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STATUS OF OBSERVER DATA MANAGEMENT

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Revision 1 – 29th July 2016

- Updated Table 4 to reflect the provision of 2015 observer data for Chinese Taipei distant-water longline vessels (as provided in April 2016).

Revision 2 – 30th August 2016

- Updated Table 4 to reflect the latest provisions of 2015 observer data as at this date.
- Modification to footnote 20 in Table 3 and footnote 14 in Table 4

1. Introduction

Observer data management encompasses a number of activities that ensure the data collected by observers are made available for the work of the Western and Central Pacific Fisheries (WCPFC) in a form that is both representative and of acceptable quality. The underlying activity involved in Observer Data Management is the management and entry of the observer data into a standardised database system, but it also covers the many other related activities with examples described in Williams (2011).

The Pacific Community (SPC) OFP has been processing observer data on behalf of its member countries for more than 15 years. The Seventh Regular Session of the WCPFC (6–10 December 2010) approved the continuation of this work in respect of the Regional Observer Programme (ROP) data in the short-medium term (Anon., 2010a, Anon., 2010b). The Twelfth Regular Session of the Commission (3–8 December 2015; Anon., 2015) reconfirmed the Commission's support for ROP data processing with its inclusion in the indicative budget for the period 2016-2018.

The Pacific Island Forum Fisheries Agency (FFA) processes observer data for the US Multilateral Purse Seine Treaty and these data are regularly incorporated into the ROP data submitted to the WCPFC. Staff supported by the WCPFC Regional Observer Programme (ROP) data management project based at the WCPFC Secretariat mainly process data from the national observer programme of the Federated States of Micronesia (FSM). WCPFC members other than Pacific Island countries have also contributed to the ROP Database including Australia, China, Japan, New Zealand, Philippines, Chinese Taipei and the USA.

The majority of the observer data processed by the SPC are ROP-defined purse seine trips[1] which have been designated as the highest priority for processing since 2010. However, the WCPFC requirement for 5% observer coverage in the longline fishery (established in 2012) has resulted in increased submission of observer longline data in recent years and these data are now assigned equal priority for data processing as the purse seine observer.

The SPC/OFP also processes non-ROP observer data that are, *inter alia*, of importance to the scientific work of the WCPFC and so have been included in the description of observer data management and data summaries, presented in this paper.

This paper serves to provide an update on the status of ROP data management at SPC/OFP over the past twelve months, covering the following:

- Human resources involved in observer data management at SPC/OFP
- Activities over the past 12 months
- Status of observer data entry, data provisions, coverage and issues, and
- Future expectations.

The SC is encouraged to review the information in this paper and provide suggestions for enhancements for future WCPFC meetings, as required.

[1] CMM 2007-01 paragraph 5
Scope of the Commission ROP
5. The Commission ROP shall apply to the following categories of fishing vessels authorized to fish in the Convention Area in accordance with the Commission's Conservation and Management Measures 2004-01:

i) vessels fishing exclusively on the high seas in the Convention Area, and

ii) *vessels fishing on the high seas and in waters under the jurisdiction of one or more coastal States and vessels fishing in the waters under the national jurisdiction of two or more coastal States.*

2. Human Resources for managing observer data

The team dedicated to managing and entering observer data is fully supported under the WCPFC ROP Data Management project. The current team comprises:

- Two (2) technical staff overseeing observer data management at SPC Noumea, but also coordinating and supporting observer data entry in other countries
    - Observer Data Manager
    - Observer Data Audit Officer
- Sixteen (16) observer Data Entry staff
    - One observer data registry officer at SPC Noumea
    - Ten (10) data entry staff at SPC Noumea
    - Four (4) data entry staff at WCPFC Secretariat offices in Pohnpei, and
    - Two (2) data entry staff based at Fiji Fisheries Offices in Suva.

The Regional E-Reporting Coordinator position was established in early 2014 with the funding support from the International Seafood Sustainability Foundation (ISSF). The duties of this position cover, *inter alia*, aspects of observer data collection and management related to E-Reporting and E-Monitoring.

The staffing levels were relatively stable over the past year with only one resignation reported. In addition to the cadre of staff dedicated to observer data management, there are several other SPC/OFP staff involved in this area, including:

- Head of OFP Data Management Section, who works with the Observer Data Manager on strategy, priorities related to observer data management, human resources issues, preparation of ROP data for inclusion in stock assessments, and related analytical work, and responding to requests for ROP data summaries from the WCPFC Secretariat.
- OFP Data Management Section database development staff (3) who are responsible for the development, maintenance and capacity development related to the web observer reporting tool (DORADO – TUBS Reporting) which facilitates the extraction of observer data for a number of ROP data clients according to the WCPFC ROP data access rules through secure login/password. This tool is now used regularly by the WCPFC Secretariat, OFP scientific staff, FFA, SPC member countries (including NZ, US) and other non-SPC member countries who are members of the Commission (e.g. Philippines).
- Fisheries and Ecosystem Monitoring and Analysis (FEMA) Section staff (4), who are regularly called on for their knowledge and expertise in resolving issues identified in the observer data during data entry, and who organize the printing and distribution of observer workbooks to SPC member observer programmes who are providers to the ROP.
- The Regional E-Reporting Coordinator (FEMA Section) who liaises regularly with the Observer Data Manager and Observer Data Audit Officer on a range of matters related to initiatives in the regional producing E-Reported observer data and observer data generated from E-Monitoring systems. This work also includes, for example, maintenance of the draft WCPFC E-Reporting data field standards and development of the draft WCPFC E-Monitoring data field standards.
- OFP technical staff, who are involved in the provision of scanners and associated software in the offices of fisheries administrations for the electronic provision of scanned observer work books to SPC/OFP.

3. Activities over the past twelve months

The work related to observer data management achieved over the past twelve months includes,

- SPC technical staff continued to provide remote technical support to the observer data entry staff based at the offices of the WCPFC Secretariat. Over the past year, support was provided to upgrading versions of the database system, updating structures of the database and reference tables and resolving issues in the data that was not possible through the user interface. Other support included changes to the database system and procedures to support the pre-notification process for alleged

infringements (related to the observer GEN3 form), and the addition of compliance related reports to the DORADO/TUBS web reporting tool based on Secretariat requests.

- SPC staff visited the offices of FFA in November 2015 to provide review progress and technical support for the observer database system (TUBs) used to enter US Treaty purse seine observer data (installed in January 2015).
- SPC technical staff also travelled to PNG (December 2015) and Fiji (December 2015 and March 2016) to review progress and provide technical support for the observer database systems (TUBs). A brief visit was also made to the offices of the Philippines national observer programme in May 2016.
- The two dedicated observer data entry staff established in Fiji progressed well in their first full year, entering data for 155 observer trips covering 2015 activities, with SPC covering the remainder of 2015 trips. These positions will eventually be integrated into the Fiji Fisheries, and technical support will be provided by SPC.
- Audits of the observer data entered in PNG, Fiji, Solomon Islands and Tonga were conducted over the past year. The quality of observer data entered in the Solomon Islands was evaluated as of an acceptable quality but the coverage is very low at this stage. The audit of the Tonga and Fiji data was also favourable – the low number of trips conducted in Tonga means that observer data entry is manageable. The audit of the PNG observer data entry concluded that there were some issues, their data could not be accepted at this stage and that the usual training course for data entry staff should be conducted as a matter of priority. There have also been technical issues with the observer database system installed in PNG offices and it has been difficult to rectify these problems due to security constraints in using remote-access software to access the database on their servers.
- The most time consuming work over the past year for the observer technical staff was the development of data loaders for the non-standard observer data provided by several CCMs for their national observer programme data. Loaders where produced for observer data provided by Australia, China, New Zealand, US (Hawaii/American Samoa) and Chinese Taipei. The loaders for some non-standard observer data had been developed for the legacy observer database system (in Visual Foxpro) many years ago but these needed to be completely redeveloped to support upload into the SQL SERVER observer database. Data collection systems in the countries providing the non-standard observer data need to satisfy national requirements and so often do not exactly align to regional observer database structures which presented challenges in developing the loaders and follow-up/liaison with the providers of the data. However, now that the loaders are developed, there should no longer be delays in the upload of non-standard observer data.
- The online web-based Observer (DORADO/TUBs) database reporting module is now well established and used regularly by national observer providers, the WCPFC and FFA Secretariats and several other CCMs. It has a comprehensive set of reports (currently 100+ reports) covering a wide range of observer data summaries including a set of reports specifically designed to produce some of the WCFPC CMM reporting output requirements related to observer data. This system was used heavily by Pacific Island countries in preparation of the WCPFC Part 1 and Part 2 reports for submission this year (see Figure 1 for an example of the available reports). This system will continue to expand over the coming years to meet the requirements of not only national observer programmes, but also SPC, the WCPFC Secretariat and FFA.
- E-Reporting and E-Monitoring initiatives to acquire observer data continued to progress during the past year and are covered in Hosken et al. (2016). This paper also documents the progress with the draft WCPFC E-Reporting observer data field standards[2] and the recent development of E-Monitoring process standards.
- Observer data quality control continues to be enhanced with additional online checks added to the TUBS MS SQLSERVER database system and audits of the historical observer data over the past year. Specific data quality control work was undertaken in the production of the Bycatch Data Exchange Protocol (BDEP) template in recent months (see Williams et al., 2016).
- SPC started development of the next version of the observer data entry system in May 2016. This new system (TUBS 2) is an online web-based system running under the TUFMAN 2 framework which supports the data entry, quality control and integration of logbook, port sampling and unloadings data

[2] See the draft standard WCFPC E-Reporting observer data fields at http://www.wcpfc.int/node/21569

and has been installed in over 16 countries to date. Development is well advanced and this new system will resolve, *inter alia*, some of the issues with remote support of the TUBS system and will be ready for trial in 2017.

The FFA-developed Observer Programme Management System (OPM) continues to be deployed throughout the region and most of their member countries are now covered; this system is designed, *inter alia*, to manage the process of observer placements from national and subregional observer programmes and centralise the base observer trip information in one area.

4. Status of Observer data entry, data provisions and issues

Table 1 shows the status of observer data received and entered by SPC as at 15th July 2016 and Table 2 provides an indication of the available purse-seine observer data processed by fleet. Table 3 shows the coverage of observer longline activity for 2014 as nominated by the flag state and according to the metrics proposed at TCC10[3] and agreed at WCPFC11[4], and Table 4 shows the provisional coverage of observer longline activity for 2015, as nominated by the flag state. Tables 3 and 4 also provide an indication of the longline observer data submitted to WCPFC/SPC by year and fleet, and the approximate coverage of the data provided; this allows a comparison to the coverage nominated by the flag state.

As noted in this paper in previous years, the summaries of observer data provisions presented herein continue to be constrained by a number of factors, including:

i. **Accurate information on the complete number of vessel trips by gear and flag in the WCPFC Convention Area.** This information is used as the 'base' with which to determine observer coverage. For purse seine, VMS data provides the best source of information to determine vessel trips by gear and flag, but there are several issues in using VMS data for the longline gear as a basis for determining coverage, the main issue being how to deal with transhipments at sea and accessibility of complete VMS data. Ideally, the full provision of operational data would be the best source of information to determine vessel trips for the purpose of determining coverage.

ii. **Accurate information on the actual number of observer trips by observer programme, gear and flag.** At this stage, we have accurate information on the observer data received, but do not have complete information on the actual observer trips undertaken which would provide a means of better determining coverage and where we should be focussing efforts to obtain the data. Some progress has been made in the past three years, but there remains data yet to be provided.

iii. **Assignment of an ROP trip in the unprocessed data.** The assignment of a trip as an ROP or a non-ROP trip (or part of a trip as ROP) can only be determined after the data have been processed since it depends on where the fishing activity occurred.

iv. **Lags in the uploading of observer data received in 'non-standard' format.** The SPC/FFA member countries have collected observer data on standard data collection forms and databases for more than 15 years and this facilitates the consolidation of data into the ROP database with minimal overhead. Most other national observer programmes (excluding the Philippines which also uses the SPC/FFA standard) have developed their own standards based on both regional and national requirements; the submission of observer data from these other national observer programmes has required the development of specific data loaders which need to be reviewed each year to ensure they are consistent with the data provided. The work involved in developing and checking the data loaders each year is considerable and results in lags in loading some of the observer data (received in electronic form) into the ROP database. The advent of E-Reporting data field standards (Hosken et al., 2016) is envisaged to resolve such issues.

[3] See the TCC10 paper at http://www.wcpfc.int/node/19567
[4] See the WCPFC11 report at http://www.wcpfc.int/node/20349, para 477 and Attachment L, Table 1

4.1 Purse seine

Observer data for an estimated 94% (1,508 trips) of observer purse seine trips conducted (but excluding those rejected by the observer programme and trips with unknown status) during 2012 have been received at SPC at the time of writing this paper. Observer data received at SPC cover an estimated 96% (1,648 trips) of 2013 purse seine trips, an estimated 84% (1,537 trips) of trips undertaken in 2014 and an estimated 79% (1,172 trips) of trips undertaken in 2015.

A total of 92% (1,325 trips) of the observer data received at SPC for 2012 observer activities have now been entered (excluding the trips awaiting resolution at SPC). All observer trip data received at SPC for 2013 (1,607 trips), 2014 (1,456 trips) and 2015 (1,061 trips) activities have been entered (excluding the trips awaiting resolution at SPC). SPC employs a strategy of processing the most recent observer data as highest priority, mainly to ensure CCMs can satisfy their Part 1 and Part 2 reporting obligations (for which compliance applies to the most recent year). This is reflected in the "**% of trips received without problems**" in **CATEGORY 5** of Table 1 whereby the outstanding data entry for 2015 (for example) had a higher priority than the outstanding trips to be entered in 2012/2013, and therefore a higher proportion in this column. The outstanding trips for earlier years will be entered once the current priority for 2014/2015 data entry has been achieved (i.e. resolving the outstanding issues in trip data already received and working with observer programmes in regards to the submission of trips not yet received). For the 2015 purse seine trips received at SPC, about 7% (111 trips) have problems awaiting to be resolved (mainly issues with scanning or incomplete data submitted).

Tables 1 and 2 do not yet account for trips by Philippine observers on their domestic fleet permitted to fish in the high sea pocket area #1 (HSP1), or the cases where observers may be deployed in the purse seine fisheries of Indonesia and Vietnam. The observer coverage for the Philippine vessels in the HSP1 is acknowledged to be 100% and data have been provided to the WCPFC, although submissions for 2015 are currently incomplete due delays in data processing as a result of technical issues with installations of the latest versions of operating system and RDBMS software. Nonetheless, the data collected by these observers are summarised in at least one SC12 information paper (submitted but yet to be assigned an Information Paper number).

The breakdown of processed purse-seine observer data by fleet (Table 2) shows that the coverage of 2015 observer data submitted to SPC is generally very good, although further investigation is required in regards to the outstanding trips for observers deployed on Ecuador, Spain and New Zealand vessels.

Figure 2 highlights the lag in the provision of 2015 purse seine observer data with nearly two-thirds of the 2015 observer data provide after 1st January 2016. This lag in the provision of observer data results in an imbalance in the availability of data to process by data entry staff whereby there are certain periods (e.g. 4th quarter 2015) when there are insufficient data available to process; when scientists started using the 2015 data (in early 2016) the coverage of 2015 data was low. With most of the 2015 data provided in Feb-May 2016, this created a significant backlog and meant that data with adequate coverage were only available in June 2016.

As reported in previous years, the 'problematic' trip data held at SPC awaiting resolution are mainly due to (i) incomplete or poor quality scanned data submissions, or (ii) issues in the data which result in the trip being set aside pending further information/review all of which prevent the trip data being entered.

We expect further ongoing work in this area will be required until E-Reporting is implemented on a large scale; the work involved will be required to, *inter alia*, ensure best practice procedures are implemented, and scanning software is updated. During 2015/2016, SPC undertook some research to identify the latest recommended scanner model/make for the Pacific Islands member countries and several new units have since been deployed to replace older models.

It is important that the observer trip data rejected by the observer programmes still be submitted to ensure all observer trip data are available, and that the problems encountered can be reviewed and referred to in future training, debriefing and data quality control procedures.

Information on the trips "with unknown status" will require follow-up with flag and observer service providers, in the absence of any observer trip reporting obligations. **Provision of a list of ALL observer trips conducted by each observer service provider on a regular basis would enhance the summary reports presented in this paper. The lack of provision of 'observer placement lists' from most national observer programmes remains a major issue.**

We also highlight the importance of observer service providers submitting debriefing evaluations/scores to allow the assignment of appropriate data quality indicators to the data.

4.2 Longline

SC11 directed SPC to present a table of longline observer coverage which included both the coverage reported by each CCM for their longline fleet and the coverage of that fleet according to data provided to the WCPFC; Tables 3 and 4 have been prepared in response to this recommendation for longline observer coverage for 2014 and 2015 respectively. The available information on longline observer data (Tables 3 and 4) is provisional and continues to be constrained by the several issues, some of which are noted above. The following are some of the additional issues with specific respect to the availability of longline observer data, based on Tables 3 and 4:

- 2015 data from some observer service providers have yet to be submitted, although at least two CCMs have indicated they will be provided in the coming months.
- Some CCMs have advised that their longline fleet did not have any observer coverage but they are actively working on arrangements to ensure their vessels are covered in the future.
- Korea provided observer coverage for 2014 and 2015 which differs from the coverage according to the data provided and appears to be due to the non-provision of data collected through their national observer programme.
- Japan has advised of ROP longline observer coverage for 2014 and 2015, but this differs significantly with the coverage of the observer data submitted. Trip-level observer data covering 82 trips conducted in 2015 were provided to the WCPFC Secretariat, but these data did not include any set-level (i.e. catch and effort) data.

SC12 is invited to consider these tables and comment on their usefulness and recommend modifications as required. While we expect some of the differences in coverage levels to be obvious, we also expect there will need to be discussion with CCMs on a one-to-one basis to work through and clarify some of the differences in what CMMs report as their version of longline coverage and the coverage according to the data submitted.

In the future, this paper could consider a more in-depth review of the available longline observer data provided as directed; for example, this paper could consider the broad spatial coverage of available observer coverage.

5. Future expectations

There are several observer data entry teams[5] operating throughout the region entering data into a standardised observer database system (TUBs) and supported by the two technical positions (Observer Data Manager and Observer Data Audit Officer) based in SPC Noumea.

There continues to be a lag in the provision of observer data (see Figure 2) which results in lags in the observer data processing and ultimately incomplete data for the users. However, there have been improvements and the remaining issues should be resolved over time as the national and regional resources dedicated to observer data management grow and become more experienced.

[5] SPC Noumea, WCPFC Secretariat (NORMA), FFA, Philippines and Fiji Fisheries are undertaking complete observer data entry. PNG/NFA and Tonga Fisheries continue to enter observer data on a trial basis.

The TUBs Observer database will continue to be supported in the offices of Pacific Island member countries as required; there have been issues dealing with the remote support of systems over the past year and the plan to move to a new web-based observer data entry system (TUFMAN 2/TUBS 2) during 2017 should hopefully resolve most of these issues. Once this new web-based system settles down, we expect that Pacific Island member countries will continue to take over some of the observer data entry work, if not through this new web-based system, then through the increased use of observer E-Reporting systems.

SPC will continue to develop data loaders for any new ROP data provisions that are not aligned to the standard established by SPC/FFA over the past twenty years. The continued development of draft WCPFC E-Reporting data field standards[6] and the recent development of the draft E-Monitoring process standards[7] provide an ideal opportunity to align ROP data submissions with standards that will be adopted for E-Reporting and E-Monitoring systems and should be pursued.

SPC will continue to expand the work in conducting observer E-Reporting and E-Monitoring trials in collaboration with their member countries in the coming years, with an expectation of larger-scale implementation, if and when national fisheries authorities are adequately resourced and prepared to venture down this path. SPC will also continue to collaborate with other E-Reporting projects involving observer data, as required.

The trials for observer data collection using E-Reporting and E-Monitoring continue to progress and are changing the way technical support and training is provided to national observer programmes, with the proposal to establish dedicated positions (E-Reporting officers) at the national level now seen as fundamental to deal with the day-to-day management of observer and logbook E-Reporting.

SPC will continue to work closely with the WCPFC Secretariat over the coming year on the following areas:

- Where required, and subject to donor resourcing, continue to provide technical advice and support to address the recommendations from the WCPFC E-Reporting and E-Monitoring Workshop (the next workshop to be conducted in early August 2016 in conjunction with SC12);
- Provide advice and technical support on the E-Reporting and E-Monitoring standards for data fields, processes and protocols;
- Continued support for the WCPFC/NORMA observer data entry;
- Continued support (technical and training) related to the web DORADO/TUBS observer reporting tool;
- Continued provision of ROP data to the WCPFC on a regular basis;
- Continued support in responding to requests to disseminate ROP data according to the WCPFC data dissemination rules;
- Continued work in satisfying WCPFC requirements for ROP data reports mainly aligned to their requirements for CMM monitoring.

SPC will also continue to work with the Pacific Islands Forum Fisheries Agency (FFA) and the PNA office to improve efficiencies in observer data management, particularly since the TUBs system has now been adopted as the regional standard in FFA/PNA member countries and the DORADO/TUBs reporting system is integrated into the FFA-developed national IMS portals.

6. References

Anonymous. 2010a. Report of the Seventh Regular Session of the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean. 7–11 December 2010, Honolulu, Hawaii, USA. Western and Central Pacific Fisheries Commission, Pohnpei, Federated States of Micronesia.

[6] See the WCPFC 1st Workshop on ERandEM at http://www.wcpfc.int/meetings/ERandEMWG1 and the draft standard WCFPC E-Reporting observer data fields at http://www.wcpfc.int/node/21569

[7] See http://www.spc.int/oceanfish/en/meetingsworkshops/e-reporting-a-e-monitoring/440-e-monitoring-technical-standards-workshop-june-2016 Electronic Monitoring (Longline) Technical Standard Workshop

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FIGURES

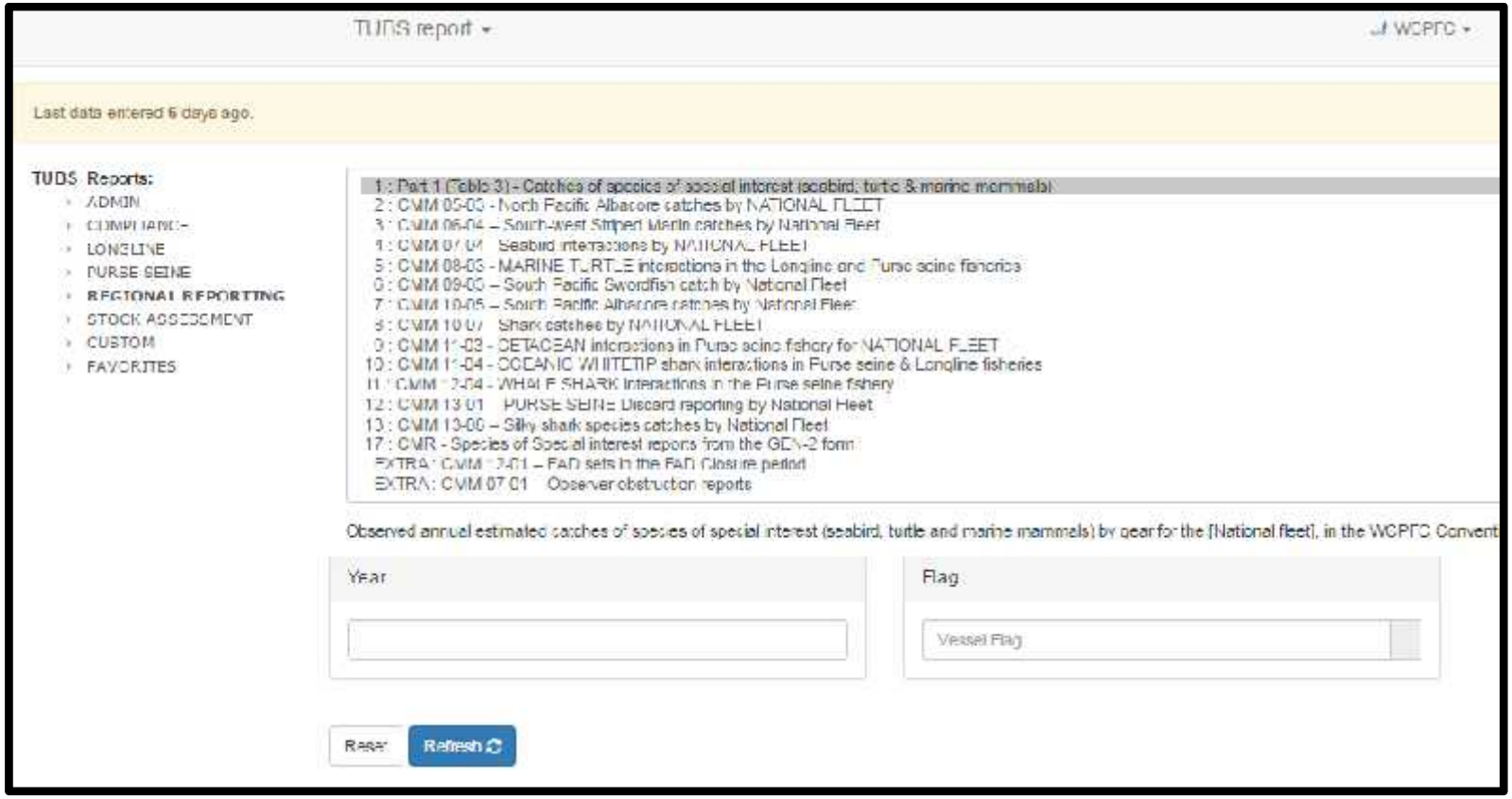

Figure 1. The WCPFC Part1 reports menu in the web DORADO/TUBS observer reporting system

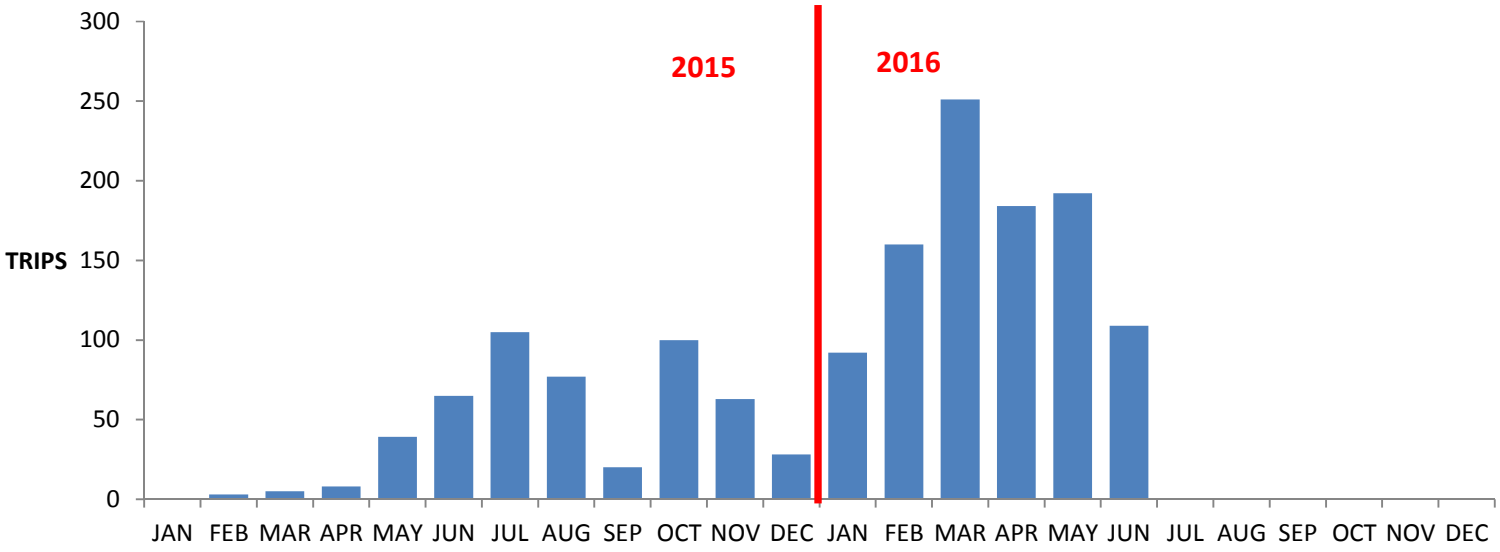

Figure 2. Monthly frequency of provision of 2015 purse seine data

TABLES

Table 1. Summary of the provision and processing of Purse seine Observer data

YEAR	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements		4. TRIP data submitted		5. TRIP data processed				6. Problems awaiting resolution			7. TRIPS not yet sent by Obsv. Progs.	
			Trips	%	Trips	%	Trips	% of Estimated trips	% of total available trips	% of trips received without problems	Trips	% of total available trips	% of received	Trips	% of total
2012	2,261	652	1,609	71%	1,508	94%	1,325	59%	82%	92%	64	4%	5%	101	6%
2013	2,343	627	1,716	73%	1,648	96%	1,607	69%	94%	100%	41	2%	3%	68	4%
2014	2,482	655	1,827	74%	1,537	84%	1,456	59%	80%	100%	81	4%	6%	290	16%
2015	2,203	715	1,488	68%	1,172	79%	1,061	48%	71%	100%	111	7%	10%	316	21%

Notes

1. **CATGEORY 1** represents estimated trips determined from VMS data. These trips exclude the Philippines and Indonesian domestic fisheries, purse seine trips undertaken completely outside the tropical waters (20°N-20°S).). In some instances, trips identified in the VMS data where no fishing actually took place (e.g. returning to home port in Asia for annual maintenance) may have been included in the "Estimated" trips and so the estimated trips will be an over-estimate of actual fishing trips.
2. **CATEGORY 2** represents trips of unknown status and is essentially the difference between VMS trips (**CATEGORY 1**) and those trips that SPC has a record of having taken place (**CATGEORY 3**). In some instances, trips identified in the VMS data where no fishing actually took place (e.g. returning to home port in Asia for annual maintenance) may have been included in the "Estimated" trips. This category may also include fishing trips without an observer on-board.
3. **CATEGORY 3** covers (i) data received at SPC and (ii) basic trip information provided by observer programmes indicating an observer trip took place, but data have yet to be provided.
4. SPC employs a strategy of processing the most recent observer data as highest priority, mainly to ensure CCMs can satisfy their Part 1 and Part 2 reporting obligations (for which compliance applies to the most recent year). This is reflected in the **"% of trips received without problems**" in **CATEGORY 5** whereby the outstanding data entry for 2014/2015 has higher priority than outstanding trips data entry in 2012/2013, for example. Every effort has been made to resolve the backlog from previous years.
5. **CATGEORY 7** is essentially the difference between **CATEGORY 3** and **CATEGORY 4**.
6. Observer data from the Philippines fleet fishing in the High Seas Pocket #1 (HSP #1) are not included in this table at this stage.

Table 2. Summary of Purse seine Observer data received at SPC, by year and flag

2012								
FLEET	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements	4. TRIP data submitted		5. TRIP data processed		
				Trips	%	Trips	% of total available trips	% of total trips recvd
China	88	36	52	47	90%	39	75%	83%
Ecuador	46	31	15	11	73%	6	40%	55%
Spain	34	18	16	9	56%	7	44%	78%
FSM	80	39	41	40	98%	22	54%	55%
Japan	290	89	201	198	99%	192	96%	97%
Kiribati	84	36	48	46	96%	40	83%	87%
Korea	319	107	212	175	83%	144	68%	82%
Marshall Is.	100	39	61	61	100%	58	95%	95%
New Zealand	23	12	11	11	100%	0	0%	0%
PNG / PH / Vanuatu	513	64	449	427	95%	378	84%	89%
Solomon Islands	64	39	25	23	92%	17	68%	74%
El Salvador	17	10	7	1	14%	0	0%	0%
Tuvalu	10	3	7	7	100%	7	100%	100%
Chinese Taipei	294	98	196	188	96%	166	85%	88%
USA	299	31	268	264	99%	249	93%	94%
	2261	652	1609	1508	94%	1325	82%	88%

2013								
FLEET	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements	4. TRIP data submitted		5. TRIP data processed		
				Trips	%	Trips	% of total available trips	% of total trips recvd
China	131	42	89	88	99%	86	97%	98%
Ecuador	51	24	27	22	81%	21	78%	95%
Spain	33	3	30	28	93%	26	87%	93%
FSM	71	66	5	5	100%	4	80%	80%
Japan	297	87	210	209	100%	207	99%	99%
Kiribati	93	37	56	46	82%	45	80%	98%
Korea	302	74	228	210	92%	207	91%	99%
Marshall Is.	106	13	93	91	98%	84	90%	92%
New Zealand	26	13	13	12	92%	12	92%	100%
PNG / PH / Vanuatu	526	70	456	438	96%	431	95%	98%
Solomon Islands	51	43	8	8	100%	8	100%	100%
El Salvador	26	12	14	11	79%	9	64%	82%
Tuvalu	10	2	8	7	88%	6	75%	86%
Chinese Taipei	322	115	207	205	99%	201	97%	98%
USA	298	26	272	268	99%	260	96%	97%
	2343	627	1716	1648	96%	1607	94%	98%

Table 2. Summary of Purse seine Observer data received at SPC, by year and flag (continued)

2014								
FLEET	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements	4. TRIP data submitted		5. TRIP data processed		
				Trips	%	Trips	% of total available trips	% of total trips recvd
China	146	39	107	96	90%	90	84%	94%
Ecuador	46	31	15	15	100%	15	100%	100%
Spain	35	11	24	22	92%	21	88%	95%
FSM	65	8	57	49	86%	48	84%	98%
Japan	285	96	189	159	84%	147	78%	92%
Kiribati	101	0	101	83	82%	82	81%	99%
Korea	376	212	164	136	83%	131	80%	96%
Marshall Is.	96	6	90	80	89%	79	88%	99%
New Zealand	24	20	4	4	100%	4	100%	100%
PNG / PH / Vanuatu	503	21	482	353	73%	346	72%	98%
Solomon Islands	71	37	34	34	100%	34	100%	100%
El Salvador	28	13	15	15	100%	14	93%	93%
Tuvalu	8	4	4	3	75%	3	75%	100%
Chinese Taipei	367	137	230	208	90%	193	84%	93%
USA	331	20	311	280	90%	249	80%	89%
	2482	655	1827	1537	84%	1456	80%	95%

2015								
FLEET	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements	4. TRIP data submitted		5. TRIP data processed		
				Trips	%	Trips	% of total available trips	% of total trips recvd
China	96	15	81	62	77%	58	72%	94%
Ecuador	40	38	2	1	50%	1	50%	100%
Spain	20	16	4	2	50%	2	50%	100%
FSM	73	0	73	66	90%	62	85%	94%
Japan	276	148	128	81	63%	73	57%	90%
Kiribati	84	0	84	60	71%	50	60%	83%
Korea	353	138	215	186	87%	155	72%	83%
Marshall Is.	93	26	67	56	84%	51	76%	91%
New Zealand	26	26	0	0	0%	0	0%	0%
PNG / PH / Vanuatu	456	95	361	271	75%	250	69%	92%
Solomon Islands	60	23	37	29	78%	29	78%	100%
El Salvador	11	7	4	3	75%	2	50%	67%
Tuvalu	5	2	3	3	100%	2	67%	67%
Chinese Taipei	302	132	170	130	76%	117	69%	90%
USA	308	49	259	222	86%	209	81%	94%
	2203	715	1488	1172	79%	1061	71%	91%

Notes

1. **CATGEORY 1** represents estimated trips determined from VMS data. These trips exclude the Philippines and Indonesian domestic fisheries, purse seine trips undertaken completely outside the tropical waters (20°N-20°S).). In some instances, trips identified in the VMS data where no fishing actually took place (e.g. returning to home port in Asia for annual maintenance) may have been included in the "Estimated" trips.
2. **CATEGORY 2** represents trips of unknown status and is essentially the difference between VMS trips (**CATEGORY 1**) and those trips that SPC has a record of having taken place (**CATGEORY 3**). In some instances, trips identified in the VMS data where no fishing actually took place (e.g. returning to home port in Asia for annual maintenance) may have been included in the "Estimated" trips. This category may also include fishing trips without an observer on-board.
3. **CATEGORY 3** covers (i) data received at SPC and (ii) basic trip information provided by observer programmes indicating an observer trip took place, but data have yet to be provided.
4. **"PNG / PH / Vanuatu"** represent a combination of vessels chartered to PNG and flagged to Philippines and Vanuatu, but also those vessels flagged to Philippines and Vanuatu that are not chartered to PNG. The reason for combining these fleets is that VMS data used to determine coverage does NOT take into account chartering arrangements while the observer data does take into account chartering arrangements.
5. Observer data from the Philippines fleet fishing in the High Seas Pocket #1 (HSP #1) are not included in this table at this stage.

Table 3. 2014 Longline observer coverage by CCM – based on reporting from CCMs and data submissions

The fleet breakdown, metric and reporting by CCMs is based on WCPFC11 Summary Report para 483-486 and Attachment L (Anon., 2010a). Flag CCM reporting is from Annual Report Part 1.

			OBSERVER COVERAGE						
CCM Fleet	Fishery	Metric selected for Coverage	Total estimated effort	As reported by flag state		Total estimated effort	As per data submission		
				Observer	%		Observer	%	See NOTES
AUSTRALIA	Domestic	No. of Hooks	6,930,000	195,032	2.8%	6,720,962	192,982	2.9%	2
CHINA	Ice/Fresh	No. of Trips	2,170	31	1.4%	2,170	31	1.4%	3, 10, 11
	Frozen	No. of Trips							
COOK ISLANDS	Pacific Islands	Days at Sea	2,234	199	8.9%	2,234	199	8.9%	8, 9
EUROPEAN UNION	Distant-water	No. of Trips	20	0	0.0%	20	0	0.0%	4, 10
FSM	Pacific Islands	No. of Trips	301	8	2.6%	292	10	3.4%	7
FIJI	Pacific Islands	No. of Trips	682	148	17.0%	682	138	20.2%	8, 9
FRENCH POLYNESIA	Pacific Islands	No. of Trips	918	42	4.5%	918	43	4.7%	2, 9
INDONESIA	Domestic	No. of Trips	-	-	0.0%	-	-	0.0%	5
	Distant-water	No. of Trips	-	-	0.0%	-	-	0.0%	5, 10
JAPAN	Ice/Fresh, short-trip	Days fished	29,254	825	2.8%	29,737	232	0.8%	10
	Frozen, long-trip	Days fished	9,528	544	5.7%	26,174	0	0.0%	10
KIRIBATI	Pacific Islands	No. of Trips	23	-	5.0%	23	0	0.0%	8, 9, 14
MARSHALL ISLANDS	Pacific Islands	No. of Trips	0	-	-	0	-	-	1, 2, 9
NEW CALEDONIA	Pacific Islands	No. of Hooks	4,312,484	271,208	6.3%	4,404,734	265,271	6.0%	2
NEW ZEALAND	Domestic	No. of Hooks	2,431,597	758,670	31.2%	2,483,933	654,656	26.4%	2
PAPUA NEW GUINEA	Pacific Islands	No. of Trips	103	10	9.7%	103	10	9.7%	2, 9, 15
PHILIPPINES	Distant-water	No. of Trips	2	1	50.0%	2	0	0.0%	10, 22
REPUBLIC OF KOREA	Distant-water	Days at Sea	25,364	1,829	7.2%	25,364	863	3.4%	10, 16
SAMOA	Pacific Islands	No. of Trips	213	-	5.0%	213	2	0.9%	21, 2, 9
SOLOMON ISLANDS	Pacific Islands	No. of Trips	316	-	5.0%	316	14	4.4%	2, 17
TONGA	Pacific Islands	No. of Trips	41	1	2.4%	41	4	9.8%	2
TUVALU	Pacific Islands	Days at Sea	553	-	0.0%	553	0	0.0%	8, 12, 18
CHINESE TAIPEI	Small longline – STLL	Days at Sea	74,036	841	1.1%	74,036	586	0.8%	10, 20
	Distant-water – DWLL	Days at Sea	20,714	2,183	10.5%	20,714	3,385	16.3%	10
USA	HAWAII/California-based	No. of Hooks	22,513,958	5,157,213	23.0%	24,033,069	2,171,866	9.0%	6
	AMERICAN SAMOA	No. of Hooks	1,127,442	512,985	45.0%	7,836,466	1,457,769	18.6%	6
VANUATU	Pacific Island-based, short trip	No. of Trips	410	8	2.0%	410	8	2.0%	9, 10, 11
	Distant-water	No. of Trips							

NOTES

1. No activity in 2014 by this CCMs longline fleet
2. Domestic fleet with no fishing on the high seas or other EEZs and therefore no ROP trips. Observer coverage of the domestic fleet is provided in some cases nonetheless.
3. China has yet to advise on which of the four metrics they choose to measure ROP longline observer coverage. At this stage, the number of trips has been used in these tables.
4. In a communication of 28 February 2015, EU advised that they will use "NUMBER OF TRIPS" for measuring and reporting observer coverage on its flagged LL vessels for years from 2014. For 2013, they had previously advised that "*We are currently exploring options for improving observer coverage on EU LLs. Recent amendments in the ES legislation should contribute also in improving these aspects. At TCC10, EU advised that legislation has been adopted*."
5. No information provided by the CCM for this fleet.
6. The information provided for the US fleets EXCLUDES activities in their respective EEZs, that is, the coverage rates provided are for their ROP trips only and estimated effort is for activities outside their EEZ.
7. The information provided for the FSM fleets EXCLUDES activities of their domestic fleet, that is, the coverage is for their ROP trips only.
8. Most (if not all) vessel trips (and therefore most days-at-sea) would be non-ROP trips since mostly restricted to waters of national jurisdiction. . Observer coverage is for all activities (ROP and non-ROP) of the domestic fleet.
9. Observer trip value represents the trip data provided to SPC in the absence of advice from this CCM on total number of observer trips conducted. This value may not represent the overall trips undertaken (i.e. it may be an under-estimate).
10. All vessel trips (and therefore days-at-sea) would be defined as ROP trips. "Distant-water" vessels have very long trips and since some fleets tranship at sea, the unit of coverage might more suitably be "days-at-sea" for these situations.
11. Covers both 'fleets' as coverage cannot be split by fleet at this stage.
12. Tuvalu advised their choice of metric for 2014 was "days at sea".
13. Observer coverage information (as nominated from flag state) was taken from the CCMs WCPFC Annual Report Part 1 prepared for SC11 (as per WCPFC11 Summary Report paragraphs 483 – 486).
14. In their WCPFC Annual Report Part 1 prepared for SC11, Kiribati advised that the required coverage for 2014 had been met but did not indicate the number of observer trips conducted.
15. In their WCPFC Annual Report Part 1 prepared for SC11, PNG advised that there were no ROP trips in 2014.
16. In their WCPFC Annual Report Part 1 prepared for SC11, Korea advised that the coverage for 2014 was 7.2% but did not indicate the number of observer days-at-sea. The total estimated days at sea and observer days at sea have been provided here based on figures reported in Annual Report Part 2
17. In their WCPFC Annual Report Part 1 prepared for SC11, Solomon Islands advised that the required coverage for 2014 had been met but did not indicate the number of observer trips conducted.
18. In their WCPFC Annual Report Part 1 prepared for SC11, Tuvalu advised they are currently finalizing the terms of a Memorandum of Agreement with the Fiji Fisheries Department to ensure a minimum of 5% observer coverage on Tuvalu's two longliners, which are based in Fiji.
19. In their WCPFC Part 1 Report, China advised that they deployed observers on six trips (477 sea days; 1,335,384 hooks) on China-flagged vessels during 2014 which is in addition to observer trips conducted by Coastal state observer programmes on China-flagged vessels.
20. Includes observer trips conducted by Coastal state observer programmes on Chinese Taipei-flagged STLL vessels.
21. This CCM did not have flagged longline vessels on the Record of Fishing Vessels in 2014.
22. Philippines advised that an observer from Vanuatu was active for one trip during 2014.

Table 4. Provisional 2015 Longline observer coverage by CCM – based on reporting from CCMs and data submissions

The fleet breakdown, metric and reporting by CCMs is based on WCPFC11 Summary Report para 483-486 and Attachment L (Anon., 2010a). Flag CCM reporting is from Annual Report Part 1.

			OBSERVER COVERAGE						
CCM Fleet	Fishery	Metric selected for Coverage	Total estimated effort	As reported by flag state		Total estimated effort	As per data submission		See NOTES
				Observer	%		Observer	%	
AUSTRALIA	Domestic	No. of Hooks	8,220,000	482,623	5.9%	8,180,749	473,178	5.8%	2, 17
CHINA	Ice/Fresh	No. of Trips	2,185	31	1.4%	2,185	31	1.4%	3, 10, 11
	Frozen	No. of Trips							
COOK ISLANDS	Pacific Islands	Days at Sea	1,915	245	12.8%	2,392	230	9.6%	8, 9
EUROPEAN UNION	Distant-water	No. of Trips	11	0	0.0%	11	0	0.0%	4, 10
FSM	Pacific Islands	No. of Trips			3.0%	306	5	1.6%	7
FIJI	Pacific Islands	No. of Trips	709	147	20.7%	709	147	20.7%	8, 9
FRENCH POLYNESIA	Pacific Islands	No. of Trips	990	36	3.6%	990	36	3.6%	2, 9
INDONESIA	Domestic	No. of Trips	-	-	0.0%	-	-	0.0%	5
	Distant-water	No. of Trips	-	-	0.0%	-	-	0.0%	5, 10
JAPAN	Ice/Fresh, short-trip	Days fished	28,597	1,226	4.3%	28,597	0	0.0%	10, 18
	Frozen, long-trip	Days fished	8,298	627	7.6%	8,298	0	0.0%	10,18
KIRIBATI	Pacific Islands	No. of Trips	9	0	0.0%	9	0	0.0%	8, 9
MARSHALL ISLANDS	Pacific Islands	No. of Trips	0	-	-	0	-	-	1, 2, 9
NEW CALEDONIA	Pacific Islands	No. of Hooks	4,359,200	147,337	3.4%	4,415,751	204,870	4.6%	2
NEW ZEALAND	Domestic	No. of Hooks	2,321,336	714,000	30.8%	2,321,336	625,673	27.0%	2
PAPUA NEW GUINEA	Pacific Islands	No. of Trips	76	0	0.0%	76	0	0.0%	2, 9
PHILIPPINES	Distant-water	No. of Trips	-	-	-	-	-	-	1
REPUBLIC OF KOREA	Distant-water	Days at Sea	20,157	1,339	6.6%	20,157	337	1.7%	10
SAMOA	Pacific Islands	No. of Trips	171	4	2.3%	161	2	1.2%	15, 2, 9
SOLOMON ISLANDS	Pacific Islands	No. of Trips	149	6	4.0%	149	6	4.0%	2
TONGA	Pacific Islands	No. of Trips	-	-	7.0%	137	12	8.8%	2
TUVALU	Pacific Islands	Days at Sea	500	-	0.0%	500	0	0.0%	8, 12
CHINESE TAIPEI	Small longline – STLL	Days at Sea	78,146	1,936	2.5%	61,851	1,029	1.7%	10, 14
	Distant-water – DWLL	Days at Sea	21,039	1,793	8.5%	15,080	1,882	12.5%	10
USA	HAWAII/California-based	No. of Hooks	19,151,199	4,326,788	22.6%	22,866,245	4,326,788	18.9%	6
	AMERICAN SAMOA	No. of Hooks	148,306	8,801	5.9%	151,654	8,801	5.8%	6
VANUATU	Pacific Island-based, short trip	Days at Sea	...	250	3.7%	17,905	394	2.2%	9, 10, 11
	Distant-water								

NOTES

1. No activity in 2015 by this CCMs longline fleet
2. Domestic fleet with no fishing on the high seas or other EEZs and therefore no ROP trips. Observer coverage of the domestic fleet is provided in some cases nonetheless.
3. China has yet to advise on which of the four metrics they choose to measure ROP longline observer coverage. At this stage, the number of trips has been used in these tables.
4. In a communication of 28 February 2015, EU advised that they will use "NUMBER OF TRIPS" for measuring and reporting observer coverage on its flagged LL vessels for years from 2014. For 2013, they had previously advised that "*We are currently exploring options for improving observer coverage on EU LLs. Recent amendments in the ES legislation should contribute also in improving these aspects. At TCC10, EU advised that legislation has been adopted*."
5. No information provided by the CCM for this fleet.
6. The information provided for the US fleets EXCLUDES activities in their respective EEZs, that is, the coverage rates provided are for their ROP trips only and estimated effort is for activities outside their EEZ.
7. The information provided for the FSM fleets EXCLUDES activities of their domestic fleet, that is, the coverage is for their ROP trips only.
8. Most (if not all) vessel trips (and therefore most days-at-sea) would be non-ROP trips since mostly restricted to waters of national jurisdiction. . Observer coverage is for all activities (ROP and non-ROP) of the domestic fleet.
9. Observer trip value represents the trip data provided to SPC in the absence of advice from this CCM on total number of observer trips conducted. This value may not represent the overall trips undertaken (i.e. it may be an under-estimate).
10. All vessel trips (and therefore days-at-sea) would be defined as ROP trips. "Distant-water" vessels have very long trips and since some fleets tranship at sea, the unit of coverage might more suitably be "days-at-sea" for these situations.
11. Covers both 'fleets' as coverage cannot be split by fleet at this stage.
12. Tuvalu advised their choice of metric for 2014 and 2015 was "days at sea".
13. Observer coverage information (as nominated from flag state) was taken from the CCMs WCPFC Annual Report Part 1 prepared for SC12 (as per WCPFC11 Summary Report paragraphs 483 – 486).
14. Includes observer trips conducted by Coastal state observer programmes on Chinese Taipei-flagged STLL vessels.
15. This CCM did not have flagged longline vessels on the Record of Fishing Vessels in 2015.
16. Philippines advised that an observer from Vanuatu was active for one trip during 2015.
17. Australia commenced producing observer data from their E-Monitoring system in 2015.
18. Japan provided trip-level details for 82 observer trips on Japanese longline vessels for 2015 activities including trip monitoring information. However, data at the set level has yet to be provided.