COMMISSION
Twenty-First Regular Session
28 November to 3 December 2024
Suva, Fiji (Hybrid)

Longline EM Minimum Data Fields Standard

Submitted by FFA Member CCMs

Attachment 2

Data Collection Committee (DCC)

Longline EM Minimum Data Fields Standard

21 October 2024

Contents

Background

1. [The Draft DCC Longline EM minimum data field standard (version DCC-November 2020)](#) were developed in 2020. The header of this standard mentioned: *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 specified 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 (Latest version: November 2020).*

2. The EM minimum data fields standard was developed through the SPC/FFA/PNA Data Collection Committee (DCC) with the involvement of national EM programmes. The standard is a living document and will be updated based on data needs.

3. In 2022, SPC evaluated the adherence to these standards by examining the EM data provided from seven member countries from 2015 to 2022 [Draft DCC LL EM standards data fields completeness for EM countries - Version May 2022 .xlsx](#) and https://oceanfish.spc.int/en/publications/doc_download/2119-dcc12-wp3-review-of-em-data-with-em-minimum-data-fields . For only two countries for which data was available after 2020, the EM data did not meet all the minimum data fields standard.

4. Furthermore in 2022, [JSON formatted DCC Longline EM Minimum Data Fields Standard](#) were presented at DCC12, https://oceanfish.spc.int/en/meetingsworkshops/dcc/524-dcc12. The purpose of the JSON formatted standard is to improve transmission and data quality assurance processes and these standards would be maintained in a Github repository to facilitate continued national programme and other stakeholders' input in developing the JSON formatted standards. JSON formatting of the adopted fields is seen as a logical next step in implementation.

5. In 2022, the *FFA final draft EM Standards, Specifications and Procedures (SSPs)* were endorsed as interim guidelines and presented at WCPFC19 https://meetings.wcpfc.int/node/17866 . In these SSPs, under section *SSP2b: EM Records Analysis and Quality Assurance*, the activity *1. EM Records Analysis and Development of EM Data* is described as: *EM Analysts will annotate EM Data required according to the latest version of the regional Longline EM Minimum Data Field Standards, Instructions and Protocols.* In response to this need, the following table in Appendix 1 are the proposed DCC EM longline Minimum Data Field Standards.

6. Therefore, considering:
   - The FFA EM Longline Policy and the development of the SSPs;
   - The development of the PNA E-Monitoring Program and the intention to have EM data flow into the FIMS system;
   - The development of the WCPFC REM Programme;
   - SPC's analysis of EM data received by one EM provider on behalf of countries, showing that some data fields were not provided;
   - SPC's technical advice of EM data flow, showing that missing meta data (such as EM analyst code, EM reviewer code, place of analysis, etc..) makes the upload and management of EM data cumbersome;

- In the SPPs, under SSP2b, point b, notes "EM Analysts will analyse EM Records in accordance with the regional Longline EM Minimum Data Field Standards, Instructions and Protocols";
- That on 15 and 16 April 2024, an informal subject matter expert group comprising staff from Australia, Fiji, FSM, SPC and FFA reviewed the Draft DCC Longline EM minimum data field standard (version DCC-November 2020) in light of the need to progress its consideration for adoption by FFC in October 2024.
- The potential objectives of a WCPFC EM programme and the ERandEM IWG email dated 4th March 2024 on Progressing Interim Electronic Monitoring Standards. A subsequent ERandEM IWG meeting in TCC20 further emphasised the need for regional EM LL data standards.
- The DCC 13 meeting 13th to 16th May reviewed the DCC Longline EM Minimum Data Fields Standard[1].
- Working paper 2 from the Regional Electronic Monitoring Workshop (July 18-19 2024) https://fame.spc.int/events/EMWorkshop/2024
- The preMOC20 reviewed **DCC Longline EM Minimum Data Fields Standard (version October 2024).**

This version represents the DCC13 draft data field standards as assessed reviewed and with minor modifications by the 18 October 2024 preMOC meeting.

Proposed amendments

1. The proposed amendments of The Draft DCC Longline EM minimum data field standards (version DCC-November 2020) are based on inputs from several practicing EM national programs and data subject matter experts as useful for ensuring improved EM data production, quality and flow.
2. One of the key proposed amendments is to consider the mandatory nature of a given data field. To consider this, the summary of some of the key findings from SC Project 93 related to WCPFC data gaps, and regarding the potential for E-monitoring to fill the gaps was used. Another column with 2 sub-columns is added to the table in Appendix 1. (References: Paragraph 7- https://www.wcpfc.int/doc/wcpfc-erandemwg4-2020-04/outcomes-review-commissions-data-needs-and-collection-programmes-sc) - WCPFC-SC15-2019/ST-WP-04 AND WCPFC-TCC15-2019-14

3. Specifically, the major potential application of EM for fleets not already significantly covered by observers, includes:
   a. Reporting against WCPFC longline catch limits, and improving the precision of longline catch data for scientific purposes
   b. Bycatch and non-target catch monitoring -the biggest gap being for non-key species

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[1] The DCC workshop, originally scheduled for an in-person meeting in Noumea from May 13-16, was disrupted due to the serious civil unrest in Noumea. While the meeting did continue with some participants online, the situation presented some challenges in achieving the same level of focus and interaction as an in-person gathering.

c. Monitoring discards of, and interactions with, key species that do not result in retention or landing
d. Augmenting data for science where coverage is currently low (e.g. size data for key species in the longline fishery)
e. Monitoring any exceptional at-sea transhipments permitted under CMM 2009-06
f. Monitoring the application of bycatch mitigation measures

4. Considering that the above potential objectives (a to d) address CATCH monitoring and that (e to f) address COMPLIANCE monitoring, it is proposed that the mandatory nature of each field be considered against these two main objectives categories. Note that some fields are not mandatory neither for catch or compliance monitoring. This is because at least three national EM programmes have requested that these fields would be useful for their national needs.

5. 2024 preMOC amendments included:
   a. In the category TRIP INFORMATION, field EM Trip ID that the addition of 'Trip Number' compatible with that of the logsheet trip number be included ID.
   b. Recommendations that the fields related to estimating catch length are retained but not mandatory for future proofing if developments in technology or protocols allow their collection

6. The table in Appendix 1 below shows the proposed amendments.

APPENDIX 1: Proposed DCC Longline EM Minimum Data Fields Standard

	DCC LL E-Monitoring minimum data fields	Description	Notes on EM PROTOCOL *(How the data are to be acquired)*	Minimum Data Field? *a-f refers to Project 93 potential objectives*	
				CATCH Monitoring (a to d)	COMPLIANCE Monitoring (e to f)
VESSEL IDENTIFICATION					
Vessel identification	Vessel name	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. *Refer to* https://vessels.wcpfc.int/ https://vessels.wcpfc.int/*AND* https://vessel-register.ffa.int/	X	X
	Flag State Registration Number	Flag registration number of the vessel		X	X
	Flag	Flag or chartering nation of the vessel		X	X
	International Radio Call Sign (IRCS)		If the IMO, WCPFC VID or FFA VID is provided, then there is no need to provide the other vessel identification data. If the IMO, WCPFC VID and/or FFA VID are not provided, then the EM data provider needs to provide other data (Vessel Name, Flag State Registration and IRCS to uniquely identify the vessel).	X	X
	Unique Vessel Identifier	IMO, WCPFC Vessel ID and the FFA VID would be generated by the EM system using these VESSEL reference databases.		X	X
	Comment	Is useful to allow EM analysts to make comments at the trip level.	EM Analyst to add additional information that is not captured elsewhere or needs further detail.		
TRIP INFORMATION					
Trip information	EM trip ID	Trip identifier. This value must be unique.	Generated by EM analysis system. It should be generated by the source system and could for example be formatted as follow: VESSEL NAME + TRIP DEPARTURE DATE+ LOGSHEET TRIP #	X	X

	DCC LL E-Monitoring minimum data fields	Description	Notes on EM PROTOCOL (How the data are to be acquired)	Minimum Data Field? a-f refers to Project 93 potential objectives	
				CATCH Monitoring (a to d)	COMPLIANCE Monitoring (e to f)
	TRIP START Date and time	The UTC date and time the vessel DEPARTS a port to start its fishing trip. If the vessel is departing from a carrier vessel after an at sea transhipment, the UTC date and time of the departure from a carrier vessel will be used.	Dates must be ISO 8601 standard and UTC. Latitude and Longitude coordinates must be ISO 6709 standard. The international standard of Location Code (UNLOCODE) for PORTs must be used. Data is entered into EM records analysis system by EM Analyst or auto generated or a combination of both. Data can be confirmed by EM analysts using other sources.	X	X
	TRIP START Latitude and longitude	Port of DEPARTURE (UNLOCODE) for when a vessel starts a new trip from a port. 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' departure MUST be provided.		X	X
	TRIP END Date and time	The UTC date and time the vessel RETURNS to port to END its fishing trip for a full or partial unloading. If the vessel is ENDING its fishing trip to a carrier vessel for a full or partial unloading, the UTC date and time of when this activity begins with the receiving vessel will be used.		X	X
	TRIP END Latitude and longitude	Port of RETURN (UNLOCODE) for when a vessel ENDS a fishing trip for a full or partial unload. If the vessel is ENDING its fishing trip AT SEA to a receiving vessel for a full or partial unloading, this field will be "AT SEA" the receiving vessel		X	X

	DCC LL E-Monitoring minimum data fields	Description	Notes on EM PROTOCOL (How the data are to be acquired)	CATCH Monitoring (a to d)	COMPLIANCE Monitoring (e to f)
				Minimum Data Field? *a-f refers to Project 93 potential objectives*	
		name and the coordinates of the 'at sea' transhipment MUST be provided.			
	Name of receiving vessel	For when the vessel is engaged in a transhipment activity. This field only required when start or end of trip is 'AT SEA' Consider vessel unique identifier.	Entered into EM records analysis system by EM Analyst.	X	X
	Total number of sets	Total number of sets conducted by the vessel during the trip.	Generated by EM system based on sensors or vessel speed or by another method used by the EM service provider.	X	X
	EM ANALYSIS INFORMATION				
	Trip Analysis Start date and time	The date and time when the analysis of the EM records STARTED [at the trip level]. Required for national EM program management purposes.	Generated by the EM analysis system based on EM analyst activity.		
	Trip Analysis End date and time	The date and time when the analysis of the EM records ENDED [at the trip level]. Required for national EM program management purposes.	Generated by the EM analysis system based on EM analyst activity.		
	EM Analyst(s) code(s)	List of EM Analyst's EM Analyst code to identify who produced EM data.	Entered into EM system by EM Analyst. The EM Analyst code should correspond to the regional EM Analyst code reference table maintained at SPC.	X	X
	EM programme code	EM programme provider code 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 country providing	X	X

	DCC LL E-Monitoring minimum data fields	Description	Notes on EM PROTOCOL *(How the data are to be acquired)*	Minimum Data Field? *a-f refers to Project 93 potential objectives*	
				CATCH Monitoring *(a to d)*	COMPLIANCE Monitoring *(e to f)*
			the data, and appropriate two-letter codes for any sub-regional programme.		
	EM Data Quality Reviewer Code	The EM data Quality Reviewer is a qualified EM analyst who reviews EM data to verify and validate EM information produced by the EM analyst. List of EM Data Quality Reviewer (TRIP LEVEL). When this field is populated, it means that there was a data quality conducted.	Entered into EM system by EM Analyst (from a list of recognised EM staff). The EM data quality review SSPs have yet to be agreed.	X	X
	HAUL analysis rate strategy	The review objective and the percentage of analysis rates are recommended to be between 10 – 20% (SC18-ST-IP-06). Programmes may vary analysis rates according to national procedures and rationale.	The options for HAUL coverage for SCIENCE and COMPLIANCE is entered by Analyst on % rate of review and objective.	X	X
	EM Service provider	The name of the EM technical service provider for the EM records analysis software. This may be different from the provider of EM equipment/hardware on the vessel.	Generated by the EM System	X	X
	EM system software name and version	Software name and version of the system used to analyse the EM records.	Generated by the EM system	X	X
CALIBRATION OF LENGTH MEASURING TOOL					
	Digital Calibration before analysis	Has the EM analyst performed a digital calibration of the measuring tool before the start of EM records analyses? Used to	Yes or No. Entered by the EM analyst.	X	

DCC LL E-Monitoring minimum data fields		Description	Notes on EM PROTOCOL (How the data are to be acquired)	Minimum Data Field? a-f refers to Project 93 potential objectives	
				CATCH Monitoring (a to d)	COMPLIANCE Monitoring (e to f)
		understand accuracy of length measurements when they are generated.			
SETTING AND HAULING INFORMATION					
Setting and Hauling information	EM Set ID	Set identifier. This value must be a unique identifier for the whole set.	Generated by the EM system and must be formatted as follow: VESSEL NAME + TRIP DEPARTURE DATE + START OF SET DATE AND TIME	X	X
	Set Analysis method	At this stage it is recommended that national EM programmes and EM service providers describe here how EM records are generated, in particular how AI models are used. Longer term work on this field is needed to understand how data fields are generated using human analysis only, AI or a combination of both.	Comments entered by EM analyst.		
	Set number	The number of the SET in the trip. This is to identify the SET for which EM data is produced. For example: A trip has 10 sets, the second set is analysed and EM data produced, the number for this field is 2.	Entered by the EM analyst	X	X
	EM Set Analyst code	Code or list of Codes for the EM analyst(s) who produced EM data at the SET level.	Entered by the EM analyst	X	X
	Set Analysis Start Date and Time	Date and time in UTC when the analysis of the set started. Required for national EM programme management.	Entered by Analyst or auto generated when analyst starts analysing the set OR when EM system on vessel automatically produces EM data using AI computing.		
		Date and time in UTC when the analysis of the set ended. Required for national EM programme management.	Entered by Analyst or auto generated when analyst starts analysing the set OR when EM system on vessel automatically produces EM data using AI computing.		

DCC LL E-Monitoring minimum data fields	Description	Notes on EM PROTOCOL *(How the data are to be acquired)*	Minimum Data Field? *a-f refers to Project 93 potential objectives*	
			CATCH Monitoring (a to d)	COMPLIANCE Monitoring (e to f)
Set Analysis End Date and Time				
EM set reviewer code	Code or list of codes for the EM Data Quality Reviewer(s) who conducted a data quality review of EM data at the SET level.	Entered by Analyst or auto generated when analyst starts analysing the set OR when EM system on vessel automatically produces EM data using AI computing.		
Data Quality Control (DQC) Process	To indicate if Data Quality Control procedures were conducted at the SET level. Data quality procedures include a secondary review which may be to verify or validate, for example species identification of catch or Species of Special Interest (SSIs) caught, including fate condition (Refer to FFA EM SSPs Activity 2b). Data quality procedures may be conducted for both science and potential compliance events.	The EM system should include a feature that allows to indicate whether DQC process(es) was followed and provide a description of the review protocol according to FFA EM SSPs Activity 2b.	X	X
Date & time start of SET	Date and time when 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. Dates must be ISO 8601 standard and UTC. Latitude and Longitude coordinates must be ISO 6709 standard with 3 decimals maximum.	X	X
Latitude and longitude of start of SET	GPS reading at time when first buoy enters water		X	X
Date and time of end of SET	Date and time when the last buoy enters the water		X	X

DCC LL E-Monitoring minimum data fields		Description	Notes on EM PROTOCOL (How the data are to be acquired)	Minimum Data Field? a-f refers to Project 93 potential objectives	
				CATCH Monitoring (a to d)	COMPLIANCE Monitoring (e to f)
	Latitude and longitude of end of SET	GPS reading at time when last buoy enters water	Auto-generated by the EM system from the float HAUL timestamping. Minimum resolution of position is 1/1000 of a minute. Dates must be ISO 8601 standard and UTC. Latitude and Longitude coordinates must be ISO 6709 standard with 3 decimals maximum.	X	X
	Date and time of start of HAUL	Date and time when the first buoy of the mainline is hauled from the water to start the haul		X	X
	Latitude and longitude of start of HAUL	GPS reading at time when first buoy is hauled from the water		X	X
	Date and time of end of HAUL	Date and time when the last buoy of the mainline is hauled from the water to end the haul		X	X
	Latitude and longitude of end of HAUL	GPS reading at time when last buoy is HAULED		X	X
	FLOAT DEPLOYED	UTC Date and time (to nearest second) of each FLOAT SET Generated by the EM Analyst event 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[2]s or other sensors on FLOATS).	Minimum resolution of position is 1/1000 of a minute.		
	Latitude and longitude of each FLOAT DEPLOYED	GPS reading of each FLOAT SET (as recorded by EM equipment).			
	Date and time stamp for each FLOAT HAULED		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	X	

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[2] RFID - Radio-frequency identification

DCC LL E-Monitoring minimum data fields		Description	Notes on EM PROTOCOL *(How the data are to be acquired)*	Minimum Data Field? *a-f refers to Project 93 potential objectives*	
				CATCH Monitoring *(a to d)*	COMPLIANCE Monitoring *(e to f)*
		UTC Date and time (to nearest second) of each FLOAT HAULED (depending on target coverage). These data are important for estimation of hook number of catch event.	sensors on FLOATS). Minimum resolution of position is 1/1000 of a minute.		
	Latitude and longitude of each FLOAT HAULED	GPS reading of each FLOAT HAULED depending on target coverage (as recorded by EM equipment).	Generated by the EM Analyst event declaration in the EM system	X	
	Total number of baskets	The number of baskets deployed is the number of floats deployed minus one	With each float timestamped, the EM system should automatically calculate this.	X	
	Number of hooks between floats	Number of hooks between floats. For calculating total number of hooks and depth range fished from the main line catenary curve.	The current 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.	X	
	Total number of hooks used in a set	Total number of hooks deployed, calculated by multiplying the number of baskets by the number of hooks between floats	EM system calculates the total number of HOOKS DEPLOYED, calculated by multiplying the number of baskets by number of hooks between floats.	X	
	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.	X	

DCC LL E-Monitoring minimum data fields		Description	Notes on EM PROTOCOL (How the data are to be acquired)	Minimum Data Field? a-f refers to Project 93 potential objectives	
				CATCH Monitoring (a to d)	COMPLIANCE Monitoring (e to f)
			Crew should be required in the vessel monitoring plan to show bait to the camera.		
	Number of baskets monitored	The total number of baskets monitored by the EM Analyst in a single HAUL.	EM System calculates total number of BASKETS monitored using the FLOAT HAUL TIMESTAMP data.	X	
SPECIAL GEAR ATTRIBUTES					
Note that under WCPFC CMM 2018-03 - only applies **between 25°S and 23°N; or exempted vessels:** longline vessels are encouraged to employ one or more of the seabird mitigation measures listed in Table 1. (though encouraged, this is not mandatory) – This means it is unlikely that LL Vessels operating in and adjacent to FFA member countries will be deploying this gear (in the context of DCC EM minimum data fields). However, these data fields are required for other WCPFC fisheries and therefore are included for consistency, these fields could be populated even if the vessel is operating within 25°S and 23°N.					
Special gear attributes	Tori line	Recorded at the set level whether the vessel uses a single or double tori lines when setting.	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). EM analyst indicates Yes, No or Undetermined.		X
	Blue dyed bait	Recorded at the set level, whether the vessel used bait that has been dyed especially to look blue.	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). EM analyst indicates Yes, No or Undetermined.		X

	DCC LL E-Monitoring minimum data fields	Description	Notes on EM PROTOCOL *(How the data are to be acquired)*	CATCH Monitoring *(a to d)*	COMPLIANCE Monitoring *(e to f)*
				Minimum Data Field? *a-f refers to Project 93 potential objectives*	
X	Deep setting line shooter	Recorded at the set level whether the vessel used a deep setting line shooter.	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). EM analyst indicates Yes, No or Undetermined.		X
	Strategic offal disposal	Recorded at the SET level whether the vessel used strategic offal disposal.	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. The EM analyst indicates Yes, No or Undetermined.		X
CATCH EVENT INFORMATION					
Catch event information	Catch Analysis Method	At this stage it is recommended that national EM programmes and EM service providers describe here how EM records with respect to catch eg. Species and length data are generated, whether AI models are used. Longer term work on this field is needed to understand how some data fields are generated using	Comments to be entered by EM analyst.		

DCC LL E-Monitoring minimum data fields	Description	Notes on EM PROTOCOL (How the data are to be acquired)	Minimum Data Field? a-f refers to Project 93 potential objectives	
			CATCH Monitoring (a to d)	COMPLIANCE Monitoring (e to f)
	human analysis only, AI or a combination of both.			
EM catch analyst code	List of code/s for the EM analysts who produced EM data at the CATCH level.	Entered by EM Analyst	X	X
EM catch reviewer code	List of code/s for the EM Data Quality Reviewers who conducted a data quality review of EM data at the CATCH level.	Entered by EM Analyst	X	X
Catch or Event clip	A ten second short video clip in MP4 format of the catch event. Recommended for catch and compliance events.	For example, each time an EM analyst produces data from analysing an event on the EM records, a short video clip (e.g. 5 seconds before and 5 seconds after the event) is produced and saved. Another approach could be that EM analysts decide if an event should have a short video clip produced. This would depend for example on the objective of the EM records analyses. Another though could be that the short clip is produced automatically for specific types of events (e.g. all interactions with SSIs, all pollution events).		

	DCC LL E-Monitoring minimum data fields	Description	Notes on EM PROTOCOL *(How the data are to be acquired)*	Minimum Data Field? *a-f refers to Project 93 potential objectives*	
				CATCH Monitoring (a to d)	COMPLIANCE Monitoring (e to f)
	Hook number of Catch Event	Hook number <u>between successive floats</u> that the fish is caught on.	EM Analyst to determine HOOK NUMBER for catch events. With the availability of FLOAT timestamp and the timestamp for when SNAP of each catch event comes onboard, an algorithm may be used as a proxy to estimate this field.		
	Species code	FAO code of the species caught, identified by the EM Analyst and verified by EM Data Quality Reviewer.	Entered by EM Analyst	X	X
	Catch Length	The length of catch measured using recommended standard protocols. Noting the need for an assigned area on the deck where the fish should be measured for use of a digital measuring tool AND a calibration process	EM Analyst using the calibrated digital measuring tool to collect the appropriate length of the catch.		
	Length code	Length code for the type of measurement produced	EM Analyst declaration depending on how the catch was measured. <u>Must use regional standard codes for LENGTH CODES</u>		
	Digital measuring method	The code (M1, M2 or M3) of the digital measuring method used to provide length of specimens. EM analyst using a calibrated measuring tool to produce a digital length measurement = M1; EM analyst using a reference length to produce a visual estimate =	EM analyst to select the code.		

	DCC LL E-Monitoring minimum data fields	Description	Notes on EM PROTOCOL (How the data are to be acquired)	Minimum Data Field? a-f refers to Project 93 potential objectives	
				CATCH Monitoring (a to d)	COMPLIANCE Monitoring (e to f)
		M2; and Artificial intelligence tool to produce digital length measurement = M3.			
	Catch image quality	Is the quality of the footage clear enough and free from obstructions that the snout and the tail of the fish are visible to a resolution where the measurement can be precisely taken, and the species identified with confidence because the determining characteristics are clearly visible.	A yes or no field to be selected by EM analyst.		
	Location of fish with respect to calibration area.	Is the measured fish located well within the calibration area on deck?	A yes or no field to be selected by EM analyst.		
	Length accuracy	The digital length measurement is precise or not? If yes, then the processes used to determine that the length measurement is precise must be provided. For the digital length measurement to be labelled as precise, values for the fields, 'digital calibration before analysis', 'catch image quality', and 'location of fish with respect to calibration area' MUST ALL BE YES. If digital measuring method=M2 then by default Length accuracy is FALSE.	Generated by the EM analyst using the criteria.		
	Sex	Sex of the species, if possible, determined from external morphology.	EM Analyst declaration. Not possible for most species. Can collect sharks and rays sex, for example, if shown ventrally. Some other species		

DCC LL E-Monitoring minimum data fields		Description	Notes on EM PROTOCOL (How the data are to be acquired)	Minimum Data Field? a-f refers to Project 93 potential objectives	
				CATCH Monitoring (a to d)	COMPLIANCE Monitoring (e to f)
			may be possible (e.g. mahi mahi, opah and sea turtles). Must use regional standard codes for SEX.		
	Condition when caught	Condition of the catch when caught.	EM Analyst declaration. Must use the regional standard codes for CONDITION.	X	X
	Fate	Fate of the catch. This indicates whether it was RETAINED, DISCARDED, or ESCAPED and how it is PROCESSED.	EM Analyst declaration. Must use the regional standard codes for FATE.	X	X
	Interaction	For Species of Special Interest (SSIs) only, details of the gear interaction with the SSI. For example, hooking position for marine turtles and sharks.	EM Analyst declaration. Must use the regional standard codes for INTERACTION.		X
	Condition when released	Condition of the catch if released or discarded.	EM Analyst declaration. Must use the regional standard codes for CONDITION.	X	X
	Catch event date and time	UTC Date and time (to nearest second) of the catch event (as recorded by EM equipment).	Field automatically generated by EM system when the EM analyst records the catch coming onboard or if not landed at all, when it is struck off, released or discarded.	X	X
	Catch SNAP date and time	UTC Date and time (to nearest second) of when the branchline SNAP for each catch event is removed from the mainline.	Field automatically generated by EM system and stored with the other relevant catch event data.		
	Catch event latitude and longitude	Latitude and longitude of each catch (ISO 6709 standard)	Field automatically generated by EM system. Minimum resolution of position is 1/1000 of a minute.	X	X

				Minimum Data Field? *a-f refers to Project 93 potential objectives*	
DCC LL E-Monitoring minimum data fields		*Description*	*Notes on EM PROTOCOL* *(How the data are to be acquired)*	**CATCH Monitoring** *(a to d)*	**COMPLIANCE Monitoring** *(e to f)*
POTENTIAL COMPLIANCE EVENTS					
Potential Compliance event	Date and time of potential compliance event	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.		X
	Latitude and longitude of compliance event	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.		X
	Compliance category code	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.)**, **EM EQUIPMENT TRANSHIPMENT event**, other national regulations not covered. **(See TABLE 2)**	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). The EM System will need to have a component that allows the EM Analyst to efficiently enter a potential compliance event when viewed in the video (and based on the standard viewing or any additional EM analysis rate based on compliance only). The EM System will allow the EM Analyst to do the following: o At the relevant point in the video, the EM Analyst will SELECT the Potential Compliance event TOOL option. o Selecting this option will display the range of Compliance CATEGORIES and then the EM Analyst will select one of these.		

	DCC LL E-Monitoring minimum data fields	Description	Notes on EM PROTOCOL (How the data are to be acquired)	CATCH Monitoring (a to d)	COMPLIANCE Monitoring (e to f)
					Minimum Data Field? *a-f refers to Project 93 potential objectives*
			o The range of potential compliance events under the selected CATEGORY will be displayed and the EM Analyst will select the relevant compliance event. o The EM Analyst will add any necessary comments related to this particular potential compliance event and on selecting the SAVE/SUBMIT option, the information, with the timestamp and position relevant to that point in the video, will be stored by the EM system with the compliance information.		
	Coded compliance event type	Specific Compliance Event under this category **(See Table 2)**			X
	Compliance note	Notes from the EM Analyst on each potential compliance issue Event clip can also capture potential compliance events for secondary review by EM data quality reviewer as per FFA EM SSPs Activity 2b.	EM Declaration. The EM analyst (sometimes in conjunction with compliance personnel) will provide detailed notes on the compliance issue.		

Table 2. Potential Compliance CATEGORIES and EVENTS reference codes table.

CATEGORY CODE	CATEGORY	COMPLIANCE EVENT CODE	GEN-3 code	COMPLIANCE EVENT	Description	Notes
P	POLLUTION	P1	PN-a	Waste disposal at sea	Disposal of any metals, plastics, chemicals, or fishing gear	Generated by the EM Analyst declaration during video analyses conducted over randomly selected video periods based on compliance coverage strategy
		P2	PN-b	Oil discharged	Discharge of any oil	
T	TARGETTING	T1	NR-b	Target species	Target species other than those they are licensed to target	EM Analyst declaration during video analyses conducted over randomly selected video periods based on compliance coverage strategy *Maybe be confirmed from the species (composition) recorded under the Catch Event information section*
B	SOCIAL BEHAVIOUR	B1		Observer safety	Did the operator or any crew member assault, obstruct, intimidate, or interfere with observers in the performance of their duties	EM Analyst declaration during video analyses conducted over randomly selected video periods based on compliance coverage strategy
		B2	RS-a	Crew safety	Mistreat other crew	
C	ALLEGED CRIMINAL BEHAVIOUR	C1		Extreme violence		EM Analyst declaration during video analyses conducted over randomly selected video periods based on compliance coverage strategy
		C2		Transfer/transport of people		
		C3		Contraband	Importing/exporting goods illegally including drug trafficking	

CATEGORY CODE	CATEGORY	COMPLIANCE EVENT CODE	GEN-3 code	COMPLIANCE EVENT	Description	Notes
L	LICENSING	L1	NR-a	Prohibited areas	Fish in areas where the vessel is not permitted to fish	EM Analyst declaration during video analyses conducted over randomly selected video periods based on compliance coverage strategy *Maybe auto generated if possible by EM, based on the info in the SETTING AND HAULING section? (info there included date & time start & end of SET, position data for start & end of set etc)*
		L2	NR-f	Bunker	Was involved in bunkering activities	EM Analyst declaration during video analyses conducted over randomly selected video periods based on compliance coverage strategy
		L3	NR-g	Stowing of gear	Fail to stow fishing gear when entering areas where vessel is not authorised to fish	
S	SSIs	S1	SI-a	SSI landed	Land on deck Species of Special Interest (SSIs)	*For SSIs that are recorded (eg. OCS, FAL):* Auto generated by the EM system based on the Species Code + Fate field under CATCH EVENT INFORMATION *For SSI that may not be recorded but were landed on deck eg. turtles:* EM Analyst declaration during video analyses conducted over randomly selected video periods based on compliance coverage strategy
		S2	SI-b	SSI interaction	Interact (not land) with SSIs	EM Analyst declaration during video analyses conducted over randomly selected video periods based on compliance coverage strategy
		S3		Shark finning	Prohibit shark finning	

CATEGORY CODE	CATEGORY	COMPLIANCE EVENT CODE	GEN-3 code	COMPLIANCE EVENT	Description	Notes
G	GEAR	G1		Large scale driftnet	Did the vessel use large scale driftnet?	EM Declaration. The EM analyst (sometimes in conjunction with compliance personnel) will provide detailed notes on the compliance issue.
		G2		Wire trace/Shark lines	Did the vessel use wire trace or have shark lines?	EM Declaration. The EM analyst (sometimes in conjunction with compliance personnel) will provide detailed notes on the compliance issue.
		G3		Line cutters & de-hookers	Did the vessel carry and use line cutters & de-hookers to handle and release turtles?	Check if there was a SSI interaction that involve turtle: EM Declaration. The EM analyst (sometimes in conjunction with compliance personnel) will provide detailed notes on the compliance issue.
E	EM EQUIPMENT	E1		EM Equipment tampering	Tampering with EM equipment eg. blocking/obstructing/cutting the camera	EM Declaration. Noted on occasions when the EM analyst identifies tampering with EM equipment. Could also be autogenerated through EM equipment sensors.
T	TRANSHIPMENT	T1	NR-e	Transshipment	Did the EM analyst witness two vessels come together alongside each other?	Can be auto generated base on vessels proximity?
O	OTHER			Other	To capture other compliance events not in the table above	