TECHNICAL AND COMPLIANCE COMMITTEE
Nineteenth Regular Session
20 – 26 September 2023
Pohnpei, Federated States of Micronesia

STATUS OF OBSERVER DATA MANAGEMENT

WCPFC-TCC19-2023-IP02[1]
26 July 2023

SPC-OFP

[1] This paper was posted to SC19 as SC19-2023-ST-IP02

SCIENTIFIC COMMITTEE
NINETEENTH REGULAR SESSION

Koror, Palau
16 –24 August 2023

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WCPFC-SC19-2023/ST-IP-02

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Oceanic Fisheries Programme (OFP)
Pacific Community (SPC)

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 Nineteenth Regular Session of the Commission (27 November–4 December 2022; Anon., 2023) reconfirmed the Commission's support for ROP data processing with its inclusion in the indicative budget for the period 2023-2025.

3. 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. OLLO was used at sea in New Caledonia, Tonga, Fiji, Cook Islands and French Polynesia during the last twelve months.
   - Due to the stability and robustness achieved by the E-reporting tool OLLO, the SPC technical staff has commenced the development of an electronic debriefing module within Tufman2 for the purpose of handling the data collected through OLLO. Presently, the debriefing process necessitates the utilization of paper-based forms.
   - 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 ("Tufman Reports") reports, which summarise EM data and provide comparisons of EM data to other types of data (logbook, onboard observer and port sampling data).
   - In 2022, several SPC data experts have started to put together the JSON formatted DCC Longline EM Minimum Data Fields Standard. With a clearly explained format plus additional data fields which ensure a better understanding of the context of the EM records' analysis as well as improving the Data Quality Control processes. The first draft has been part of the discussion in the DCC 12(December 2022) and have been reviewed by Fiji. The intent is EM Json Standard will allow EM data to be transmitted efficiently between database systems. SPC OFP developers have also created an EM module in Tufman2 so that the EM countries will be able to view their data. This module will also include a data submission portal via Application Programme Interface (API).
   - Several countries (TW, HW, KR, JP) now use the WCPFC ER observer data field standards to prepare and submit their observer data, which significantly reduces the time taken to load the observer data provided by these countries (up to five times faster). However, SPC refers to observer data that are not entered using the Tufman 2 system and do not align to the WCPFC ER observer data field standards as "non-standard" observer data, which requires the development of specific data loaders with the subsequent loading process being complicated (requiring manual intervention) and time consuming. There remains some CCMs (for example CN, EU and NZ) that continue to submit their observer data in "non-standard" format and SPC will continue to liaise with these CCMs to explore options for enhancing the formats for their data submissions. As at the time of writing this paper, all the recent observer data submissions have now been loaded, noting that some data quality issues required manual intervention and/or referral to the original source of the data and has proved to be time consuming.
   - "Tufman Reports" (SPC-developed reporting tools) 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 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, 2021 and 2022 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 "Tufman Reports" but more consultation is required with the member countries to ensure they can access all the data.

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 June 2nd 2023. 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 2022 as reported by the flag state and according to the metrics proposed at TCC10[2] and agreed on at WCPFC-11[3]. Table 4 shows the coverage of ROP longline activity for 2022, 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 (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 2012–2020 have been described in previous versions of this paper.

13. Observer data for an estimated 12% (265 trips out of 2149 trips according to VMS data) of observer purse seine trips conducted during 2022 have been received at SPC at the time of writing this paper. The 2022 observer data received represents 87% of the trips with known observer placements (306 trips).

14. A total of 82% (216 trips) of the observer data received at SPC for 2022 observer activities have now been entered. SPC employs a strategy of processing the most recent observer data (in this case 2022 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 2022 (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 2022 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 2022 purse seine trips received at SPC, none of the trips had problems awaiting to be resolved, which is, so far, a significant improvement on previous years.

15. The breakdown of processed purse-seine observer data by fleet (Table 2) shows that the coverage of 2022 observer data submitted to SPC is generally high, with respect to observer data with known placements, but acknowledging the overall purse seine observer coverage for 2022 is only ~15-20% due to the impacts of COVID-19.

[2] See the TCC10 paper at http://www.wcpfc.int/node/19567
[3] 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 data entry work done by the SPC team and the data entry staff in the region. This graph represents the number of purse seine trips entered during each month years 2021 and 2022 and the colours represent a breakdown of when the processed trips were conducted. The graph highlights (1) the priority given to the more recent trips and (2) the data entry work done to catch up with the backlog of the previous years. The timely data entry of 2022 and 2021 observer data has meant that data for the most recent calendar year were available for the scientific work required for SC19.

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. However, trips conducted in 2022 and received by SPC so far showed no problems.

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 2022, 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 2022 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 2021 and 2022, 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 2021 and 2022, respectively. These tables use the common longline effort metric (hooks) and indicate that overall coverage was 4.2% and 4.4% (respectively for 2021 and 2022) according to data provisions to date. Due to the impacts of COVID-19, it is unlikely that the longline observer coverage for 2021 and 2022 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 2021 and 2022, respectively. Spatial coverage of longline observer data has improved in recent years, but as noted, the impacts of COVID-19 in 2021 and 2022 means that the spatial coverage will be less representative in 2021 and 2022 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 2021 and 2022. For purse seine, the PIC observer data currently cover 8.7% of the tropical WCPFC fishery (based on total tuna catch estimates for the tropical fishery) for 2021, and 9.9% for 2022 (acknowledging that the overall coverage for the tropical purse seine fishery in 2021 and 2022 is expected to be only 15%-20%). For longline, the PIC observer data currently covers 3.68% and 4.31% of the fishery, respectively for 2021 and 2022, based on total WCPFC tuna catch estimates.

4. 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.

Anonymous. 2010b. Annual Report to the Commission – Regional Observer Programme. Meeting Document WCPFC7-2010/26. Seventh Regular Session of the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPFC7). 7–11 December 2010, Honolulu, Hawaii, USA. Western and Central Pacific Fisheries Commission, Pohnpei, Federated States of Micronesia.

Anonymous. 2023. Report of the Nineteenth Regular Session of the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean. 27 November–4 December 2022, Da Nang, Vietnam. Western and Central Pacific Fisheries Commission, Pohnpei, Federated States of Micronesia.

Williams, P.G. 2011. Status of Observer data management. Information Paper SC7 ST IP–6. Seventh Regular Session of the WCPFC Scientific Committee (SC7), 9–17 August 2011, Pohnpei, FSM. Oceanic Fisheries Programme, Secretariat of the Pacific Community, Noumea, New Caledonia.

Williams, P.G, I. Tuiloma & A. Panizza. 2017. Status of ROP Data Management. SC13 ST-IP-02. Thirteenth Regular Session of the Scientific Committee of the WCPFC (SC13). Rarotonga, Cook Islands. 7–19 August 2017.

Williams, P.G. 2023. Scientific Data to be provided to the Commission. SC19 ST-WP-01. Nineteenth Regular Session of the Scientific Committee of the WCPFC (SC19). Koror, Palau 16–24 August 2023.

FIGURES

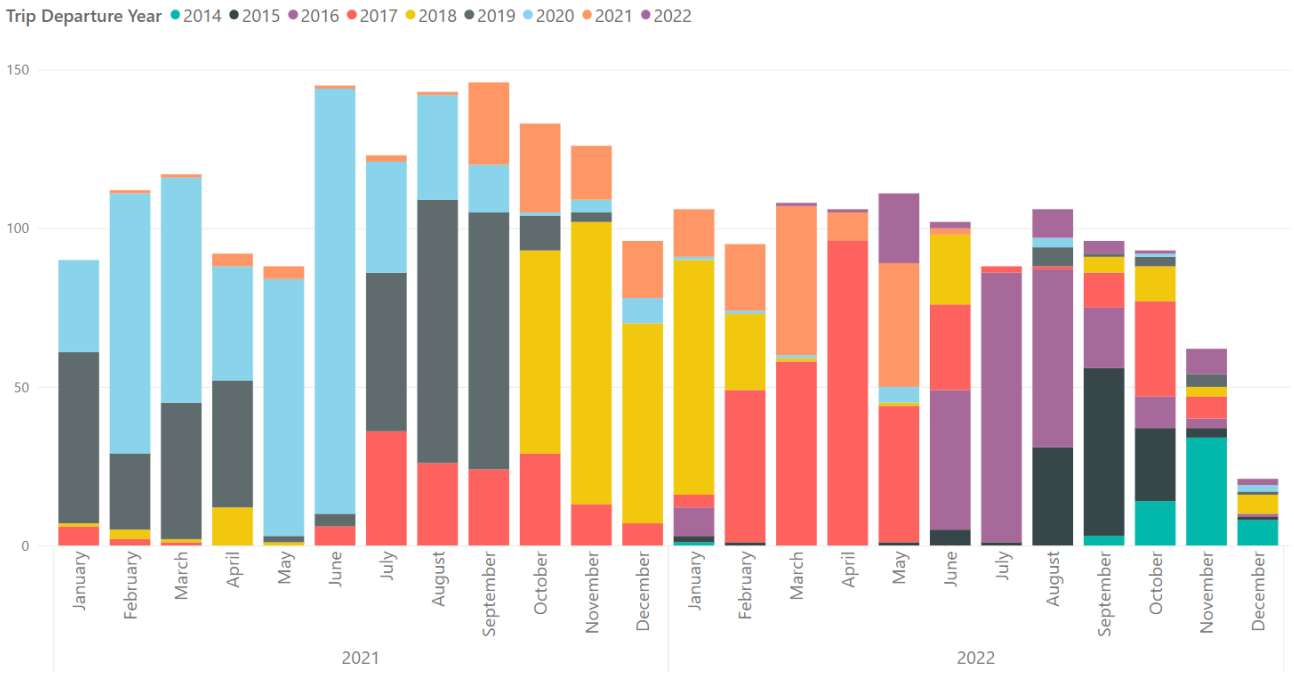


Figure 1. Monthly data entry of purse seine observer data over the past two years. The x-axis represents the year/month when respective observer data were entered into SPC system. The colours represent the departure year for the trips. For example, from January 2021 to September 2021, most of the data entry was from trips conducted in 2019 and 2020.

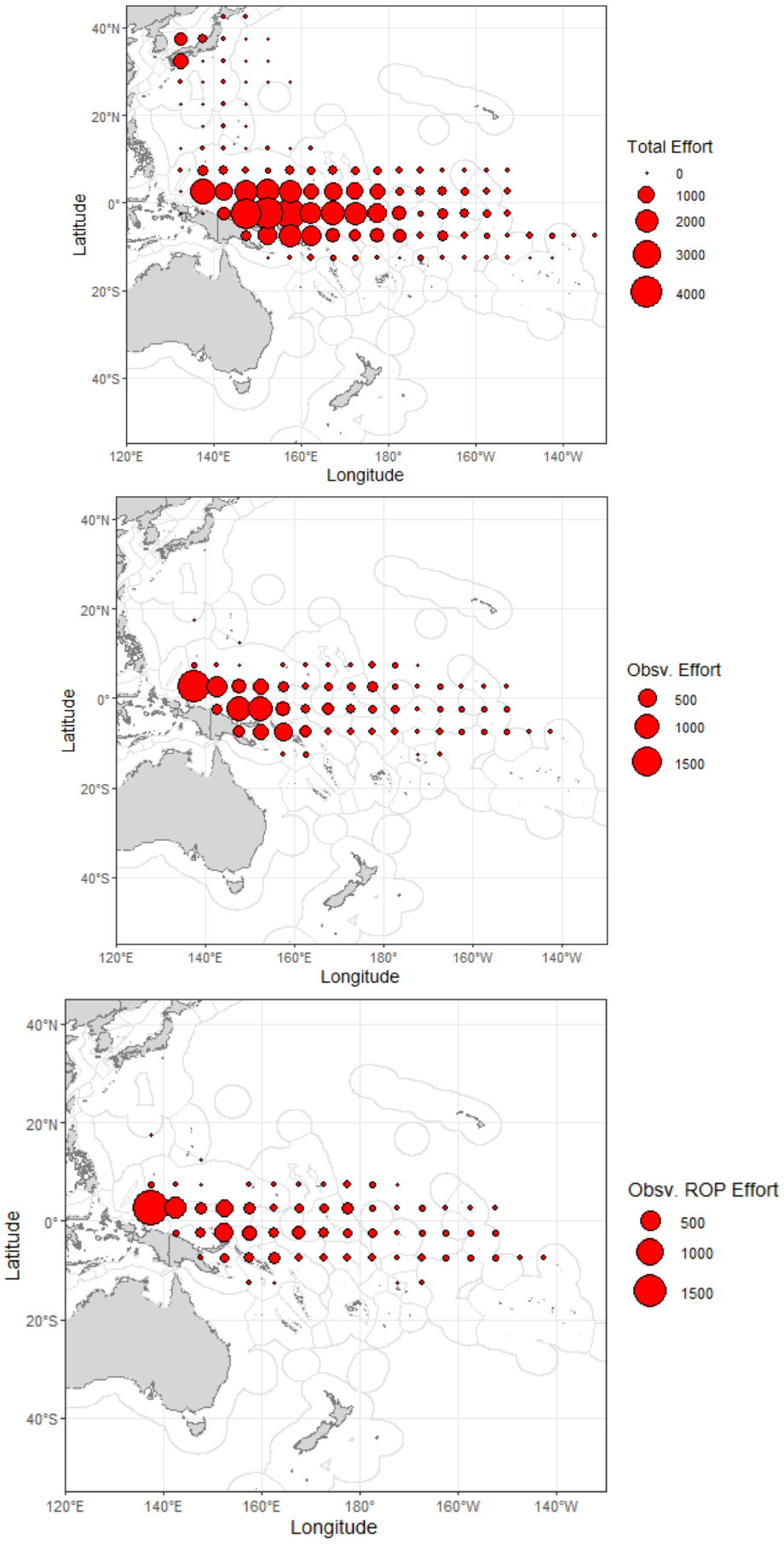


Figure 2. Distribution of purse seine effort (days; top), observed effort (days; middle) and observer ROP effort (days; bottom) in the WCPFC Area for 2022. A day of effort includes fishing and searching. (These data exclude Indonesia, Philippines and Vietnam domestic fisheries)

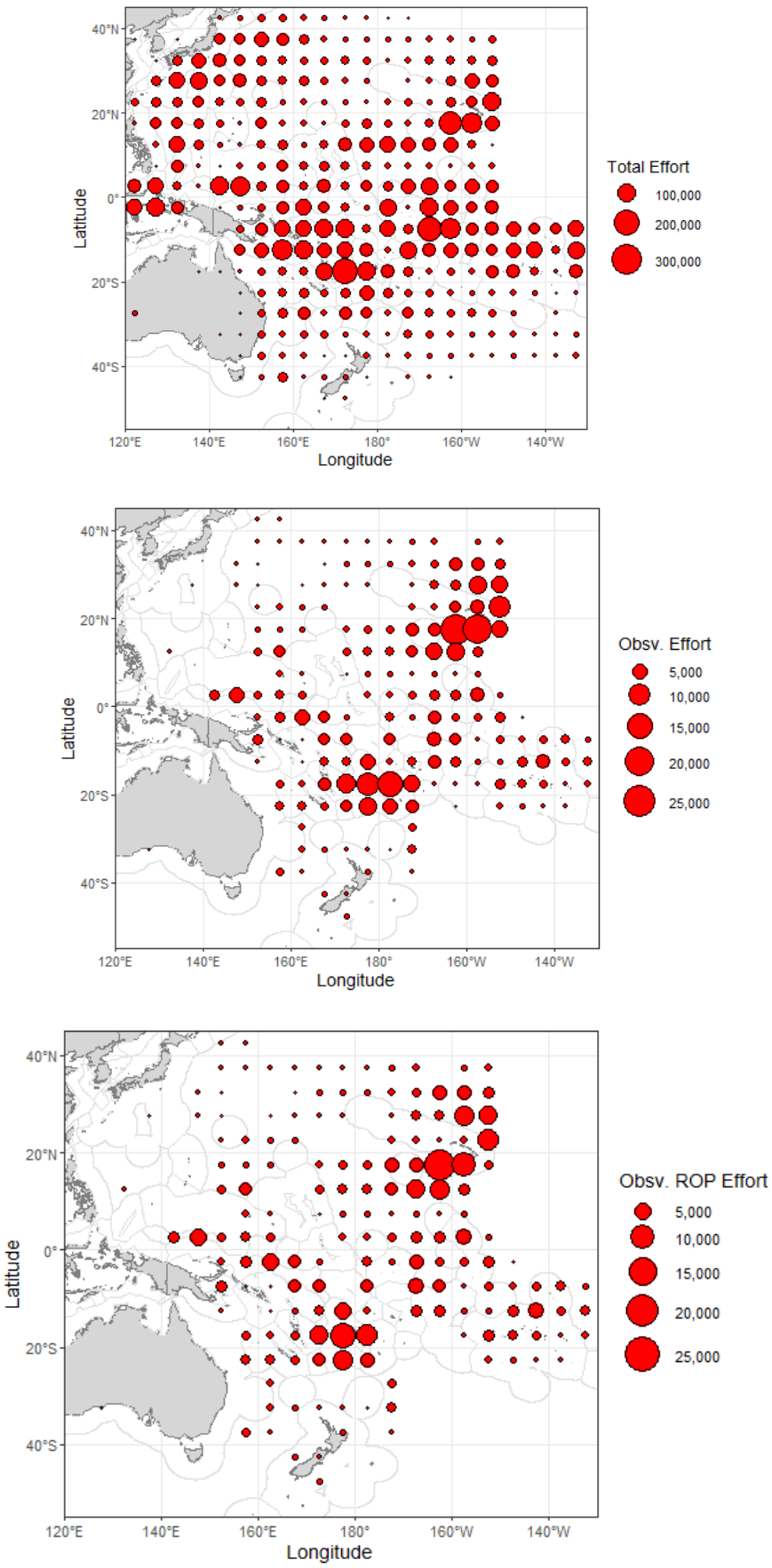


Figure 3. Distribution of longline effort (100 hooks; top), observer effort (100 hooks; middle) and observed ROP effort (100 hooks; bottom) in the WCPFC Area for 2022.

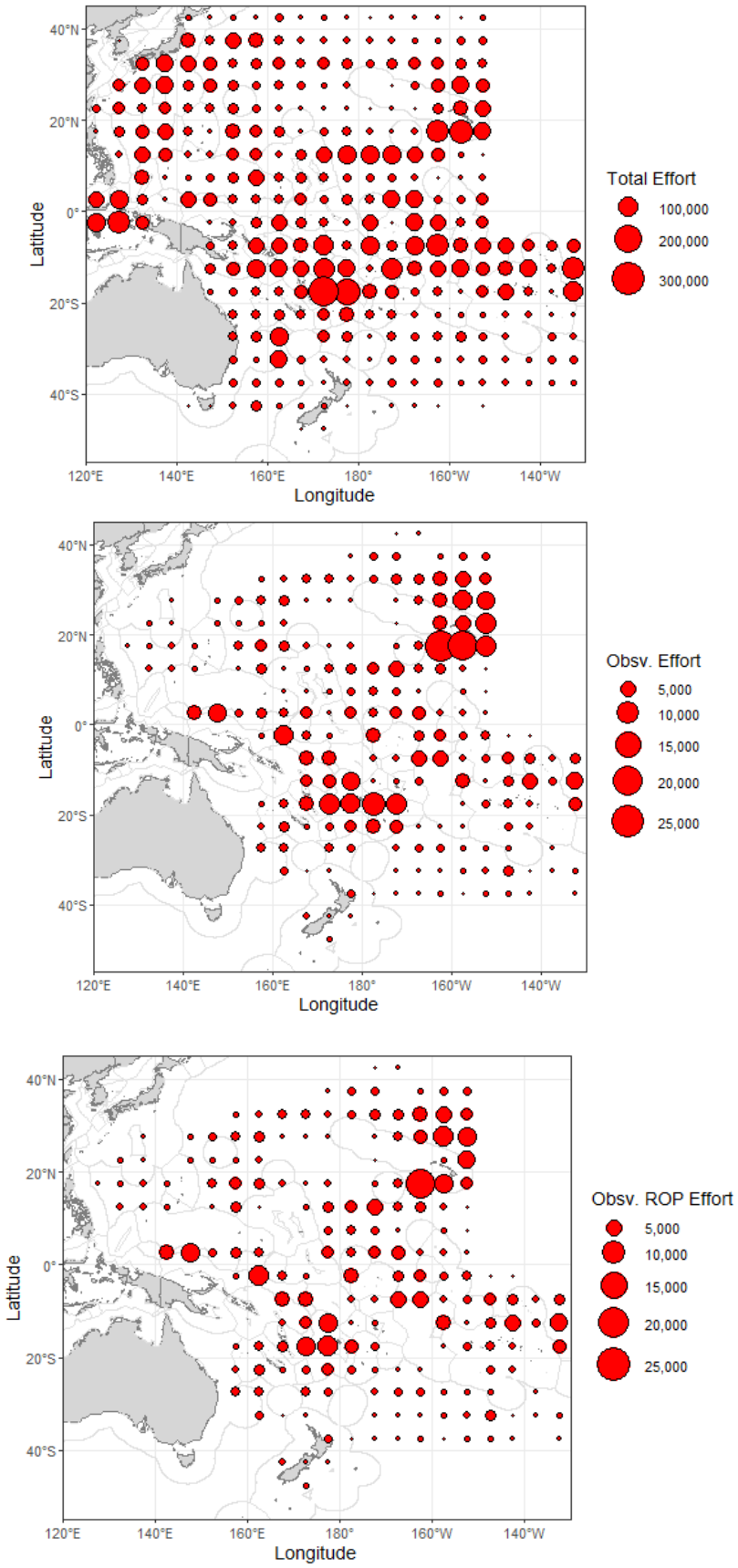


Figure 4. Distribution of longline effort (100 hooks; top), observer effort (100 hooks; middle) and observed ROP effort (100 hooks; bottom) in the WCPFC Area for 2021.

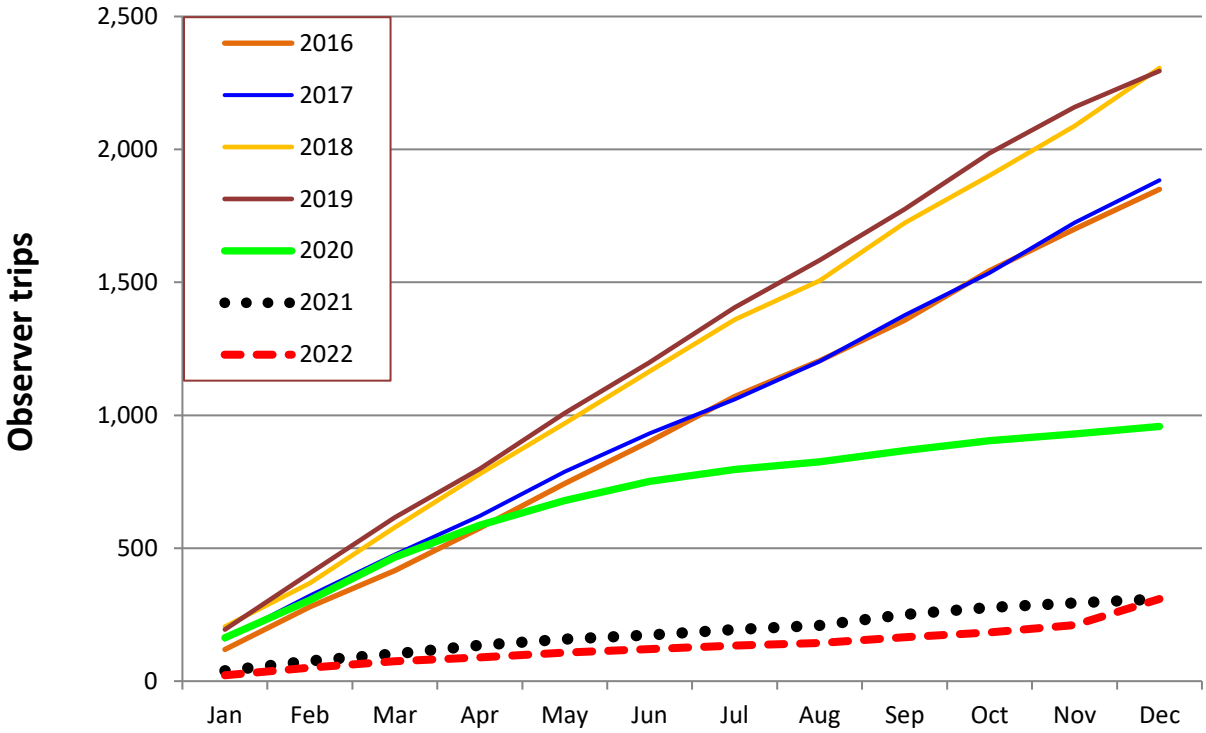


Figure 5. Cumulative monthly purse seine observer trips conducted in the WCPFC Area for 2016–2022 (based on data received and advice on observer placements).

TABLES

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

As at June 2023																	
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.		8. TRIP data provided to WCPFC	
			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	Trips	% of data processed
2018	2,358	52	2,306	98%	2,133	92%	2,119	90%	99%	100%	10	0%	0%	173	8%	1746	82%
2019	2,473	178	2,295	93%	2,135	93%	2,128	86%	100%	100%	6	0%	0%	160	7%	1770	83%
2020	2,077	1,119	958	46%	859	90%	853	41%	99%	100%	3	0%	0%	99	10%	610	72%
2021	2,066	1,757	309	15%	309	100%	294	14%	95%	95%	0	0%	0%	0	0%	105	36%
2022	2,149	1,840	309	14%	265	86%	216	10%	82%	82%	0	0%	0%	44	14%	107	50%

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**). 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 2022/2021 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.

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			6. TRIP data provided to WCPFC	
				Trips	%	Trips	% of total available trips	% of total trips recvd	Trips	% of data processed
China	22	4	18	16	89%	16	89%	100%	16	100%
Ecuador	25	9	16	16	100%	16	100%	100%	16	100%
European Union	15	5	10	10	100%	10	100%	100%	10	100%
FSM	182	3	179	163	91%	160	89%	98%	145	91%
Japan	235	0	235	208	89%	208	89%	100%	208	100%
Kiribati	232	0	232	212	91%	211	91%	100%	191	91%
Korea	286	3	283	234	83%	231	82%	99%	223	97%
Marshall Is.	99	3	96	93	97%	92	96%	99%	92	100%
Nauru	9	1	8	7	88%	7	88%	100%	7	100%
New Zealand	7	4	3	3	100%	3	100%	100%	3	100%
PNG	503	0	503	498	99%	498	99%	100%	240	48%
Philippines	75	0	75	75	100%	75	100%	100%	68	91%
Solomon Islands	115	0	115	91	79%	88	77%	97%	28	32%
El Salvador	11	9	2	2	100%	2	100%	100%	2	100%
Tuvalu	14	0	14	14	100%	13	93%	93%	13	100%
Chinese Taipei	284	0	284	258	91%	256	90%	99%	252	98%
USA	228	10	218	218	100%	218	100%	100%	218	100%
Vanuatu	16	1	15	15	100%	15	100%	100%	14	93%
	2358	52	2,306	2,133	92%	2,119	92%	99%	1746	82%

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			6. TRIP data provided to WCPFC	
				Trips	%	Trips	% of total available trips	% of total trips recvd	Trips	% of data processed
Cook Islands	3		3	3	100%	3	100%	100%	3	100%
China	2	2	0	0	0%	0	0%	0%	0	0%
Ecuador	32	13	19	19	100%	18	95%	95%	18	100%
European Union	9	0	9	9	100%	9	100%	100%	9	100%
FSM	215	14	201	181	90%	178	89%	98%	174	98%
Japan	223	21	202	160	79%	160	79%	100%	160	100%
Kiribati	287	8	279	265	95%	265	95%	100%	206	78%
Korea	313	0	313	286	91%	286	91%	100%	255	89%
Marshall Is.	114	0	114	107	94%	107	94%	100%	104	97%
Nauru	41	0	41	39	95%	39	95%	100%	38	97%
New Zealand	7	7	0	0	0%	0	0%	0%	0	0%
PNG	480	94	386	378	98%	376	97%	99%	199	53%
Philippines	58	0	58	58	100%	58	100%	100%	58	100%
Solomon Islands	127	0	127	111	87%	111	87%	100%	39	35%
El Salvador	11	6	5	5	100%	5	100%	100%	5	100%
Tuvalu	10	0	10	9	90%	8	80%	89%	8	100%
Chinese Taipei	301	8	293	271	92%	271	92%	100%	261	96%
USA	197	5	192	192	100%	192	100%	100%	192	100%
Vanuatu	43	0	43	42	98%	42	98%	100%	41	98%
	2473	178	2,295	2,135	93%	2,128	93%	100%	1770	83%

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

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			6. TRIP data provided to WCPFC	
				Trips	%	Trips	% of total available trips	% of total trips recvd	Trips	% of data processed
Cook Islands	1	0	1	1	100%	1	100%	100%	1	100%
China	0	0	0	0	0%	0	0%	0%	0	0%
Ecuador	9	4	5	5	100%	5	100%	100%	5	100%
European Union	4	2	2	2	100%	2	100%	100%	2	100%
FSM	48	0	48	40	83%	40	83%	100%	38	95%
Japan	44	15	29	28	97%	28	97%	100%	28	100%
Kiribati	54	2	52	52	100%	50	96%	96%	47	94%
Korea	59	1	58	54	93%	54	93%	100%	51	94%
Marshall Is.	26	0	26	20	77%	20	77%	100%	20	100%
Nauru	25	0	25	25	100%	25	100%	100%	25	100%
New Zealand	3	3	0	0	0%	0	0%	0%	0	0%
PNG	95	34	61	60	98%	60	98%	100%	15	25%
Philippines	23	0	23	23	100%	23	100%	100%	20	87%
Solomon Islands	23	1	22	22	100%	20	91%	91%	5	25%
El Salvador	3	1	2	0	0%	0	0%	0%	0	0%
Tuvalu	2	0	2	2	100%	1	50%	50%	1	100%
Chinese Taipei	62	0	62	41	66%	41	66%	100%	40	98%
USA	38	0	38	38	100%	38	100%	100%	38	100%
Vanuatu	10	0	10	10	100%	10	100%	100%	10	100%
	529	63	466	423	91%	418	90%	99%	346	83%

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			6. TRIP data provided to WCPFC	
				Trips	%	Trips	% of total available trips	% of total trips recvd	Trips	% of data processed
Cook Islands	2	1	1	1	100%	1	100%	100%	1	100%
China	1	1	0	0	0%	0	0%	0%	0	0%
Ecuador	33	24	9	9	100%	9	100%	100%	9	100%
European Union	10	8	2	2	100%	2	100%	100%	2	100%
FSM	238	148	90	76	84%	76	84%	100%	72	95%
Japan	200	157	43	41	95%	41	95%	100%	41	100%
Kiribati	215	130	85	84	99%	82	96%	98%	77	94%
Korea	175	68	107	96	90%	96	90%	100%	93	97%
Marshall Is.	106	76	30	23	77%	23	77%	100%	23	100%
Nauru	111	67	44	39	89%	39	89%	100%	39	100%
New Zealand	8	8	0	0	0%	0	0%	0%	0	0%
PNG	391	173	218	211	97%	211	97%	100%	43	20%
Philippines	55	0	55	55	100%	55	100%	100%	49	89%
Solomon Islands	81	13	68	64	94%	61	90%	95%	7	11%
El Salvador	10	4	6	0	0%	0	0%	0%	0	0%
Tuvalu	11	5	6	6	100%	5	83%	83%	5	100%
Chinese Taipei	244	135	109	68	62%	68	62%	100%	65	96%
USA	139	80	59	59	100%	59	100%	100%	59	100%
Vanuatu	47	21	26	25	96%	25	96%	100%	25	100%
	2077	1,119	958	859	90%	853	89%	99%	610	72%

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

2021										
FLEET	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements	4. TRIP data submitted		5. TRIP data processed			6. TRIP data provided to WCPFC	
				Trips	%	Trips	% of total available trips	% of total trips recvd	Trips	% of data processed
Cook Islands	3	3	0	0	0%	0	0%	0%	0	0%
China	1	1	0	0	0%	0	0%	0%	0	0%
Ecuador	26	26	0	0	0%	0	0%	0%	0	0%
European Union	16	14	2	2	100%	2	100%	100%	2	100%
FSM	227	227	0	0	0%	0	0%	0%	0	0%
Japan	203	203	0	0	0%	0	0%	0%	0	0%
Kiribati	226	226	0	0	0%	0	0%	0%	0	0%
Korea	183	183	0	0	0%	0	0%	0%	0	0%
Marshall Is.	110	110	0	0	0%	0	0%	0%	0	0%
Nauru	151	151	0	0	0%	0	0%	0%	0	0%
New Zealand	7	7	0	0	0%	0	0%	0%	0	0%
PNG	367	172	195	195	100%	180	92%	92%	53	29%
Philippines	50	0	50	50	100%	50	100%	100%	50	100%
Solomon Islands	77	15	62	62	100%	62	100%	100%	0	0%
El Salvador	11	11	0	0	0%	0	0%	0%	0	0%
Tuvalu	31	31	0	0	0%	0	0%	0%	0	0%
Chinese Taipei	282	282	0	0	0%	0	0%	0%	0	0%
USA	41	41	0	0	0%	0	0%	0%	0	0%
Vanuatu	54	54	0	0	0%	0	0%	0%	0	0%
	2066	1,757	309	309	100%	294	95%	95%	105	36%

2022										
FLEET	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements	4. TRIP data submitted		5. TRIP data processed			6. TRIP data provided to WCPFC	
				Trips	%	Trips	% of total available trips	% of total trips recvd	Trips	% of data processed
Cook Islands	6	6	0	0	0%	0	0%	0%	0	0%
China	11	11	0	0	0%	0	0%	0%	0	0%
Ecuador	29	29	0	0	0%	0	0%	0%	0	0%
European Union	18	18	0	0	0%	0	0%	0%	0	0%
FSM	221	202	19	16	84%	14	74%	88%	13	93%
Japan	182	172	10	10	100%	3	30%	30%	3	100%
Kiribati	263	253	10	9	90%	7	70%	78%	7	100%
Korea	221	221	0	0	0%	0	0%	0%	0	0%
Marshall Is.	107	99	8	8	100%	7	88%	88%	7	100%
Nauru	140	125	15	11	73%	11	73%	100%	11	100%
New Zealand	1	1	0	0	0%	0	0%	0%	0	0%
PNG	350	224	126	125	99%	90	71%	72%	9	10%
Philippines	44	0	44	43	98%	43	98%	100%	43	100%
Solomon Islands	89	45	44	31	70%	31	70%	100%	5	16%
El Salvador	13	13	0	0	0%	0	0%	0%	0	0%
Tuvalu	54	50	4	2	50%	2	50%	100%	1	50%
Chinese Taipei	260	242	18	2	11%	2	11%	100%	2	100%
USA	61	51	10	7	70%	6	60%	86%	6	100%
Vanuatu	79	78	1	1	100%	0	0%	0%	0	0%
	2149	1,840	309	265	86%	216	70%	82%	107	50%

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 2021 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	37,820	3,724	9.8%	37,820	2,073	5.5%	3, 10, 11, 22
	Frozen								
COOK ISLANDS	Pacific Islands	Days at Sea	1,516	90	5.9%	1,516	90	5.9%	8
EUROPEAN UNION	Distant-water	No. of Trips	22	0	0.0%	22	0	0.0%	4, 10, 19, 28
FSM	Pacific Islands	No. of Trips	–	–	–	–	–	–	26, 27
FIJI	Pacific Islands	No. of Trips	443	72	16.3%	64	13	20.3%	7
FRENCH POLYNESIA	Pacific Islands	Days at Sea	–	–	–	–	–	–	2
INDONESIA	Domestic	No. of Trips	–	–	–	–	–	–	2, 19, 21
JAPAN	Ice/Fresh, short-trip	Days fished	20,006	20	0.1%	20,006	33	0.2%	10, 18
	Frozen, long-trip	Days fished	5,578	0	0.0%	5,578	0	0.0%	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	31,252	618	2.0%	31,252	618	2.0%	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	59,742	5,928	9.9%	59,742	1,418	2.4%	10, 14
	Distant-water – DWLL	Days at Sea	17,508	2,685	15.3%	17,508	445	2.5%	10
USA	HAWAII/California-based	No. of Trips	1,206	275	22.8%	1,206	279	23.1%	6
	AMERICAN SAMOA	No. of Trips	–	–	–	–	–	–	2, 6
VANUATU	Pacific Islands and DW	No. of Trips	383	0	0.0%	383	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 2021.
16. No longline vessels from Philippines active in 2021.
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 2021 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. 2021 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 2021 is DAYS AT SEA. Coverage of data submitted represents only activity in the WCPFC Area.
24. No activity in 2021 by this CCM's longline fleet.
25. Represents the chartered vessels in this fleet; no vessels were flagged to RMI in 2021.
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 2021 due to the COVID-19 situation.

Table 4. Provisional 2022 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	42,025	2,799	6.7%	42,025	1,015	2.4%	3, 10, 11, 22
	Frozen								
COOK ISLANDS	Pacific Islands	Days at Sea	1,547	0	0.0%	1,547	0	0.0%	8
EUROPEAN UNION	Distant-water	No. of Trips	35	2	5.7%	35	2	5.7%	4, 10, 19
FSM	Pacific Islands	No. of Trips	–	–	–	–	–	–	26, 27
FIJI	Pacific Islands	No. of Trips	414	117	28.3%	414	117	28.3%	7
FRENCH POLYNESIA	Pacific Islands	Days at Sea	–	–	–	–	–	–	2
INDONESIA	Domestic	No. of Trips	–	–	–	–	–	–	2, 19, 21
JAPAN	Ice/Fresh, short-trip	Days fished	20,006	0	0.0%	20,006	0	0.0%	10, 29
	Frozen, long-trip	Days fished	5,578	0	0.0%	5,578	0	0.0%	10, 28, 29
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	32,241	1,592	4.9%	32,241	1,592	4.9%	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	76,447	5,928	7.8%	76,447	6,098	8.0%	10, 14
	Distant-water – DWLL	Days at Sea	19,540	2,685	13.7%	19,540	3,071	15.7%	10
USA	HAWAII/California-based	No. of Trips	1,224	290	23.7%	1,224	290	23.7%	6
	AMERICAN SAMOA	No. of Trips	–	–	–	–	–	–	2, 6
VANUATU	Pacific Islands and DW	No. of Trips	135	1	0.7%	135	1	0.7%	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 2022.
16. No longline vessels from Philippines active in 2022.
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 2022 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. 2022 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 2022 is DAYS AT SEA. Coverage of data submitted represents only activity in the WCPFC Area.
24. No activity in 2022 by this CCM's longline fleet.
25. Represents the chartered vessels in this fleet; no vessels were flagged to RMI in 2022.
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 2022 due to the COVID-19 situation.
29. The total effort has been carried over from 2021 and is subject to change.

Table 5. Coverage of Longline Observer data in the WCPFC Area, for 2021 (all observer data available to the WCPFC Science Service Provider; includes both ROP and non-ROP data.

	Hooks		
CCM Fleet	Total Effort	Observer	
AUSTRALIA	7,590,477	0	
CHINA	148,066,158	3,903,427	
COOK ISLANDS	6,080,330	125,207	
EUROPEAN UNION	1,261,700		
FIJI	36,786,737	3,433,207	
FRENCH POLYNESIA	20,034,657	1,053,283	
FSM	22,769,311	116,285	
INDONESIA	40,099,171		
JAPAN	37,265,411	38,064	
KIRIBATI	10,585,625	364,555	
MARSHALL ISLANDS	7,242,425	263,069	
NEW CALEDONIA	6,201,151	428,504	
NEW ZEALAND	1,554,430	179,169	
PALAU		0	
PAPUA NEW GUINEA		0	
REPUBLIC OF KOREA	55,420,872	752,996	
SAMOA	6,849,447	0	
SOLOMON ISLANDS	20,988,877	0	
TONGA	676,111	122,068	
TUVALU	308,359	0	
CHINESE TAIPEI	139,201,996	10,214,946	
USA	73,081,987	6,958,720	
VANUATU	28,087,634	0	
Total	**670,152,866**	**27,953,500**	**4.2%**

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 WCPFC Area, for 2022 (all observer data available to the WCPFC Science Service Provider; includes both ROP and non-ROP data).

	Hooks		
CCM Fleet	**Total Effort**	**Observer**	
AUSTRALIA	6,861,765	0	
CHINA	124,940,006	2,749,934	
COOK ISLANDS	4,729,482	5,740	
EUROPEAN UNION	1,996,310		
FIJI	30,082,736	4,893,213	
FRENCH POLYNESIA	21,702,456	1,269,255	
FSM	14,299,189	116,959	
INDONESIA	33,814,409		
JAPAN	30,610,049	0	
KIRIBATI	24,321,154	501,961	
MARSHALL ISLANDS	10,007,054	1,925	
NEW CALEDONIA	5,941,575	451,150	
NEW ZEALAND	1,272,310	68,670	
PALAU	20,750	0	
PAPUA NEW GUINEA		0	
REPUBLIC OF KOREA	57,075,963	1,370,505	
SAMOA	7,069,309	0	
SOLOMON ISLANDS	26,126,848	0	
TONGA	875,246	153,138	
TUVALU	6,000	0	
CHINESE TAIPEI	155,388,655	9,163,786	
USA	74,630,290	11,752,896	
VANUATU	16,816,793	0	
Total	**648,588,349**	**28,768,161**	**4.4%**

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 2021 (top) and 2022 (bottom).

2021				
Observer Provider/Programme	PURSE SEINE		LONGLINE	
	Trips	Cov% [1]	Trips	Cov% [2]
COOK ISLANDS	2	0.2%	2	0.06%
FEDERATED STATES OF MICRONESIA	0	0.0%	0	0.00%
FIJI	0	0.0%	54	1.02%
FRENCH POLYNESIA	0	0.0%	57	0.48%
KIRIBATI	0	0.0%	0	0.00%
MARSHALL ISLANDS	0	0.0%	19	0.21%
NAURU	0	0.0%	0	0.00%
NEW CALEDONIA	0	0.0%	24	0.33%
PALAU	0	0.0%	0	0.00%
PAPUA NEW GUINEA	195	7.0%	0	0.00%
PHILIPPINES	50	1.5%	0	0.00%
PNA Observer Programme	0	0.0%	0	0.00%
SAMOA	0	0.0%	0	0.00%
SOLOMON ISLANDS	62	1.5%	0	0.00%
TONGA, KINGDOM OF	0	0.0%	46	1.11%
TUVALU	0	0.0%	0	0.00%
US MLT Observer Programme	0	0.0%	0	0.00%
VANUATU	0	0.0%	15	0.47%
Total	309	8.7%	217	3.68%

2022				
Observer Provider/Programme	PURSE SEINE		LONGLINE	
	Trips	Cov% [1]	Trips	Cov% [2]
COOK ISLANDS	0	0.0%	1	0.00%
FEDERATED STATES OF MICRONESIA	1	0.0%	0	0.00%
FIJI	0	0.0%	105	1.90%
FRENCH POLYNESIA	0	0.0%	62	0.41%
KIRIBATI	5	0.2%	0	0.00%
MARSHALL ISLANDS	6	0.0%	0	0.00%
NAURU	1	0.0%	0	0.00%
NEW CALEDONIA	0	0.0%	25	0.30%
PALAU	0	0.0%	0	0.00%
PAPUA NEW GUINEA	135	5.5%	0	0.00%
PHILIPPINES	44	1.6%	0	0.00%
PNA Observer Programme	78	3.2%	0	0.00%
SAMOA	0	0.0%	0	0.00%
SOLOMON ISLANDS	38	0.9%	2	0.00%
TONGA, KINGDOM OF	0	0.0%	44	1.12%
TUVALU	0	0.0%	0	0.00%
US MLT Observer Programme	1	0.1%	0	0.00%
VANUATU	0	0.0%	17	0.58%
Total	309	9.9%	256	4.31%

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.

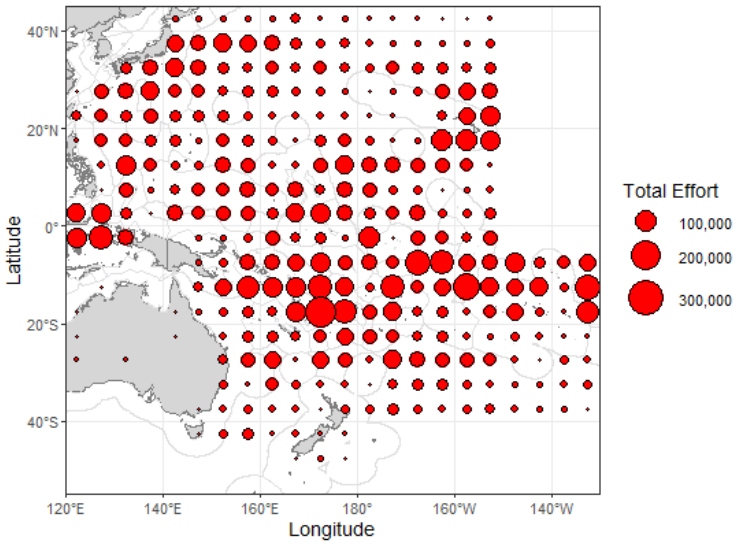
Table 8. Annual longline E-Monitoring (EM) data reviews (sets), by national EM programme, 2015–2022.

	E-MONITORING DATA (Sets reviewed)							
EM Programme	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Australia	56	420	528	489	525	418	403	344
Fiji	222	621	2170	1510	405			
FSM		311	314	21	30	210	10	
French Polynesia							171	1
Marshall Islands			810	629	310			
Palau		102	159	56				
Solomon Islands			74	25				
Vanuatu			41	43	23			

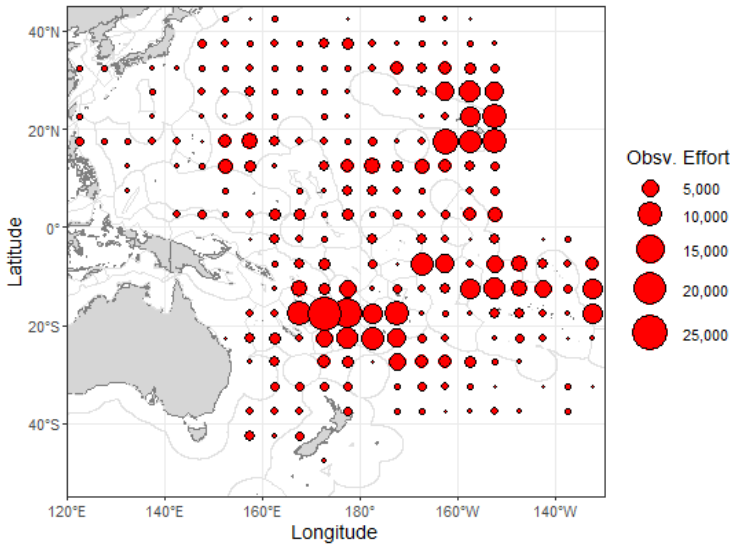
NOTES

1. According to data submitted to SPC.
2. 2022 values are provisional.

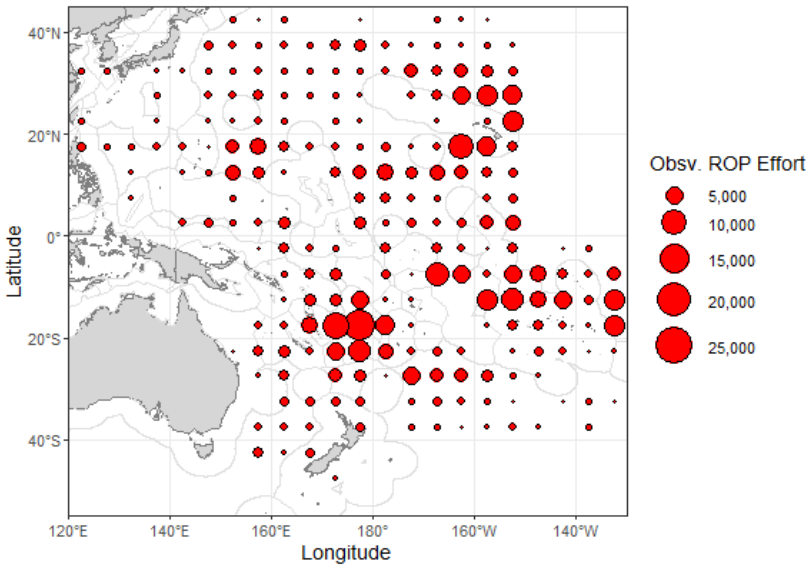
ANNEX 1 – Maps showing Longline and Purse seine Observer coverage



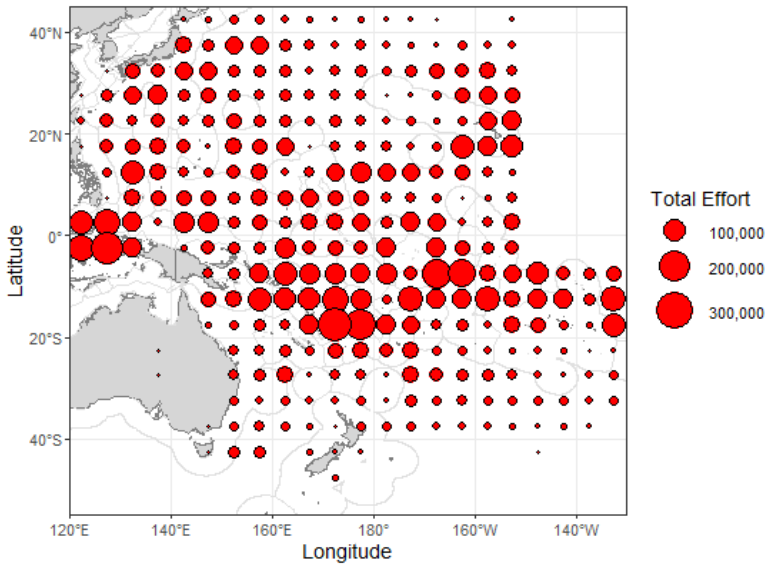
2020 – Longline All effort



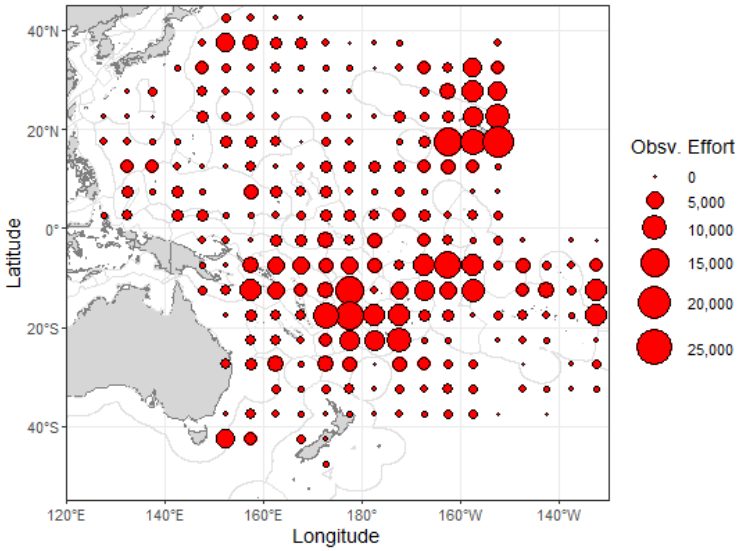
2020 – Longline Observer effort



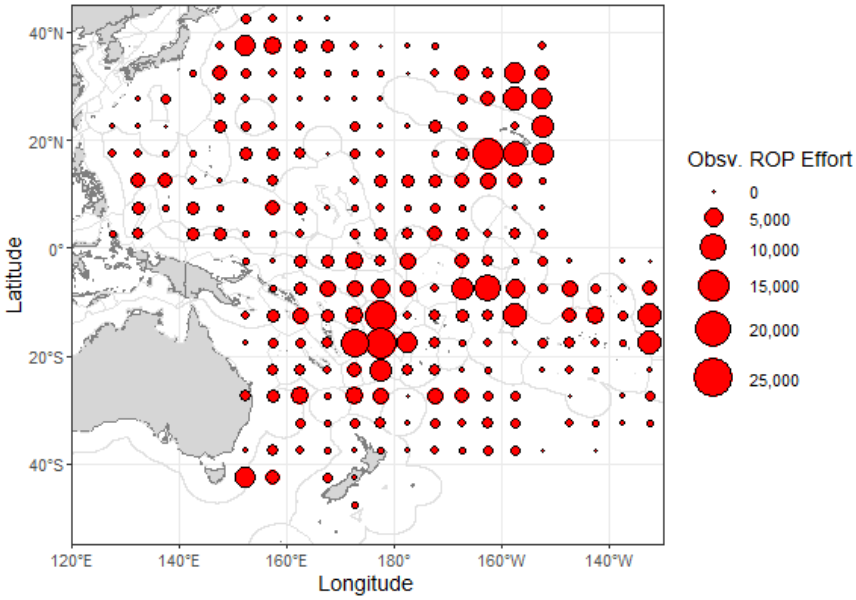
2020 – Longline ROP effort



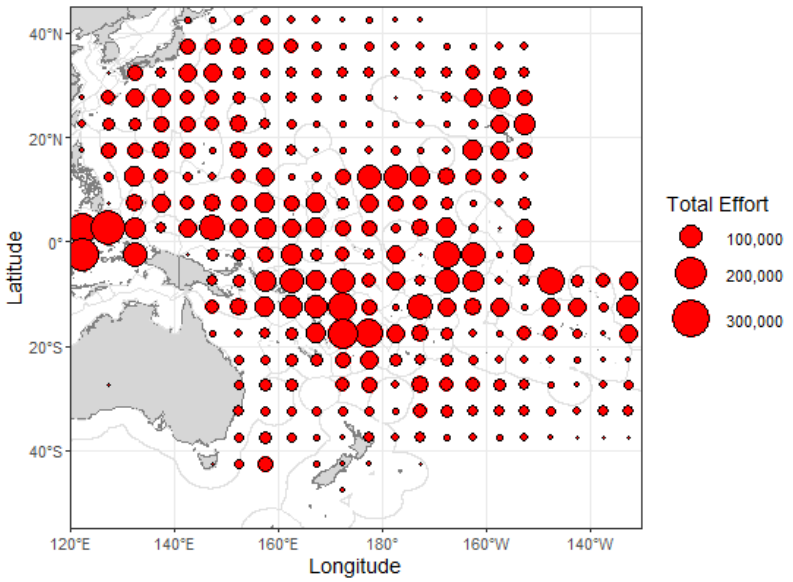
2019 – Longline All effort



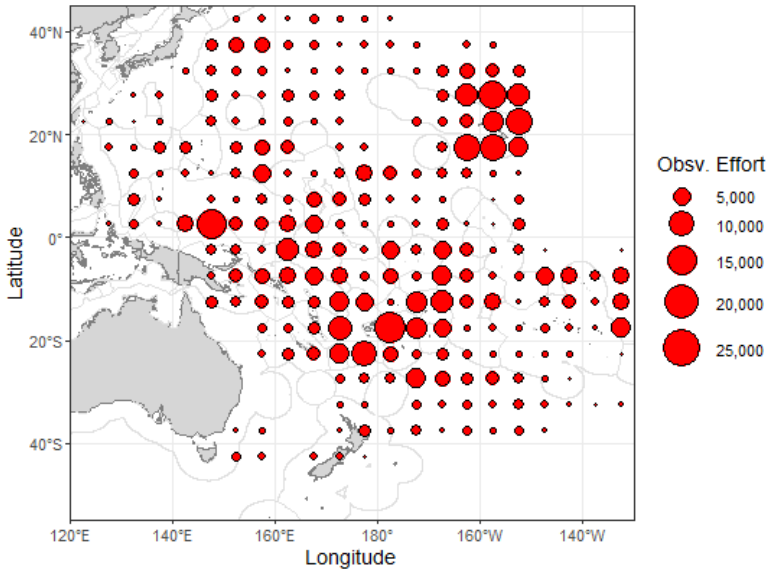
2019 – Longline Observer effort



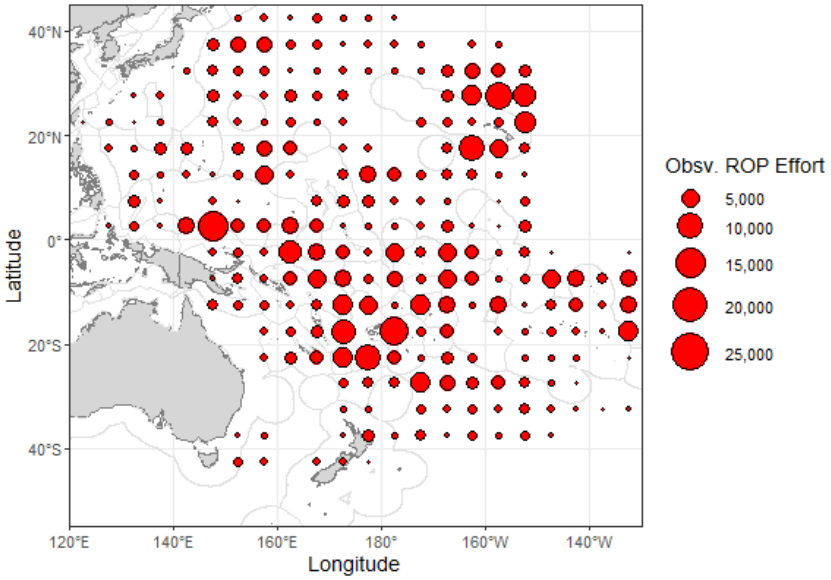
2019 – Longline ROP effort



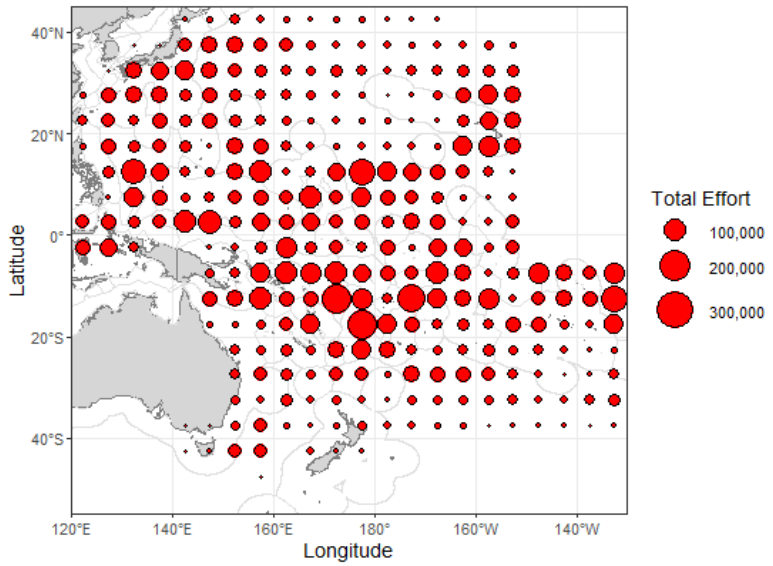
2018 – Longline All effort



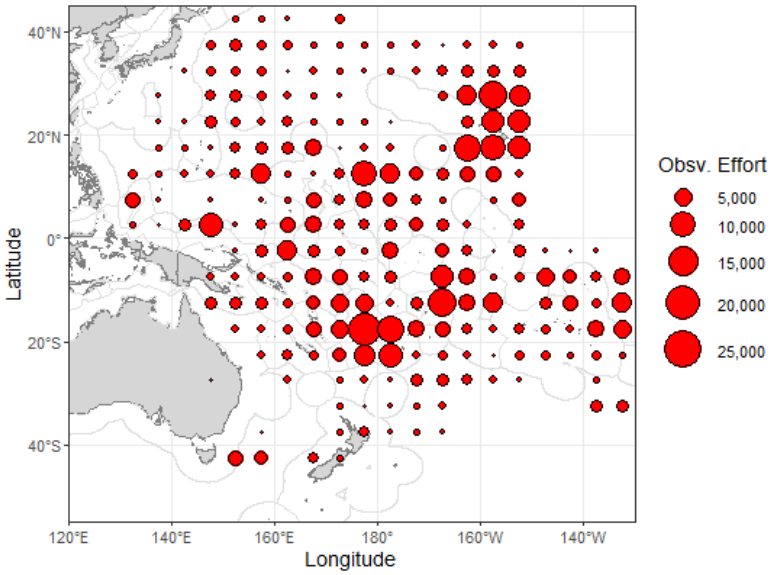
2018 – Longline Observer effort



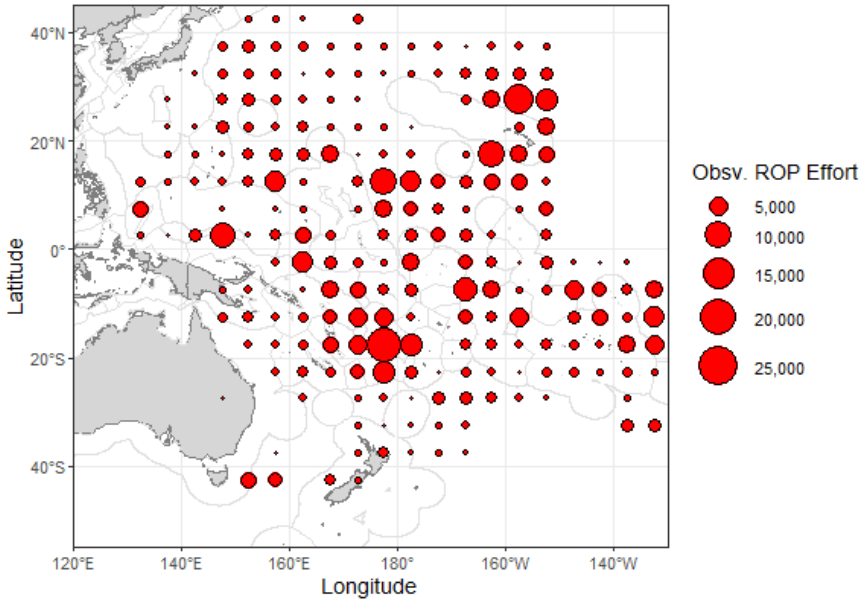
2018 – Longline ROP effort



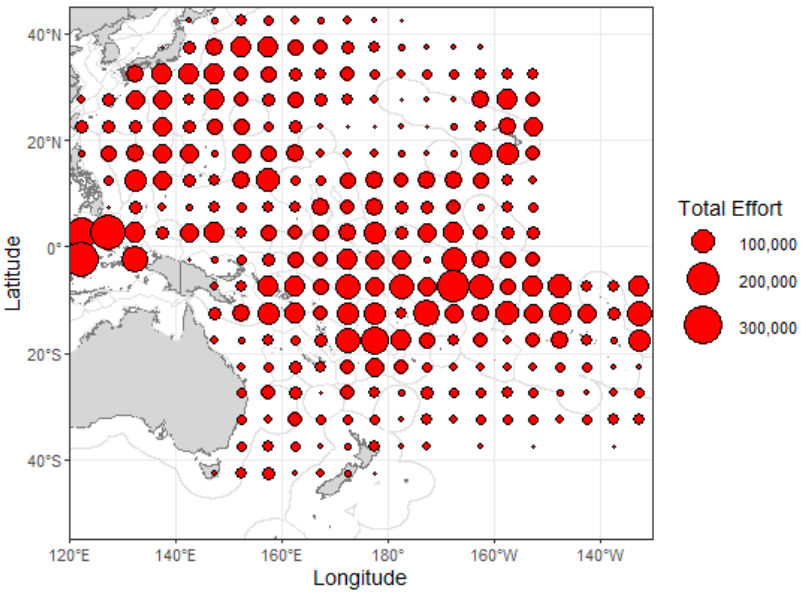
2017 – Longline All effort



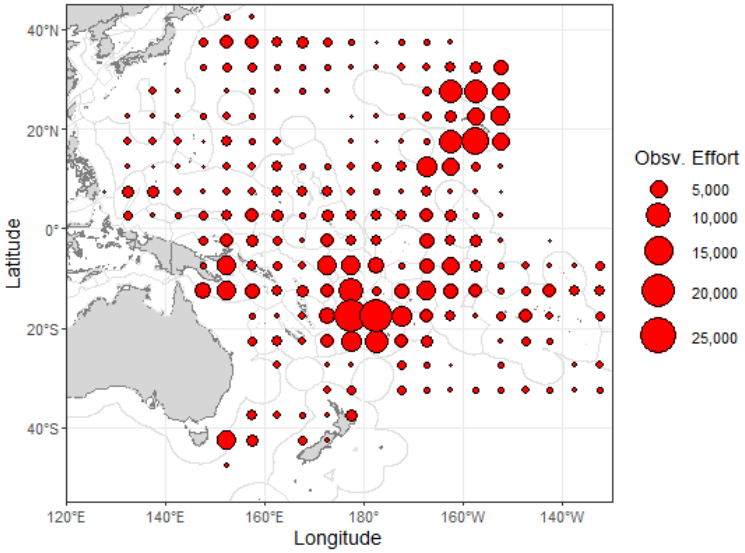
2017 – Longline Observer effort



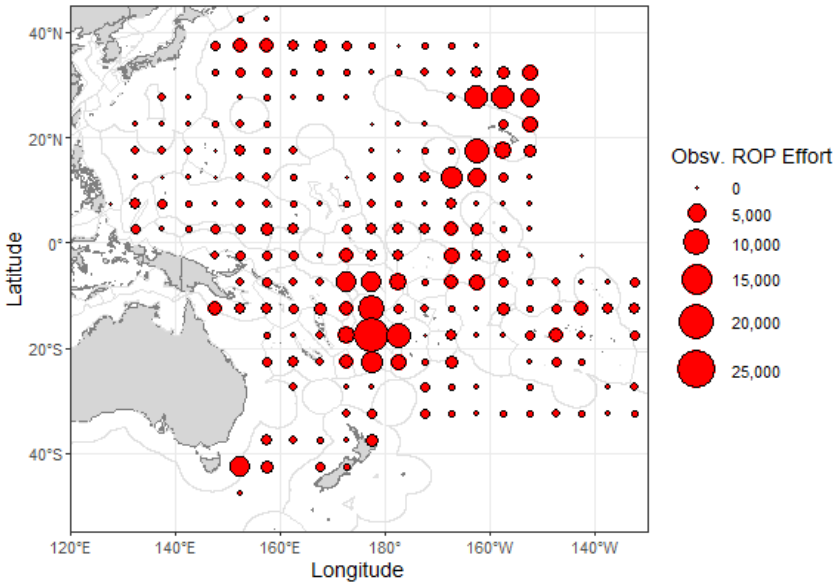
2017 – Longline ROP effort



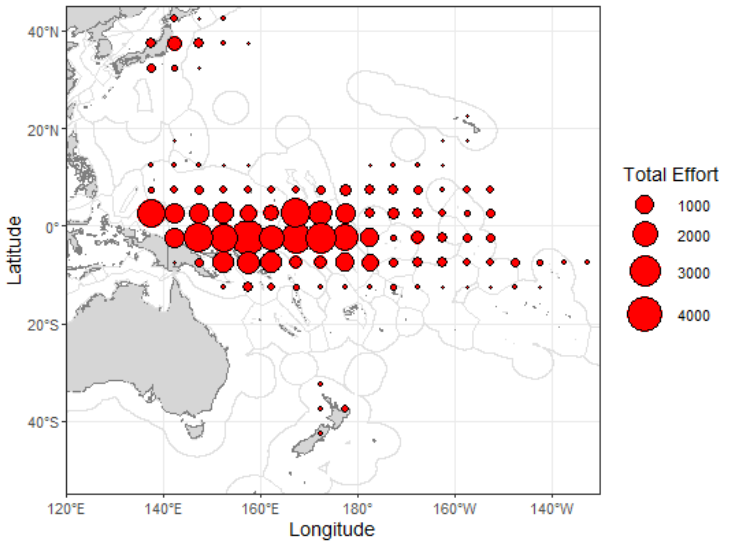
2016 – Longline All effort



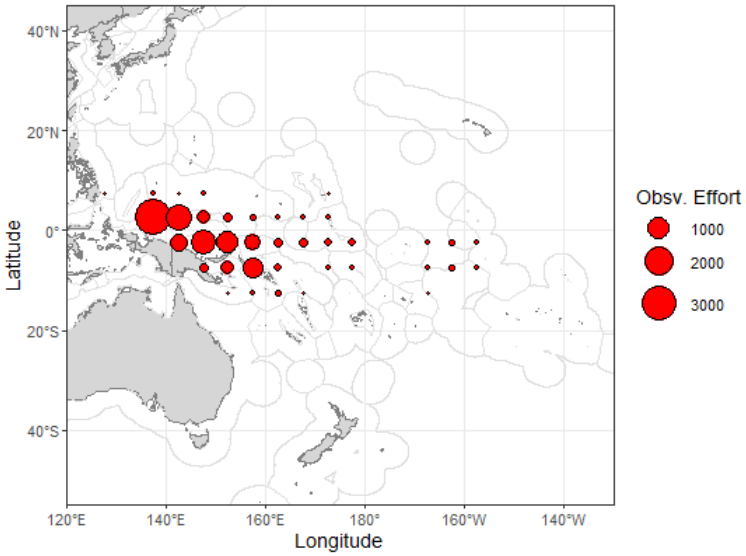
2016 – Longline Observer effort



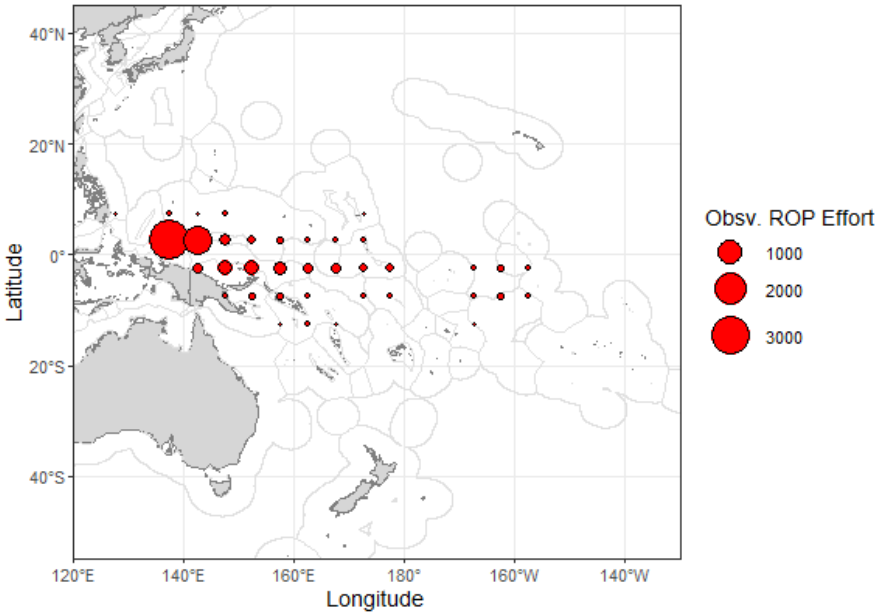
2016 – Longline ROP effort



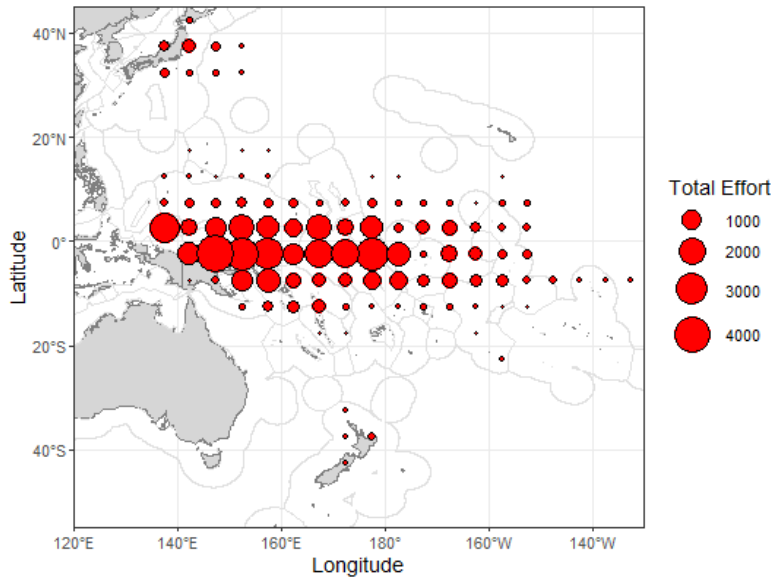
2021 – Purse seine All effort



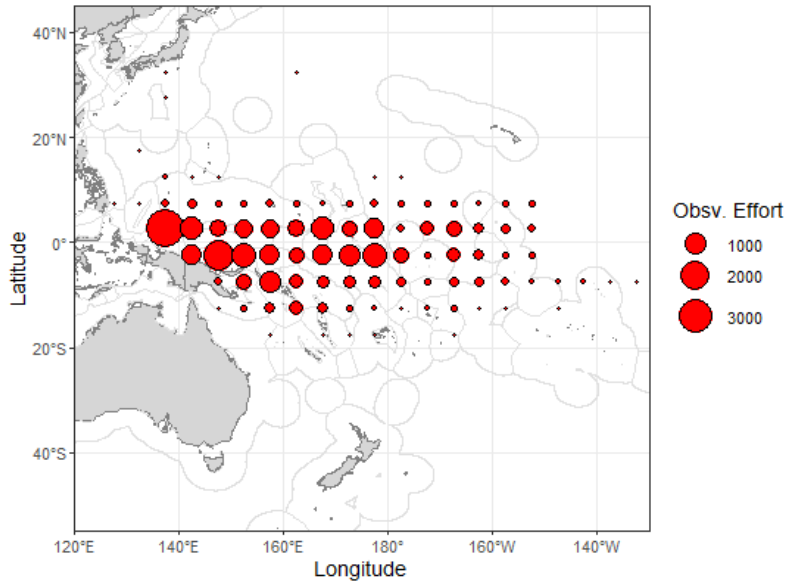
2021 - Purse seine Observer effort



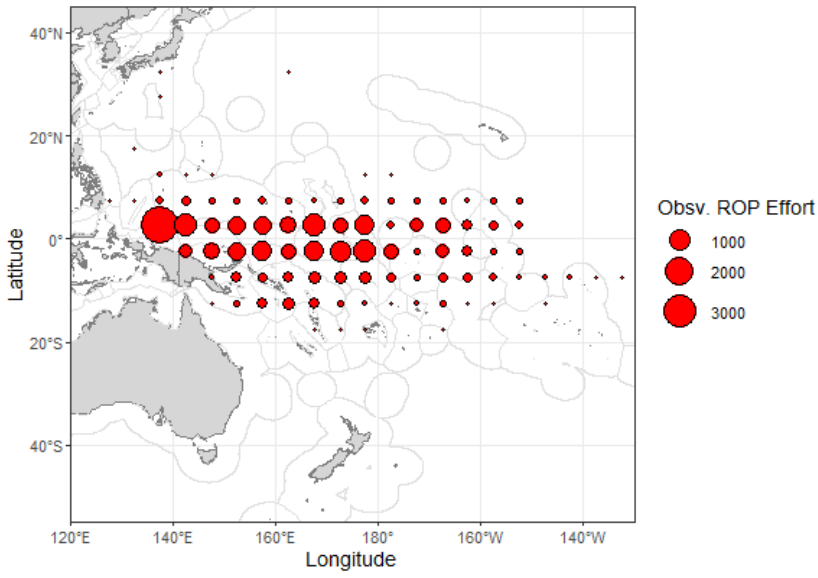
2021 – Purse seine ROP effort



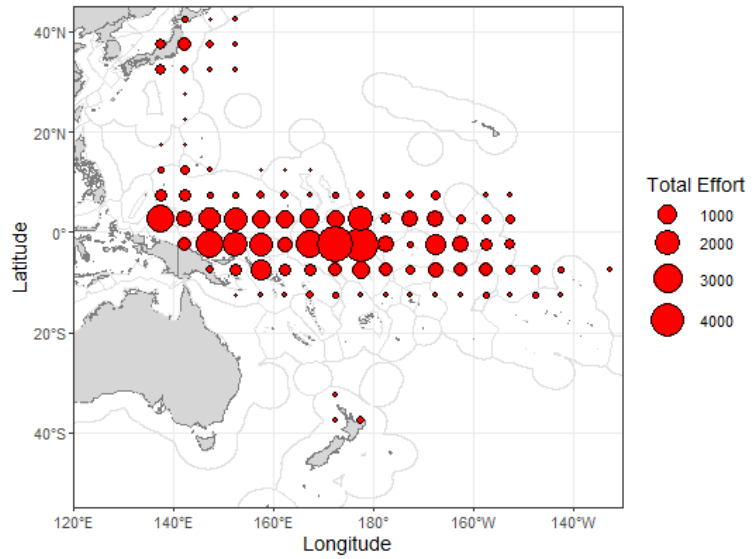
2020 – Purse seine All effort



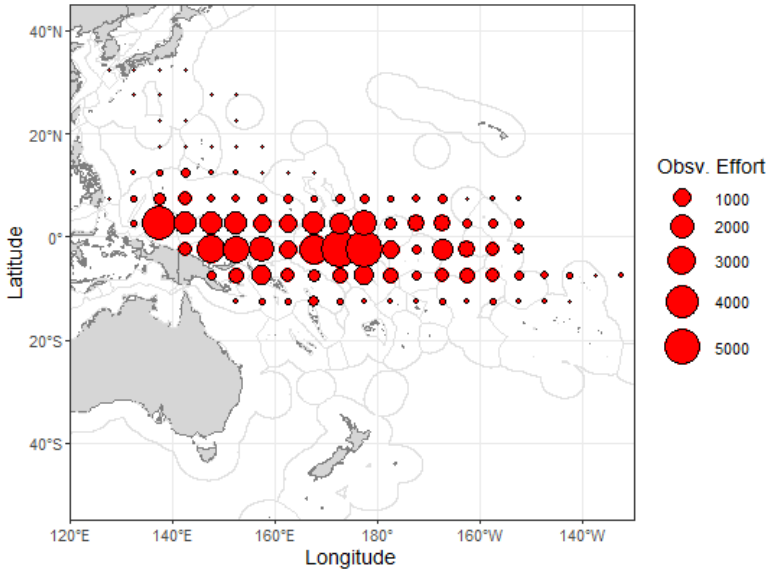
2020 - Purse seine Observer effort



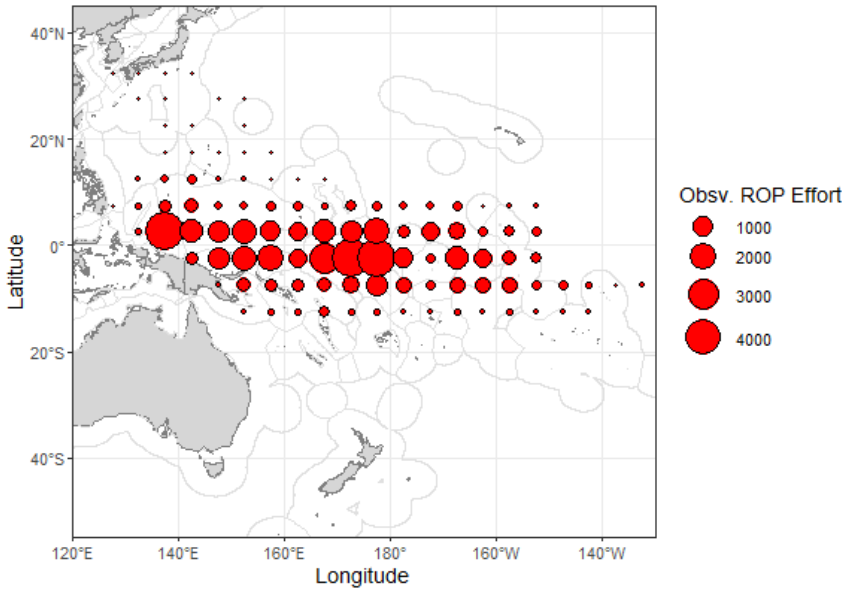
2020 – Purse seine ROP effort



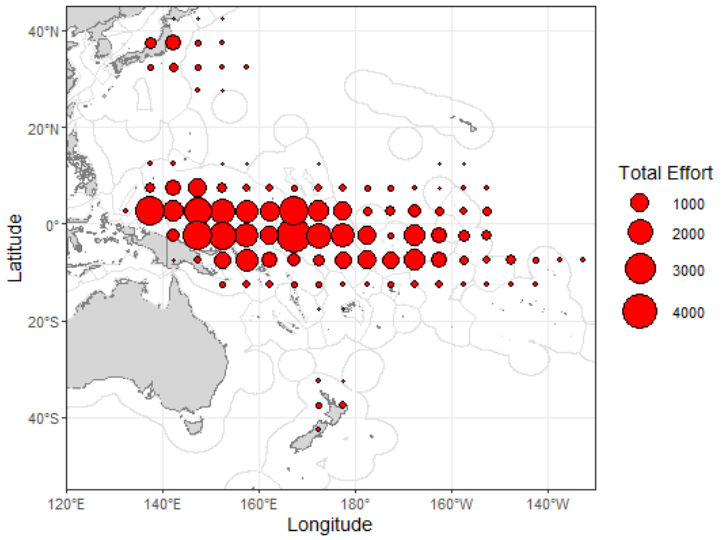
2019 – Purse seine All effort



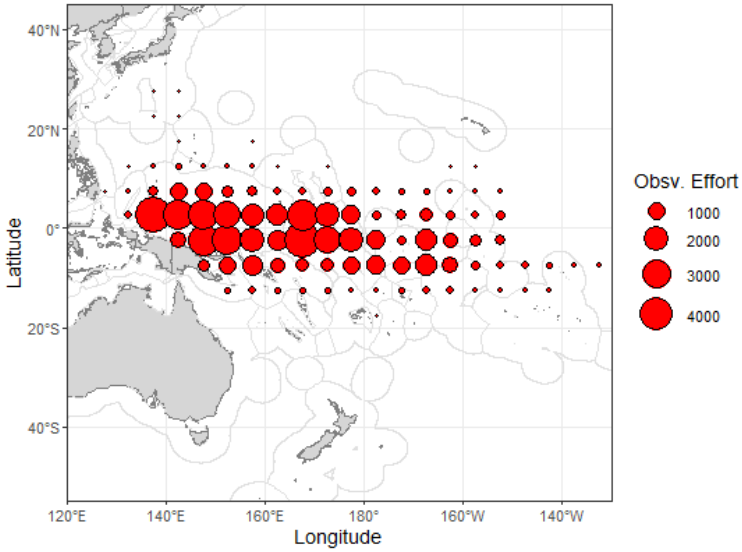
2019 – Purse seine Observer effort



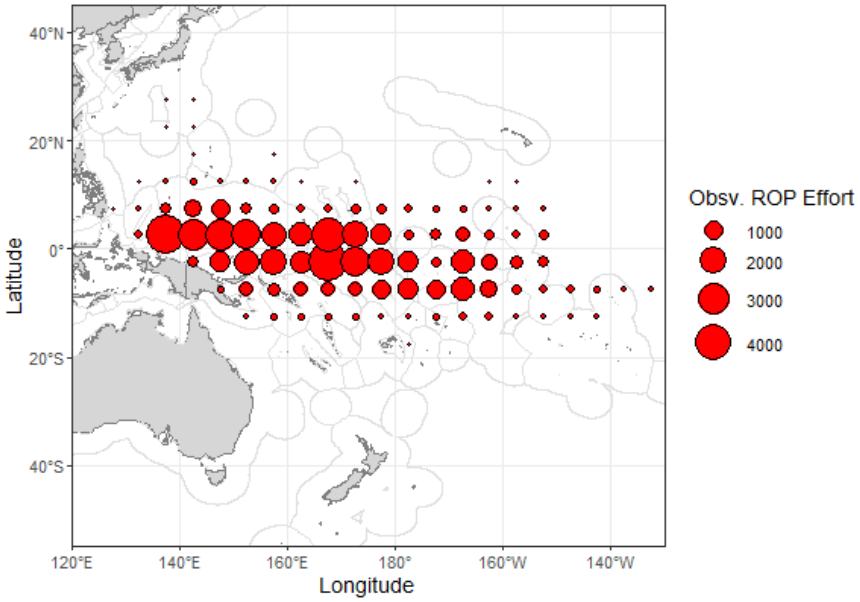
2019 – Purse seine ROP effort



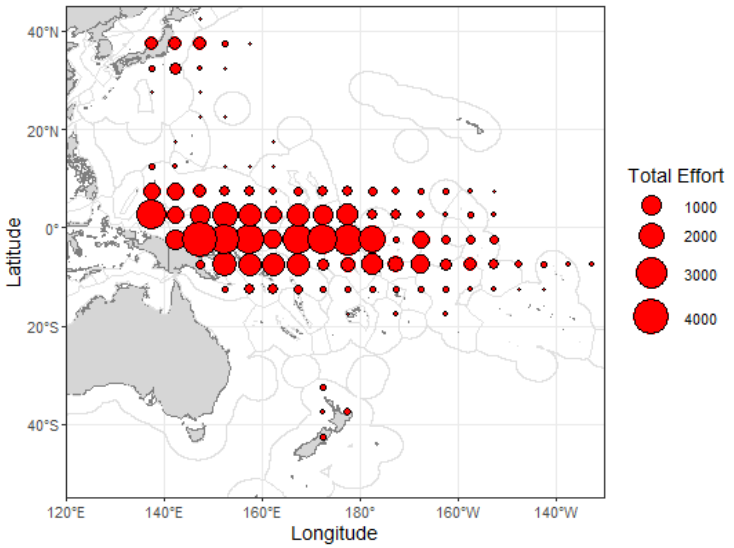
2018 – Purse seine All effort



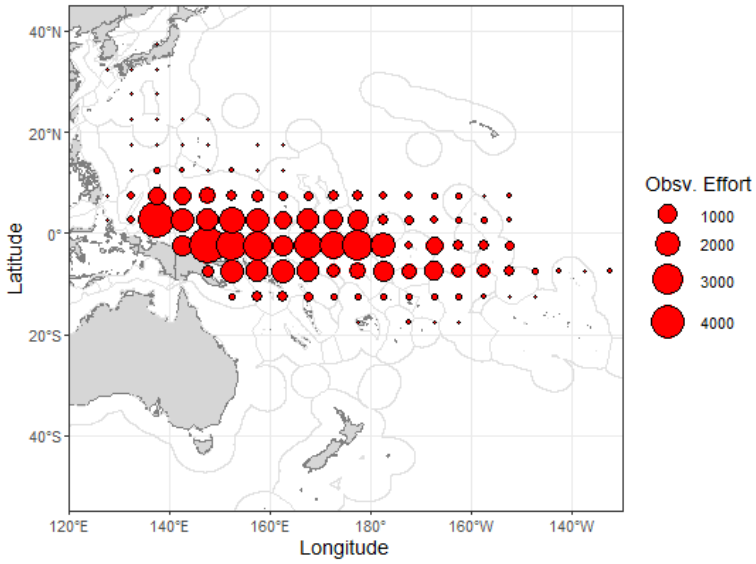
2018 – Purse seine Observer effort



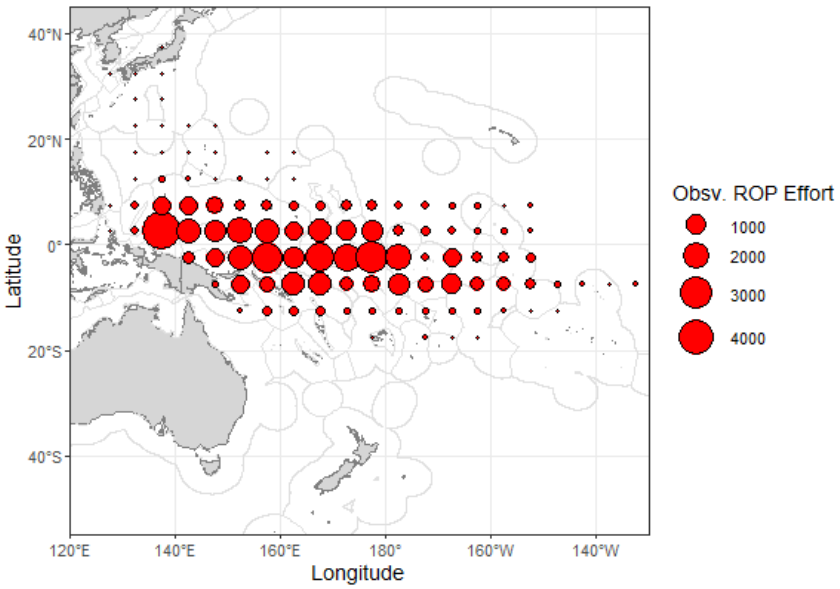
2018 – Purse seine ROP effort



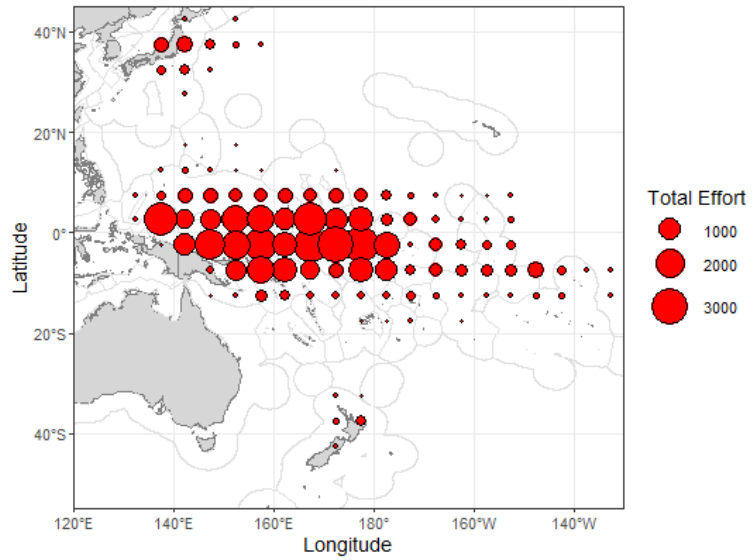
2017 – Purse seine All effort



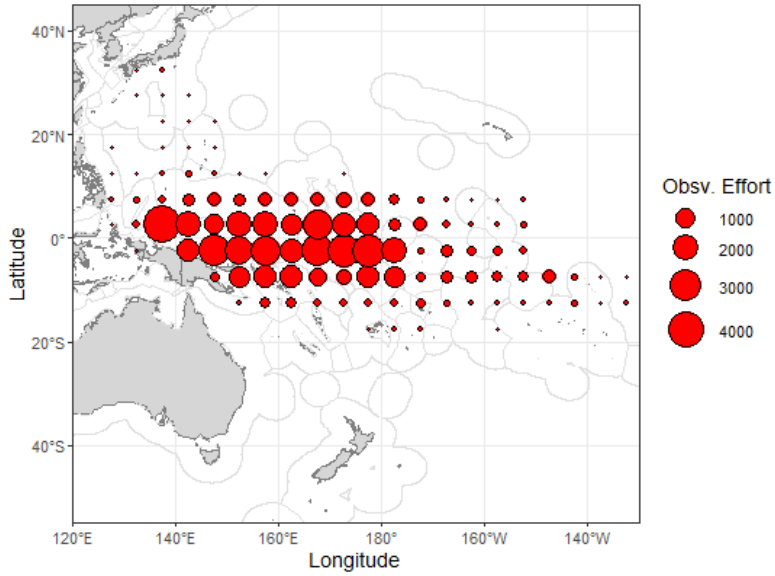
2017 – Purse seine Observer effort



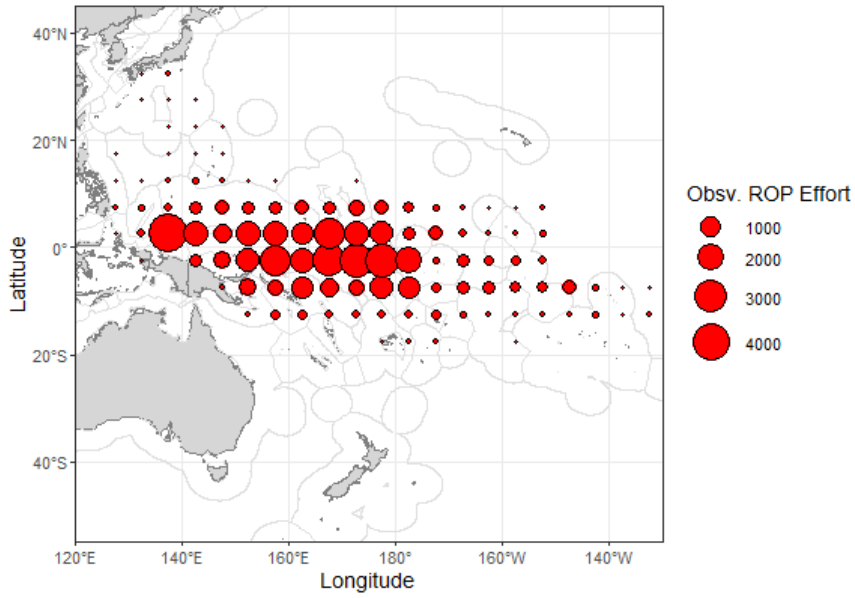
2017 – Purse seine ROP effort



2016 – Purse seine All effort



2016 – Purse seine Observer effort



2016 – Purse seine ROP effort

ANNEX 2 – Tables showing Longline and Purse seine Observer coverage

LL Effort 2022

Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. LL subtropical north of 20N	959,642	38,081	38,081
2. Longline tropical 20N - 10S	2,915,566	115,741	115,741
3. Longline 10S to 25S	2,665,885	90,142	67,285
4. Longline 25S to 30S	197,476	861	861
5. Longline south of 30S	378,126	3,946	3,946
Total	**7,116,695**	**248,771**	**225,914**

LL Effort 2021

Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. LL subtropical north of 20N	1,105,263	52,135	52,135
2. Longline tropical 20N - 10S	2,840,941	129,943	126,131
3. Longline 10S to 25S	2,688,322	92,150	62,220
4. Longline 25S to 30S	195,279	7,405	7,405
5. Longline south of 30S	551,307	6,640	6,640
Total	**7,381,112**	**288,273**	**254,531**

LL Effort 2020

Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. LL subtropical north of 20N	1,187,947	47,714	47,714
2. Longline tropical 20N - 10S	2,915,748	107,532	104,175
3. Longline 10S to 25S	2,978,286	154,064	109,843
4. Longline 25S to 30S	265,966	16,920	16,920
5. Longline south of 30S	736,968	10,759	10,759
Total	**8,084,915**	**336,989**	**289,411**

LL Effort 2019

Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. LL subtropical north of 20N	1,171,084	65,882	65,882
2. Longline tropical 20N - 10S	3,914,068	170,896	147,286
3. Longline 10S to 25S	3,407,678	159,461	115,389
4. Longline 25S to 30S	252,993	21,327	21,327
5. Longline south of 30S	554,044	20,478	20,478
Total	**9,299,867**	**438,044**	**370,362**

LL Effort 2018

Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. LL subtropical north of 20N	1,056,659	74,096	74,096
2. Longline tropical 20N - 10S	4,531,341	177,700	160,111
3. Longline 10S to 25S	2,697,180	140,975	126,821
4. Longline 25S to 30S	238,451	18,149	18,149
5. Longline south of 30S	629,086	12,216	12,216
Total	**9,152,717**	**423,136**	**391,393**

LL Effort 2017

Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. LL subtropical north of 20N	1,091,893	58,609	58,609
2. Longline tropical 20N - 10S	3,197,200	166,472	155,332
3. Longline 10S to 25S	2,910,659	127,737	101,952
4. Longline 25S to 30S	307,608	6,549	6,479
5. Longline south of 30S	578,161	12,863	12,863
Total	**8,085,521**	**372,230**	**335,235**

LL Effort 2016

Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. LL subtropical north of 20N	1,276,111	46,769	46,769
2. Longline tropical 20N - 10S	4,121,296	112,994	91,729
3. Longline 10S to 25S	2,809,672	125,432	84,624
4. Longline 25S to 30S	220,076	2,363	2,363
5. Longline south of 30S	444,783	15,685	15,685
Total	**8,871,938**	**303,243**	**241,170**

***Total effort - Source : LONGLINE aggregated and raised Catch/Effort database**

PS - Effort 2022

Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. Purse Seine N of 20N	252.6	0	0
2. Purse Seine 20N - 20S	42319.4	7896	5965
3. Purse Seine S of 20S	0	0	0
Total	**42572**	**7896**	**5965**

PS - Effort 2021

Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. Purse Seine N of 20N	1192.5	0	0
2. Purse Seine 20N - 20S	45067.3	9679	5994
3. Purse Seine S of 20S	128.9	0	0
Total	**46388.7**	**9679**	**5994**

PS - Effort 2020

Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. Purse Seine N of 20N	1054.1	3	3
2. Purse Seine 20N - 20S	47395.1	23570	18906
3. Purse Seine S of 20S	120.1	0	0
Total	**48569.3**	**23573**	**18909**

PS - Effort 2019

Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. Purse Seine N of 20N	1242.7	12	12
2. Purse Seine 20N - 20S	45101.7	45477	43078
3. Purse Seine S of 20S	127.5	0	0
Total	**46471.9**	**45489**	**43090**

PS - Effort 2018

Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. Purse Seine N of 20N	1155.8	5	5
2. Purse Seine 20N - 20S	47657.7	47533	40994
3. Purse Seine S of 20S	112.2	0	0
Total	**48925.7**	**47538**	**40999**

PS - Effort 2017

Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. Purse Seine N of 20N	1449	14	14
2. Purse Seine 20N - 20S	50280.4	49100	41141
3. Purse Seine S of 20S	152	0	0
Total	**51881.4**	**49114**	**41155**

PS - Effort 2016

Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. Purse Seine N of 20N	1438.2	13	13
2. Purse Seine 20N - 20S	46767.4	47433	41187
3. Purse Seine S of 20S	197	0	0
Total	**48402.6**	**47446**	**41200**

***Total effort - Source : PURSE SEINE aggregated and raised Catch/Effort database**