SCIENTIFIC COMMITTEE
SIXTEENTH REGULAR SESSION

Online Meeting
11 –20 August 2020

REPORT OF THE DCC MEETING FOR THE REVIEW OF LONGLINE ELECTRONIC MONITORING (EM) DATA FIELDS

WCPFC-SC16-2020/ST IP-07

Oceanic Fisheries Programme (OFP)
Pacific Community (SPC)

Pacific Islands Forum Fisheries Agency (FFA)

Office of the Parties of the Nauru Agreement (PNAO)

Abstract

An initial meeting to review the standardisation of Longline E-Monitoring data fields for member countries of the SPC, FFA and PNAO was conducted in February 2020. This initial meeting produced draft DCC Longline EM minimum data fields in considering the following key criteria:

1. The importance for both science and compliance objectives, with some guidance provided by the recent SPC/FFA/PNAO Regional Longline EM Planning/Policy workshop[1] and outcomes of the pre-workshop survey;
2. The philosophy of the WCPFC Project 93 (WCPFC-SC15-2019/ST-WP-04[2]), which is an initiative to review the various sources of the data obtained from the tuna fisheries in order to, *inter alia*, more efficiently collect data by removing redundancy, promote synergy between the different data collection programmes and consider which source of data is the most appropriate as the primary source and those data sources which are most appropriate for verification only.
3. The efficiency and practicality of collecting each data field through EM. This criterion used the outcomes/decisions of previous EM Process Standards workshops, but more importantly, the meeting used the experience of member countries that have conducted EM trials over the past 3-5 year as the basis for deciding whether it was efficient/practical to collect the data field.

This information paper provides the report of this meeting which includes the draft DCC Longline E-Monitoring data fields and recommendations from the meeting.

This paper is provided to inform the WCPFC Scientific Committee of these developments and will also be made available to the WCPFC ER and EM Working Group meeting and the 16th Meeting of the WCPFC Technical and Compliance Committee (TCC16), both meetings to be conducted in late 2020.

[1] SPC/FFA/PNAO Data Collection Committee (DCC) Longline Electronic Monitoring (EM) Planning Workshop, FFA Main Conference room, Honiara, Solomon Islands, 16–18 October 2019
https://oceanfish.spc.int/en/meetingsworkshops/e-reporting-a-e-monitoring/499-e-monitoring-oct-2019

[2] https://www.wcpfc.int/node/42921

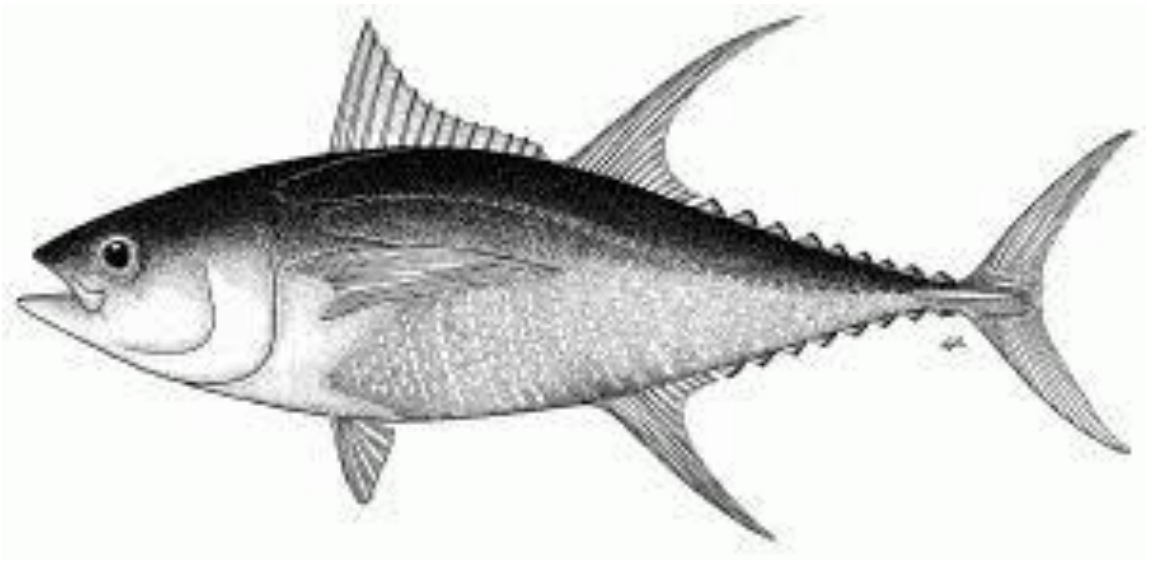
Report of the Data Collection Committee (DCC)

Meeting for the

Review of Longline Electronic Monitoring (EM) Data Fields

4–6 February 2020

Nadi, Fiji



Prepared by the Oceanic Fisheries Programme of the Pacific Community (SPC), Pacific Islands Forum Fisheries Agency (FFA) and the Office of the Parties to the Nauru Agreement (PNAO)

Contents

1. Preliminaries

Traditionally, the chair of the Tuna Fishery Data Collection Committee (DCC) has been shared between the Pacific Islands Forum Fisheries Agency (FFA) and the Pacific Community (SPC). The current chair is Tim Park, the Observer Coordinator from SPC who assumed the role of chair for this meeting. The rapporteur work for the meeting was conducted by SPC staff, with Jed MacDonald taking the lead, assisted by Tim Park, Malo Hosken and Peter Williams.

The proposed agenda was adopted.

The Chair explained the history and the role of DCC and how it has influenced the decisions on data standards for the WCPFC. He also briefly explained how the work of DCC will now take into account the WCPFC Project 93 and that the outcomes of this meeting will be made available to other important meetings this year, including SC16 and the WCFPC E-Reporting and E-Monitoring (ERandEM) Working Group, which will be meeting in September 2020.

The main body of this report is a concise record of discussions, and readers are directed to **SECTION 12** for a detailed record of discussions. Various documents including this report, annotated agenda, Meeting documents and the draft standards are available on the meeting web page.

For efficiency sake, the meeting is herein referred to in this report as "DCC-EM-LL-2020".

2. Background and current status of work related to Longline EM data fields

This agenda item provided the meeting with the background of various work conducted over recent years related to Longline EM data fields, including the EM Process standards and the WCPFC Project 93. Two presentations covered the potential use of EM Data for science (see Doc #6 in **SECTION 10)** and some background on the basis for observer coverage and options for future EM coverage (see Doc #7 in **SECTION 10**). In regards to EM coverage, planning and policy meetings during 2019 reached some level of agreement on the following coverage strategy:

- The main EM objective (catch validated) is for both Science and Compliance (this is an outcome of a member country survey prior in September 2019);
- There will be a requirement for 100% coverage of EM equipment, that is, all vessels must have EM equipment and it must be running 24/7 while at sea;
- The anticipated EM Review Protocol will require :
    - Minimum EM Records (video) review rate nominally established at xx% of randomly selected sets per trip (with all trips being sampled)
    - For the set selected, a representative sample of the SETTING operation is reviewed, mainly to determine effort
    - For the set selected, the entire HAUL operation is reviewed
    - The minimum recommended review rate for science is 20%, although further analyses will be conducted to provide guidance to member countries, acknowledging that the constraints on resources (funding, people, etc.) will need to be considered in decisions on the review rate.

Each country and the PNAO then presented the current status and future plans with respect to their EM programmes and systems (see **SECTION 12** for a detailed record of their presentations and subsequent discussion).

3. Review of draft Longline EM data fields

This agenda item was the focus of the meeting and therefore most of the meeting time was spent on this topic. The approach of this DCC meeting was to work through a table of draft Longline EM data fields used in previous EM Process standards workshops – Electronic Monitoring Longline Process Standards Workshop (2016) and Second Regional E-Monitoring Process Standards Workshop (2017). The table of draft Longline EM data fields had been augmented for this workshop to include comments related to WCPFC Project 93 (WCPFC-SC15-2019/ST-WP-04) and Emery et al., (2018). The Emery (2018) paper evaluated the ROP minimum data fields, their scientific application and whether EM could be used to collect the ROP fields. The Project 93 outcomes had grouped the fields and determined which data collection tool would be a primary source and which would be a secondary or validating source. This working table is available in **SECTION 11**. In reviewing this table, the meeting considered each of the following key criteria in its decision to include or exclude a data field for the draft DCC Longline EM minimum data fields:

1. The importance for both science and compliance objectives, with some guidance provided by the recent Regional Longline EM Planning/Policy workshop and outcomes of the pre-workshop survey;
2. The philosophy of the WCPFC Project 93, which is an initiative to review the various sources of the data obtained from the tuna fisheries in order to, *inter alia*, more efficiently collect data by removing redundancy, promote synergy between the different data collection programmes and consider which source of data is the most appropriate as the primary source and those data sources which are most appropriate for verification only.
3. The efficiency and practicality of collecting each data field through EM. This criterion used the outcomes/decisions of previous EM Process Standards workshops, but more importantly, the meeting used the experience of member countries that have conducted EM trials over the past 3-5 year as the basis for deciding whether it was efficient/practical to collect the data field.

It was acknowledged that there are data fields that are important for science but cannot be efficiently collected by EM (at this stage) and these fields were not be included but there is potential for EM to cover these fields in the future with further work by the EM technical service providers (See **SECTION 6**).

The meeting proceeded to work through each field based in the original ROP longline minimum data field standards. The previous EM Process standards workshops identified ROP fields that were clearly not possible to collect through EM and other fields that could not be efficiently generated (at this stage) through EM, so the meeting considered they should not be included on the current draft list of DCC LL EM minimum data fields. The meeting also considered the outcomes of Project 93 for each field and this determined whether a field was better collected through another source of data. The meeting also included new fields that EM could generate (i.e. automatically or efficiently acquire) and are useful for science and/or compliance.

The meeting considered the addition of new fields to effectively identify and describe any potential compliance events during the EM video review process. These new fields for potential compliance events would allow the EM Analyst to record a potential compliance incident through the assignment of an event to a broad compliance descriptive category, then accompanying detailed notes, with this information linked directly (and automatically) to the video, including date/timestamp and the position coordinates. This would allow compliance people to efficiently locate and extract information (potentially including a video clip of the event) by broad compliance category, rather than the current painstaking work in searching the general comments field. The benefit of adding Compliance codes to the event recording structure is that this information can be recorded at any point as a potential compliance incident from among the other fishing operation or catch events.

The detailed discussion on this agenda item is included in **SECTION 12.**

The outcome of this agenda item of the meeting was agreement of a list of draft DCC Longline EM data fields (see **SECTION 11**) and a plan for having these draft data fields endorsed through other fora (See **SECTION 6**).

It was acknowledged that review of draft DCC Longline EM data fields to the broader regional group, beyond the participants of the workshop was important and so these draft standards were to be sent out to other relevant people in SPC, FFA and PNAO for their comments by 24th February 2020, after which the report and draft standards would be finalised in preparation for review by the FFA MCS Working Group (March/April) and then other for a later in the year.

4. Draft TORs to produce draft SSPs for Longline EM Quality Assurance / Verification Systems

A draft of the TORs for a consultancy to produce draft SSPs for Longline EM Quality Assurance / Verification Systems was presented to the meeting and is available in Meeting Doc #5 (see **SECTION 10**). The meeting provided some minor enhancements to the draft notes which are now available on the meeting web page. SPC and FFA will proceed to work on these draft TORs and present them at other relevant meetings, later in the year.

5. Protocols and coverage options for Longline EM

Draft notes on the TORs for a study to be conducted by SPC in the next six months were presented and are available in Meeting Doc #4 (see **SECTION 10**). The meeting provided some minor enhancements to the draft notes which are now available on the meeting web page.

6. Recommendations and future work

The meeting produced Recommendations listed below. Several recommendations identified future priority work for Longline EM data fields and systems.

The most important work in the short term is the following:

i. Review of the draft DCC Longline EM minimum data field standards (see **SECTION 11** of this report) by all relevant SPC, FFA and PNAO officers involved in E-Monitoring work, with responses due back by 24 February 2020 so a paper can be prepared for the FFA MCS Working Group Meeting.
ii. Review by the FFA MCS Working Group meeting (March 2020). Updates based on comments from this meeting are to be finalised by 1st April 2020, so that an FFC Information Paper can be prepared.
iii. Review and Endorsement from FFA MCS Working Group of the draft DCC Longline EM minimum data field standards, accepted by MCS Working Group.
iv. Information papers on the draft DCC Longline EM minimum data field standards prepared for WCPFC SC16 (August 2020) and the 4th WCPFC ERandEM Working Group Meeting (September 2020).

7. Closing

The meeting closed with and prayer and then a round of vigorous applause.

References:

Emery et al., (2018). The use of electronic monitoring within tuna longline fisheries in the WCPO - implications for international data collection, analysis and reporting. Reviews in Fish Biology and Fisheries, volume 28, pages 887–907 (2018).

FFA, PNAO, SPC and WCPFC Secretariat, (2019). Update On Project 93: Review of the Commission's data needs and data sources, including the potential for e-Monitoring to address gaps. WCPFC-SC15-2019/ST-WP-04.

SPC (2016) Electronic monitoring longline process standards workshop summary. SPC, Nouméa

SPC (2017) Report on the second regional electronic monitoring process standards workshop 20–24 November 2017. SPC, Nouméa

8. Meeting Annotated Agenda

SPC/FFA/PNAO Data Collection Committee (DCC)
Meeting for the
Review of Longline Electronic Monitoring (EM) Data Fields

4–6 February 2020
Nadi, Fiji

Annotated Agenda

WORKSHOP OBJECTIVES

To develop draft DCC Longline EM minimum data fields for review and adoption by member countries prior to the next WCPFC ERandEM meeting (September 2020).

Secondary objectives (pending available time) include:

- Presenting TORs for a consultancy to produce SSPs for the EM Verification System, based on the concept note produce at the 2nd EM Process standards workshop;
- Developing and presenting a draft protocol for EM coverage for review, modification and agreement;

SCOPE

This workshop focusses on the required data fields from E-Monitoring for the Longline fishing operation only.

PARTICIPANTS

Participation at this DCC technical meeting will be restricted to the following:

- DCC Chair
- Member countries
  At least one person overseeing operations related to the EM trials in respective countries (FSM, RMI, Fiji and Solomon Islands)
- SPC
  SPC Scientist(s) and SPC EM Monitoring specialists (operations and data management)
- FFA
  EM, compliance and data specialists
- PNAO
  EM Coordinator, EM specialists
- WCPFC Secretariat representative

WORKSHOP AGENDA

Agenda item – 1: Prayer, Opening address and objectives of the workshop (DCC Chair)

Agenda item – 2: Background and current status of work related to Longline EM data fields

Brief presentation(s) covering the background to longline EM data fields to date, including:

- EM Process standards
- Emery et al. paper
- WCPFC Project 93 and ROP data fields
- Explanation of the scientific requirements for certain key fields

Agenda item – 3: Review of draft Longline EM data fields

The DCC meeting will proceed to work through the table of draft Longline EM data fields (see **ANNEX 1** which describes the template table), considering their importance for science and compliance, but also the efficiency and practicality in collecting each data field using EM. For example, data fields that are important for science but cannot be efficiently collected by EM (at this stage) will be categorised accordingly. The fields examined will not include general vessel characteristics and crewing fields that have previously been characterised as EM Not possible. There may be suggestion s of other fields natural or calculated, not in this list but of scientific utility and efficiently collected by EM.

Consistent with SC15 WP-04 Project 93 update (**ANNEX 2** Tables) the potential of EM as the principal (minimum data field) or secondary validating source of data for a field or whether secondary but critical for the calculation of other fields will be considered.

The outcome will be an agreed list of draft Longline EM data fields, with an appropriate designation for collection through EM at this stage.

Agenda item – 4: Terms of Reference (TORs) for a consultancy to produce draft SSPs for Longline EM Quality Assurance / Verification Systems

The DCC meeting will review and enhance the draft Terms of Reference for a consultancy to produce draft SSPs for Longline EM Quality Assurance / Verification Systems for member countries.

A focus on fundamentals such as definitions of terminology with reference to the EM Data verification and validation process

Agenda item – 5: Protocols and coverage options for Longline EM

The DCC meeting will discuss/review options for sampling regime protocols (e.g. determining base unit of calculation, set/trip/partial set etc.) and coverage for Longline EM, considering science and compliance objectives, and in particular, spatial/temporal coverage. The objective is to produce advice to respond to the PNA and other member countries requests for guidance on what protocols/coverage should be used for their EM trials and moving to full EM implementation.

For example, an integrated analytical tool reviewing year-to-date observer and EM-generated data, in conjunction with near-real-time VMS data, could be developed to advise national EM programmes which trips/sets should be selected for EM Analysis. This tool could be developed to use business rules such as gaps in spatial/temporal coverage (identified by VMS data analysis), and specific compliance objectives, for example.

Agenda item – 6: Draft Longline EM Standards - next steps…

Discussion on the next steps, based on the outcomes from Agenda items 3, 4 and 5, and in particular, a schedule and assignment of responsibilities for preparation of documents/presentations for the respective WCPFC (ERandEM WG), SPC (HoF12), FFA (MSC WG and FFC) and PNAO meetings during 2020.

Agenda item – 7: Adoption of meeting outcomes and close of meeting

- Adoption of Meeting outcomes and next steps
- Timeline for producing report of the meeting
- Close of Meeting

9. Participants

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10. Meeting Reference documents

Meeting Reference Document	Title	URL
Doc 1	Pre-meeting Working document – draft Longline EM data fields with annotations for WCPFC Project 93 and scientific use of each field	https://oceanfish.spc.int/en/meetingsworkshops/dcc/510-data-collection-committee-review-of-longline-electronic-monitoring-data-fields-4-6-feb-2020
Doc 2	Emery et al. 2018. The use of electronic monitoring within tuna longline fisheries: implications for international data collection, analysis and reporting	https://www.researchgate.net/publication/327281110_The_use_of_electronic_monitoring_within_tuna_longline_fisheries_implications_for_international_data_collection_analysis_and_reporting
Doc 3	WCPFC Project 93 (Paper prepared for SC15)	https://www.wcpfc.int/node/42921
Doc 4	Notes on TORs for a study to review coverage options for Longline E-Monitoring	(see meeting web page as per Doc 4)
Doc 5	Draft TORs for a consultancy to produce draft SSPs for Longline EM Quality Assurance / Verification Systems	(see meeting web page as per Doc 5)
Doc 6	Presentation : Potential scientific use of longline EM data	(see meeting web page as per Doc 6)
Doc 7	Presentation : Longline E-Monitoring - Considerations for coverage	(see meeting web page as per Doc 7)

11. Draft Longline EM minimum data field standards (as agreed by DCC-EM-LL-2020)

These standards are proposed for member countries to use when embarking on trials or implementation of E-Monitoring (EM) for longline vessels licensed to operate in your waters (and adjacent waters). These standards should be provided to the EM technical provider to ensure the minimum data fields specific here are generated from the EM system, according to the EM Protocol notes provided. These standards are in draft format and will be reviewed from time to time.

SPC/FFA DCC LL E-Monitoring minimum data fields		***Description***	***Notes on EM PROTOCOL** (How the data are to be acquired)*
VESSEL IDENTIFICATION			
Vessel identification	Name of vessel	Name of vessel. This information would normally be linked to a VESSEL reference database (e.g. FFA Vessel Register) which will ensure consistency/standardisation.	The EM system should have linkages into the regional VESSEL REGISTERs (WCPFC and/or FFA) and so these fields must be generated by the EM system to be consistent with these vessel registers.
	Flag State Registration Number	Flag registration number of the vessel	
	Flag	Flag or chartering nation of the vessel	
	International Radio Call Sign	International Call sign	
	WCPFC VID, FFA VID and IMO	IMO, WCPFC Vessel ID and the FFA VID would be generated by the EM system using these VESSEL reference databases.	
	TRIP INFORMATION		
Trip information	**Date and time of departure from port**, or the departure from the "carrier" vessel immediately after an at-sea transhippment event.	The date and time the vessel leaves port to start its fishing campaign. If the vessel is departing from a carrier vessel after an at sea transhipment, the date and time of the departure from a carrier vessel will be used.	The EM system will estimate these fields based on auto-analyses of the EM date/time and positional information in a similar way that VMS TRIP data are generated and in conjunction with geo-fenced port areas (6 or 12 nautical mile geo-fence). This generated information will then be confirmed in the EM system by the analyst. The international standard of Location Code (UNLOCODE) for PORTs must be used.
	Port of departure, or the departure from the "carrier" vessel immediately after an at-sea transhippment event. (Coordinates of at sea transhipment)	Port of departure. If the vessel is departing from a carrier vessel after an at sea transhipment, this field will be "AT SEA" and the coordinates of the 'at sea' transhipment will be generated.	

SPC/FFA DCC LL E-Monitoring minimum data fields		*Description*	***Notes on EM PROTOCOL** (How the data are to be acquired)*
	Date and time of return to port, or the arrival at the "carrier" vessel just before an at-sea transhippment event.	The date and time the vessel returns to a port after a fishing trip. If the vessel is arriving at a carrier vessel to undertake an at sea transhipment, the date and time of the arrival at the carrier vessel will be used.	
	Port of return, or the arrival at the "carrier" vessel just before an at-sea transhippment event. (Coordinates of at sea transhipment)	Port where the vessel returns. If the vessel is arriving at a carrier vessel to undertake an at sea transhipment, "AT SEA" will be used and the coordinates of the 'at sea' transhipment will be generated.	
	EM ANALYSIS INFORMATION		
EM Analysis	EM Analyst name and code	EM Analyst's name and EM Analyst code.	Entered into EM system by EM Analyst. The EM Analyst code should correspond to the regional EM Analyst code reference table.
	EM Country provider (EM data review centre)	EM programme provider code - data review centre - e.g. FJEM (Fiji E-Monitoring Programme)	Entered into EM system by EM Analyst. It should adhere to the format "xxEM" where xx is the ISO two-letter country code of the EM data centre, and appropriate two-letter codes for any sub-regional programme.
	EM Data Quality Reviewer	EM Data Quality Reviewer.	Entered into EM system by EM Analyst (free format text). **The EM data quality review SSPs have yet to be established and agreed.**
	EM Data Quality Review conducted	EM Data Quality Review has been conducted (Y/N)	Entered into EM system by EM Reviewer. **The EM data quality review SSPs have yet to be established and agreed.**
	HAUL coverage strategy for SCIENCE and COMPLIANCE	Options (1) All hauls for this trip analysed, or (2) x% of randomly selected hauls analysed for **both SCIENCE and COMPLIANCE.** (Noting that this will also allow the analysis and recording of COMPLIANCE EVENTS).	The options for HAUL coverage for SCIENCE and COMPLIANCE will be elaborated through a study conducted by SPC in 2nd QTR 2020 and then reviewed by member countries to establish an agreed protocol in late 2020. At this stage, it may be either (i) All hauls for this trip analysed, or (ii) **x%** of randomly selected hauls analysed FOR SCIENCE

SPC/FFA DCC LL E-Monitoring minimum data fields		*Description*	***Notes on EM PROTOCOL** (How the data are to be acquired)*
	Trip coverage strategy for COMPLIANCE only	Coverage of sets/hauls analysed specifically **for COMPLIANCE**. This information is only required when the HAUL coverage for SCIENCE is not 100% (i.e. when a % of hauls are analysed only). The requirements for COMPLIANCE EVENT information is listed below.	Yet to be discussed and agreed. Coverage of sets/hauls analysed specifically **for COMPLIANCE only** (and in addition to the SCIENCE/COMPLIANCE coverage strategy listed above), noting that coverage objectives for compliance is usually consistent with science objective and this field would only be where additional coverage specifically for COMPLIANCE is required. Coverage related to EEZ only may be a consideration for COMPLIANCE coverage strategy. This strategy will be required when only some HAULs are analysed based on the main coverage protocol, and there is a COMPLIANCE need to analyse ALL HAULS, for example. This review will only need to complete the COMPLIANCE EVENT information listed below.
	EM Technical service provider	EM system technical service provider	Generated from EM system
	EM system software name and version	EM software name and version	Generated from EM system
	SETTING AND HAULING INFORMATION		
Setting and Hauling information	Date & time start of SET	Date and time the first buoy enters the water to start the setting of line	**Auto-generated by the EM system from the float SET timestamping. Minimum resolution of position is 1/1000 of a minute.**
	Latitude and longitude of start of SET	GPS reading at time first buoy enters water	
	Date and time of end of SET	Date and time the last buoy enters the water	
	Latitude and longitude of end of SET	GPS reading at time last buoy enters water	
	Date and time of start of HAUL	Date and time the first buoy of the mainline is hauled from the water to start the haul	**Auto-generated by the EM system from the float HAUL timestamping. Minimum resolution of position is 1/1000 of a minute.**

SPC/FFA DCC LL E-Monitoring minimum data fields		*Description*	***Notes on EM PROTOCOL** (How the data are to be acquired)*
	Latitude and longitude of start of HAUL	GPS reading at time first buoy is hauled from the water	
	Date and time of end of HAUL	Date and time the last buoy of the mainline is hauled from the water to end the haul	
	Latitude and longitude of end of HAUL	GPS reading at time last buoy is HAULED	
	Date and time stamp for each FLOAT SET	UTC Date and time (to nearest second) of each FLOAT SET	Generated by the EM Analyst declaration in the EM system. Analysis of this information usually takes 30-60 minutes per set. Potential to do this using technical enhancements in the future (i.e. RFID[3]s or other sensors on FLOATS). Minimum resolution of position is 1/1000 of a minute.
	Latitude and longitude of each FLOAT SET	GPS reading of each FLOAT SET (as recorded by EM equipment)	
	Date and time stamp for each FLOAT HAULED	UTC Date and time (to nearest second) of each FLOAT HAULED (depending on target coverage)	Generated by the EM Analyst declaration in the EM system. Potential to do this using technical enhancements in the future (i.e. RFIDs or other sensors on FLOATS). These data are important for estimation of hook number of catch event, only the timestamps for the hauled floats either side of catch event may only be required (to be discussed further). Minimum resolution of position is 1/1000 of a minute.
	Latitude and longitude of each FLOAT HAULED	GPS reading of each FLOAT HAULED (as recorded by EM equipment) (depending on target coverage)	
	Total number of baskets or floats	Number of baskets set; usually it is the same as the number of floats set minus one	**With each float timestamped, the EM system should automatically calculate this.**
	Number of hooks between floats or number of hooks per basket	Number of hooks between floats	**PROTOCOL is to count hooks from first 3 baskets, middle 3 baskets and last 3 baskets and the average HOOKS per BASKET (successive floats) can then be determined.**
	Total number of hooks used in a set	Total number of hooks set, calculated by multiplying the number of baskets by number of hooks between floats	**EM system calculates total number of HOOKS SET, calculated by multiplying the number of baskets by number of hooks between floats**

[3] RFID - Radio-frequency identification

SPC/FFA DCC LL E-Monitoring minimum data fields		*Description*	***Notes on EM PROTOCOL*** *(How the data are to be acquired)*
	Bait species	At the set level record the bait species used. Should cater for more than one species.	**PROTOCOL is to review the BAIT used during the analyses conducted over the setting of the first 3 baskets, the middle 3 baskets and the last 3 baskets. This should be possible using appropriate placement of the camera mounted to view the SETTING process.**
	Total amount of baskets, floats monitored by EM Analyst in a single HAUL	How many floats or baskets monitored by the EM Analyst	**EM System calculates total number of BASKETS monitored using the FLOAT HAUL TIMESTAMP data.**
	SPECIAL GEAR ATTRIBUTES		
Special gear attributes	Tori line	Recorded at the set level whether the vessel uses a single or double tori lines when setting (Y/N)	**BIRD MITIGATION. PROTOCOL is to review the TORI POLE usage during the video analyses conducted over randomly selected video periods of the SET based on the compliance coverage strategy (yet to be established).**
	Blue dyed bait	Recorded at the set level, whether the vessel used bait that has been dyed especially to look blue (Y/N)	**BIRD MITIGATION. PROTOCOL is to review the BLUE DYED BAIT usage during the video analyses conducted over randomly selected video periods of the SET based on the compliance coverage strategy (yet to be established).**
	Deep setting line shooter	Recorded at the set level whether the vessel used a deep setting line shooter (Y/N)	**BIRD MITIGATION. PROTOCOL is to review the DEEP SETTING Line shooter during the video analyses conducted over randomly selected video periods of the SET based on the compliance coverage strategy (yet to be established).**
	Strategic offal disposal	Recorded at the SET level whether the vessel used strategic offal disposal (Y/N)	**BIRD COMPLIANCE at SET level. PROTOCOL is to review the OFFAL discharge during the video analyses conducted over randomly selected video periods of the SET based on the compliance coverage strategy (yet to be established). Potential with camera in setting area to capture field for verification (presence/absence). This would be evident if the vessel throws the offal on the same side or area as the hooks are being SET and so the EM analyst should be able to view this practice.**
	CATCH EVENT INFORMATION		

SPC/FFA DCC LL E-Monitoring minimum data fields		*Description*	***Notes on EM PROTOCOL** (How the data are to be acquired)*
Information on catch event	Hook number, between successive floats of **the CATCH EVENT**	Hook number between successive floats that the fish is caught on	**Recommendation for EM Analyst to determine this field for any encounters with Species of special interest (SSIs = shark, marine reptiles, seabirds and marine mammals) as the minimum requirement. (This process may also require the count of hooks between successive floats for these catch events only, in order to cross-check with value estimated during the review of the SET).** **With the availability of FLOAT timestamp data (before and after the catch event) and the timestamp for when SNAP of each catch event comes onboard, an algorithm to estimate this field should be used for the non-SSI species.**
	Species code	FAO code of species caught	**EM Analyst declaration. Must use the FAO standard Species codes.**
	Length of fish	Measure length of species using the recommended measurement	**EM Analyst using the calibrated digital measuring tool, noting the need for an assigned area on the deck where the fish should be measured.**
	Length measurement code	Code the type of measurement used	**EM Analyst declaration depending on how the fish was measured. Must use regional standard codes for LENGTH CODES**
	Sex	Sex the species, if possible with certainty for SHARK and RAY species only.	**EM Analyst declaration. Not possible for most species. Can collect sharks and rays sex, for example, if shown ventrally. Some other species may be possible (e.g. mahi mahi). Must use regional standard codes for SEX**
	Condition when caught	Use condition codes to indicate status when caught.	**EM Analyst declaration. Must use the regional standard codes for CONDITION.**
	Fate	What happens to the fish after its caught use codes	**EM Analyst declaration. Must use the Regional standard codes for FATE.**
	Interaction	For SSIs only, details of the gear interaction with the SSI. For example, hooking position for marine turtles and shark	**EM Analyst declaration. Must use the Regional standard codes for INTERACTION.**
	Condition when released	Use condition codes to indicates status when released to the sea	**EM Analyst declaration. Must use the regional standard codes for CONDITION.**

SPC/FFA DCC LL E-Monitoring minimum data fields		*Description*	***Notes on EM PROTOCOL** (How the data are to be acquired)*
	Catch event date and time	UTC Date and time (to nearest second) of the catch event (as recorded by EM equipment).	Fields automatically generated by EM system of use for science and compliance. This represents the point when the EM analyst registers the catch coming onboard or if not landed at all, when it is struck off, released or discarded.
	Catch SNAP date and time	UTC Date and time (to nearest second) of when the branchline SNAP for each catch event comes onboard	Fields automatically generated by EM system and stored with the other relevant catch event data.
	Latitude and longitude of Catch event	GPS reading at catch event (as recorded by EM equipment)	Fields automatically generated by EM system. Minimum resolution of position is 1/1000 of a minute.
	POTENTIAL COMPLIANCE EVENTS		
Potential Compliance event	Date and time of potential compliance issue	UTC Date and time (to nearest second) for each potential compliance issue recorded by the EM Analyst (the position as generated by EM equipment). **Note that Potential Compliance events can be recorded outside the fishing operation period.**	Fields automatically generated by EM system and stored with the related potential compliance event information.
	Latitude and longitude of compliance issue	GPS reading for the potential compliance issue recorded by the EM Analyst (as generated by EM equipment)	Fields automatically generated by EM system and stored with the related potential compliance event information. Minimum resolution of position is 1/1000 of a minute.
	Compliance category	Category (code) for the potential compliance issue as viewed and recorded by the EM Analyst, including **MARPOL (waste disposal, strategic disposal)**, **TARGETTING species not licensed to do so** (e.g. shark , squid, DWS), **SOCIAL BEHAVIOUR**, alleged **CRIMINAL BEHAVIOUR**, **Licencing Conditions**, **SSI (birds, marine turtles, sharks)**, **GEAR Compliance (wire trace, shark line, etc.)**, **TRANSHIPMENT event**, other national regulations not covered.	EM Analyst declaration when a compliance event is identified on the video. There will be a list of broad COMPLIANCE CATEGORIES to choose from **with these standards are yet to be determined** (e.g. the MCS Working Group may determine the list of broad COMPLIANCE Categories).
	Compliance note	Notes from the EM Analyst on each potential compliance issue	EM Declaration. The EM analyst (sometimes in conjunction with compliance personnel) will provide detailed notes on the compliance issue.

12. Meeting Recommendations

1. DCC-EM-LL-2020 recommended that in the short term, SPC/FFA/PNAO forward the draft DCC longline EM minimum data fields (Section xx) for review and endorsements to the following processes as priority work:
    v. Review of the draft DCC Longline EM minimum data field standards (see SECTION 10 of this report) by all relevant SPC, FFA and PNAO officers involved in E-Monitoring work, with responses due back by 24 February 2020 so a paper can be prepared for the FFA MCS Working Group Meeting.
    vi. Review by the FFA MCS Working Group meeting (March 2020). Updates based on comments from this meeting are to be finalised by 1st April 2020, so that an FFC Information Paper can be prepared.
    vii. Review and Endorsement from FFC (May 2020) of the draft DCC Longline EM minimum data field standards, as accepted/endorsed by FFA MCS Working Group.
    viii. Information papers on the draft DCC Longline EM minimum data field standards prepared for WCPFC SC16 (August 2020) and the 4th WCPFC ERandEM Working Group Meeting (September 2020).
2. DCC-EM-LL-2020 identified the following priority work as areas which will make the EM analysis more efficient and may allow additional data fields to be included in the draft Longline EM minimum data field standards in the future. This list should be forwarded to relevant EM Technical Service Providers for their attention:
    a. Continue to progress work on automatic identification of each catch event;
    b. Continue to progress work on automatic species identification;
    c. Continue to progress work on automatically identifying hooks and floats as they are hauled onboard the vessel. For example, investigate the potential for using sensor devices for hooks (smart hooks) and floats, which would remove the need for the EM analyst to timestamp respective set/haul events for these objects;
    d. Continue to progress work on automatically calculating the hook number of each catch event;
    e. Identify better processes to transfer and document EM hardware among vessels leaving and entering the fishery in DWFN ports;
    f. Investigate ways of improving the means to identify fish cut-off/struck off.
3. DCC-EM-LL-2020 identified an efficient method for EM systems to record potential compliance issues and included this new data section in the draft DCC Longline EM minimum data field standards under the "Compliance event". However, DCC-Feb-2020 was unable to finalise the list of potential broad compliance categories that should be used and so recommends that the MCS FFA Working Group be tasked with producing a concise list of "Compliance event" categories to be included in the draft DCC Longline EM minimum data field standards, acknowledging that this list can be further reviewed and updated in the future.
4. DCC-EM-LL-2020 recommended that, in line with WCPFC Project 93, future DCC meetings ensure the important data fields that have not been included in the draft DCC Longline EM minimum data field standards, are covered by other data sources, for example,
    a. Data fields deemed to be better collected through pre-trip boarding inspections (e.g. crewing information and specific gear information);
    b. Data fields deemed to be better collected (i.e. added to) through vessel logsheet reporting;
    c. Biological parameters, adoption and use of emerging fishing technologies and practices and gear use for effort standardisation, SSI interactions and mitigation by observer programmes;
5. In relation to RECOMMENDATION 4, the DCC-EM-LL-2020 recommended that SPC, FFA and PNAO continue to collaborate with member countries towards enhancing and developing

ER applications for the fields **not** included in the draft DCC Longline EM minimum data field standards, but have been agreed by DCC and WCPFC Project 93 to be better collected through other sources of data (for example, pre-trip inspection data collection is more appropriate to collect crewing information and specific gear information).

6. DCC-EM-LL-2020 recommended SPC/FFA/PNAO seek guidance on establishing formal SSPs for the E-Monitoring data quality assurance processes, noting the commitments by some member countries to implement 100% E-monitoring by 2023.
7. DCC-EM-LL-2020 recommended that FFA pursue the convening of a dedicated DCC meeting to establish minimum standards for MCS fields across the tuna fishery. Further consideration of these standard MCS fields (using WCPFC Project 93, for example) will identify which MCS fields could be included in the draft DCC Longline EM minimum data field standards in the future.