SCIENTIFIC COMMITTEE
SEVENTEENTH REGULAR SESSION

Online Meeting
11 –19 August 2021

STATUS OF OBSERVER DATA MANAGEMENT

WCPFC-SC17-2021/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 main data management responsibilities include the entry and management of observer data in a standardised database system but include a suite of additional activities described in detail 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 Seventeenth Regular Session of the Commission (5–11 December 2020; Anon., 2021) reconfirmed the Commission's support for ROP data processing with its inclusion in the indicative budget for the period 2021-2023.

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 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, the European Union, Japan, Korea, New Zealand, Philippines, Chinese Taipei and the USA.

4. The majority of 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 processing as the purse seine observer data. The SPC-OFP also processes non-ROP observer data that are 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 Electronic Monitoring (EM) initiatives undertaken by several Pacific Island countries in recent years. These data are aligned with 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 EM initiatives has been included in this paper (Table 8).

6. This paper serves to provide an update on the status of ROP data management at SPC-OFP, 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.

[1] 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.
- 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 Electronic Reporting (ER) 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. For example, OLLO was trialled in New Caledonia, Tonga and French Polynesia during the last twelve months.
- 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 EM systems and assistance on the use of online web-based Observer database-reporting module (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[2] observer data provided by several WCPFC member countries (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; EM data), China (2020), Japan (2020), New Zealand (2020), US (Hawaii/American Samoa 2020), Korea (2020) and Chinese Taipei (2020). All of the non-standard observer data have now been loaded, although some data quality issues require manual intervention and/or referral to the original source of the data and has proved to be time consuming. However, as noted in this paper last year, several countries providing non-standard observer data are using the WCPFC ER observer data field standards[3] to submit their observer data, which significantly reduces the time taken to load the observer data provided by these countries (up to five times faster).
- DORADO continues to be enhanced and used regularly by national observer providers, the WCPFC, FFA Secretariats and several other CCMs. This system continues to be used by Pacific Island countries in preparation of the WCPFC annual reports Part 1 and Part 2 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 the PNAO.
- The restrictions in the region during 2020 and 2021 due to the impacts of COVID-19 presented various challenges in observer data collection and data management throughout the region. The decline in purse seine observer data from April 2020 was noticeable and is described in tables and figures included in this paper. Regional and sub-regional meetings and workshops were usually a good opportunity for national observer programmes to submit their scanned workbooks to SPC saving time where bandwidth is limited in transmitting scanned data. Despite these new challenges, observer data submission and data entry were not delayed and were comparable with previous years.
  In 2019, SPC technical staff developed a module in Tufman2 to manage the data entry of the debriefing data. Some reports have been made available in the reporting tools DORADO but more consultation is required with the member countries to ensure they can access all the data.

[2] 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)
[3] https://www.wcpfc.int/doc/data-05/e-reporting_ssps

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 of July 8th 2021. Table 2 provides an indication of the available purse-seine observer data processed by fleet. Table 3 details the coverage of Regional Observer Programme (ROP) longline activity for 2019 as reported by the flag state and according to the metrics proposed at TCC10[4] and agreed on at WCPFC11[5]. Table 4 shows the coverage of ROP longline activity for 2020, as reported by the flag state. Tables 3 and 4 also provide an indication of the longline ROP data submitted to WCPFC/SPC by year and fleet, with the coverage of the data provided; this allows a comparison to the coverage as reported 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.

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 EM in recent years (although acknowledging the more recent impacts due to COVID-19), and an attempt to quantify these data has been made in Table 8.

11. As noted in previous versions of this report, the summaries of observer data provisions presented herein continue to be constrained by several 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; and
iii. Assignment of an ROP trip in the unprocessed data.

3.1 Purse seine

12. Provisions of purse seine observer data from 2012–2019 have been described in previous versions of this paper.

13. Observer data for an estimated 39% (794 trips out of 2,051 trips according to VMS data) of observer purse seine trips conducted during 2020 have been received at SPC at the time of writing this paper. The 2020 observer data received represents 88% of the trips with known observer placements (905 trips).

14. A total of 85% (767 trips) of the observer data received (794 trips) at SPC for 2020 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 2020 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 2020 (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 2020 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 2020 purse seine trips received at SPC, about 1% (9 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 2020 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).

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

16. Figure 1 highlights the continuation in the timely provision of 2020 purse seine observer data. 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 timelier 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 2020 observer data has meant that data for the most recent calendar year were available for the scientific work required for SC17.

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 state 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 some 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 (Fisheries Information Management System) observer-debriefing component into the regional observer database. We anticipate reporting summaries from the observer debriefing data in future versions of this report.

20. Figure 2 provides an indication of the spatial coverage of the purse seine observer data for 2020, 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 2020 in the tropical fishery is not as representative as previous years due to the impacts of COVID-19 but at least appears to cover the spatial extent of the fishery.

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 2019 and 2020, 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 15th 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.

23. Tables 5 and 6 provide a breakdown of all longline observer data (ROP and non-ROP) provided to the WCPFC Science Service Provider for Commission work, covering 2019 and 2020, respectively. These tables use the common longline effort metric (hooks) and indicate that overall coverage was 5.2% and 3.0% (respectively for 2019 and 2020) according to data provisions to date. Due to the impacts of COVID-19, it is unlikely that the longline observer coverage for 2020 will exceed the required 5% once all data are submitted.

24. Figures 3 and 4 provide an indication of the spatial coverage of all longline observer data (ROP and non-ROP) provided for 2019 and 2020, respectively. Spatial coverage of longline observer data has improved in recent years, but as noted, the impacts of COVID-19 in 2020 means that the spatial coverage will be less representative in 2020 than the previous few years (2017-2019).

3.3 Contribution of Pacific Island observer programmes

25. Table 7 provides a breakdown of observer data collected by each Pacific Island (PIC) observer programme for 2019 and 2020. For purse seine, the PIC observer data currently cover 96.2% of the tropical WCPFC fishery (based on total tuna catch estimates for the tropical fishery) for 2019, and 35.7% for 2020 (acknowledging that the overall coverage for the tropical purse seine fishery in 2020 is expected to be only 40–45%. For longline, the PIC observer data currently covers 1.66% and 1.30% of the fishery, respectively for 2019 and 2020, based on total WCPFC tuna catch estimates.

4. Summary and Future expectations

26. There are several observer data entry teams[6] 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 at SPC in Noumea, but also by other SPC-OFP staff who will continue to assist member countries using this system via the SLACK Helpdesk.

27. 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 than has been done historically.

28. Despite the decrease of observed trips in 2020 due to the restrictions from COVID-19, there are still pending 2020 trips that have yet to be provided to SPC. Observer placement data and information from national programmes suggest that there was an estimate of around 1,000 purse seine observer trips conducted in 2020; therefore, there are approximately 200 outstanding purse seine trips still need to be provided and processed into Tufman2.

29. Observer data from years prior to 2019/2020 continue to be submitted and there remains a significant backlog of observer data (as of July 8th 2021, data for around 1300 trips from the past 5 years that have yet to be entered). The original calculations for the rate of entry for purse seine and longline observer trips will need to be revisited, since there are now more data to process and check, and the estimates of the resourcing of this increased volume needs to be considered.

30. SPC-OFP will continue to be involved in observer ER and EM 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 ER projects involving observer data, as required.

31. 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;
- Provide ongoing support for the WCPFC/NORMA observer data entry (using the Tufman 2 web-based system);
- Provide ongoing support (technical and training) related to the web DORADO observer reporting tool;
- Continue responding to and supporting requests to disseminate ROP data according to the WCPFC data dissemination rules;
- Continue to work towards satisfying WCPFC requirements for ROP data reports mainly aligned to their requirements for CMM monitoring.

32. 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 regarding data flow and reporting tools for the benefit of SPC-OFP/FFA/PNA member countries.

[6] 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

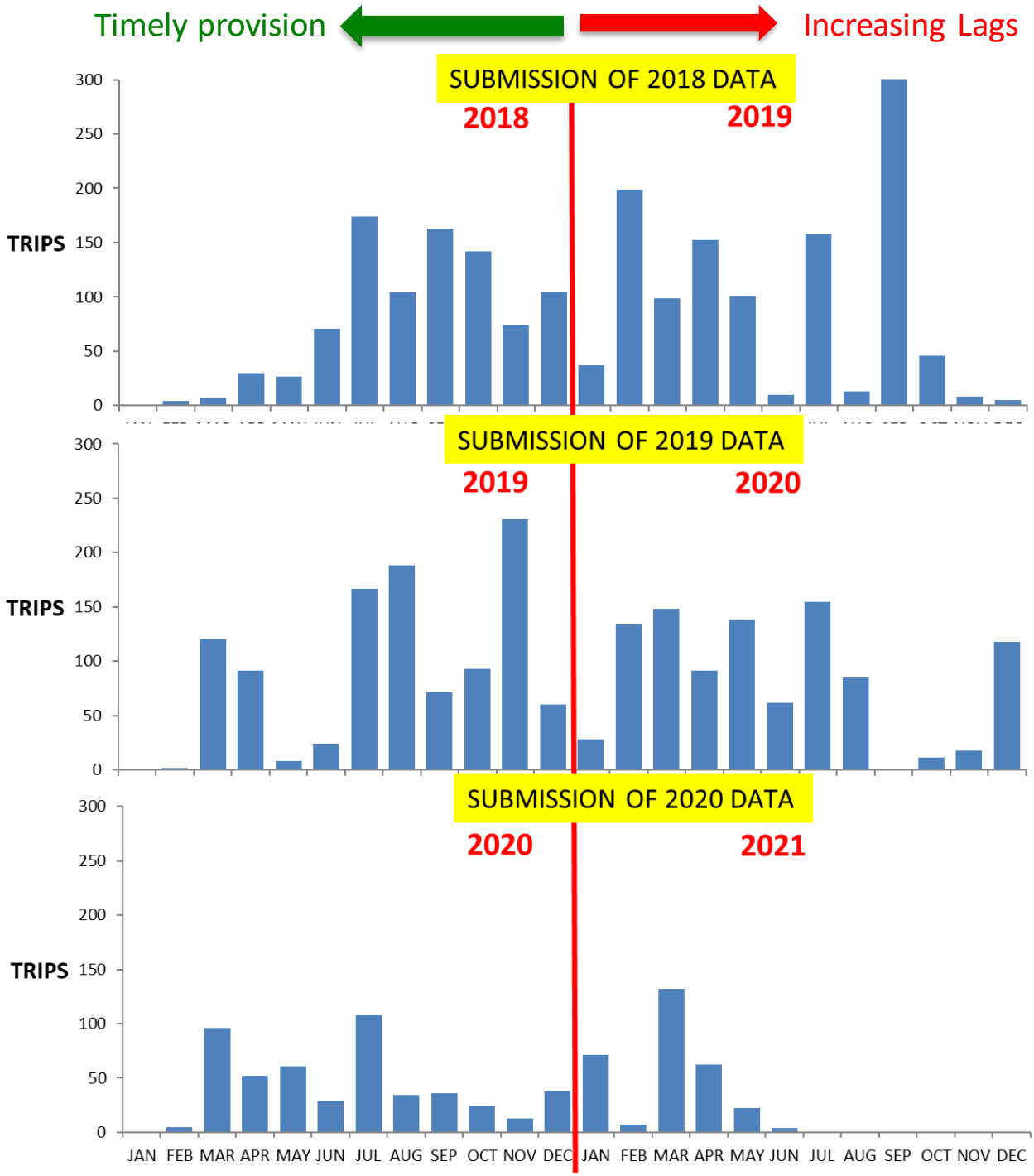

Figure 1. Monthly frequency of provision of 2018 (top), 2019 (middle) and 2020 (bottom) purse seine observer data. The x-axis represents the year/month when respective observer data were received. For example, the top graph represents when provisions of 2018 observer data were received at SPC throughout the months of 2018–2019. Provisions of data to the left of the red line indicate timely provisions, provisions to the right indicate increasing lags.

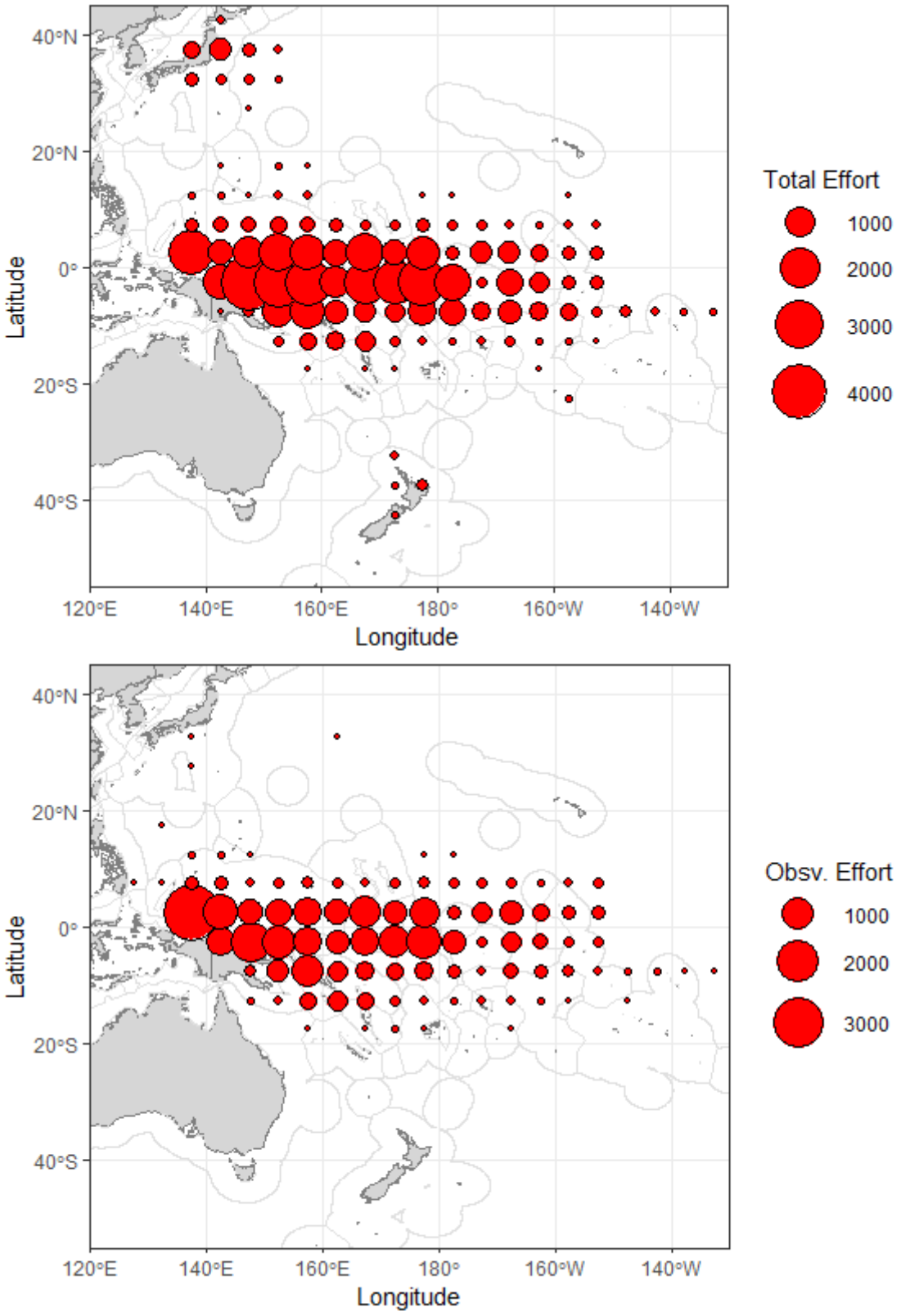

Figure 2. Distribution of purse seine effort (days; top) and observed effort (days; bottom) in the WCPFC Area for 2020. A day of effort includes fishing and searching. (These data exclude Indonesia, Philippines and Vietnam domestic fisheries)

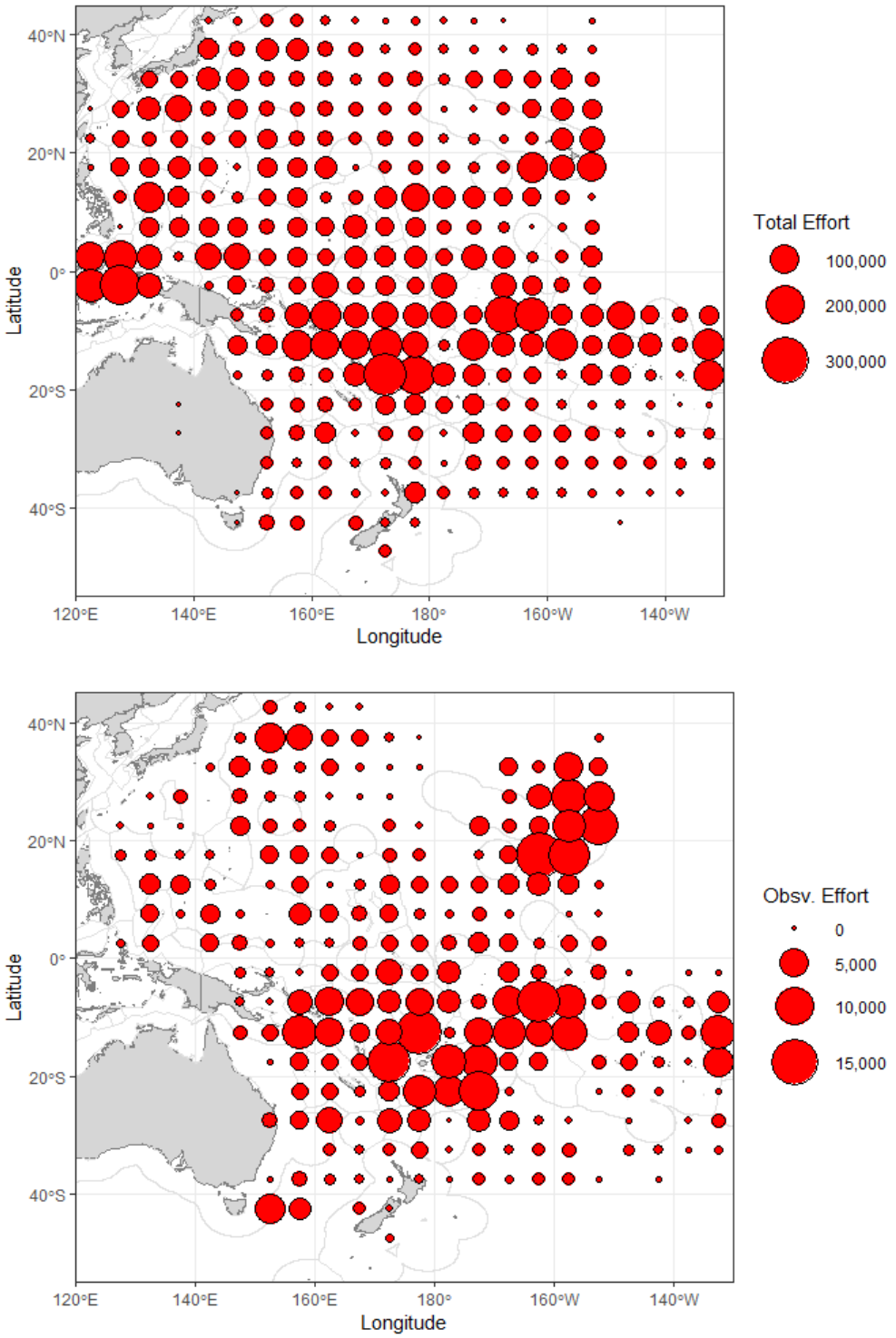

Figure 3. Distribution of longline effort (100 hooks; top) and observed effort (100 hooks; bottom) in the WCPFC Area for 2019.

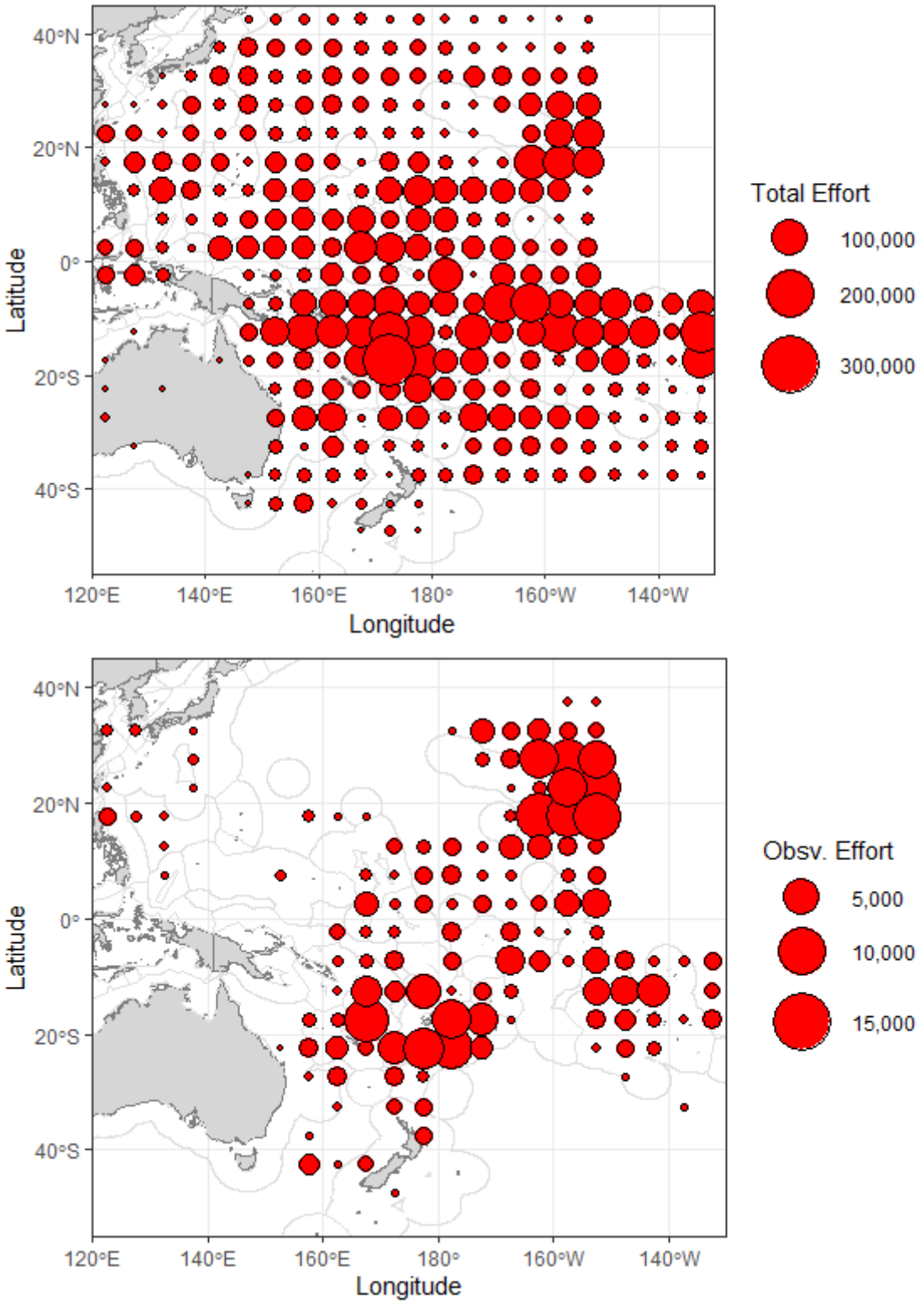

Figure 4. Distribution of longline effort (100 hooks; top) and observed effort (100 hooks; bottom) in the WCPFC Area for 2020. (2020 data are provisional)

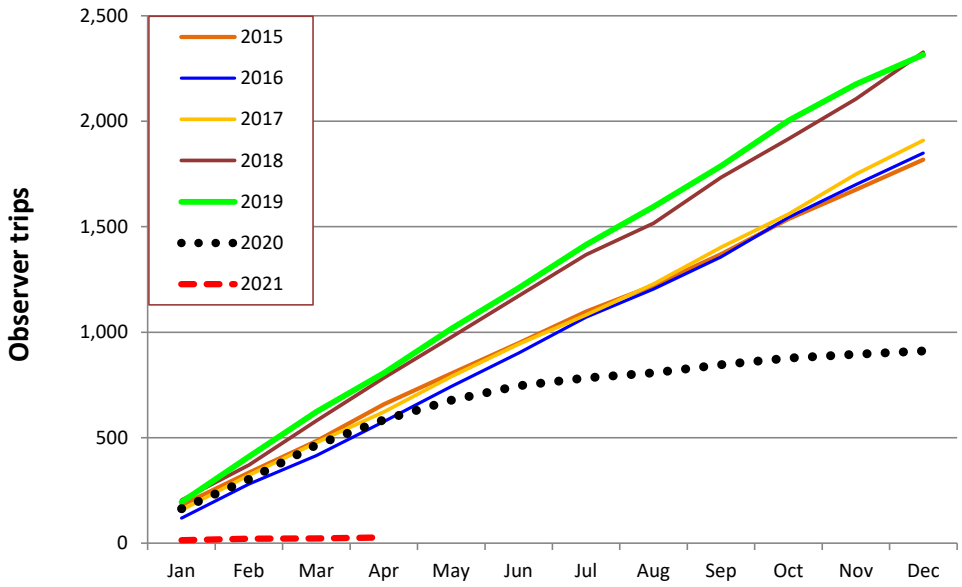

Figure 5. Cumulative monthly purse seine observer trips conducted in the WCPFC Area for 2015–2021 (based on data received and advice on observer placements; 2021 data are provisional).

TABLES

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

As at July 2021																
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
2016	2,213	364	1,849	84%	1,836	99%	1,612	73%	87%	90%	51	3%	3%	13	1%
2017	2,233	350	1,883	84%	1,812	96%	1,349	60%	72%	79%	100	5%	7%	71	4%
2018	2,353	46	2,307	98%	2,131	92%	1,770	75%	77%	85%	44	2%	2%	176	8%
2019	2,472	175	2,297	93%	2,131	93%	1,894	77%	82%	90%	26	1%	1%	166	7%
2020	2,051	1,146	905	44%	794	88%	767	37%	85%	98%	9	1%	1%	111	12%

NOTES

1. **CATGEORY 1** represents estimated trips determined from VMS data. These trips exclude the Philippines and Indonesian domestic fisheries and 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.
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 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.
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 are included in this table.

Table 2. Summary of purse seine observer data received at SPC, by year and flag.

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	39	27	12	12	100%	12	100%	100%
European Union	25	14	11	11	100%	11	100%	100%
FSM	146	2	144	136	94%	77	53%	57%
Japan	218	72	146	146	100%	100	68%	68%
Kiribati	215	41	174	149	86%	91	52%	61%
Korea	262	70	192	187	97%	165	86%	88%
Marshall Is.	85	2	83	80	96%	67	81%	84%
New Zealand	8	3	5	5	100%	5	0%	100%
PNG	515	0	515	494	96%	306	59%	62%
Philippines	93	0	93	93	100%	82	88%	88%
Solomon Islands	105	0	105	101	96%	80	76%	79%
El Salvador	14	9	5	5	100%	5	100%	100%
Tuvalu	7	1	6	5	83%	4	67%	80%
Chinese Taipei	244	69	175	171	98%	149	85%	87%
USA	229	23	206	206	100%	187	91%	91%
Vanuatu	10	2	8	8	100%	6	60%	75%
	2233	350	1,883	1,812	96%	1,349	72%	74%

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	21	3	18	16	89%	16	89%	100%
Ecuador	25	9	16	16	100%	12	75%	75%
European Union	15	5	10	10	100%	10	100%	100%
FSM	183	4	179	163	91%	139	78%	85%
Japan	228	-9	237	208	88%	187	79%	90%
Kiribati	232	0	232	211	91%	172	74%	82%
Korea	287	4	283	234	83%	188	66%	80%
Marshall Is.	99	3	96	93	97%	86	90%	92%
Nauru	9	1	8	7	88%	7	88%	100%
New Zealand	7	4	3	3	100%	3	100%	100%
PNG	502	0	502	497	99%	462	92%	93%
Philippines	75	0	75	75	100%	75	100%	100%
Solomon Islands	115	0	115	91	79%	82	71%	90%
El Salvador	11	9	2	2	100%	2	100%	100%
Tuvalu	14	0	14	14	100%	12	86%	86%
Chinese Taipei	284	0	284	258	91%	89	31%	34%
USA	230	12	218	218	100%	218	100%	100%
Vanuatu	16	1	15	15	100%	10	63%	67%
	2353	46	2,307	2,131	92%	1,770	77%	83%

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

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	2	2	0	0	0%	0	0%	0%
Ecuador	32	13	19	19	100%	18	95%	95%
European Union	9	0	9	9	100%	9	100%	100%
FSM	215	14	201	181	90%	151	75%	83%
Japan	223	17	206	160	78%	130	63%	81%
Kiribati	288	9	279	265	95%	241	86%	91%
Korea	313	0	313	286	91%	282	90%	99%
Marshall Is.	114	0	114	107	94%	89	78%	83%
Nauru	41	0	41	39	95%	31	76%	79%
New Zealand	7	7	0	0	0%	0	0%	0%
PNG	481	98	383	375	98%	291	76%	78%
Philippines	58	0	58	58	100%	58	100%	100%
Solomon Islands	127	0	127	111	87%	102	80%	92%
El Salvador	11	6	5	5	100%	5	100%	100%
Tuvalu	10	0	10	8	80%	3	30%	38%
Chinese Taipei	301	7	294	271	92%	253	86%	93%
USA	197	5	192	192	100%	192	100%	100%
Vanuatu	43	0	43	42	98%	36	84%	86%
	2472	178	2,294	2,128	93%	1,891	82%	89%

2020								
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	2		1	1	100%	1	100%	100%
China	1	1	0	0	0%	0	0%	0%
Ecuador	34	25	9	9	100%	9	100%	100%
European Union	10	8	2	2	100%	2	100%	100%
FSM	239	149	90	72	80%	67	74%	93%
Japan	196	154	42	40	95%	40	95%	100%
Kiribati	215	130	85	84	99%	77	91%	92%
Korea	175	68	107	96	90%	93	87%	97%
Marshall Is.	105	75	30	23	77%	21	70%	91%
Nauru	111	67	44	39	89%	37	84%	95%
New Zealand	8	8	0	0	0%	0	0%	0%
PNG	350	202	148	144	97%	144	97%	100%
Philippines	74	0	74	70	95%	69	93%	99%
Solomon Islands	79	11	68	61	90%	60	88%	98%
El Salvador	10	4	6	0	0%	0	0%	0%
Tuvalu	11	5	6	2	33%	1	17%	50%
Chinese Taipei	244	136	108	67	62%	63	58%	94%
USA	140	81	59	59	100%	59	100%	100%
Vanuatu	49	23	26	25	96%	24	92%	96%
	2051	1,147	904	793	88%	766	85%	97%

Table 2. Summary of Purse seine Observer data received at SPC, by year and flag (continued; the first quarter 2020).

2020 Q1								
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	1		1	1	100%	1	100%	100%
China	0	0	0	0	0%	0	0%	0%
Ecuador	8	3	5	5	100%	5	100%	100%
European Union	4	2	2	2	100%	2	100%	100%
FSM	48	0	48	39	81%	38	79%	97%
Japan	42	13	29	28	97%	28	97%	100%
Kiribati	53	1	52	52	100%	47	90%	90%
Korea	59	1	58	54	93%	52	90%	96%
Marshall Is.	26	0	26	20	77%	18	69%	90%
Nauru	25	0	25	25	100%	25	100%	100%
New Zealand	3	3	0	0	0%	0	0%	0%
PNG	86	36	50	49	98%	49	98%	100%
Philippines	29	0	29	28	97%	28	97%	100%
Solomon Islands	22	0	22	21	95%	20	91%	95%
El Salvador	3	1	2	0	0%	0	0%	0%
Tuvalu	2	0	2	1	50%	0	0%	0%
Chinese Taipei	61	0	61	40	66%	38	62%	95%
USA	38	0	38	38	100%	38	100%	100%
Vanuatu	10	0	10	10	100%	10	100%	100%
	519	60	459	412	90%	398	87%	97%

NOTES

1. **CATGEORY 1** represents estimated trips determined from VMS data. These trips exclude the Philippines and Indonesian domestic fisheries and 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 are included in this table.

Table 3. 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	3,305	5.8%	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	–	–	–	–	–	–	26, 27
FIJI	Pacific Islands	No. of Trips	899	144	16.0%	94	14	14.9%	7
FRENCH POLYNESIA	Pacific Islands	Days at Sea	–	–	–	–	–	–	2
INDONESIA	Domestic	No. of Trips	–	–	–	–	–	–	2, 19, 21
JAPAN	Ice/Fresh, short-trip	Days fished	24,945	1,473	5.9%	26,527	1,473	5.6%	10
	Frozen, long-trip	Days fished	7,394	888	12.0%	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	2,605	10.4%	10, 20, 23
SAMOA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
SOLOMON ISLANDS	Pacific Islands	No. of Trips	359	15	4.2%	300	20	6.7%	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	6,734	7.0%	10, 14
	Distant-water – DWLL	Days at Sea	20,252	3,031	15.0%	20,252	2,480	12.2%	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	11	8.5%	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 (small-scale longline fleet) 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 2020 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	52,254	2,968	5.7%	53,000	1,834	3.5%	3, 10, 11, 22
	Frozen								
COOK ISLANDS	Pacific Islands	Days at Sea	2,447	0	0.0%	2,447	0	0.0%	8, 9, 28
EUROPEAN UNION	Distant-water	No. of Trips	13	0	0.0%	13	0	0.0%	4, 10, 19, 28
FSM	Pacific Islands	No. of Trips	–	–	–	–	–	–	26, 27
FIJI	Pacific Islands	No. of Trips	546	126	23.1%	99	7	7.1%	7
FRENCH POLYNESIA	Pacific Islands	Days at Sea	–	–	–	–	–	–	2
INDONESIA	Domestic	No. of Trips	–	–	–	–	–	–	2, 19, 21
JAPAN	Ice/Fresh, short-trip	Days fished	25,440	51	0.2%	25,440	51	0.2%	10, 18, 28
	Frozen, long-trip	Days fished	5,775	232	4.0%	5,775	232	4.0%	10, 18, 28
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	32,590	1,249	3.8%	27,392	1,081	3.9%	10, 20, 23
SAMOA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
SOLOMON ISLANDS	Pacific Islands	No. of Trips	–	–	–	–	–	–	2, 7, 9
TONGA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
TUVALU	Pacific Islands	No. of Trips	–	–	–	–	–	–	2,
CHINESE TAIPEI	Small longline – STLL	Days at Sea	84,179	7,333	8.7%	84,179	0	0.0%	10, 14
	Distant-water – DWLL	Days at Sea	18,418	2,092	11.4%	18,418	809	4.4%	10
USA	HAWAII/California-based	No. of Trips	1,182	193	16.3%	739	187	25.3%	6
	AMERICAN SAMOA	No. of Trips	–	–	–	–	–	–	2, 6
VANUATU	Pacific Islands and DW	No. of Trips	166	0	0.0%	166	0	0.0%	7, 28

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 2020.
16. No longline vessels from Philippines active in 2020.
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 2020 observer activities including trip monitoring information. Some data submitted recently have yet to be loaded and may not be included in the total effort for submitted data.
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. 2020 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 of data submitted in this table.
23. Effort metric for Korean longline fleet in 2020 is DAYS AT SEA. Coverage of data submitted represents only activity in the WCPFC Area.
24. No activity in 2020 by this CCM's longline fleet.
25. Represents the chartered vessels in this fleet; no vessels were flagged to RMI in 2020.
26. Excludes trips/activities from chartered vessels and also non-fishing trips.
27. The information provided for these fleets EXCLUDES activities of either domestically-based (in home EEZ) or locally-based components of this fleet; that is, vessels from this fleet that fish exclusively in one Pacific Island EEZ and adjacent high seas only are not included (i.e. considered non-ROP trips); the coverage represents the component that conduct ROP-defined trips only.
28. A number of countries advised that there was no ROP longline coverage in 2020 due to the COVID-19 situation.

Table 5. Coverage of Longline Observer data in the WCFPC Area, for 2019 (all observer data available to the WCPFC Science Service Provider; includes both ROP and non-ROP data.

	Hooks		
CCM Fleet	**Total Effort**	**Observer**	
AUSTRALIA	8,505,890	0	
CHINA	161,767,526	5,878,285	
COOK ISLANDS	11,038,797	990,804	
EUROPEAN UNION	885,877	*47,748*	
FIJI	59,036,952	7,239,647	
FRENCH POLYNESIA	17,948,110	753,287	
FSM	39,055,361	1,085,831	
INDONESIA	69,142,624	0	
JAPAN	114,945,875	5,097,878	
KIRIBATI	10,006,783	613,332	
MARSHALL ISLANDS	9,589,365	383,006	
NEW CALEDONIA	5,800,855	470,263	
NEW ZEALAND	10,076,486	163,590	
PALAU	9,213,967	0	
PAPUA NEW GUINEA	5,426,295	2,940	
REPUBLIC OF KOREA	60,080,836	2,236,933	
SAMOA	12,752,371	333,708	
SOLOMON ISLANDS	37,188,994	2,098,690	
TONGA	1,216,619	47,286	
TUVALU	817,466	22,036	
CHINESE TAIPEI	192,342,326	9,137,038	
USA	72,606,809	11,127,512	
VANUATU	31,012,439	854,642	
Total	**940,458,623**	**48,584,456**	**5.2%**

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 WCFPC Area, for 2020 (all observer data available to the WCPFC Science Service Provider; includes both ROP and non-ROP data).

	Hooks		
CCM Fleet	Total Effort	Observer	
AUSTRALIA	8,130,185	0	
CHINA	156,763,980	5,252,724	
COOK ISLANDS	9,255,695	0	
EUROPEAN UNION	952,989	*0*	
FIJI	46,941,519	4,129,801	
FRENCH POLYNESIA	18,341,479	1,002,040	
FSM	28,390,701	791,116	
INDONESIA	8,918,471	0	
JAPAN	31,257,262	459,213	
KIRIBATI	18,755,428	442,279	
MARSHALL ISLANDS	7,956,465	101,600	
NEW CALEDONIA	6,353,475	431,435	
NEW ZEALAND	1,949,002	193,329	
PALAU	5,700	0	
PAPUA NEW GUINEA	594,186	0	
REPUBLIC OF KOREA	56,368,161	1,279,170	
SAMOA	11,303,482	35,296	
SOLOMON ISLANDS	20,483,504	0	
TONGA	781,827	87,639	
TUVALU	538,600	0	
CHINESE TAIPEI	170,768,578	902,272	
USA	64,640,744	5,242,765	
VANUATU	19,252,147	0	
Total	**688,703,580**	**20,350,679**	**3.0%**

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 2019 (top) and 2020 (bottom).

2019				
Observer Provider/Programme	PURSE SEINE		LONGLINE	
	Trips	Cov% [1]	Trips	Cov% [2]
COOK ISLANDS	12	0.8%	14	0.21%
FEDERATED STATES OF MICRONESIA	45	1.6%	2	0.01%
FIJI	0	0.0%	144	0.52%
FRENCH POLYNESIA	0	0.0%	45	0.09%
KIRIBATI	497	22.9%	5	0.01%
MARSHALL ISLANDS	29	1.2%	33	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	435	15.9%	2	0.07%
PHILIPPINES	58	1.2%	0	0.00%
PNA Observer Programme	703	29.6%	0	0.00%
Samoa	0	0.0%	2	0.00%
SOLOMON ISLANDS	107	2.6%	19	0.19%
TONGA, KINGDOM OF	0	0.0%	27	0.27%
TUVALU	221	11.9%	0	0.00%
US MLT Observer Programme	191	9.8%	0	0.00%
VANUATU	0	0.0%	10	0.15%
Total	2298	96.2%	331	1.66%

2020				
Observer Provider/Programme	PURSE SEINE		LONGLINE	
	Trips	Cov% [1]	Trips	Cov% [2]
COOK ISLANDS	3	0.2%	1	0.00%
FEDERATED STATES OF MICRONESIA	11	0.4%	0	0.00%
FIJI	0	0.0%	133	0.56%
FRENCH POLYNESIA	0	0.0%	48	0.09%
KIRIBATI	158	7.3%	0	0.00%
MARSHALL ISLANDS	1	0.0%	12	0.02%
NAURU	0	0.0%	0	0.00%
NEW CALEDONIA	0	0.0%	27	0.07%
PALAU	0	0.0%	0	0.00%
PAPUA NEW GUINEA	182	6.3%	0	0.00%
PHILIPPINES	46	2.0%	0	0.00%
PNA Observer Programme	277	10.7%	0	0.00%
SAMOA	0	0.0%	2	0.00%
SOLOMON ISLANDS	115	4.3%	0	0.00%
TONGA, KINGDOM OF	0	0.0%	31	0.16%
TUVALU	53	3.2%	0	0.00%
US MLT Observer Programme	59	3.3%	0	0.00%
VANUATU	0	0.0%	56	0.40%
Total	905	35.8%	310	1.30%

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, 2015–2020.

	E-MONITORING DATA (Sets reviewed)					
EM Programme	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
AUSTRALIA	*56*	*420*	*528*	*489*	*525*	*418*
FIJI	222	621	2,170	1510	405	-
FSM	-	311	283	21	104	54
MARSHALL ISLANDS	-	-	944	523	310	-
PALAU	-	102	153	56	-	-
SOLOMON ISLANDS	-	-	74	25	-	-

NOTES

1. According to data submitted to SPC.
2. 2020 values are provisional.