **the date and time that the declaration was submitted.**

The td_re_pr_transhipped and td_re_pr_onboard records for a single transhipment, must be able to be logically linked to the td_receiving_vessel record for the same transhipment, using the concatenated receiving vessel's WIN number and declaration datetime.

Information Required	Field Name	Field Format	Entry Source (SETUP PRE EM-A POST AG CF)	Priority	Category	EM Workshop Comments	Notes
The Offloading Vessel's WCPFC Identification Number (WIN)	*off_win*	VARCHAR(16) Example: ABC1234	EM-A	Achieved	EM-R3	Requires dedicated cameras for EM-A to observe or digital recognition of WIN by camera. Some combination of geofencing and vessel detection/speed to switch the camera on.	Reference: CMM2009-06, annex 1, para 2. Validation: Must be a valid WIN, on the date of transhipment, in the WCPFC Record of Fishing Vessels.
			AG	High	EM P1	Possible to generate through VMS tracks or transhipment pre-notification (may not be available to service provider). If both vessels have EM then maybe able to connect through RF and identify each other.	
The Offloading Vessel's Name	*off_vessel*	VARCHAR(64) Example: Lucky Fisher III	AG	High	EM-R1	Derived from WIN	Reference: CMM2009-06, annex 1, para 2. Validation: Must be the vessel name which, in the WCPFC Record of Fishing Vessels, corresponds to the off_win provided.
The Receiving Vessel's WCPFC Identification Number (WIN)	*rec_win*	VARCHAR(16) Example: DEF5678	SETUP	Achieved	EM-R1	Ideally this would be UVI and programmed into the software during setup The service provider needs to have access to this data and vessel names	Reference: CMM2009-06, annex 1, para 3. Validation: Must be a valid WIN, on the date of transhipment, in the WCPFC Record of Fishing Vessels.
The Receiving Vessel's name	*rec_vessel*	VARCHAR(64) Example: Super Hauler 2	CF	Achieved	EM-R1	Calculated from WIN Is it necessary if WIN is available?	Reference: CMM2009-06, annex 1, para 3. Validation: Must be the vessel name which, in the WCPFC Record of Fishing Vessels, corresponds to the rec_win provided.
The date on which the transhipment started	*trans_date*	VARCHAR(11) ISO8601 – Date only format. See Appendix 2. Example: 2016-11-25	EM-A AG	High	EM-R1	Flagged by EM Analyst	Reference: CMM2009-06, annex 1, para 9. Validation: Must be a date in the recent past.
The location at which the transhipment started	*trans_loc*	VARCHAR(8), Uppercase Example: WCPFC-HS	AG	High	EM-R1	AG either from Lat and Long or by EM or by post analysis	Reference: CMM2009-06, annex 1, para 9. Validation: Must be a valid location code as found in Appendix 3.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

The latitude at which the transhipment started	*trans_latitude*	CHAR(5) ISO6709, to the nearest 0.1 degree ±DDD.D Example for Pohnpei Airport: +07.0	EM-A AG	High	EM-R1	Flagged by the EM Analyst. Could be automatically generated from use of sensors on cranes / winches	Reference: CMM2009-06, annex 1, para 9. Validation: Must be a valid latitude.
The longitude at which the transhipment started	*trans_longitude*	CHAR(6) ISO6709, to the nearest 0.1 degree ±DDD.D Example for Pohnpei Airport: +158.2	EM-A AG	High	EM-R1	Flagged by the EM Analyst. Could be automatically generated from use of sensors on cranes / winches	Reference: CMM2009-06, annex 1, para 9.
The name of the WCPFC observer	*obs_name*	VARCHAR(64)		N/A	Null		Reference: CMM2009-06, annex 1, para 10. Validation: Must not be blank. Use "No Observer" where no observer was present.
Whether this is a new transhipment declaration, or an amendment to a previous transhipment declaration	*trans_id*	CHAR(16) Example: New-Transhipment	AG	High	EM-R1	Could be automatically generated based on whether previous matching data has been submitted.	NEW - Rationale: Needed to allow already submitted transhipment declarations to be amended. Validation: In the case of new transhipment declarations, must be "New-Transhipment". In the case of amendments to a previous transhipment declaration, must be the Transhipment ID that the WCPFC sent to the contact email address when confirming receipt of the declaration.
The date and time that the declaration was submitted	*submit_time*	VARCHAR(17) ISO 8601 – Date and time without seconds. See Appendix 2. Example: 2016-11-25T14:46	AG	High	EM-R1	Could be automatically generated by the submitters computer system at the moment that the declaration was sent.	NEW - Rationale: Needed (along with the *off_win*field) to allow *td_receiving_vessel*, *td_re_pr_transhipped* and *td_re_pr_onboard* records to be correctly linked. Validation: Must be a recent earlier date/time.
The number of transhipped product records that are being submitted	*product_count*	INTEGER Example: 25 Must be 0 if no product was transhipped.	AG	High	EM-R1	Note: Could be automatically generated by the submitters computer system at the moment that the declaration was sent.	NEW - Rationale: Needed to ensure that product transhipped records have not been lost or duplicated in transmission.
The number of product already on-board records that are being submitted	*onboard_count*	INTEGER Example: 49 Must be 0 if no product was on-board before the transhipment started.	AG	High	EM-R1	Automatically generated from ER or EM data	NEW - Rationale: Needed to ensure that product already on-board records have not been lost or duplicated in transmission.
A contact email address	*contact_email*	VARCHAR(50) Example: a.fisher@gmail.com		N/A	Null		NEW - Rationale: An email address that WCPFC should use to (1) confirm receipt of this declaration and (2) contact if there are any problems with the quality / completeness of this declaration. Validation: Must be a valid email address.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

RECORD NAME: *td_ov_product*

Based on WCPFC Draft Standards for the E-reporting of Transhipment Declarations and Transhipment Notices, 13 November 2017

All fields listed below are required in each record. No field may contain missing or null values.

Any Offloading Vessel Transhipment Declaration must be able to be uniquely identified by concatenating:
- the vessel's WCPFC WIN number; and
- the date and time that the notice was submitted.

The td_ov_product records for a single transhipment, must be able to be logically linked to the td_offloading_vessel record for the same transhipment, using the concatenated vessel's WIN number and declaration datetime.

Information Required	Field Name	Field Format	Entry Source SETUP PRE EM-A POST AG CF	Priority	Category	EM Workshop Comments	Notes
The Offloading Vessel's WCPFC Identification Number (WIN)	*off_win*	VARCHAR(16) Example: ABC1234	SETUP	Achieved	EM-R1	Ideally this would be UVI and programmed into the software during setup The service provider needs to have access to this data and vessel names	DUPLICATE - Rationale: Needed (along with the submit_time field) to allow td_offloading_vessel records and td_ov_product records to be correctly linked. Validation: Must have a matching entry in the td_offloading_vessel record. Validation: Must be a valid WIN, on the date of transhipment, in the WCPFC Record of Fishing Vessels.
The date and time that the declaration was submitted	*submit_time*	VARCHAR(17) ISO 8601 – Date and time without seconds. See Appendix 2. Example: 2016-11-25T14:46	AG	Achieved	EM-R1	Could be automatically generated by the submitters computer system at the moment that the declaration was sent.	NEW & DUPLICATE - Rationale: Needed (along with the off_win field) to allow td_offloading_vessel records and td_ov_product records to be correctly linked. Validation: Must have a matching entry in the td_offloading_vessel record.
The species that was transhipped	*species*	CHAR(3), Uppercase The three-letter FAO species code for the species. Example: SKJ		Achieved	EM-R1	May depend on how it is being transhipped. Difficullt if product is mixed species. May not be able to be coded by EM-A to species level	Reference: CMM2009-06, annex 1, para 5. Validation: Must be a valid three-letter FAO species code - www.fao.org/fishery/collection/asfis/en
The processed state of the transhipped fish	*processed_state*	CHAR(2), Uppercase Example: WH	EM-A	Achieved	EM-R1	May depend on how it is being transhipped. Difficullt if product is mixed species	Reference: CMM2009-06, annex 1, para 5. Validation: Must be a valid processed state code as found in Appendix 4.
Whether the transhipped fish was fresh or frozen	*fresh_frozen*	VARCHAR(8), Uppercase VARCHAR(6), containing the string "Fresh" or "Frozen"	EM-A	Achieved	EM-R1		Reference: CMM2009-06, annex 1, para 6.
The geographic location of the catch	*catch_loc*	VARCHAR(8), Uppercase Example: WCPFC-HS	AG	Achieved	EM-R1	Automatically generated from Trip report	Reference: CMM2009-06, annex 1, para 8. Validation: Must be a valid location code as found in Appendix 3.
The quantity of the product that was transhipped	*quantity_product*	FLOAT Example: 3.92	EM-A	Achieved	EM-R1 with EM-A visual est	Method of estimation may need to be coded.	Reference: CMM2009-06, annex 1, para 5. The weight of product transhipped, measured in metric tonnes.
			AG	High	EM P2 for scales	Weight sensors on the cranes would provide the most advantage.	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

RECORD NAME: ***td_re_pr_transhipped***

Based on WCPFC Draft Standards for the E-reporting of Transhipment Declarations and Transhipment Notices, 13 November 2017

All fields listed below are required in each record. No field may be missing or null.

Any Receiving Vessel Transhipment Declaration must be able to be uniquely identified by concatenating:
- **the vessel's WCPFC WIN number; and**
- **the date and time that the declaration was submitted.**

The td_re_pr_transhipped and td_re_pr_onboard records for a single transhipment, must be able to be logically linked to the td_receiving_vessel record for the same transhipment, using the concatenated receiving vessel's WIN number and declaration datetime.

Information Required	Field Name	Field Format	Entry Source SETUP PRE EM-A POST AG CF	Priority	Category	EM Workshop Comments	Notes
The Receiving Vessel's WCPFC Identification Number (WIN)	*rec_win*	VARCHAR(16) Example: DEF5678	SETUP	Achieved	EM-R1	**Ideally this would be UVI and programmed into the software during setup** **The service provider needs to have access to this data and vessel names**	Reference: CMM2009-06, annex 1, para 3. Validation: Must be a valid WIN, on the date of transhipment, in the WCPFC Record of Fishing Vessels.
The date and time that the declaration was submitted	*submit_time*	VARCHAR(17) ISO 8601 – Date and time without seconds. See Appendix 2. Example: 2016-11-25T14:46	AG	Achieved	EM-R1	**Could be automatically generated by the submitters computer system at the moment that the declaration was sent.**	**NEW & DUPLICATE** - Rationale: Needed (along with the *rec_win* field) to allow *td_receiving_vessel* records and *td_re_pr_transhipped* records to be correctly linked. Validation: Must have a matching entry in the td_receiving_vessel record.
The species that was transhipped	*species*	CHAR(3), Uppercase The three-letter FAO species code for the species. Example: SKJ	EM-A	Achieved	EM-R1	**May depend on how it is being transhipped. Difficullt if product is mixed species. May not be able to be coded by EM-A to species level**	Reference: CMM2009-06, annex 1, para 5. Validation: Must be a valid three-letter FAO species code - www.fao.org/fishery/collection/asfis/en
The processed state of the transhipped fish	*processed_state*	CHAR(2), Uppercase Example: WH	EM-A	Achieved	EM-R1	**May depend on how it is being transhipped. Difficullt if product is mixed species**	Reference: CMM2009-06, annex 1, para 5. Validation: Must be a valid processed state code as found in Appendix 4.
Whether the transhipped fish was fresh or frozen	*fresh_frozen*	VARCHAR(6), containing the string "Fresh" or "Frozen"	EM-A	Achieved	EM-R1		Reference: CMM2009-06, annex 1, para 6.
The quantity of the product that was transhipped	***quantity_product***	**FLOAT** **Example: 3.92**	EM-A	Achieved	EM-R1 with EM-A visual est	**Method of estimation may need to be coded.**	**Reference: CMM2009-06, annex 1, para 5. The weight of product transhipped, measured in metric tonnes.**
			AG	High	EM P2 for scales	**Weight sensors on the cranes would provide the most advantage.**	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

RECORD NAME: ***td_re_pr_onboard***

Based on WCPFC Draft Standards for the E-reporting of Transhipment Declarations and Transhipment Notices, 13 November 2017

All fields listed below are required in each record. No field may be missing or null.

Any Receiving Vessel Transhipment Declaration must be able to be uniquely identified by concatenating:
- **the vessel's WCPFC WIN number; and**
- **the date and time that the declaration was submitted.**

The td_re_pr_transhipped and td_re_pr_onboard records for a single transhipment, must be able to be logically linked to the td_receiving_vessel record for the same transhipment, using the concatenated receiving vessel's WIN number and declaration datetime.

Information Required	Field Name	Field Format	Entry Source SETUP PRE EM-A POST AG CF	Priority	Category	EM Workshop Comments	Notes
The Receiving Vessel's WCPFC Identification Number (WIN)	***rec_win***	**VARCHAR(16)** **Example: DEF5678**	SETUP	**Achieved**	**EM-R1**	**Ideally this would be UVI and programmed into the software during setup** **The service provider needs to have access to this data and vessel names**	Reference: CMM2009-06, annex 1, para 3. Validation: Must be a valid WIN, on the date of transhipment, in the WCPFC Record of Fishing Vessels.
The date and time that the declaration was submitted	***submit_time***	**VARCHAR(17)** **ISO 8601 – Date and time without seconds. See Appendix 2.** **Example: 2016-11-25T14:46**	AG	**Achieved**	**EM-R1**	**Could be automatically generated by the submitters computer system at the moment that the declaration was sent.**	**NEW & DUPLICATE** - Rationale: Needed (along with the *rec_win* field) to allow *td_receiving_vessel* records and *td_re_pr_transhipped* records to be correctly linked. Validation: Must have a matching entry in the td_receiving_vessel record.
The species of the product that was on-board before the transhipment started	***species***	**CHAR(3), Uppercase** **The three-letter FAO species code for the species.** **Example: SKJ**	AG	**Achieved**	**EM-R1**	**Automatically generated from ER or EM data**	**Reference: CMM2009-06, annex 1, para 5.** **Validation: Must be a valid three-letter FAO species code - www.fao.org/fishery/collection/asfis/en**
The geographic origin (RFMO) of the product that was onboard before the transhipment started	***origin_loc***	**VARCHAR(11)** **ISO8601 – Date only format. See Appendix 2.** **Example: 2016-11-25**	AG	**High**	**EM-R1**	**AG either from Lat and Long or by EM or by post analysis**	**Reference: CMM2009-06, annex 1, para 11.** **Validation: Must be a valid RFMO Area code as found in Appendix 5.**
The quantity of the product that was on-board before the transhipment started	***quantity_pro duct***	FLOAT Example: 3.92	AG	**Achieved**	**EM-R1**	**Automatically generated from ER or EM data**	**Reference: CMM2009-06, annex 1, para 11.** **The weight of product on-board, measured in metric tonnes.**

ANNEX VIII – Preliminary assessment of E-Monitoring Process Standards for SPC/FFA Unloading forms

SPC / FFA REGIONAL LONGLINE UNLOADING DESTINATION FORM

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	* Data better collected by PS onboard observer	
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

FIELD	Data Collection Instructions	Entry Source	Field format notes	WCPFC Field	EM Priority	Category	Comments
		SETUP PRE EM-A POST AG CF					
LOAD IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be DELIVERING ENTITY IDENTIFER + RECEIVING ENTITY IDENTIFER + FIRST DAY OF LOADING	CF		N	Achieved	EM Nat	
INFORMATION COMPLETED BY	Person recording the information	EM-A		N	Achieved	EM-R1	
DELIVERING ENTITY	Fishing vessel / Carrier vessel / Cannery / Coolstore	EM-A		N	Achieved	EM-R1	
DELIVERING ENTITY IDENTIFIER	For vessels refer to Appendix A4 Ideally this would be UVI and programmed into the software during setup	SETUP		N	Achieved	EM-R1	
DELIVERING VESSEL TRIP START DATE		AG		N	Achieved	EM-R1	Automatically generate from OBS_TRIP
DELIVERING VESSEL TRIP END DATE		AG		N	Achieved	EM-R1	Automatically generate from OBS_TRIP
RECEIVING ENTITY	Fishing vessel / Carrier vessel / Cannery / Coolstore	EM-A		N	Achieved	EM-R1	
RECEIVING ENTITY IDENTIFIER	For vessels refer to Appendix A4 Ideally this would be UVI and programmed into the software during setup	SETUP		N	Achieved	EM-R1	

SPC / FFA REGIONAL LONGLINE UNLOADING DESTINATION FORM

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	* Data better collected by PS onboard observer	
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	WCPFC Field	EM Priority	Category	Comments
LOADING LATITUDE	Must adhere to the ISO 6709 – Positions Degrees and minutes to 3 decimal places	EM-A		N	Achieved	EM-R1	
LOADING LONGITUDE	Must adhere to the ISO 6709 – Positions Degrees and minutes to 3 decimal places	EM-A		N	Achieved	EM-R1	
FIRST DAY OF LOADING	(YY / MM / DD)	EM-A		N	Achieved	EM-R1	
LAST DAY OF LOADING	(YY / MM / DD)	EM-A		N	Achieved	EM-R1	
AGENT / COMPANY				N	Low	EM-NP	
PREVIOUS LOAD ONBOARD ?	Yes / No	EM-A CF		N	Low	EM-P1	Could be calculated based on previos trip data.
ALREADY LOADED SPECIES	SKJ, YFT-S, YFT-L, BET-S, BET-L, YFT/BET, SKJ / YFT/ BET, OTHER	EM-A CF		N	Low	EM-P1	Could be calculated based on previos trip data.
ALREADY LOADED WEIGHT	Weight of that species	EM-A CF		N	Achieved	EM R1 with EM-A visual est	Could be calculated based on previos trip data.

SPC / FFA REGIONAL LONGLINE UNLOADING DESTINATION FORM

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work		
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

* Data better collected by PS onboard observer

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	WCPFC Field	EM Priority	Category	Comments
LOAD SPECIES	SKJ, YFT-S, YFT-L, BET-S, BET-L, YFT/BET, SKJ / YFT/ BET, OTHER	EM-A		N	Low	EM-R1	May depend on how it is being transhipped. Difficullt if product is mixed species. May not be able to be coded by EM-A to species level
LOAD WEIGHT	Weight of that species	EM-A		N	Achieved	EM R1 with EM-A visual est	Method of estimation may need to be coded.
		AG			High	EM P2 for scales	Weight sensors on the cranes would provide the most advantage.
FULL OR PARTIAL LOAD	FULL / PART	EM-A CF		N	High	EM-R1	Could be calculated based on previos trip data.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	* Data better collected by PS onboard observer	
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

SPC / FFA REGIONAL LONGLINE UNLOADING DESTINATION FORM

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	WCPFC Field	EM Priority	Category	Comments
TRIP IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + DEPARTURE DATE	CF		N	Achieved	EM Nat	
UNLOAD IDENTIFIER	Internally generated. Can be NATURAL KEY or unique integer. NATURAL KEY would be VESSEL + FIRST DAY OF UNLOAD	CF		N	Achieved	EM Nat	
FISHING VESSEL IDENTIFIER	Refer to Appendix A4 Ideally this would be UVI and programmed into the software during setup	SETUP		N	Achieved	EM-R1	
FIRST DATE ON LOGSHEET		AG		N	Achieved	EM-R1	Automatically generate from OBS_TRIP
LAST DATE ON LOGSHEET		AG		N	Achieved	EM-R1	Automatically generate from OBS_TRIP
FULL OR PARTIAL UNLOAD		EM-A AG CF		N	High	EM-P1	Could be generated from data on catch weight vs unload weight.

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	* Data better collected by PS onboard observer	
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

SPC / FFA REGIONAL LONGLINE UNLOADING DESTINATION FORM

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	WCPFC Field	EM Priority	Category	Comments
CARRIER VESSEL IDENTIFIER	Refer to Appendix A4 Ideally this would be UVI and programmed into the software during setup	SETUP		N	Achieved	EM-R1	
UNLOAD LOCATION LATITUDE	Must adhere to the ISO 6709 – Positions Degrees and minutes to 3 decimal places	EM-A		N	Achieved	EM-R1	
UNLOAD LOCATION LONGITUDE	Must adhere to the ISO 6709 – Positions Degrees and minutes to 3 decimal places	EM-A		N	Achieved	EM-R1	
FIRST DAY OF UNLOADING	(YY / MM / DD)	EM-A		N	Achieved	EM-R1	
LAST DAY OF UNLOADING	(YY / MM / DD)	EM-A		N	Achieved	EM-R1	
AGENT / COMPANY		POST		N	N/A	EM-NP	

EM Categories

EM-R1	EM Ready 1 - operational now	EM-Nat	EM Natural Key
EM-R2	EM Ready 2 - requires significant crew support	EM-New	EM new field
EM-R3	EM Ready 3 - requires additional dedicated camera / sensor	Null	Null field
EM-R4	EM Ready 4 - but inefficient / costly		
EM-P1	EM Possible - with minor work	*	Data better collected by PS onboard observer
EM-P2	EM Possible - with major work		
EM-NP	EM Not possible		

SPC / FFA REGIONAL LONGLINE UNLOADING DESTINATION FORM

FIELD	Data Collection Instructions	Entry Source SETUP PRE EM-A POST AG CF	Field format notes	WCPFC Field	EM Priority	Category	Comments
DESTINATION COUNTRY		POST		N	N/A	EM-NP	
DESTINATION TYPE	CANNERY / MARKET / OTHER	POST		N	N/A	EM-NP	
SPECIES		EM-A		N	Achieved	EM-R1	May depend on how it is being transhipped. Difficullt if product is mixed species. May not be able to be coded by EM-A to species level
FORM	FRESH / FROZEN	EM-A		N	Achieved	EM-R1	May depend on how it is being transhipped. Difficullt if product is mixed species
NUMBER	No. of fish of that species	EM-A		N	Achieved	EM-R1	
WEIGHT	Weight of that species	EM-A		N	Achieved	EM R1 with EM-A visual est	Method of estimation may need to be coded.
		AG			High	EM P2 for scales	Weight sensors on the cranes would provide the most advantage.
WEIGHT CODE	Kg / lbs	AG		N	Low	EM-R1	