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TRENDS IN THE SOUTH PACIFIC ALBACORE LONGLINE AND TROLL FISHERIES

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SPC-OFP
Pacific Community (SPC), Noumea, New Caledonia

[1] This paper is an update of SC15 meeting paper (**SC15-SA-WP08**) by Stephen Brouwer, Graham Pilling, Peter Williams and the WCPFC Secretariat

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1 Executive Summary

This paper presents a compendium of fishery indicators for south Pacific albacore tuna, as requested at previous WCPFC-related meetings. These indicators include: total catch; catch by gear; and longline effort and nominal troll and longline CPUE trends, along with their spatial patterns. Commentary provided includes comparisons of 2018 values to 2017 and to the average over 2013-2017. Information provided includes data loaded into databases as of 2^{nd} December 2019. Note that catch levels and their distribution amongst areas may change as more data become available. This paper complements the information provided by Brouwer et al. (2019) that summarises the latest trends for the main target species for the fisheries of the Western and Central Pacific Fisheries Commmission (WCPFC).

Transshipment data are available over the period from the inception of transshipment reporting (July 2010) to March 2019. Data presented represent high seas transshipments only; they do not include in-port or in-zone transshipments. Monthly reported transshipment levels fluctuate notably, and may reflect logistical/operational factors rather than fishing activity. There is a notable peak in transshipment activity in October 2017 (4,186 mt) of which 57% was reported by China (2,404 mt), and 27% by Vanuatu (1,122 mt) fleets. It should be noted that transshipment levels are unlikely to be fully reported for the most recent 18 months.

The average stock status in 2016 (the last year of the assessment) across the 72 model runs was $\text{SB}_{latest}/\text{SB}_{F=0} = 0.52$, below the interim target reference point ($\text{SB}_{latest}/\text{SB}_{F=0} = 0.56$) established by the WCPFC in 2018 (WCPFC, 2018). Due to the complex interactions between the major species-specific fisheries, it is difficult to correctly interpret the stock status-related implications from the trends in any indicators in isolation from other data sets and a population dynamics model. Therefore, we summarise the stock status from the most recent assessment (2018), and update an analysis of the potential long-term stock consequences of recent fishing patterns on the south Pacific albacore stock relative to the agreed biomass limit reference point assuming 2018 status quo effort. This analysis uses stochastic stock projections and incorporates the recommendations on inclusion of uncertainty from WCPFC-SC14. Based upon the 2018 stock assessment, assuming 2018 catch levels through 2018-2035, the main difference from previous reports is that, provisional catch in 2018 was lower than levels seen in 2013 and 2014. The stock is projected to decline from 2016 ($\text{SB}_{latest}/\text{SB}_{F=0} = 0.52$) to $\text{SB}_{2035}/\text{SB}_{F=0} = 0.39$ at the end of the projection period. When compared to the biomass Limit Reference Point (SB_{LRP}) the risk of $\text{SB}_{2035}/\text{SB}_{F=0} < \text{SB}_{LRP}$ is 23%. Overall, vulnerable biomass (biomass vulnerable to longline fisheries; a CPUE proxy) is estimated to decrease by 36% relative to 2013 levels (a year where some CCMs considered the longline fishery to have an adequate catch rate to meet economic fishery objectives) (SPC-OFP, 2018).

2 Introduction

At the 7^{th} Technical and Compliance Committee, some members requested a paper on south Pacific albacore be prepared by the Western and Central Pacific Fisheries Commission (WCPFC) Secretariat. That request indicated the paper should contain all available catch and transshipment data available, and should highlight trends. The paper was first prepared by the Secretariat for WCPFC8 in March 2012. It has since been updated frequently, taking into consideration further requests from members.

This paper presents trends in catch, effort and Catch Per Unit Effort (CPUE) both spatially and temporally for the south Pacific albacore fishery. In addition, information on transshipment patterns are presented, consistent with WCPFC and SPC-OFP (2013). Following the request for further information to assist in the interpretation of key observations, and noting that it is difficult to correctly interpret the stock status-related implications of trends in any indicators in isolation of other data sets, and population dynamics models, the potential consequences of recent fishing levels for future south Pacific albacore stock status are evaluated using stochastic projections.

The analyses presented are based on data available to SPC as of 2^{nd} December 2019. The overall catch, and its distribution amongst spatial areas, may change as more data become available. Please note that the figures may include or exclude specific fleets that are included in summaries made for other purposes (e.g. CMM tables) and therefore the reported values (catch, effort, CPUE, etc.) may not be identical to those presented in other documents. Additional information by latitudinal zone, requested at WCPFC9, are posted as Microsoft Excel files annexed to this paper (SC15-SA-WP-08a and SC15-SA-WP-08b). The vessel number data are for south of 20°S.

3 Patterns of longline and troll fishing

Two groups of fleets exploit south Pacific albacore, longline and troll vessels. In this section we examine trends in their catch, effort and catch rate (CPUE). Catch and effort information come primarily from logsheet returns, or for the high seas from the provision of aggregate data from distant water fishing nations.

3.1 Catch

Annual catch estimates for albacore in the south Pacific (south of the equator) as a whole peaked in 2017 at 96,164 mt (all gears) (Figure 1). Catch by longliners represented 97% of the catch weight in 2018 at 81,610 mt. The 2018 longline catch was 13% lower than 2017. Provisional other catch (2,731 mt - the majority being being troll catch) was 7% higher than 2017. The longline catch in the EPO south of the equator contributed 27% of the total catch in 2016, but 15% in 2017, however, data from one large fleet are currently missing for 2017 (Williams, 2019 and Williams and Reid, 2019).

By comparison, the 2018 total albacore catch within the southern part of the WCP-CA[1] Table 1) was 64,901 mt and the longline catch was 62,153 mt. High seas longline catch estimates represent 46% of the 2018 total, and have ranged from 31-51% of the total over the last 10 years. By flag (or attributed nationality based on charter agreements), China and Chinese Taipei had the highest catch estimates of south Pacific albacore in 2018 (21,138 mt and 9,317 mt respectively), representing 49% of the total catch (Table A1-1), with 63% of their catch was taken on the high seas (Table A1-2).

Four flag states reported troll catch within the WCP-CA during the period 2000 to 2018, namely Canada, the Cook Islands, USA and New Zealand (Table A1-3) totalling 2,748 mt. Troll activity has been reported only in the New Zealand EEZ and on the high seas in 2018 (Table 2). Catch estimates for 2018 were 475 mt for the high seas and 2,272 mt for the New Zealand EEZ. The total troll catch in 2018 was 11% higher than the 2017 catch.

The spatial pattern of south Pacific albacore catch over the long-term (1950-2013), the last 5 years (2014-2018) and 2018 alone, are shown in Figure 2. In recent years, catch has been concentrated in the 10-20°S latitudinal band. Note that while 2018 estimates remain provisional, the geographic distribution of catch is generally consistent with that seen in recent years, however, in the most recent years there is a large increase in catch between 10-20°S around 170°W.

3.2 Effort

It is challenging to identify the specific species being targeted by longline vessels, particularly within the aggregate data received from particular fleets fishing on the high seas. To more directly relate the patterns seen in effort to the declared south Pacific albacore catch, we have evaluated fishing effort south of 10°S to approximate south Pacific albacore targeting (noting that this will include longline effort targeting swordfish) and to attempt to exclude tropical longline fishery effort.

Raised effort data for the southern WCP-CA south of 10°S were available up to 2018 (Figure 3). We note there is considerable uncertainty in 2018 effort estimates. The number of deployed hooks in 2018 within the WCP-CA south of 10°S was 12% lower than in 2017, and 22% lower than the high seen in 2012. The estimated longline effort in this region was estimated at 247 million hooks in 2018.

Effort data from VMS provides the most 'up to date' information available, given that logsheet effort for recent years may be incomplete, and hence the uncertainty in raised annual logsheet effort estimates for 2018 is high. VMS data analysed represents days-at-sea and includes fishing and transit activity, but excludes data close to port. As for the aggregate longline data, it does not allow information on the species targeted by vessels during fishing to be assessed. In turn, some trends over time may be influenced by increased coverage of VMS across longline vessels in the south Pacific, while data for certain EEZs may be incomplete or non-existent. A list of notes on the VMS data and a table of effort by high seas area are provided in Appendix 2. To overcome the absence of VMS data for some EEZs, data were augmented with logsheet information in these locations.

[1] Note that these annual catch estimate-based tables approximate the southern area of the WCP-CA as far as possible, given that some EEZs and high seas area span the equator.

Effort south of 10°S (VMS days-at-sea, augmented by logsheet days) both within EEZs and on the high seas generally increased through to 2013 but has declined slightly since then. Around 25% of the VMS days occurred within the high seas in 2018 (Table 3). Overall effort has increased in the EEZs and decreased on the high seas (Table 3). Of the VMS days in 2018 within the international waters 21% was in region I5 east of the Line Islands and French Polynesia, and 53% from region north and northeast of New Zealand (I7) (Figure 4; Figure A2-1; Table A2-1).

3.3 Catch per unit effort

Figure 5 presents nominal longline south Pacific albacore CPUE series by key fleets south of 10° south (note, the values presented in Brouwer et al. (2019) are south of the equator and will therefore differ from those presented here), some key changes in CPUE in the recent periods were:

- Japanese longline CPUE in 2018 (11.3 Kg per 100 hooks) was a 26% decrease on 2017, the 2013-2017 average was 14.48 Kg per 100 hooks;
- Fiji longline CPUE in 2018 (18.56 Kg per 100 hooks) was a 11% decrease on 2017, the 2013-2017 average was 18.03 Kg per 100 hooks;
- Chinese longline CPUE in 2018 (27.7 Kg per 100 hooks) was a 13% decrease on 2017, the 2013-2017 average was 24.35 Kg per 100 hooks;
- Chinese Taipei longline CPUE in 2018 (30.28 Kg per 100 hooks) was a 10% increase on 2017, the 2013-2017 average was 24.77 Kg per 100 hooks.

Examining longer-term trends, the average nominal CPUE for the Fiji fleet was 23.67 Kg per 100 hooks between 1991 and 2000, while that for the Chinese Taipei fleet was 34.85 Kg per 100 hooks. In contrast, the Japanese fleet averaged 17.95 Kg per 100 hooks over that time.

The relative spatial pattern of CPUE is presented in Figure 6 for two time periods, and for 2018. In the period 1950-2000, catch rates were relatively high across much of the southern WCP-CA, in particular within high seas areas and the EEZs of New Caledonia, Vanuatu and Tonga. Catch rates in the recent period (2001-2018) are generally lower across the region. It is notable that increases in effort within particular 5°x5° squares are generally matched by declines in CPUE. The CPUE in the high seas east of New Zealand was high in 2018.

Figure 7 presents nominal south Pacific albacore CPUE series for two troll fleets. The CPUE of the US fleet generally declined over the period 1987 to 2006, with catch rates in the most recent years of activity being comparable to that in the mid-2000s. By comparison, the nominal CPUE of the New Zealand fleet has generally been lower, but relatively stable.

4 Transshipment information

High seas transshipment data are available from July 2010 to March 2019; no in-port or in-zone transshipment data are presented. Fluctuations in reported transshipments may reflect logistical/operational factors rather than fishing activity. It is noted that historically south Pacific albacore would have been offloaded directly to canneries (e.g. Pago Pago, American Samoa, or Levuka, Fiji) rather than being transshipped on the high seas. There is a notable peak in transshipment activity in September of each year while Vanuatu has had the highest transhipment volumes in the past, and the highest peak in the time series was in October 2017 (4,186 mt) (Figure 8), of which 2,403 mt was by China and 1,122 mt Vanuatu. Further transshipment information by flag and month is presented in Appendix 3. It should be noted that transshipment levels are unlikely to be fully reported for the most recent 18 months. Transshipment data for 2018 to 2019 should, therefore, be considered preliminary and subject to change.

5 Albacore stock status

The most recent south Pacific albacore stock assessment was conducted in 2018 (Tremblay-Boyer et al., 2018) and used data up until the end of 2016. SC14 provided advice to the Commission based upon the the structural uncertainty grid that was used to characterize uncertainty in the assessment. This included

different levels of natural mortality, stock recruitment relationship steepness, and weighting of the input length data. Estimates are presented in Table 5, and the Majuro plot in Figure 9.

As noted in previous papers (e.g. Harley and Williams 2013), it is difficult to correctly interpret the stock status-related implications of trends in any indicators in isolation of other data sets and a population dynamics model. To examine the potential consequences of recent fishing levels relative to the agreed biomass limit reference point for south Pacific albacore (20% $SB_{recent}/SB_{F=0}$), stochastic 20-year effort-based projections were performed under different assumptions of population dynamics (defined by 72 stock assessment runs from the 2018 Multifan-CL stock assessment, as selected by SC14 to present key uncertainties within SC14 advice), and future conditions (variability in future recruitment around the stock-recruitment relationship), consistent with the recommendations on inclusion of uncertainty within projections from WCPFC-SC9 and in Berger et al. (2013).

There had been small reductions in southern longline catch in 2018 compared to 2017 (Figure 3). We therefore update the status quo projection assuming future southern longline and troll fishery catch would continue into the future at levels equal to those seen in 2018 (based on the information available to SPC as at 6^{th} June 2019). Potential future adult (spawning) biomass levels relative to unfished levels were examined, and the probability that the south Pacific albacore stock may fall below the biomass Limit Reference Point (SB_{LRP}) was calculated (Figure 10).

Across the 72 stock assessment models used within the analysis, the average stock status in 2016 (the last year of the assessment) was $SB_{current}/SB_{F=0} = 0.52$, below the interim target reference point ($SB_{recent}/SB_{F=0}$ =0.56) established by the WCPFC in 2018 (WCPFC, 2018). If 2018 catch levels continue into the future, however, the stock is predicted to continue to decline on average, falling to $SB/SB_{F=0} = 0.39$ in 2035, this is a slight improvement on previous estimates. The main difference from previous reports is that, as provisional effort in 2018 was lower than levels seen in 2013 and 2014 (Figure 3). When compared to the biomass Limit Reference Point (SB_{LRP}) the risk of $SB_{2035}/SB_{F=0} < SB_{LRP}$ is 23%. Overall, vulnerable biomass (biomass vulnerable to longline fisheries; a CPUE proxy) is estimated to decrease by 36% relative to 2013 levels (a year where some CCMs considered the longline fishery to have an adequate catch rate to meet economic fishery objectives) (SPC-OFP, 2018).

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Tables

Table 1: Annual southern WCP-CA albacore longline catch estimates (excluding archipelagic waters) by EEZ and High Seas, for the most recent 10 years. Note: Available operational and aggregate logsheet data raised to annual catch estimates. EEZ are approximate 200-mile boundaries; High seas is the high seas in the WCPFC Convention Area, south of the equator. Allocation of flag catch to EEZ is approximate due to the lack of operational logsheet data in some cases.

EEZ	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
American Samoa	4,667	2,830	3,188	2,833	1,782	2,410	1,764	1,376	1,760	1,511	1,380	1,427
Australia	1,867	1,256	1,471	706	627	655	708	656	911	1,007	803	732
Cook Islands	2,999	2,467	4,643	4,861	5,584	10,475	5,989	4,484	4,556	3,178	3,328	3,804
Fiji	3,998	4,520	5,609	5,744	4,156	4,275	3,642	3,927	5,837	4,933	5,874	5,633
High seas	16,276	23,030	30,260	36,870	22,922	29,567	29,371	20,298	20,869	16,748	34,675	28,654
Jarvis (USA)	0	0	0	0	0	0	0	0	0	0	0	0
Kiribati	675	360	1,125	1,272	550	1,240	822	1,253	2,588	4,760	332	69
Matthew and Hunter	6	2	24	15	7	10	0	0	2	1	5	1
New Caledonia	1,312	1,484	1,611	1,923	1,732	1,700	1,712	1,624	1,569	1,735	1,718	1,742
Niue	216	337	241	196	0	0	362	208	206	92	13	414
New Zealand	277	382	422	460	418	266	302	311	223	233	181	239
French Polynesia	3,924	3,060	3,560	3,482	3,223	3,591	3,495	3,743	3,392	3,243	2,127	3,074
PNG	1,919	507	864	795	294	801	237	308	459	1,149	1,680	894
Solomon Islands	5,035	6,637	10,112	7,279	6,505	8,126	8,999	14,159	10,870	3,768	5,758	7,362
Tokelau	0	144	0	0	108	254	0	8	1,446	1,962	867	536
Tonga	354	220	124	57	36	760	1,469	264	710	1,189	627	719
Tuvalu	459	159	351	674	459	918	1,478	489	427	1,545	1,418	940
Vanuatu	5,065	5,474	5,492	2,935	6,143	4,323	6,899	5,475	4,490	6,816	8,492	4,396
Wallis and Futuna	0	0	0	0	3	0	0	0	0	0	0	0
Samoa	3,113	2,342	2,816	2,529	1,415	2,037	1,640	800	840	946	2,339	1,517
Total	52,162	55,211	71,913	72,631	55,964	71,408	68,889	59,383	61,155	54,816	71,617	62,153
EEZ Percent	69	58	58	49	59	59	57	66	66	69	52	54
HS percent	31	42	42	51	41	41	43	34	34	31	48	46

Table 2: Annual southern WCP-CA albacore troll catch estimates by EEZ and High Seas, for the most recent 10 years. Note: Available operational and aggregate logsheet data raised to annual catch estimates. EEZ are approximate 200-mile boundaries (excluding archipelagic waters); High seas is the high seas in the WCPFC Convention Area, south of the equator.

EEZ	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High seas	352	151	237	307	472	235	390	466	177	166	519	475
New Zealand	1,736	3,352	1,794	1,832	2,787	2,727	2,836	1,937	2,425	1,969	1,959	2,272
Total	2,088	3,503	2,031	2,139	3,259	2,962	3,226	2,403	2,602	2,135	2,478	2,747
EEZ Percent	83	96	88	86	86	92	88	81	93	92	79	83
HS percent	17	4	12	14	14	8	12	19	7	8	21	17

Table 3: Total VMS days-at-sea (augmented by logsheet information) by year and geographic area in the WCP-CA south of 10°S.

	2012	2013	2014	2015	2016	2017	2018
EEZ	77,354	79,776	66,705	67,744	73,596	74,235	70,467
High seas	23,178	31,795	27,197	23,540	21,014	26,278	23,289
Total	100,532	111,571	93,902	91,284	94,610	100,513	93,756
Percent EEZ	77	72	71	74	78	74	75
Percent High seas	23	28	29	26	22	26	25

Table 4: Annual total and monthly average transshipment in mt (July 2010 to April 2019).

Year	Annual total	Monthly average
2010	4,091	682
2011	9,454	788
2012	5,487	457
2013	9,321	777
2014	9,583	799
2015	9,943	829
2016	18,597	1,550
2017	18,193	1,516
2018	23,168	1,931
2019	4,830	403

Table 5: Estimates of reference points and stock status from the last (2018) south Pacific albacore tuna stock assessment (southern WCPFC region only), based upon 72 model runs used to capture uncertainty (10^{th} percentile, median and 90^{th} percentile) recent refers to 2013-2016 (Tremblay-Boyer et al. 2018).

Management quantity	10^{th} percentile	Grid median	90^{th} percentile
MSY (mt)	70,856	98,080	130,220
$SB_{latest}/SB_{F=0}$	0.37	0.52	0.69
$SB_{recent}/SB_{F=0}$	0.37	0.52	0.63
SB_{recent}/SB_{MSY}	1.96	3.3	6.56
SB_{MSY}	39,872	68,650	100,773
$SB_{F=0}$	407,792	462,633	534,040
F_{recent}/F_{MSY}	0.08	0.2	0.41

Figures

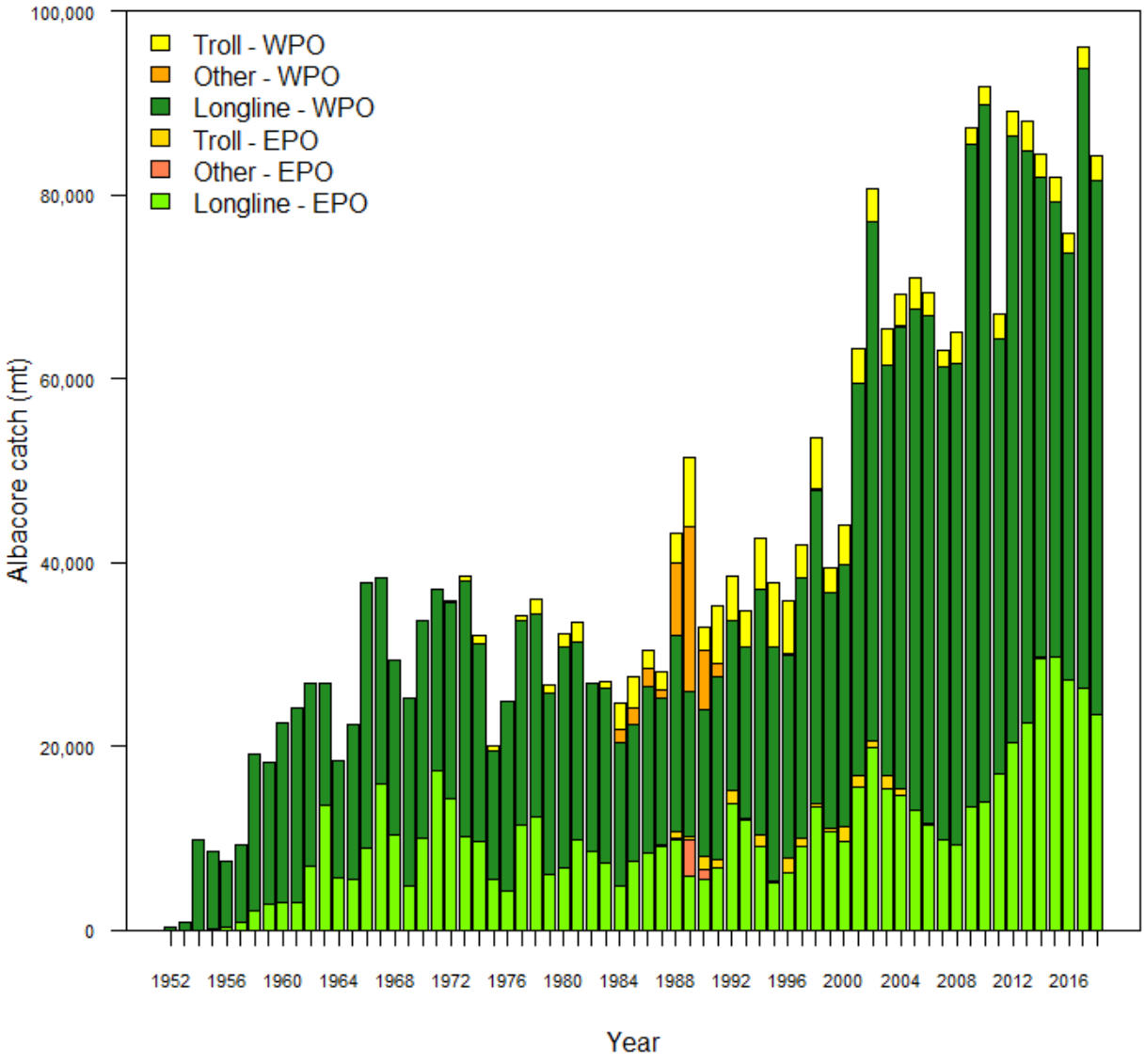

Figure 1: South Pacific albacore catch by gear (total south Pacific Ocean, including archipelagic waters).

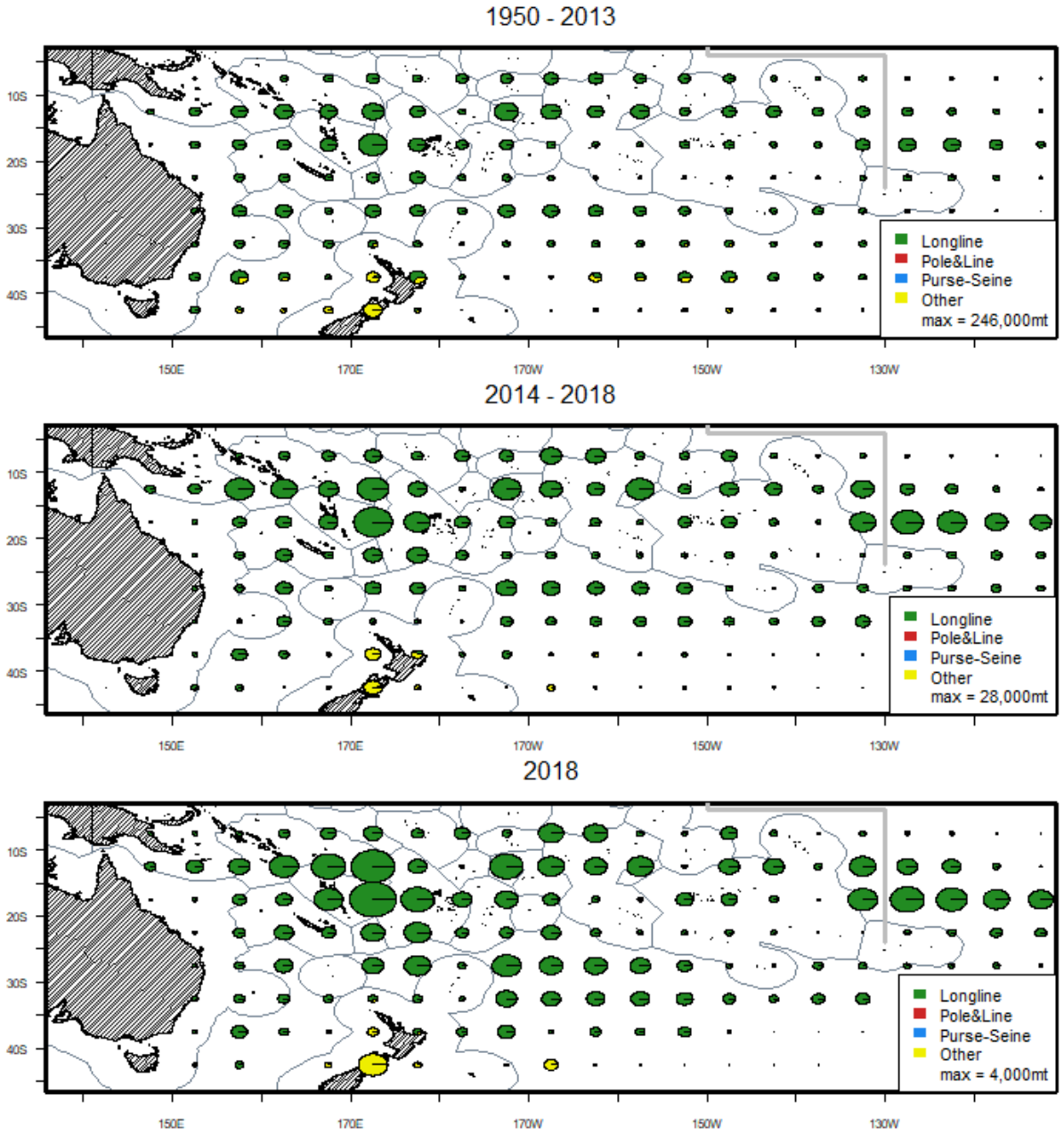

Figure 2: Albacore tuna catch distribution by gear type and 5x5 degree region in the south Pacific ocean for the period 1950-2013 (top), 2014 -2018 (middle) and 2018 (bottom). Circle size represents total catch volume with maximum circle size presented in the legends.

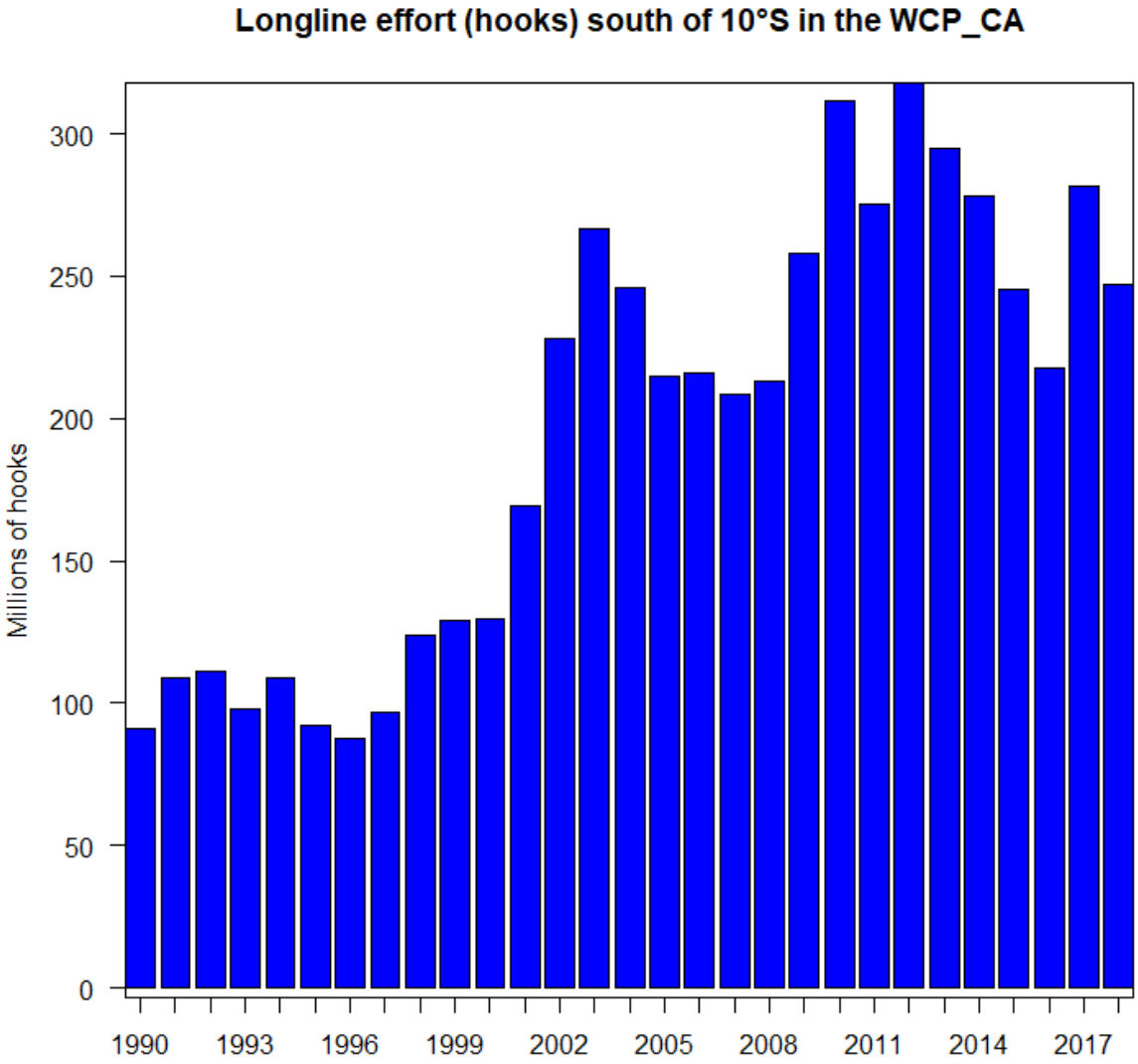

Figure 3: Temporal trends in effort (millions of hooks) in the southern longline fishery (WCP-CA south of 10°S).

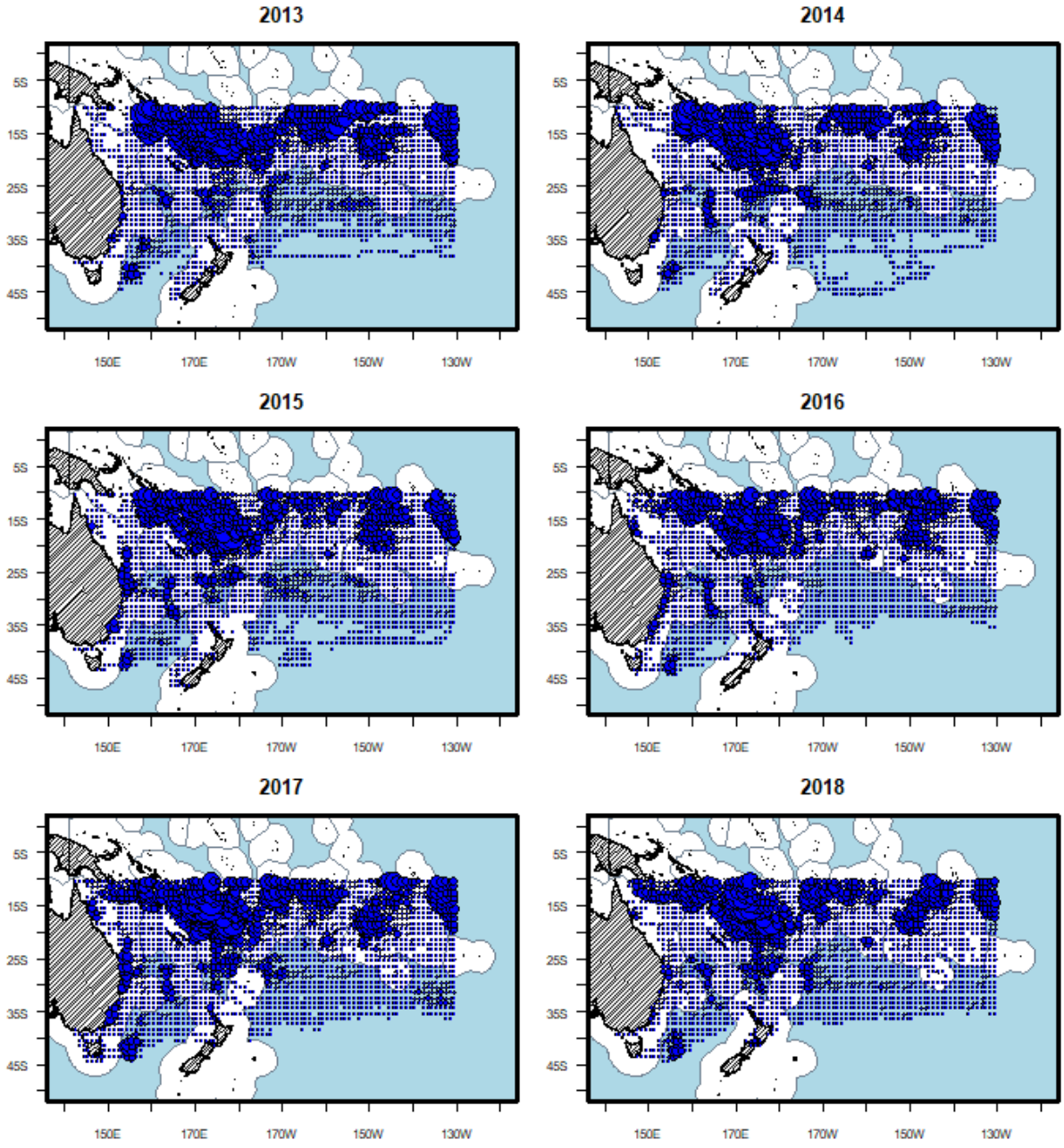

Figure 4: Longline VMS days-at-sea (augmented by logsheets) within the southern WCP-CA at 1°x1° south of 10°S. Maximum circle size = 1,190 days.

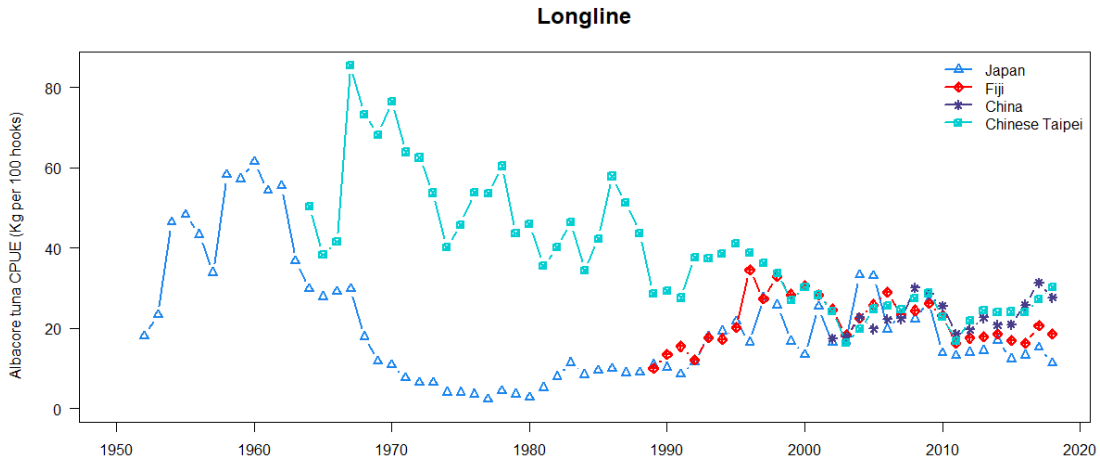

Figure 5: Trends in the nominal CPUE (Kg per 100 hooks) over time for key fleets in the southern WCP-CA south of 10°S.

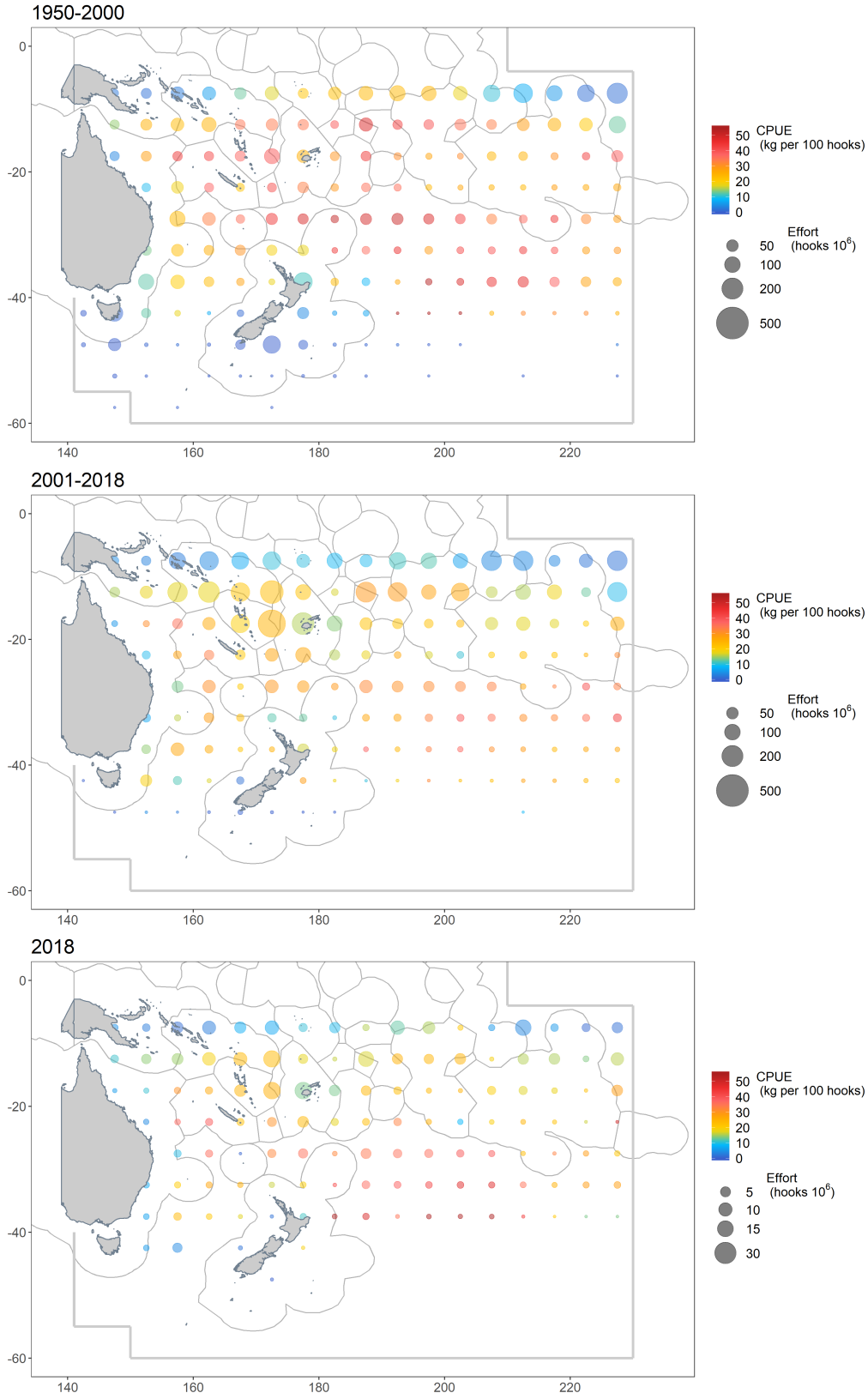

Figure 6: Albacore tuna longline CPUE distribution for the period 1950-2000 (top), 2001-2017 (middle) and 2018 (bottom). CPUE (kg/100 hooks) for a given 5°x5° square is indicated by the colour of the circle, while the relative size of the circle give an indication of the underlying effort over the period (millions of hooks). Note the change in scales between plots.

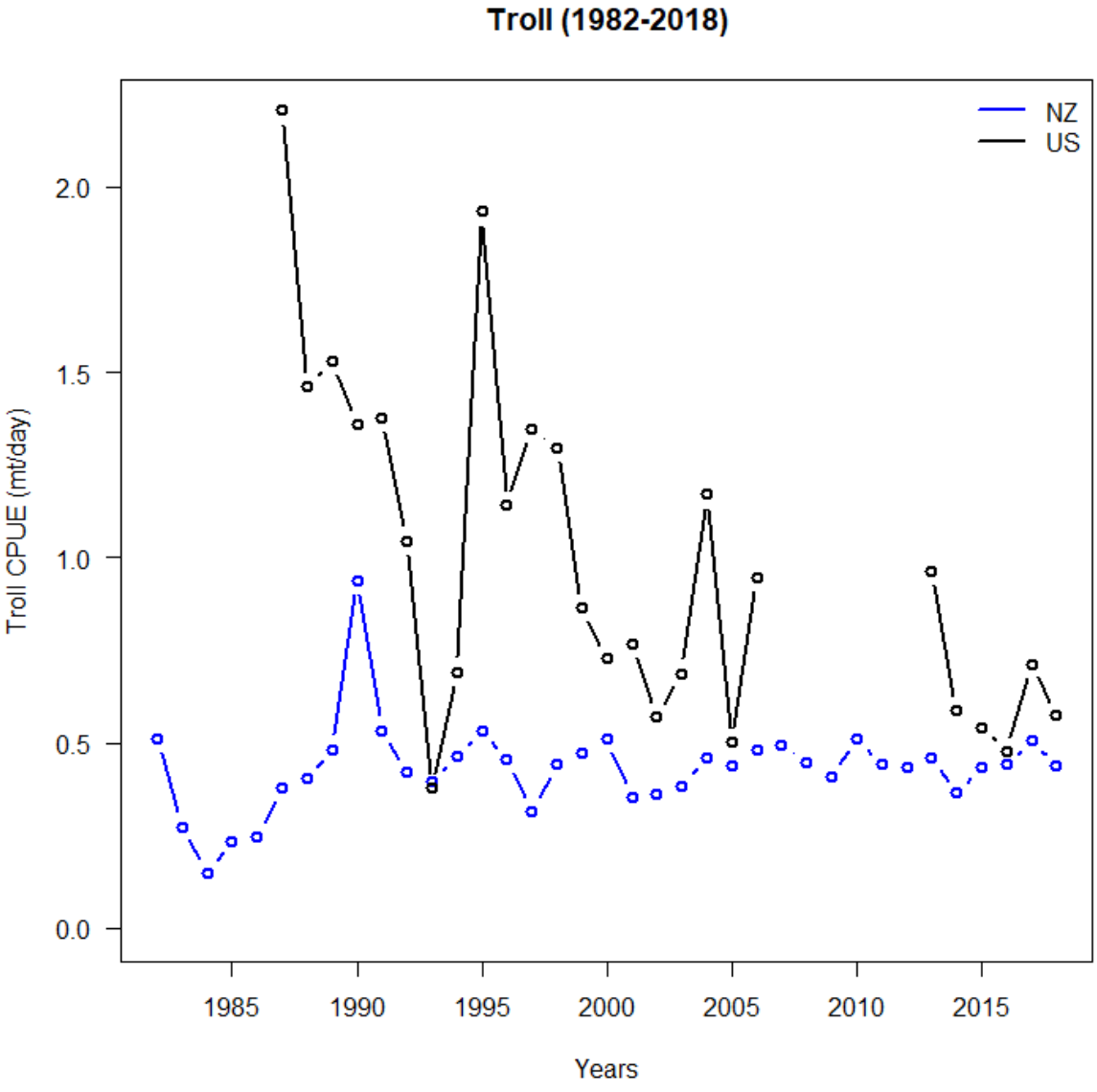

Figure 7: Trends in troll CPUE (albacore mt/day) over time for two troll fleets.

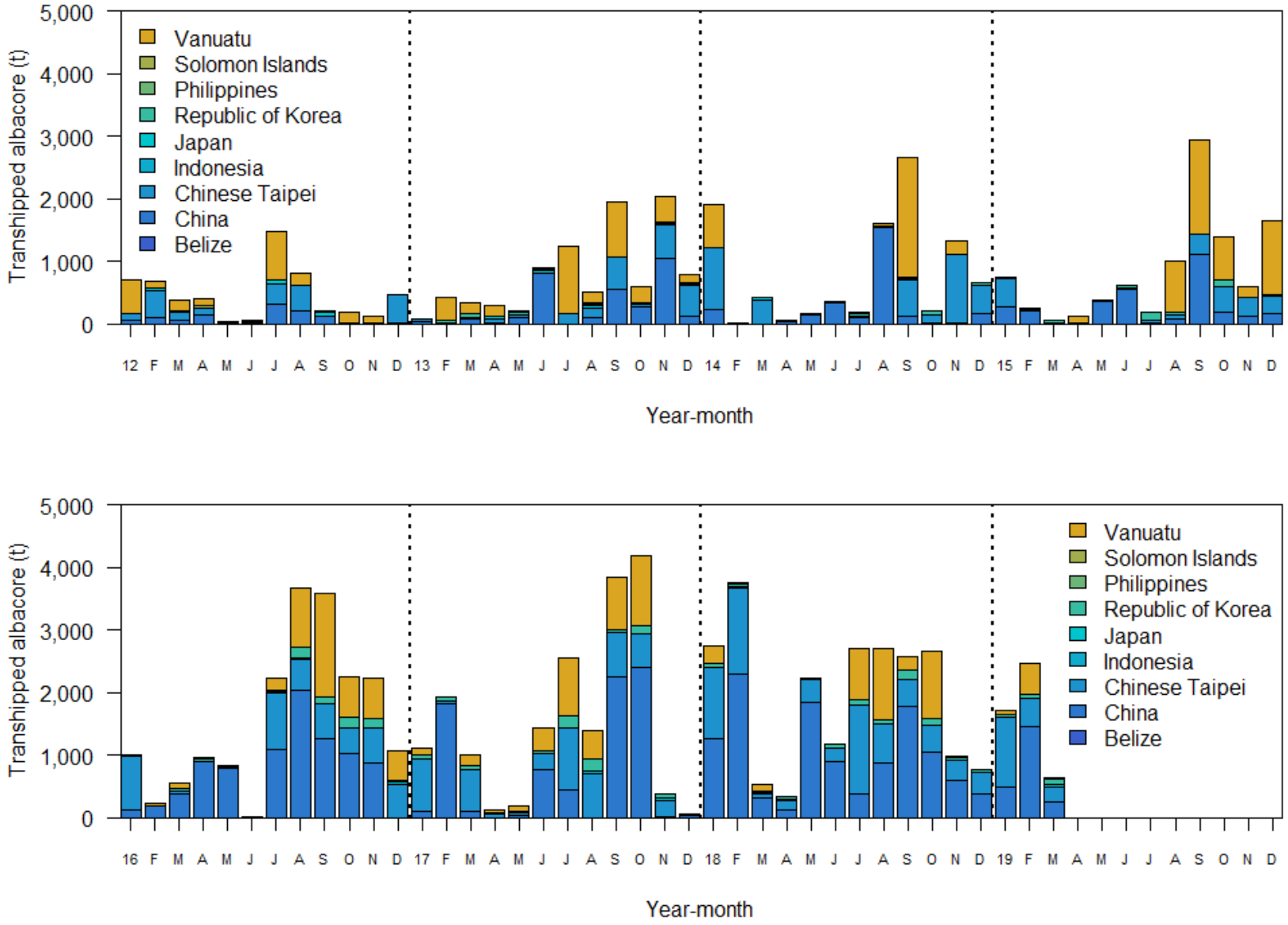

Figure 8: Reported transshipment (mt) by flag and month for 2012 to 2015 (top) and 2016 to 2019 - bottom). Source: WCPFC Transshipment Events Database (7 June 2019).

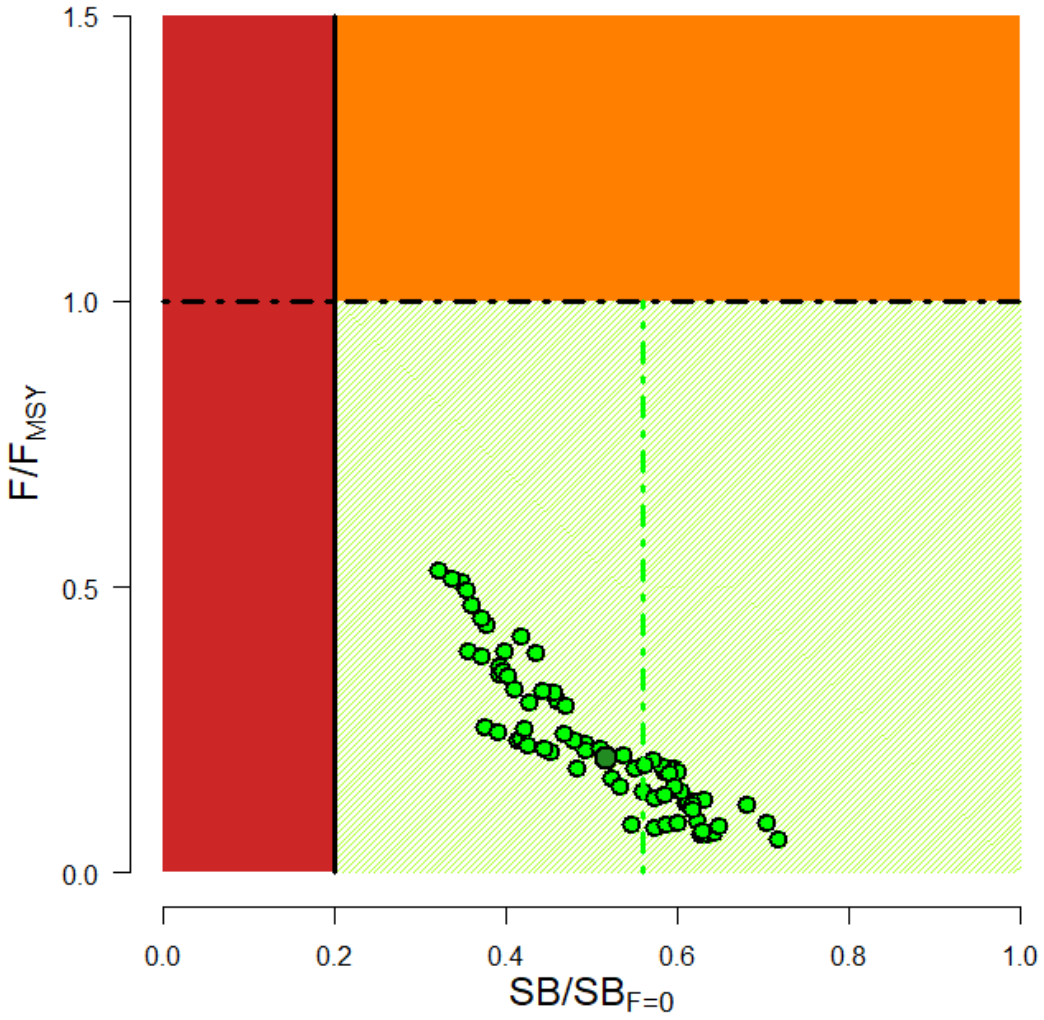

Figure 9: Assessed South Pacific albacore stock status relative to $SB_{F=0}$ (x-axis) and F_{MSY} (y-axis). The red zone represents spawning potential levels lower than the agreed LRP which is marked with the solid black line ($0.2SB_{F=0}$). The orange region is for fishing mortality greater than F_{MSY} ($F=F_{MSY}$; marked with the black dashed line). The green point is the stock status in the terminal year (2016) for the diagnostic case run and the lightgreen points indicate the stock status from other runs in the structural uncertainty grid. The green dashed line represents the WCPFC agreed target reference point ($SB/SB_{F=0} = 0.56$)

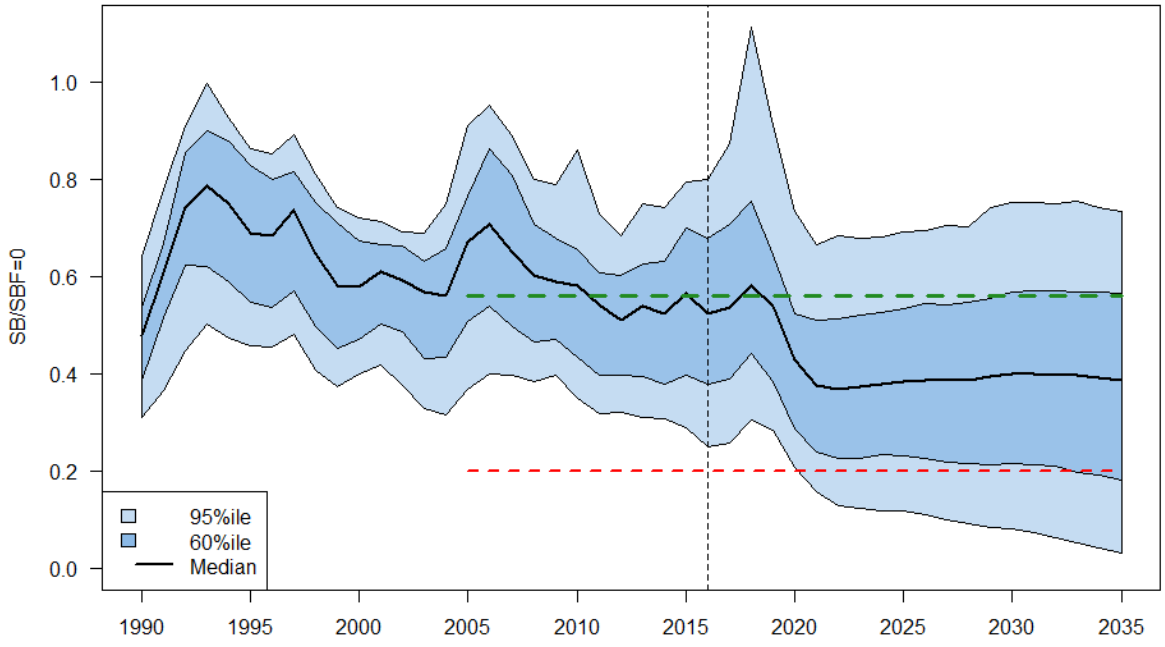

Figure 10: Stochastic projections of adult stock status under 2018 longline and troll effort levels. The limit reference point (20% $SB_{F=0}$) is indicated by horizontal dashed red line and the target reference point (56% $SB_{F=0}$) is indicated by horizontal dashed green line. Note: uncertainty after 2016 represents both structural uncertainty and stochastic recruitment (7200 simulation runs).

Appendix 1: Summaries of south Pacific albacore longline and troll catch, by flag/geographic region

Table A1-1: Annual southern WCP-CA albacore longline catch estimates by Vessel Nation, 2002 - 2018. Note: Available operational and aggregate logsheet data raised to annual catch estimates (ACE). Differences in annual totals between this table and Table 1 result from rounding errors. Southern WCP-CA approximated - some EEZ and high seas areas span the equator.

Flag	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Australia	553	490	667	743	2,591	1,925	1,277	1,523	745	653	709	773	737	949	1,101	831	752
Belize	1,467	885	353	7	0	164	7	26	10	105	32	0	0	0	0	0	0
Cook Islands	490	1,358	1,869	2,371	2,223	2,644	2,224	1,551	2,423	2,182	2,757	1,354	1,186	1,167	1,265	2,567	3,087
China	2,704	6,002	5,828	4,026	7,111	5,416	15,058	20,093	12,926	11,847	24,523	23,790	14,476	14,486	16,118	29,143	21,138
Spain (EC)	0	0	2	2	0	0	33	35	6	3	2	2	1	0	1	1	1
Fiji	7,282	6,310	10,867	11,077	11,481	6,930	9,262	12,098	8,604	9,947	9,370	8,702	7,014	6,975	7,254	9,764	8,836
FSM	0	0	0	0	0	0	0	0	1	1	161	634	401	1,224	1,923	251	1,602
Japan	2,638	3,148	4,005	4,654	3,290	2,990	2,371	2,824	2,638	2,170	2,085	1,819	1,269	855	1,558	1,825	1,159
Kiribati	0	0	0	0	0	0	0	0	66	200	349	40	7	358	508	635	340
Republic of Korea	2,850	1,394	743	2,167	790	1,080	1,143	1,208	1,027	488	892	767	689	1,012	1,383	1,134	1,063
New Caledonia	1,165	1,111	1,468	1,590	1,358	1,324	1,506	1,649	1,939	1,736	1,715	1,714	1,630	1,583	1,747	1,733	1,752
Niue	0	0	0	55	213	216	337	154	97	0	0	0	0	0	0	0	0
New Zealand	2,545	2,971	1,248	602	496	357	382	422	460	418	266	302	311	223	233	181	239
French Polynesia	4,557	3,846	2,218	2,426	2,918	3,957	3,068	3,560	3,483	3,225	3,594	3,512	3,744	3,392	3,245	2,127	3,074
PNG	82	645	1,529	2,181	1,741	1,556	437	807	791	245	693	235	308	336	77	655	92
Portugal (EC)	0	0	0	0	0	0	0	0	0	4	1	67	1	0	0	0	0
Solomon Islands	121	95	207	0	0	0	0	0	7,708	899	0	0	14,241	11,216	0	0	1,921
Senegal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tonga	1,189	611	182	283	414	390	220	124	57	34	20	13	25	29	42	26	23
Tuvalu	0	0	0	0	0	0	0	0	0	184	432	169	78	97	52	175	121
Chinese Taipei	16,452	12,680	9,200	8,384	8,206	8,683	7,053	11,105	13,004	12,956	11,620	13,387	7,367	7,949	11,858	12,454	9,317
USA	6,105	4,232	2,620	3,060	4,146	5,298	3,686	3,937	4,082	2,555	3,461	2,213	1,543	1,961	1,655	1,408	1,441
Vanuatu	5,275	3,182	6,261	7,684	7,955	6,119	4,805	7,979	10,033	4,694	6,688	7,754	3,554	6,505	3,847	4,331	5,638
Wallis and Futuna	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
Samoa	4,223	2,253	1,233	1,263	2,113	3,113	2,342	2,816	2,529	1,415	2,038	1,642	800	840	946	2,374	1,684
Total	59,698	51,213	50,500	52,575	57,046	52,162	55,211	71,911	72,629	55,964	71,408	68,889	59,382	61,157	54,813	71,615	63,280

Table A1-2: Annual southern WCP-CA albacore longline catch estimates by Vessel Nation, 2002 - 2018. Note: Available operational and aggregate logsheet data raised to annual catch estimates (ACE). Differences in annual totals between this table and Table 1 result from rounding errors. Southern WCP-CA approximated - some EEZ and high seas areas span the equator.

EEZ	Flag	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AS	US	5,334	3,204	2,019	2,880	4,078	4,667	2,830	3,188	2,833	1,782	2,410	1,764	1,376	1,760	1,511	1,380	1,427
AU	AU	505	391	587	619	2,526	1,867	1,256	1,471	706	627	655	708	656	911	1,006	803	732
CK	BZ	0	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CK	490	1,344	1,866	2,276	1,993	2,385	1,918	1,357	2,229	2,178	2,726	1,223	1,073	1,039	1,200	2,385	731
	CN	0	0	0	0	0	0	0	0	0	148	2,970	2,223	3,186	2,240	1,418	687	1,112
	FJ	0	0	0	0	0	0	0	0	139	395	329	80	0	0	0	0	0
	FM	0	0	0	0	0	0	0	0	0	0	134	573	174	1,199	556	248	1,919
	KI	0	0	0	0	0	0	0	0	0	0	244	29	0	0	0	0	0
	KR	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	4
	PF	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TW	11	12	0	0	0	311	64	972	192	163	311	0	0	0	0	6	38
	US	617	420	297	16	0	304	485	590	975	581	653	271	41	75	0	0	0
	VU	0	15	9	0	0	0	0	1,723	1,326	2,119	3,108	1,590	10	3	3	2	0
	WS	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FJ	CK	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
	CN	77	63	151	151	131	400	135	375	152	295	430	302	202	639	926	214	16
	FJ	5,528	3,755	5,855	5,439	5,334	3,512	4,376	5,228	5,580	3,757	3,844	3,259	3,725	5,190	4,005	5,658	5,615
	KR	0	0	0	0	0	0	0	0	11	69	0	38	0	0	2	0	0
	NZ	0	0	0	0	0	80	0	0	0	0	0	0	0	0	0	0	0
	TV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	TW	374	116	36	2	2	6	7	6	1	5	0	3	1	1	0	0	2
	VU	304	119	33	1	5	0	2	0	1	30	1	41	0	7	0	1	0
HS	AU	48	99	80	124	65	58	21	52	39	26	54	65	81	38	95	28	20
	BZ	1,467	805	2	7	0	19	0	2	0	0	0	0	0	0	0	0	0
	CK	0	14	3	5	75	156	180	31	50	4	23	28	0	1	7	98	309
	CN	2,494	5,588	5,271	2,465	4,480	2,857	12,409	14,932	11,460	7,763	16,244	12,889	5,888	5,832	2,058	17,835	12,907
	ES	0	0	2	2	0	0	33	35	6	3	2	2	1	0	1	1	1
	FJ	709	1,294	2,160	2,210	2,012	1,042	1,337	2,133	1,357	2,480	2,466	1,885	1,781	1,078	1,139	1,480	1,554
	FM	0	0	0	0	0	0	0	0	1	1	26	61	227	25	1,367	3	4
	JP	2,466	2,909	3,978	4,533	1,909	1,690	1,382	1,563	907	1,645	1,127	1,248	1,207	644	559	683	364
	KI	0	0	0	0	0	0	0	0	0	193	16	3	1	218	292	242	285
	KR	1,837	1,095	444	1,787	307	408	410	521	421	226	427	425	149	257	462	632	521
	NC	4	23	94	10	8	12	22	38	16	4	14	2	6	12	12	14	10
	NU	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
	NZ	23	35	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PF	2	19	7	134	72	33	8	0	1	2	3	17	1	0	2	0	0
	PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	152	0
	PT	0	0	0	0	0	0	0	0	0	4	1	67	1	0	0	0	0
	SB	0	0	0	0	0	0	0	0	2,498	74	0	0	1,058	485	0	0	18
	TO	344	293	3	27	9	36	0	0	0	0	0	0	1	0	0	1	0

Table A1-2: *(continued)*

EEZ	Flag	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
	TV	0	0	0	0	0	0	0	0	0	12	16	12	1	1	1	62	16
	TW	14,721	11,627	7,105	5,660	4,418	5,180	3,742	5,525	11,862	8,607	6,531	8,880	6,591	7,057	8,657	9,817	7,604
	US	155	555	304	164	68	327	259	159	275	192	397	178	126	126	144	28	15
	VU	4,058	1,560	4,778	5,866	5,166	4,455	3,226	5,268	7,976	1,685	2,219	3,605	3,178	5,095	1,952	3,564	4,937
	WS	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	35	89
KI	BZ	0	0	351	0	0	0	0	0	0	0	32	0	0	0	0	0	0
	CN	0	48	9	0	0	0	1	157	398	208	292	221	308	1,355	3,329	182	3
	FJ	0	0	0	0	0	0	0	0	0	16	41	29	176	152	149	6	0
	FM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	JP	43	40	27	11	2	0	9	38	19	13	45	8	6	0	0	0	0
	KI	0	0	0	0	0	0	0	0	66	7	46	3	1	0	107	98	55
	KR	692	262	234	134	131	189	140	261	358	99	335	186	349	612	410	11	9
	TV	0	0	0	0	0	0	0	0	0	3	48	0	0	0	0	0	0
	TW	23	94	116	28	14	263	98	266	48	130	327	350	263	252	668	33	3
	US	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VU	0	230	96	68	153	223	112	403	382	73	74	24	150	217	96	2	0
MA	FJ	0	17	4	9	2	4	2	10	14	7	8	0	0	1	1	0	1
	NC	1	1	7	0	2	0	0	0	0	0	1	0	0	1	0	1	0
	VU	0	1	0	2	0	2	0	14	1	0	0	0	0	0	0	4	0
NC	NC	1,160	1,087	1,367	1,579	1,348	1,312	1,484	1,611	1,923	1,732	1,700	1,712	1,624	1,569	1,735	1,718	1,742
NU	CK	0	0	0	0	47	0	0	87	99	0	0	85	33	0	0	0	412
	FJ	0	0	0	0	0	0	0	0	0	0	0	277	157	203	92	13	0
	NU	0	0	0	55	211	216	337	154	97	0	0	0	0	0	0	0	0
	PF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TW	34	0	0	0	0	0	0	0	0	0	0	0	18	3	0	0	2
NZ	NZ	2,522	2,936	1,246	602	496	277	382	422	460	418	266	302	311	223	233	181	239
PF	KR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PF	4,555	3,813	2,211	2,259	2,846	3,924	3,060	3,560	3,482	3,223	3,591	3,495	3,743	3,392	3,243	2,127	3,074
PG	JP	0	0	0	0	0	0	0	0	0	0	0	0	0	105	998	1,142	794
	PG	82	645	1,529	2,181	1,741	1,556	437	807	791	245	693	235	308	336	77	503	96
	TW	0	0	0	0	49	363	71	57	4	49	108	2	0	19	74	35	5
SB	BZ	0	10	0	0	0	145	7	24	10	105	0	0	0	0	0	0	0
	CK	0	0	0	0	45	0	12	16	0	0	5	18	79	0	0	0	0
	CN	17	102	157	426	1,035	896	1,315	2,400	68	976	1,734	2,898	238	0	1,861	3,464	3,724
	FJ	162	59	401	242	831	554	1,270	2,707	91	1,123	1,306	1,773	131	0	592	167	371
	JP	128	196	0	110	1,372	1,300	980	1,223	1,471	506	855	563	55	106	0	0	1
	KI	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0
	KR	76	16	24	83	324	313	463	299	33	43	111	96	57	34	2	39	11
	PG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	121	95	207	0	0	0	0	0	5,210	825	0	0	13,183	10,731	0	0	1,903

Table A1-2: ***(continued)***

EEZ	Flag	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
	TV	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0
	TW	274	196	906	1,394	1,831	1,443	2,032	3,118	378	2,727	3,240	2,424	278	0	1,314	1,970	1,111
	VU	307	305	756	487	1,039	385	558	325	17	187	875	1,222	138	0	0	118	239
TK	CK	0	0	0	0	0	0	33	0	0	0	0	0	0	127	58	84	183
	FJ	0	0	0	0	0	0	0	0	0	75	93	0	2	1	0	0	0
	KI	0	0	0	0	0	0	0	0	0	0	26	0	5	140	108	296	0
	TV	0	0	0	0	0	0	0	0	0	16	134	0	0	0	0	0	0
	TW	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0
	US	0	0	0	0	0	0	111	0	0	0	0	0	0	0	0	0	0
	VU	0	0	0	0	0	0	0	0	0	0	0	0	0	1,177	1,795	487	354
TO	CN	0	0	0	0	0	0	0	0	0	0	11	155	106	61	1	7	12
	FJ	0	0	27	0	0	0	0	0	0	0	29	123	0	3	1	0	134
	TO	845	318	179	256	405	354	220	124	57	34	20	13	24	29	42	25	21
	TW	0	0	0	0	0	0	0	0	0	2	700	1,179	133	618	1,145	595	552
TV	CK	0	0	0	0	0	49	20	56	35	0	3	0	0	0	0	0	0
	CN	0	0	0	0	0	1	0	0	0	77	0	0	128	149	279	474	138
	FJ	0	31	180	119	1	152	15	124	182	160	539	191	148	69	707	380	145
	JP	2	3	0	0	0	0	0	0	241	5	57	0	0	0	0	0	0
	KI	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0
	KR	184	18	41	162	6	171	123	127	204	51	19	22	135	108	508	451	552
	TV	0	0	0	0	0	0	0	0	0	142	234	157	77	95	51	112	105
	TW	0	0	4	15	0	0	1	0	12	3	0	88	1	0	0	0	0
	US	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	VU	0	0	0	0	0	86	0	45	1	22	48	1,021	0	6	0	1	0
VU	BZ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CK	0	0	0	85	63	54	62	3	10	0	0	0	0	0	0	0	0
	CN	115	202	241	985	1,465	1,262	1,197	2,230	847	2,378	2,843	5,101	4,421	4,211	6,246	6,280	3,262
	FJ	883	1,155	2,240	3,057	3,300	1,666	2,263	1,896	1,241	1,932	714	1,085	893	279	569	2,060	1,013
	JP	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0
	KR	62	4	0	0	21	0	7	0	0	0	0	0	0	0	0	0	0
	TW	1,015	635	1,034	1,286	1,892	1,116	1,038	1,162	508	1,253	403	462	83	1	0	0	0
	VU	605	951	588	1,261	1,592	966	907	202	329	579	363	251	78	0	0	152	121
WF	PF	0	0	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0
	WF	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
WS	WS	4,205	2,253	1,233	1,263	2,113	3,113	2,342	2,816	2,529	1,415	2,037	1,640	800	840	946	2,339	1,517

Table A1-3: Annual south Pacific albacore troll catch estimates by flag, 2000 - 2018.

Year	Canada	Cook Islands	New Zealand	USA	Total
2000	351	335	3,336	2,433	6,455
2001	206	202	2,736	2,107	5,251
2002	144	166	3,012	1,337	4,659
2003	0	688	3,721	1,574	5,983
2004	63	376	3,212	960	4,611
2005	72	89	2,855	576	3,592
2006	135	121	2,043	587	2,886
2007	27	53	1,736	272	2,088
2008	0	0	3,352	151	3,503
2009	0	0	1,794	237	2,031
2010	0	0	1,832	307	2,139
2011	1	0	2,787	471	3,259
2012	0	0	2,727	235	2,962
2013	0	0	2,836	390	3,226
2014	0	21	1,937	445	2,403
2015	0	21	2,425	156	2,602
2016	0	21	1,969	145	2,135
2017	55	0	1,959	464	2,478
2018	0	0	2,272	475	2,747

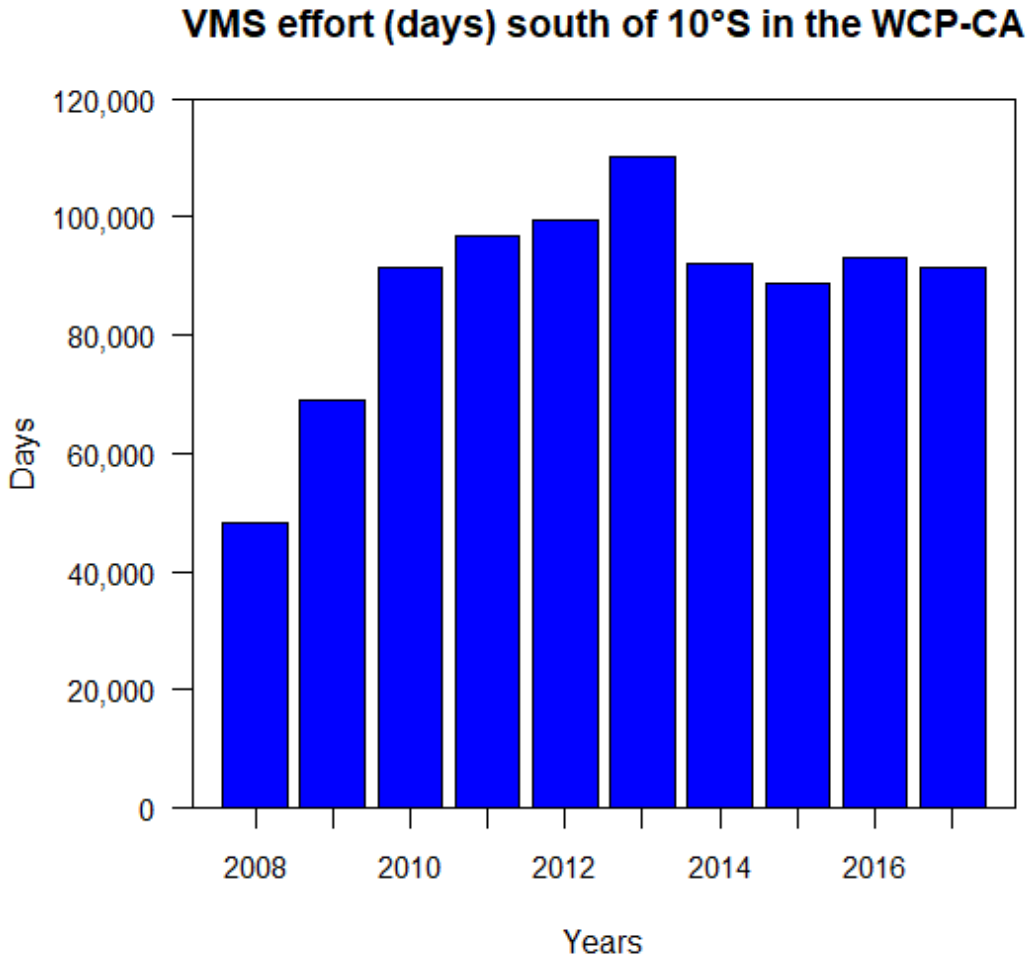

Figure A1-2: Longline VMS days-at-sea (augmented by logsheets for French Polynesia) within the southern WCP-CA at 1°x1°, south of 10°S.

Appendix 2: Notes on the time series of longline VMS information in the South Pacific

The analysis summarises the longline VMS information available to SPC through the FFA and WCPFC over the period 2010-2018, by geographic region of the southern WCPFC-CA. Effort in that database corresponds to days-at-sea (i.e. includes fishing and transiting). Please note:

- This analysis uses annual VMS data available up to and including 2^{nd} December 2019;
- Effort represents total longline effort, not just that targeted at South Pacific albacore;
- VMS effort presented for EEZs includes that in archipelagic waters;
- Effort data for some countries (e.g. those with domestic longliners not on FFA VMS) will not be included within EEZ patterns;
- Effort for some countries (e.g. New Caledonia; French Polynesia) may be incomplete;
- Some trends may result from improved VMS coverage of vessels over time;
- EEZ effort excludes the Indonesian EEZ.

Table A2-1: Total VMS days-at-sea by year in International Waters, south of 10^{o}S (Figure A2-1).

International waters code	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
H4	0	0	0	0	0	0	0	0	0	0	0
I2	225	192	169	185	236	293	244	371	639	593	598
I5	533	1,349	5,420	4,531	5,049	10,775	8,094	7,001	7,583	8,168	4,858
I7	5,946	7,687	10,650	12,628	10,465	13,459	13,111	11,511	8,298	10,855	12,349
I8	2,127	1,763	2,778	3,358	2,368	2,915	2,758	3,075	3,434	5,188	4,587
I9	290	1,161	1,764	2,612	5,060	4,352	2,989	1,582	1,060	1,473	897
Total	9,121	12,152	20,781	23,314	23,178	31,794	27,196	23,540	21,014	26,277	23,289

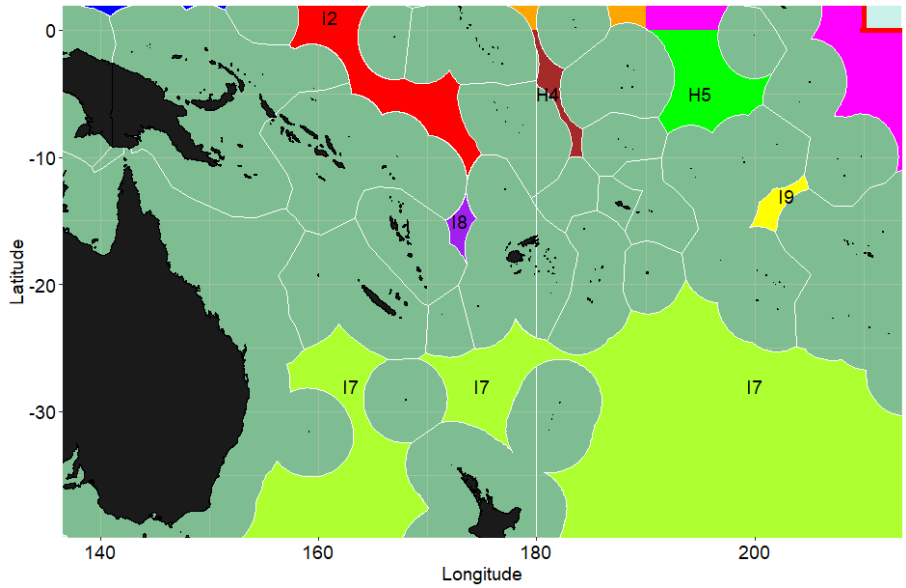

Figure A2-1: Map of International Waters in the southerly WCPFC-CA.

Table A2-2: Map key (Figure A2-1).

Code	Area	Color
H4	International waters between Tuvalu, Phoenix and Tokelau	Brown
H5	International waters between Phoenix and Line groups	Bright green
I2	High seas pocket between FSM, Solomon Islands, Kiribati, RMI, Nauru and Tuvalu	Red
I5	International waters between Phoenix and Line groups and east of Line group	Pink
I7	High seas area to the east of Australia and New Zealand	Light green
I8	High seas pocket between Fiji, Vanuatu and the Solomon Islands	Purple
I9	High seas pocket between the Cook Islands and French Polynesia	Yellow

Appendix 3: High Seas transshipment data for albacore based on CMM 2009-06 reporting

The tables below show high Seas transshipment data for albacore, by flag, year and month from July 2010 - March 2019.
Notes:

1. The requirement to report (within 15 days of transshipment) high seas transshipment activities commenced in July 2010.
2. The data refer to high seas transshipments inside and outside the WCPFC Convention Area, and it should be noted that a proportion of the catch will likely have been caught within EEZs in the Convention Area and the IATTC Convention area.
3. Weights are in kg.

Table A3-1: 2010.

CCM responsible for reporting for the Fishing Vessel	Jul	Aug	Sept	Oct	Nov	Dec
Belize	0	0	0	0	2,837	0
China	0	0	166,000	210,668	247,192	17,091
Chinese Taipei	0	115,000	165,552	125,298	147,809	20,582
Indonesia	0	0	0	0	44,170	869
Japan	0	900	0	53,543	35,437	30,000
Korea (Republic of)	16,984	0	22,303	41,890	0	6,389
Philippines	0	0	0	7,500	0	4,848
Solomon Islands	0	0	0	0	0	0
Vanuatu	0	1,435,000	270,600	232,293	521,630	148,835
Total	16,984	1,550,900	624,455	671,192	999,075	228,614

Table A3-2: 2011.

CCM responsible for reporting for the Fishing Vessel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Belize	2,015	0	0	36,000	0	0	710	0	0	0	0	0
China	5,073	101,989	24,854	31,588	31,987	29,524	61,905	748,608	34,656	82,198	63,458	28,013
Indonesia	0	0	0	794	8,277	0	0	0	8,322	29,668	0	7,220
Japan	10,850	79,731	22,475	0	1,850	5,777	822	2,900	0	32,364	57,286	4,687
Korea (Republic of)	42,584	3,017	45,988	33,941	5,622	16,595	3,678	0	1,225	13,768	98,599	6,360
Philippines	0	0	0	400	0	500	17,303	2,284	0	10,346	0	6,723
Solomon Islands	0	0	0	0	0	0	0	0	0	0	0	0
Vanuatu	100,000	110,000	1,020,165	290,970	597	13,700	816,794	313,038	62,000	12,857	0	341,175
Total	978,878	477,595	2,012,132	408,499	100,393	259,750	1,613,952	1,532,525	452,848	276,160	540,194	801,118

Table A3-3: 2012.

CCM responsible for reporting for the Fishing Vessel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Belize	0	0	0	0	0	0	841	0	0	0	0	0
China	67,701	95,807	61,927	103,977	8,055	20,149	305,884	216,568	118,390	6,507	0	11,276
Chinese Taipei	87,183	438,492	127,178	91,510	12,089	0	326,644	406,037	0	18,305	0	457,106
Indonesia	1,894	4,820	1,900	0	0	11,505	0	0	0	0	0	4,656
Japan	0	31,016	1,774	12,999	1,575	13,449	66,858	2,597	72,544	0	3,281	0
Republic of Korea	3,777	13,163	14,234	5,454	12,710	16,829	6,312	0	0	0	4,920	0
Philippines	1,500	0	4,684	0	0	0	0	0	19,278	0	0	0
Solomon Islands	0	0	0	45,500	0	0	0	0	0	0	0	0
Vanuatu	544,933	108,000	161,242	90,280	1,657	0	764,900	185,000	0	165,000	105,000	0
Total	706,988	691,298	372,939	349,720	36,086	61,932	1,471,439	810,202	210,212	189,812	113,201	473,038

Table A3-4: 2013.

CCM responsible for reporting for the Fishing Vessel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Belize	0	0	0	0	0	0	0	0	0	0	0	0
China	42,364	7,376	84,590	24,498	90,383	805,828	0	110,513	542,675	282,996	1,048,906	127,757
Chinese Taipei	33,541	0	5,000	59,423	50,711	0	157,174	140,100	532,164	39,331	543,864	498,889
Indonesia	0	0	6,891	286	5,800	0	0	0	0	0	0	2,403
Japan	0	0	9,481	38,422	3,100	39,089	13,602	42,460	147	14,639	10,539	2,765
Republic of Korea	0	45,342	53,797	0	29,523	26,676	0	20,268	0	0	24,377	18,848
Philippines	0	0	4,959	0	7,982	0	0	15,527	0	0	2,798	0
Solomon Islands	0	0	0	0	0	0	0	0	0	0	0	0
Vanuatu	0	361,951	175,489	165,000	28,228	28,496	1,062,757	174,754	864,995	249,017	412,360	130,000
Total	75,905	414,669	340,207	287,629	215,727	900,089	1,233,533	503,622	1,939,981	585,983	2,042,844	780,662

Table A3-5: 2014.

CCM responsible for reporting for the Fishing Vessel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Belize	0	0	0	0	0	0	0	0	0	0	0	0
China	224,998	875	26	31,578	138,573	331,788	102,822	1,551,373	115,965	6,825	12,505	171,219
Chinese Taipei	985,503	636	386,115	8,688	31,399	529	0	0	576,390	129,558	1,109,509	449,172
Indonesia	0	0	0	0	0	3,728	0	0	0	0	0	0
Japan	3,626	0	27,308	0	2,000	200	20,533	0	23,693	8,005	0	0
Republic of Korea	0	22,285	0	8,844	3,393	13,958	46,724	6,004	37,687	74,214	0	37,621
Philippines	0	1,162	0	0	0	0	0	0	0	0	0	0
Solomon Islands	0	0	0	0	0	0	0	0	0	0	0	0
Vanuatu	691,021	0	2,620	0	0	12,639	17,935	49,549	1,895,708	578	205,667	0
Total	1,905,148	24,958	416,069	49,110	175,365	362,842	188,014	1,606,926	2,649,443	219,180	1,327,681	658,012

Table A3-6: 2015.

CCM responsible for reporting for the Fishing Vessel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Belize	0	0	0	0	0	0	0	0	0	0	0	0
China	273,169	215,527	3,889	16	350,861	557,865	5,512	70,724	1,102,161	181,347	122,120	168,717
Chinese Taipei	449,399	7,915	12,663	19,320	0	6,246	61,526	80,938	329,500	419,241	294,284	274,693
Indonesia	0	0	0	0	0	0	0	0	0	0	0	0
Japan	1,515	5,101	5,645	2,221	119	0	647	1,466	0	5,587	6,566	0
Republic of Korea	2,444	22,212	43,063	3,759	25,975	50,251	127,526	26,143	0	100,741	4,395	21,934
Philippines	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Islands	0	0	0	0	0	0	0	0	0	0	0	0
Vanuatu	9,294	5,049	409	90,697	4,265	4,601	0	817,041	1,508,373	687,413	160,944	1,190,359
Total	735,821	255,804	65,669	116,013	381,220	618,963	195,211	996,312	2,940,034	1,394,329	588,309	1,655,702

Table A3-7: 2016.

CCM responsible for reporting for the Fishing Vessel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Belize	0	0	0	0	0	0	0	0	0	0	0	0
China	115,400	187,463	385,696	898,315	783,017	370	1,098,679	2,046,259	1,258,269	1,028,406	869,370	0
Chinese Taipei	873,578	407	47,290	6,081	17,946	0	901,867	484,572	555,906	399,841	561,586	521,253
Indonesia	0	0	0	0	0	0	0	0	0	0	0	0
Japan	2,560	0	331	0	134	1,988	13,900	12,000	4,830	0	9,639	46,529
Republic of Korea	2,821	3,631	37,070	29,140	20,184	7,152	26,756	188,441	118,212	187,865	151,934	29,322
Philippines	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Islands	0	0	0	0	0	0	0	0	0	0	0	0
Vanuatu	9,871	28,238	71,941	20,172	352	3,084	188,895	937,255	1,654,204	642,294	635,085	469,531
Total	1,004,230	219,739	542,328	953,708	821,633	12,594	2,230,097	3,668,527	3,591,421	2,258,406	2,227,614	1,066,635

Table A3-8: 2017.

CCM responsible for reporting for the Fishing Vessel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Belize	0	0	0	0	0	0	0	0	0	0	0	0
China	91,280	1,822,209	108,552	526	28,601	771,543	453,820	1,879	2,253,152	2,403,932	10,212	38,636
Chinese Taipei	840,630	39,726	664,783	49,596	60,490	263,585	971,775	709,197	707,535	526,328	265,325	6,421
Indonesia	0	0	0	0	0	0	0	0	0	0	0	0
Japan	0	0	0	1,095	0	0	0	34,153	0	4,934	43,106	13,858
Republic of Korea	72,225	56,070	48,649	18,069	8,269	27,823	193,395	189,097	34,395	129,594	65,785	79
Philippines	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Islands	0	0	0	0	0	0	0	0	0	0	0	0
Vanuatu	101,369	13,198	178,822	57,754	80,000	370,842	932,147	461,393	837,433	1,122,039	2,641	4,945
Total	1,105,504	1,931,203	1,000,806	127,040	177,360	1,433,793	2,551,137	1,395,719	3,832,515	4,186,827	387,069	63,939

Table A3-9: 2018.

CCM responsible for reporting for the Fishing Vessel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Belize	0	0	0	0	0	0	0	0	0	0	0	0
China	1,252,107	2,304,154	317,004	118,276	1,846,264	907,129	390,208	885,532	1,768,175	1,043,146	590,837	388,821
Chinese Taipei	1,145,930	1,363,445	69,267	161,974	367,380	212,544	1,413,752	611,576	428,995	439,241	321,620	335,765
Indonesia	0	0	0	0	0	0	0	0	0	0	0	0
Japan	639	30,499	18,542	7,977	0	1,678	0	0	9,437	112	63	9,486
Republic of Korea	67,650	45,182	24,074	56,270	15,247	47,629	87,007	73,972	153,958	106,635	55,637	39,503
Philippines	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Islands	0	0	0	0	0	0	0	0	0	0	0	0
Vanuatu	270,596	4,528	107,290	1,300	0	1,201	813,700	1,136,559	212,318	1,074,314	11,643	323
Total	2,736,922	3,747,808	536,177	345,797	2,228,891	1,170,181	2,704,667	2,707,639	2,572,883	2,663,448	979,800	773,898

Table A3-10: 2019.

CCM responsible for reporting for the Fishing Vessel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Belize	0	0	0	0	0	0	0	0	0	0	0	0
China	483,118	1,465,419	251,738	0	0	0	0	0	0	0	0	0
Chinese Taipei	1,117,643	433,219	241,148	0	0	0	0	0	0	0	0	0
Indonesia	0	0	0	0	0	0	0	0	0	0	0	0
Japan	0	0	31,436	0	0	0	0	0	0	0	0	0
Republic of Korea	49,371	80,609	82,520	0	0	0	0	0	0	0	0	0
Philippines	0	0	0	0	0	0	0	0	0	0	0	0
Solomon Islands	0	0	0	0	0	0	0	0	0	0	0	0
Vanuatu	72,080	494,329	27,415	0	0	0	0	0	0	0	0	0
Total	1,722,212	2,473,576	634,257	0	0	0	0	0	0	0	0	0