



**SCIENTIFIC COMMITTEE  
SIXTEENTH REGULAR SESSION**

**ELECTRONIC MEETING**  
11-20 August 2020

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**Status of Observer Data Management**

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**WCPFC-SC16-2020/ST-IP-02**

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## 1. Introduction

1. 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 Commission (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).

2. The Pacific Community's (SPC) Oceanic Fisheries Programme (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- to medium-term (Anon., 2010a, Anon., 2010b). The Sixteenth Regular Session of the Commission (5–11 December 2019; Anon., 2020) reconfirmed the Commission's support for ROP data processing with its inclusion in the indicative budget for the period 2020-2022.

3. 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, EU, Japan, Korea, New Zealand, Philippines, Chinese Taipei and the USA.

4. The majority of the observer data processed by the SPC are ROP-defined purse seine trips<sup>1</sup>, 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 processing as the purse seine observer data. 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.

5. SPC-OFP has also been provided with a significant amount of data generated from E-Monitoring initiatives undertaken by several Pacific Island countries in recent years. These data are aligned to the ROP minimum data standards but are considered as a different data source to data collected by human observers, which is consistent with the philosophy of WCPFC Project 93 (FFA, PNAO, SPC and WCPFC Secretariat, 2019); there has also been a recent initiative to produce independent draft minimum EM data field standards in Pacific Island countries (SPC, FFA and PNAO, 2020). A breakdown of data generated from E-Monitoring initiatives has been included in this paper.

6. 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:

- Activities over the past 12 months
- Status of observer data entry, data provisions, coverage and issues, and;
- Future expectations.

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

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<sup>1</sup> CMM 2018-05 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. Activities over the past twelve months

8. 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. Further progress was made in refining the process for transferring WCPFC ROP data to the WCPFC Secretariat, but there remain some areas to improve the efficiency of the Secretariat receiving observer data in a timely manner.
  - The major developments for the Tufman 2 (Observer component) have now been completed, although there is regular, ongoing maintenance of this system. Enhancements and trials of the E-Reporting system (OLLO) for observers active in the South Pacific albacore longline fishery was one of the features of work for the SPC development team during the past year.
  - SPC technical staff continued to provide regular support to other countries and regional agencies processing observer data using the Tufman 2 observer component.
  - Remote (and some direct) support continued to be provided to Fiji, RMI and FSM to assist with quality control of data generated from E-Monitoring systems and assistance on the use of DORADO reports, which summarise EM data and provide comparisons of EM data to other types of data (logbook, onboard observer and port sampling data).
  - The most time-consuming work over the past year for the observer technical staff continued to be the update of data loaders for the non-standard<sup>2</sup> observer data provided by several CCMs for their national observer programme data. Over the past year, non-standard longline observer data have been provided for the following fleets/years: Australia (2019; E-Monitoring data), China (2019), Japan (2019), New Zealand (2019), EU (2019), US (Hawaii/American Samoa 2019), Korea (2019), Chinese Taipei (some 2019 data) and Vietnam (2019). Most of the non-standard observer data have now been loaded, although some data have issues which require manual intervention and/or referral to the original source of the data (and has proved very time consuming). However, as noted in this paper last year, several countries providing non-standard observer data are using the WCPFC E-reporting observer data field standards<sup>3</sup> to submit their observer data, which significantly reduces the time taken to load the observer data provided by these countries.
  - The online web-based Observer (DORADO) database-reporting module continues to be enhanced and used regularly by national observer providers, the WCPFC and FFA Secretariats and several other CCMs. This system continues to be used by Pacific Island countries in preparation of the WCPFC Part 1 and Part 2 reports for submission, and the system will continue to expand and evolve over the coming years to meet the requirements of not only national observer programmes, but also SPC, the WCPFC Secretariat, FFA and PNAO.

## 3. Status of Observer data entry, data provisions and issues

9. Table 1 shows the status of observer data received and entered by SPC as at 2<sup>th</sup> July 2020 and Table 2 provides an indication of the available purse-seine observer data processed by fleet. Table 3 shows the coverage of Regional Observer Programme (ROP) longline activity for 2018 as nominated by the flag state and according to the metrics proposed at TCC10<sup>4</sup> and agreed at WCPFC11<sup>5</sup>, and Table 4 shows the coverage of Regional Observer Programme (ROP) longline activity for 2019, as nominated by the flag state. Tables 3 and 4 also provide an indication of the longline Regional Observer Programme (ROP) data submitted to WCPFC/SPC by year and fleet, and the coverage of the data provided; this allows a comparison to the coverage nominated by the flag state and is used to evaluate compliance in achieving the required ROP longline coverage of 5%. Tables 5 and 6 provide an indication of both ROP and non-ROP (i.e. total observer) data provided to SPC with an estimated total observer data coverage relevant to the scientific work of the WCPFC.

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<sup>2</sup> We refer to “non-standard” as observer data that are not entered using the Tufman 2 system, or do not align to the WCPFC ER observer data field standards (i.e. they are provided in different formats by CCMs which requires the development of specific data loaders)

<sup>3</sup> [https://www.wcpfc.int/doc/data-05/e-reporting\\_ssps](https://www.wcpfc.int/doc/data-05/e-reporting_ssps)

<sup>4</sup> See the TCC10 paper at <http://www.wcpfc.int/node/19567>

<sup>5</sup> See the WCPFC11 report at <http://www.wcpfc.int/node/20349>, para 477 and Attachment L, Table 1

10. Pacific Island observers and programmes generate most of the observer data used by the Commission and Table 7 provides an indication of the extent of data generated in recent years. There has also been a significant amount of data generated from E-Monitoring over the past 2-3 years, and an attempt to quantify these data has been made in Table 8.

11. 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 [see Williams et al. (2017) for the details of each factor], including:

- i. Accurate information on the complete number of vessel trips by gear and flag in the WCPFC Convention Area.
- ii. Accurate information on the actual number of observer trips by observer programme, gear and flag.
- iii. Assignment of an ROP trip in the unprocessed data.

### 3.1 Purse seine

12. Provisions of purse seine observer data for years 2012–2018 have been described in previous versions of this paper.

13. Observer data for an estimated 62% (1490 trips out of 2,386 trips according to VMS data) of observer purse seine trips conducted during 2019 have been received at SPC at the time of writing this paper (the data received represents 79% of the trips with known observer placements in 2019). This is in line with the 2018 data provision and a significant improvement on the provision of 2017 data at this stage, when the coverage was only 28%. The current coverage of 2019 observer data received at SPC is now an estimated 82% (1,782 trips) of the total estimated purse seine trips (2,165 trips according to 2019 VMS data), with a coverage of 95% for trips with known placements.

14. A total of 87% (1,268 trips) of the observer data received (1,490 trips) at SPC for 2019 observer activities have now been entered (excluding the trips awaiting resolution at SPC). SPC employs a strategy of processing the most recent observer data (in this case 2019 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 2019 (for example) had a higher priority than the outstanding trips to be entered in earlier years, and therefore a higher proportion in this column. The outstanding trips for earlier years will be entered once the current priority for 2019 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 2019 purse seine trips received at SPC, about 2% (31 trips) have problems awaiting to be resolved (mainly issues with scanning or incomplete data submitted), but a significant improvement on previous years, nonetheless.

15. The breakdown of processed purse-seine observer data by fleet (Table 2) shows that the coverage of 2019 observer data submitted to SPC is generally high, with respect to observer data with known placements. The observer data for Ecuador and El Salvador fleets are anticipated (these trips are usually conducted as IATTC cross-endorsed trips and there is a delay for the data to flow back to the observer provider and then on to SPC).

16. Figure 1 highlights the continuation in the timely provision of 2019 purse seine observer data compared with the provision of 2017 data (when there were considerable lags in data provisions). The best way to interpret these graphs is to understand that having more trips (blue bars) to the left of the red line represents the more timely provision of observer data, but having more trips (blue bars) to the right of the red line means progressive lags in the provision of data. The timely provision of 2018 and 2019 observer data has meant that more data for the most recent calendar year were available for the scientific work required for SC16 than in recent years.

17. As reported in previous years, the ‘problematic’ trip data held at SPC awaiting resolution are mainly due to incomplete or poor-quality scanned data submissions.

18. 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.

19. 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. In the future, we plan to work with observer providers to resolve the backlog of observer debriefing data and incorporate debriefing data from the PNA FIMS observer-debriefing component into the regional observer database. We anticipate reporting summaries from the observer debriefing data in future versions of this paper.

20. Figure 2 provides an indication of the spatial coverage of the purse seine observer data for 2019, noting that the domestic fisheries of Indonesia, Philippines and Vietnam are not shown (although the Philippines purse seine fleet observer effort in the high seas pocket #1 is shown). The spatial coverage of available purse seine observer data for 2019 in the tropical fishery is clearly representative of fishing effort (even though coverage of available observer data is not yet 100%).

### 3.2 Longline

21. SC11 directed SPC to present a table of longline ROP 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 ROP coverage for 2018 and 2019 respectively.

22. Previous versions of these tables included the trips for fleets that are restricted to the home EEZ/adjacent high seas only (which are defined as non-ROP). The 15<sup>th</sup> WCPFC Scientific Committee (SC15), held in Pohnpei, FSM in August 2019, recommended that future versions of Tables 3 and 4 exclude the non-ROP defined data and only report on ROP longline coverage – this recommendation has been actioned with adjustments to Tables 3 and 4 in this paper.

23. In addition to the adjustments for Tables 3 and 4, two new tables have been added (Tables 5 and 6) which provide a breakdown of all longline observer data (ROP and non-ROP) provided to the WCPFC Science Service Provider for Commission work, covering 2018 and 2019 respectively. These tables use the common longline effort metric (hooks) and indicate that overall coverage was 4.7% and 3.5% (respectively for 2018 and 2019) according to data provisions to date.

24. The positive development with some CCMs providing data aligned to the WCPFC ER observer data standards has improved the timeliness of loading the ‘non-standard’ observer data, although some provisions of data for the most recent calendar year (2019) have only recently been provided and were too late for inclusion in analyses undertaken for SC16. For example, the 2019 Japan observer data were provided at the time of completing this paper and have yet to be loaded but have been accounted for in Table 6.

25. Figures 3 and 4 provides an indication of the spatial coverage of all longline observer data (ROP and non-ROP) provided for 2018 and 2019, respectively. Spatial coverage of longline observer data has improved during the past 2–3 years compared to previous years.

### 4.3 Contribution of Pacific Island observer programmes

26. Table 7 provides a breakdown of observer data collected by each Pacific Island (PIC) observer programme for 2018 and 2019. For purse seine, the PIC observer data currently cover 99.8% of the tropical WCPFC fishery (based on total tuna catch estimates for the tropical fishery) for 2018, and 75.9% for 2019. For longline, the PIC observer data currently covers 1.46% and 1.20%, respectively for 2018 and 2019, based on total WCPFC tuna catch estimates.

#### 4. Summary and Future expectations

27. There are several observer data entry teams<sup>6</sup> operating throughout the region entering data into the Tufman 2 observer component. This system is primarily supported by the two technical positions (Observer Data Manager and Observer Data Audit Officer) based in SPC Noumea, but also by other SPC-OFP staff who will continue to assist member countries using this system via the SLACK Helpdesk.

28. The continued improvement in the timeliness of purse seine observer data over the past two years (see Figure 1 and Section 3.1, para. 16 above) is encouraging and we thank all observer providers for their work in ensuring data have been provided in a timelier manner.

29. SPC-OFP will continue to be involved in observer E-Reporting and E-Monitoring trials in collaboration with their member countries and other regional agencies in the coming years, 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.

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

- Provide ongoing support to enhance the WCPFC ROP database to align with the requirements of the WCPFC Compliance Case system;
- Continued support for the WCPFC/NORMA observer data entry (using the Tufman 2 web-based system);
- Continued support (technical and training) related to the web DORADO observer reporting tool;
- 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.

31. SPC-OFP will also continue to work with the Pacific Islands Forum Fisheries Agency (FFA) and the PNA office to improve efficiencies in observer data management and dissemination (according to established data sharing rules), particularly in regards to data flow and reporting tools for the benefit of SPC-OFP/FFA/PNA member countries.

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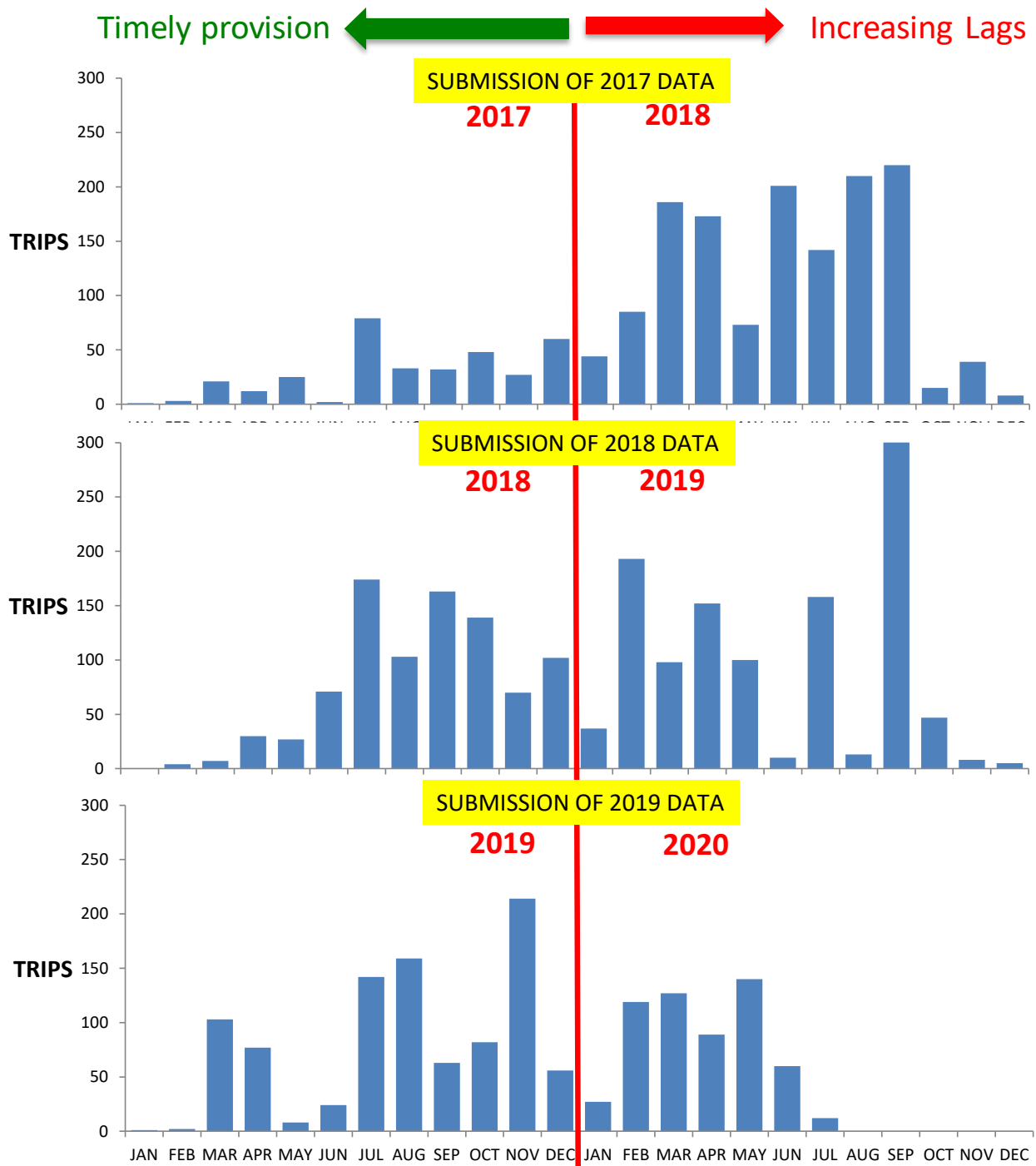
<sup>6</sup> SPC Noumea, WCPFC Secretariat, FFA, Philippines, Fiji Fisheries and Tonga are undertaking observer data entry.



## 5. 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.
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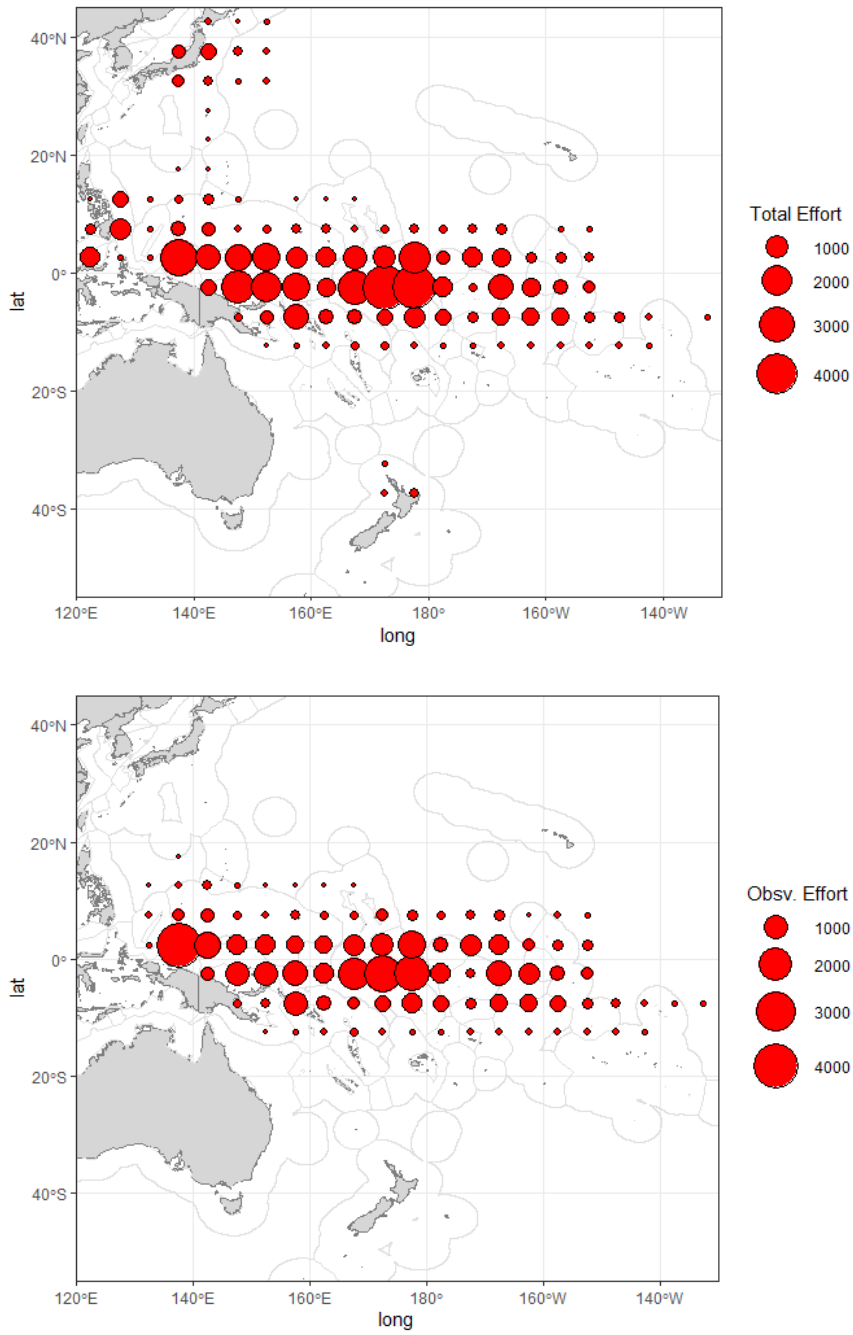
## FIGURES



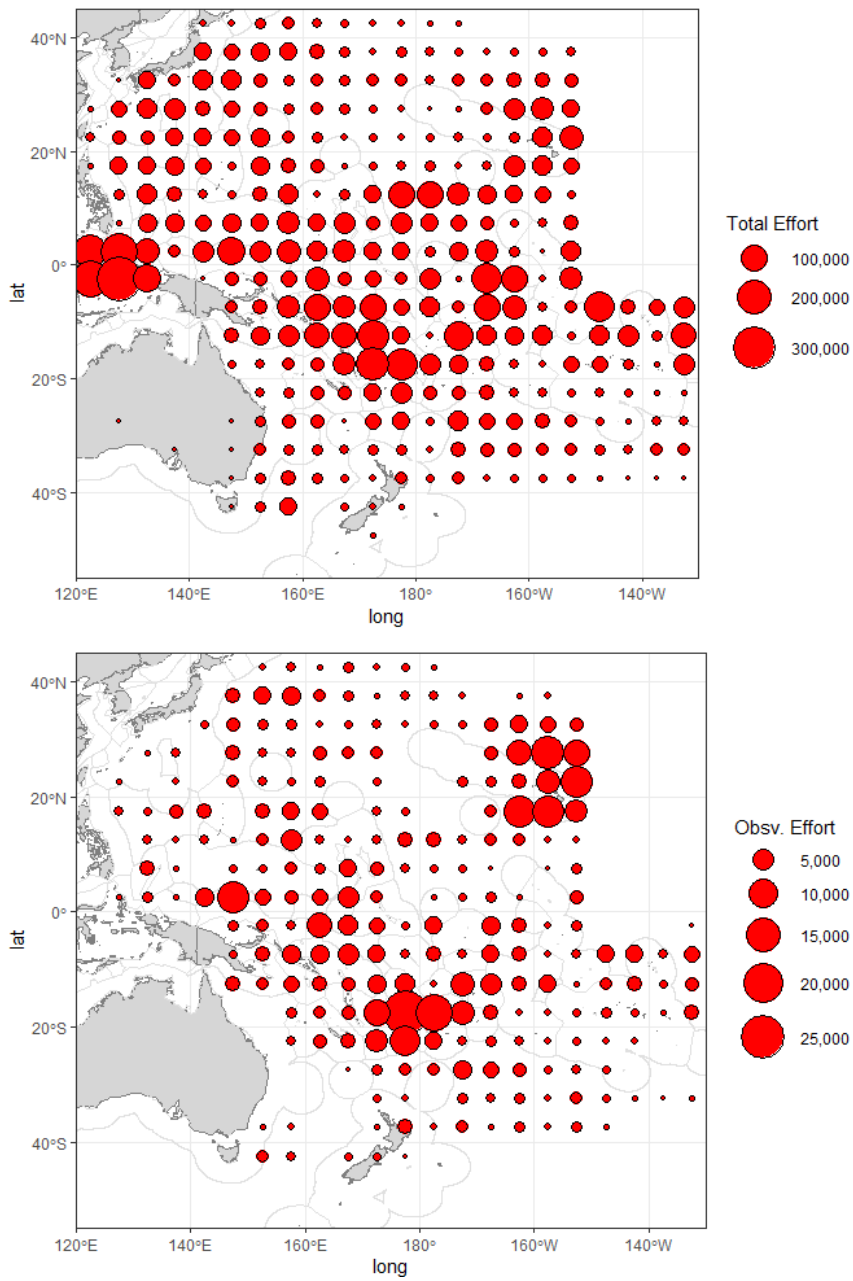
**Figure 1. Monthly frequency of provision of 2017 (top), 2018 (middle) and 2019 (bottom) purse seine observer data**

X-Axis represents the year/month when respective observer data were received. For example, the top graph represents when provisions of 2017 observer data were received at SPC throughout the months of 2017–2018. Provisions of data to the left of the red line indicate timely provisions, provisions to the right indicate increasing lags.

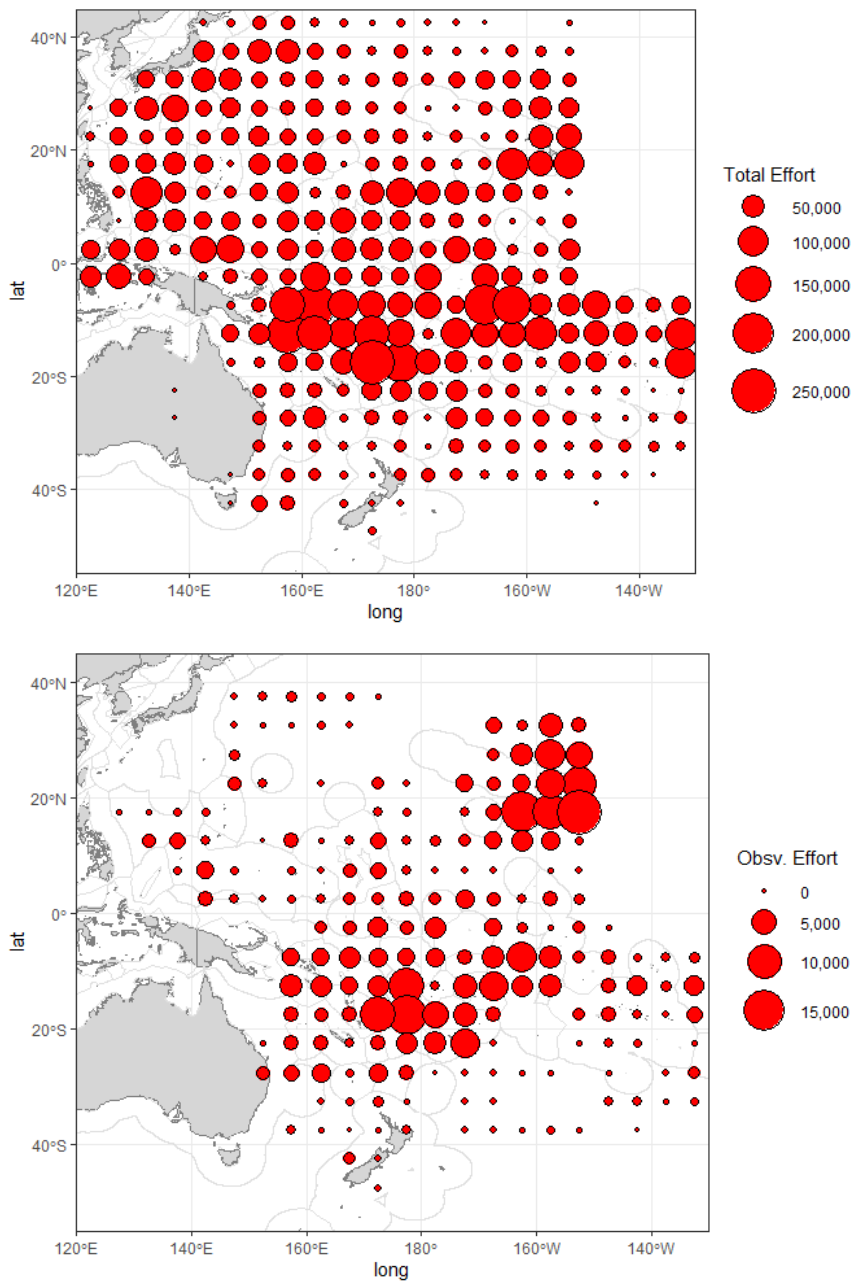




**Figure 2. Distribution of Purse seine effort (top) and Observer coverage (bottom) in the WCPFC Area for 2019. Effort is in DAYS fishing and searching. (excludes Indonesia, Philippines and Vietnam domestic fisheries)**



**Figure 3. Distribution of Longline effort (top) and Observer coverage (bottom) in the WCPFC Area for 2018. (Effort is in 100s of hooks)**



**Figure 4. Distribution of Longline effort (top) and Observer coverage (bottom) in the WCPFC Area for 2019. (Effort is in 100s of hooks)**

## TABLES

**Table 1. Summary of the provision and processing of Purse seine Observer data** (Different colours represent categories – see NOTES below)

As at July 2020															
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
2015	2,156	404	1,752	81%	1,699	97%	1,635	76%	93%	99%	47	3%	3%	53	3%
2016	2,058	248	1,810	88%	1,797	99%	1,612	78%	89%	92%	41	2%	3%	13	1%
2017	2,165	293	1,872	86%	1,782	95%	1,171	54%	63%	69%	93	5%	8%	90	5%
2018	2,335	35	2,300	99%	2,094	91%	1,741	75%	76%	85%	48	2%	3%	206	9%
2019	2,386	507	1,879	79%	1,490	79%	1,268	53%	67%	87%	31	2%	2%	389	21%

### Notes

- CATEGORY 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 values in this column will be an over-estimate of actual fishing trips.
- 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 (**CATEGORY 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.
- 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.
- 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 2018/2019 has higher priority than outstanding trips data entry in 2016/2017, for example. Every effort has been made to resolve the backlog from previous years.
- CATEGORY 7** is essentially the difference between **CATEGORY 3** and **CATEGORY 4**.
- Observer data from the Philippines fleet fishing in the High Seas Pocket #1 (HSP #1) are included in this table.

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

2016								
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 Estimated trips	% of total available trips
China	39	22	17	17	100%	15	38%	88%
Ecuador	30	27	3	3	100%	3	10%	100%
European Union	9	0	9	9	100%	8	89%	89%
FSM	122	3	119	118	99%	87	71%	74%
Japan	231	76	155	155	100%	145	63%	94%
Kiribati	203	20	183	176	96%	151	74%	86%
Korea	294	95	199	198	99%	195	66%	98%
Marshall Is.	84	0	84	84	100%	68	81%	81%
New Zealand	10	4	6	6	100%	6	60%	100%
PNG	333	10	323	320	99%	259	78%	81%
Philippines	116	-63	179	178	99%	162	140%	91%
Solomon Islands	76	-12	88	88	100%	69	91%	78%
El Salvador	14	11	3	3	100%	3	21%	100%
Tuvalu	7	0	7	7	100%	6	86%	86%
Chinese Taipei	248	29	219	219	100%	212	85%	97%
USA	236	19	217	217	100%	217	92%	100%
Vanuatu	6	0	6	6	100%	6	100%	100%
	2058	241	1817	1804	99%	1612	78%	89%

2017								
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	18	15	3	3	100%	2	67%	67%
Ecuador	35	23	12	12	100%	12	100%	100%
European Union	24	13	11	11	100%	11	100%	100%
FSM	142	1	141	133	94%	51	36%	38%
Japan	206	60	146	146	100%	85	58%	58%
Kiribati	199	29	170	145	85%	70	41%	48%
Korea	258	66	192	170	89%	161	84%	95%
Marshall Is.	81	0	81	78	96%	60	74%	77%
New Zealand	11	6	5	5	100%	5	0%	100%
PNG	516	0	516	492	95%	253	49%	51%
Philippines	91	0	91	91	100%	78	86%	86%
Solomon Islands	104	0	104	100	96%	71	68%	71%
El Salvador	14	9	5	5	100%	5	100%	100%
Tuvalu	7	1	6	5	83%	4	67%	80%
Chinese Taipei	238	63	175	171	98%	136	78%	80%
USA	211	5	206	206	100%	161	78%	78%
Vanuatu	10	2	8	8	100%	6	60%	75%
	2165	293	1,872	1,781	95%	1,171	63%	66%

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

2018								
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	20	2	18	16	89%	15	83%	94%
Ecuador	26	14	12	12	100%	12	100%	100%
European Union	15	5	10	10	100%	10	100%	100%
FSM	178	0	178	157	88%	135	76%	86%
Japan	236	0	236	206	87%	186	79%	90%
Kiribati	232	0	232	211	91%	170	73%	81%
Korea	283	0	283	227	80%	178	63%	78%
Marshall Is.	96	0	96	88	92%	85	89%	97%
Nauru	9	1	8	7	88%	7	88%	100%
New Zealand	7	4	3	3	100%	3	100%	100%
PNG	502	0	502	488	97%	461	92%	94%
Philippines	75	0	75	75	100%	75	100%	100%
Solomon Islands	115	0	115	90	78%	80	70%	89%
El Salvador	11	9	2	2	100%	2	100%	100%
Tuvalu	14	0	14	14	100%	12	86%	86%
Chinese Taipei	283	0	283	255	90%	82	29%	32%
USA	218	0	218	218	100%	218	100%	100%
Vanuatu	15	0	15	15	100%	10	67%	67%
	2335	35	2,300	2,094	91%	1,741	76%	83%

2019								
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
Cook Islands	3		3	3	100%	3	100%	100%
China	27	8	19	16	84%	12	63%	75%
Ecuador	32	24	8	8	100%	7	88%	88%
European Union	9	2	7	7	100%	5	71%	71%
FSM	210	6	204	152	75%	133	65%	88%
Japan	208	2	206	91	44%	65	32%	71%
Kiribati	240	57	183	144	79%	136	74%	94%
Korea	303	43	260	219	84%	139	53%	63%
Marshall Is.	114	0	114	89	78%	86	75%	97%
Nauru	42	0	42	30	71%	28	67%	93%
New Zealand	7	7	0	0	0%	0	0%	0%
PNG	465	206	259	198	76%	156	60%	79%
Philippines	57	0	57	57	100%	57	100%	100%
Solomon Islands	127	0	127	100	79%	97	76%	97%
El Salvador	11	10	1	1	100%	1	100%	100%
Tuvalu	10	0	10	3	30%	3	30%	100%
Chinese Taipei	295	142	153	151	99%	126	82%	83%
USA	188	0	188	187	99%	187	99%	100%
Vanuatu	41	2	39	29	74%	27	69%	93%
	2386	509	1,877	1,482	79%	1,265	67%	85%

**Table 2. Summary of Purse seine Observer data received at SPC, by year and flag (continued)****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. Observer data from the Philippines fleet fishing in the High Seas Pocket #1 (HSP #1) are included in this table.



**Table 3. Provisional 2018 Longline Regional Observer Programme (ROP) 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.

			REGIONAL OBSERVER PROGRAMME (ROP) DATA COVERAGE						
			(minimum required for ROP is 5%)						
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	–	–	–	–	–	–	2, 17
CHINA	Ice/Fresh	Days at Sea	61,316	3,323	5.4%	60,756	3,671	6.0%	3, 10, 11, 22
	Frozen								
COOK ISLANDS	Pacific Islands	Days at Sea	3,252	348	10.7%	3,408	278	8.2%	8, 9
EUROPEAN UNION	Distant-water	No. of Trips	13	1	7.7%	13	1	7.7%	4, 10, 19
FSM	Pacific Islands	No. of Trips	228	15	6.6%	220	15	6.8%	7
FIJI	Pacific Islands	No. of Trips	661	233	35.2%	74	10	13.5%	7
FRENCH POLYNESIA	Pacific Islands	Days at Sea	–	–	–	–	–	–	2
INDONESIA	Domestic	No. of Trips	–	–	–	–	–	–	2, 19, 21
JAPAN	Ice/Fresh, short-trip	Days fished	24,688	938	3.8%	25,626	938	3.7%	10
	Frozen, long-trip	Days fished	8,508	614	7.2%	8,911	614	6.9%	10
KIRIBATI	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
MARSHALL ISLANDS	Pacific Islands	No. of Trips	–	–	–	–	–	–	2, 25
NEW CALEDONIA	Pacific Islands	No. of Hooks	–	–	–	–	–	–	2
NEW ZEALAND	Domestic	No. of Hooks	–	–	–	–	–	–	2
PALAU	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
PAPUA NEW GUINEA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
PHILIPPINES	Distant-water	No. of Trips	–	–	–	–	–	–	1, 16
REPUBLIC OF KOREA	Distant-water	Days at Sea	26,717	1,695	6.3%	26,717	1,695	6.3%	10, 20, 23
SAMOA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
SOLOMON ISLANDS	Pacific Islands	No. of Trips	447	17	3.8%	17	1	5.9%	7, 9
TONGA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
TUVALU	Pacific Islands	No. of Trips	–	–	–	–	–	–	2, 12
CHINESE TAIPEI	Small longline – STLL	Days at Sea	108,883	8,950	8.2%	108,883	8,404	7.7%	10, 14
	Distant-water – DWLL	Days at Sea	20,820	1,793	8.6%	20,820	1,353	6.5%	10
USA	HAWAII/California-based	No. of Trips	1,108	254	22.9%	1,108	254	22.9%	6
	AMERICAN SAMOA	No. of Trips	–	–	–	–	–	–	2, 6
VANUATU	Pacific Island-based, short trip	Days at Sea	15,419	275	1.8%	14,986	990	6.6%	9, 10, 11
	Distant-water								

## NOTES

1. 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 includes information from Annual Reports - Part 1.
2. Domestic fleet fishing within their EEZ. There is no fishing in other EEZs but there may be very infrequent activities in adjacent high seas area. The activities of this fleet are therefore not relevant to the requirements for ROP longline coverage.
3. China has advised in their Annual Report Part 1 that their choice of metric is “days-at-sea”. Total estimated effort (of days at sea) is determined from available operational logbook data, raised to account for incomplete coverage (of operational logbook data provided).
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 these fleets EXCLUDES activities of the domestic component (i.e. vessels fishing exclusively in the home EEZ and adjacent high seas only); the coverage represents the component that conduct ROP-defined 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 was “Number of Trips”.
13. Observer coverage information (as nominated from flag state) was taken from the CCMs WCPFC Annual Report Part 1 prepared for SC14 (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 2018.
16. No longline vessels from Philippines active in 2018.
17. Australia commenced producing data from their E-Monitoring system from 2015. E-Monitoring data are not yet considered to count towards ROP coverage.
18. Japan provided trip-level details for 2018 observer activities including trip monitoring information.
19. Observer data provided does not satisfy all of the ROP minimum data field standards.
20. There is evidence that additional observer trips have been conducted by coastal states, but the data have yet to be provided.
21. The number of total trips for the Indonesian domestic longline fleet is not known but has been estimated based on the annual catch estimate and approximate catch per trip.
22. 2018 observer data provided for the China longline fleet included some activity in the Pacific Ocean beyond the WCPFC Area; these data have been excluded in the coverage rates presented in this table.
23. Effort metric for Korean longline fleet in 2018 is DAYS AT SEA.
24. No activity in 2018 by this CCM’s longline fleet.
25. Represents the chartered vessels in this fleet; no vessels were flagged to RMI in 2018.

**Table 4. Provisional 2019 Longline Regional Observer Programme (ROP) 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.

			REGIONAL OBSERVER PROGRAMME (ROP) DATA COVERAGE						
			(minimum required for ROP is 5%)						
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	–	–	–	–	–	–	2, 17
CHINA	Ice/Fresh	Days fished	56,261	3,677	6.5%	57,270	2,882	5.0%	3, 10, 11, 22
	Frozen								
COOK ISLANDS	Pacific Islands	Days at Sea	3,446	428	12.4%	3,820	432	11.3%	8, 9
EUROPEAN UNION	Distant-water	No. of Trips	17	1	5.9%	17	1	5.9%	4, 10, 19
FSM	Pacific Islands	No. of Trips	190	9	4.7%	190	9	4.7%	7, 26
FIJI	Pacific Islands	No. of Trips	899	144	16.0%	94	13	13.8%	7
FRENCH POLYNESIA	Pacific Islands	Days at Sea	–	–	–	–	–	–	2
INDONESIA	Domestic	No. of Trips	–	–	–	–	–	–	2, 19, 21
JAPAN	Ice/Fresh, short-trip	Days fished	26,527	1,473	5.6%	26,527	1,473	5.6%	10
	Frozen, long-trip	Days fished	7,785	888	11.4%	7,785	888	11.4%	10
KIRIBATI	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
MARSHALL ISLANDS	Pacific Islands	No. of Trips	–	–	–	–	–	–	2, 25
NEW CALEDONIA	Pacific Islands	No. of Hooks	–	–	–	–	–	–	2
NEW ZEALAND	Domestic	No. of Hooks	–	–	–	–	–	–	2
PALAU	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
PAPUA NEW GUINEA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
PHILIPPINES	Distant-water	No. of Trips	–	–	–	–	–	–	1, 16
REPUBLIC OF KOREA	Distant-water	Days at Sea	26,959	1,919	7.1%	25,032	2,844	11.4%	10, 20, 23
SAMOA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
SOLOMON ISLANDS	Pacific Islands	No. of Trips	359	15	4.2%	300	19	6.3%	7, 9
TONGA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
TUVALU	Pacific Islands	No. of Trips	7	1	14.3%	7	1	14.3%	7
CHINESE TAIPEI	Small longline –STLL	Days at Sea	96,706	6,731	7.0%	96,706	4,443	4.6%	10, 14
	Distant-water –DWLL	Days at Sea	20,252	3,031	15.0%	20,252	217	1.1%	10
USA	HAWAII/California-based	No. of Trips	1,298	273	21.0%	1,298	273	21.0%	6
	AMERICAN SAMOA	No. of Trips	–	–	–	–	–	–	2, 6
VANUATU	Pacific Islands and DW	No. of Trips	130	8	6.2%	130	8	6.2%	7

## NOTES

1. 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 includes information from Annual Reports - Part 1.
2. Domestic fleet fishing within their EEZ. There is no fishing in other EEZs but there may be very infrequent activities in adjacent high seas area. The activities of this fleet are therefore not relevant to the requirements for ROP longline coverage.
3. China has advised in their Annual Report Part 1 that their choice of metric is “days-at-sea”. Total estimated effort (of days at sea) is determined from available operational logbook data, raised to account for incomplete coverage (of operational logbook data provided).
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 these fleets EXCLUDES activities of the domestic component (i.e. vessels fishing exclusively in the home EEZ and adjacent high seas only); the coverage represents the component that conduct ROP-defined 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 was “Number of Trips”.
13. Observer coverage information (as nominated from flag state) was taken from the CCMs WCPFC Annual Report Part 1 prepared for SC14 (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 2019.
16. No longline vessels from Philippines active in 2019.
17. Australia commenced producing data from their E-Monitoring system from 2015. E-Monitoring data are not yet considered to count towards ROP coverage.
18. Japan provided trip-level details for 2019 observer activities including trip monitoring information.
19. Observer data provided does not satisfy all of the ROP minimum data field standards.
20. There is evidence that additional observer trips have been conducted by coastal states, but the data have yet to be provided.
21. The number of total trips for the Indonesian domestic longline fleet is not known but has been estimated based on the annual catch estimate and approximate catch per trip.
22. 2019 observer data provided for the China longline fleet included some activity in the Pacific Ocean beyond the WCPFC Area; these data have been excluded in the coverage rates presented in this table.
23. Effort metric for Korean longline fleet in 2019 is DAYS AT SEA.
24. No activity in 2019 by this CCM’s longline fleet.
25. Represents the chartered vessels in this fleet; no vessels were flagged to RMI in 2019.
26. Excludes trips/activities from chartered vessels.

**Table 5. Coverage of Longline Observer data in the WCPFC Area, for 2018**

(all observer data available to the WCPFC Science Service Provider; includes both ROP and non-ROP data)

CCM Fleet	Hooks		
	Total Effort	Observer	
AUSTRALIA	7,879,226	0	
CHINA	145,815,673	3,053,225	
COOK ISLANDS	14,708,446	854,763	
EUROPEAN UNION	945,729	146,836	
FIJI	53,934,495	7,733,530	
FRENCH POLYNESIA	17,281,966	478,055	
FSM	37,658,454	577,842	
INDONESIA	116,360,862	0	
JAPAN	116,520,896	3,069,424	
KIRIBATI	4,685,732	80,590	
MARSHALL ISLANDS	10,415,062	795,873	
NEW CALEDONIA	5,401,285	542,643	
NEW ZEALAND	2,770,435	293,138	
PALAU	8,909,396	0	
PAPUA NEW GUINEA	6,262,066	114,806	
REPUBLIC OF KOREA	58,097,555	1,649,132	
SAMOA	10,466,081	0	
SOLOMON ISLANDS	30,428,631	936,033	
TONGA	1,350,985	29,320	
TUVALU	1,345,984	89,394	
CHINESE TAIPEI	167,340,325	10,232,695	
USA	57,746,909	10,488,684	
VANUATU	35,005,097	1,466,704	
<b>Total</b>	<b>911,331,290</b>	<b>42,632,687</b>	<b>4.7%</b>

**Notes**

1. Total effort (hooks) for Indonesia has been estimated.
2. CCM Fleet includes chartered vessels.
3. Observer data have been provided for activities outside of WCPFC area, but are not included here.

**Table 6. Coverage of Longline Observer data in the WCPFC Area, for 2019**

(all observer data available to the WCPFC Science Service Provider; includes both ROP and non-ROP data)

CCM Fleet	Hooks		
	Total Effort	Observer	
AUSTRALIA	8,502,210	0	
CHINA	161,767,526	5,096,311	
COOK ISLANDS	12,779,163	324,443	
EUROPEAN UNION	885,877	47,748	
FIJI	60,154,012	4,308,851	
FRENCH POLYNESIA	17,842,061	701,986	
FSM	46,845,648	1,047,581	
INDONESIA	20,943,373	0	
JAPAN	117,301,950	5,243,762	
KIRIBATI	9,795,936	207,844	
MARSHALL ISLANDS	8,465,681	371,535	
NEW CALEDONIA	5,811,267	470,263	
NEW ZEALAND	1,976,437	163,590	
PALAU	9,857,647	0	
PAPUA NEW GUINEA	38,500	2,940	
REPUBLIC OF KOREA	115,080,826	2,236,933	
SAMOA	10,390,190	266,510	
SOLOMON ISLANDS	40,979,626	853,456	
TONGA	1,227,157	47,286	
TUVALU	825,938	22,036	
CHINESE TAIPEI	191,568,082	5,004,117	
USA	72,182,251	11,127,512	
VANUATU	22,129,869	509,780	
<b>Total</b>	<b>937,351,227</b>	<b>38,054,484</b>	<b>4.1%</b>

**Notes**

1. Total effort (hooks) for Indonesia has been estimated.
2. CCM Fleet includes chartered vessels.
3. Observer data have been provided for activities outside of WCPFC area, but are not included here.

**Table 7. Contribution of Pacific Islands' observer programmes to observer coverage, by gear, for 2018 (top) and 2019 (bottom)**

2018				
Observer Provider/Programme	PURSE SEINE		LONGLINE	
	Trips	Cov% <sup>1</sup>	Trips	Cov% <sup>2</sup>
COOK ISLANDS	10	0.8%	10	0.07%
FEDERATED STATES OF MICRONESIA	28	1.1%	2	0.02%
FIJI	0	0.0%	231	0.66%
FRENCH POLYNESIA	0	0.0%	25	0.05%
KIRIBATI	382	20.5%	4	0.01%
MARSHALL ISLANDS	28	1.2%	34	0.07%
NAURU	6	0.3%	0	0.00%
NEW CALEDONIA	0	0.0%	29	0.08%
PALAU	0	0.0%	0	0.00%
PAPUA NEW GUINEA	544	20.0%	5	0.08%
PHILIPPINES	64	1.4%	0	0.00%
PNA Observer Programme	638	27.4%	0	0.00%
SOLOMON ISLANDS	190	7.0%	16	0.14%
TONGA, KINGDOM OF	0	0.0%	17	0.15%
TUVALU	181	10.2%	0	0.00%
US MLT Observer Programme	218	11.3%	0	0.00%
VANUATU	0	0.0%	9	0.14%
<b>Total</b>	<b>2289</b>	<b>99.8%</b>	<b>382</b>	<b>1.46%</b>

2019				
Observer Provider/Programme	PURSE SEINE		LONGLINE	
	Trips	Cov% <sup>1</sup>	Trips	Cov% <sup>2</sup>
COOK ISLANDS	10	0.6%	13	0.15%
FEDERATED STATES OF MICRONESIA	58	2.0%	2	0.00%
FIJI	0	0.0%	144	0.39%
FRENCH POLYNESIA	0	0.0%	45	0.09%
KIRIBATI	223	10.4%	4	0.00%
MARSHALL ISLANDS	28	1.2%	30	0.06%
NAURU	0	0.0%	0	0.00%
NEW CALEDONIA	0	0.0%	28	0.07%
PALAU	0	0.0%	0	0.00%
PAPUA NEW GUINEA	242	8.8%	2	0.00%
PHILIPPINES	55	1.0%	0	0.00%
PNA Observer Programme	717	30.4%	0	0.00%
SOLOMON ISLANDS	106	2.6%	19	0.21%
TONGA, KINGDOM OF	0	0.0%	28	0.23%
TUVALU	204	10.5%	0	0.00%
US MLT Observer Programme	186	9.5%	0	0.00%
VANUATU	0	0.0%	9	0.00%
<b>Total</b>	<b>1829</b>	<b>75.9%</b>	<b>324</b>	<b>1.20%</b>

**Notes**

1. Cov% represents coverage in the tropical WCPFC purse seine fishery using total target tuna catch estimate as the metric.
2. Cov% represents coverage in the WCPFC longline fishery using total target tuna catch estimate as the metric.
3. Trips represent observer trips conducted by the observer programme. This metric is not used in the estimate of coverage (see notes 1. and 2. above).
4. Represents data received at SPC, including some data not yet to be processed.



**Table 8. Annual Longline E-Monitoring (EM) data reviews (sets), by national EM programme, 2015–2019**

EM Programme	E-MONITORING DATA ( <u>Sets reviewed</u> )				
	2015	2016	2017	2018	2019
AUSTRALIA	56	420	528	489	525
FIJI	222	621	2,170	1510	405
FSM	-	311	283	21	104
MARSHALL ISLANDS	-	-	944	523	181
PALAU	-	102	153	56	-
SOLOMON ISLANDS	-	-	74	25	-

**Notes**

1. 2019 values are provisional.