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Trends in the South Pacific Albacore Longline and Troll Fisheries

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Executive summary

This paper presents a compendium of fishery indicators for South Pacific albacore tuna, as requested at previous Western and Central Pacific Fisheries Commission (WCPFC) meetings. These indicators include: total catch; catch by gear; longline effort and nominal troll and longline CPUE trends, along with their spatial patterns. Commentary includes comparisons of 2023 values to 2022 and to the average over 2018-2022. Summaries are calculated from data available as of 20 July 2024. Note that catch levels and their distribution among areas may change as more data become available. This paper complements the information provided by Hare et al. (2024) who summarise the latest trends for the main target species for the fisheries occurring in the WCPFC convention area (WCPFC-CA) and Vidal, Williams, and Ruaia (2024) who provide regional catch estimates by gear and species. The most recent (accepted) estimates of stock status (from the 2021 stock assessment for the entire south Pacific, Castillo-Jordan et al. 2021) are included. Furthermore, transshipment data are available over the period from the inception of transshipment reporting (July 2010) to December 2023. Data presented represent high seas transshipments only; they do not include in-port or in-zone transshipments.

Introduction

At the 7^{th} Technical and Compliance Committee meeting (TCC), members requested the preparation of a paper on South Pacific albacore. That request indicated the paper should contain all available data on catches and transshipments, and should highlight trends in key metrics. The paper was first prepared by the scientific services provider and the WCPFC Secretariat for WCPFC8 in March 2012. It has since been updated regularly, 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 (SPA) fishery. Depending on the context, summaries are computed for the South Pacific (all waters south of the equator), for the (predominantly) albacore target longline fishery region (Pacific waters south of 10°S), and also for Exclusive Economic Zones (EEZs) and High Seas regions (HS) within the WCPFC-Convention Area (WCPFC-CA). In addition, information on transshipment patterns is presented, as requested in previous reports (WCPFC and SPC-OFP 2013).

The analyses presented are based on data available to SPC as of 20 July 2024. The overall catch, and its distribution among spatial areas, may change as more data becomes available. This is particularly the case for the eastern Pacific Ocean (EPO), where catch estimates appear to be incomplete for 2023, and so the 2022 catches were carried through to 2023 for this report. These will be revised with further data previsions and included when this report is presented at the TCC and commision meeting. Please note that the values may include or exclude specific fleets, cover different spatial areas, or involve different data sources to summaries produced 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. The stock status information is derived from the most recent stock assessment of South Pacific albacore presented in 2021 (Castillo-Jordan et al. 2021) and will be updated to include the new assessment (Teears, Hammer, and Hampton 2024) after SC20.

Patterns of longline and troll fishing

The longline and troll fleets are the two primary groups of commercial vessels exploiting South Pacific albacore. In this section we examine trends in their catch, effort and CPUE. Catch and effort information come primarily from logsheet returns and, particularly for the high seas, from the provision of aggregate data from distant water fishing nations.

Catch

Annual catch estimates for albacore in the South Pacific (south of the equator) as a whole peaked at 94,505 mt (all gears) in 2017 (Figure 1). Catch by longliners represented 98% of the catch weight in 2023 at 86,189 mt. The 2023 longline catch was a 2% decrease from 2022. Provisional troll catch (1,192 mt) was a 68% decrease from 2022. Very small amounts of catch by 'other' gears also occurred. The annual contribution of the EPO catch south of the equator has ranged from 12–32% of the total catch over the past 10 years. No provisional estimate for the 2023 EPO share is yet available.

In comparison, the 2023 total albacore catch within the southern part of the WCPFC-CA [2] (Table 1) was 64,996 mt and the longline catch was 63,804 mt. The 2023 longline catch in the southern WCPFC-CA was a 2% decrease from 2022. High seas longline catch estimates represent 51% of the 2023 total, and have ranged from 31–54% of the total longline catch since 2010. By flag (or attributed nationality based on charter agreements), China and Chinese Taipei had the highest catch estimates of South Pacific albacore in 2023 (26,502 mt and 11,179 mt respectively), representing 59% of the total longline catch (Table 5), with much of both flag's catch being taken on the high seas (Table 6).

Four flag states reported troll catch within the WCPFC-CA during the period 2000 to 2023, namely Canada, the Cook Islands, USA and New Zealand (Table 7) with catch totaling 1,192 mt in 2023. Troll activity in

[2]Note that these annual catch estimate-based tables approximate the southern area of the WCPFC-CA as far as possible, given that some EEZs and high seas areas span the equator. Slightly different totals will be achieved using these EEZ-based summaries compared to those estimated at the regional level e.g. Hare et al. (2024) and Vidal, Williams, and Ruaia (2024), and Figure 1 in this report. Also note that archipelagic catches are excluded from this table.

2023 was exclusively in the New Zealand EEZ and on the high seas (Table 2). Catch estimates for 2023 were 328 mt for the high seas and 864 mt for the New Zealand EEZ. The total troll catch within the WCPFC-CA in 2023 was a 68% decrease from the 2022 catch.

The spatial pattern of South Pacific albacore catch over the long-term (1950–2017), the last 5 years excluding the most recent year (2018–2022), and 2023 alone, are shown in Figure 2. In recent years, catch has been concentrated in EEZ's and several high seas zones in the 10-20°S latitudinal band. Note that, while 2023 estimates remain provisional, the geographic distribution of catch is generally consistent with that observed in recent years, with the exception of the scarcity of fishing in the EPO, which will most likely change with future data provisions.

Effort

It is challenging to identify the specific species being targeted by longline vessels, particularly within the aggregate data received from some fleets fishing on the high seas. To compare estimates of effort to the declared South Pacific albacore catch, we have considered fishing effort south of 10°S to approximate South Pacific albacore targeting (noting that this will include longline effort targeting swordfish, southern bluefin, and in some cases tropical tunas), in an effort to exclude most of the tropical longline fishery effort.

Raised effort data for the southern WCPFC-CA south of 10°S were available up to 2023 (Figure 3). The longline effort in this region was estimated at 220 million hooks in 2023, although we note there is considerable uncertainty in effort estimates for this most recent year. The number of deployed hooks in 2023 within the WCPFC-CA south of 10°S was a 0.03% increase from 2022, and a 34% decrease from the peak of 335 million hooks fished in 2010.

Effort data from VMS provides more 'up to date' information than raised logsheet data, given that logsheet effort for recent years may be incomplete, and the uncertainty in raised annual logsheet effort estimates for 2023 is high. The VMS data reported are restricted to the WCPFC-CA waters south of 10°S, in an effort to again remove fishing targeting tropical tunas. The VMS data represents fishing days which are identified using a fishing activity classification algorithm that accounts for speed and changes in bearing of the vessel. It must be noted that a new algorithm has been adopted since the 2019 version of this report, and this has been applied to all available VMS data. This means that estimates are comparable among years, but not with earlier reports.

VMS data does not explicitly indicate the species targeted by vessels during fishing. In addition, 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 not available. A list of notes on the VMS data and a table of effort by high seas area are provided in Appendix 1. To overcome the absence of VMS data for some EEZs, data were augmented with logsheet information in several of these locations (New Caledonia and French Polynesia).

Effort south of 10°S (VMS fishing days, augmented by logsheet days) both within EEZs and on the high seas generally increased through to 2013, then declined to a lower average level before rebounding in 2019 and 2020. Around 26% of the VMS days occurred within the high seas in 2023 (Table 3). Overall effort has increased in the EEZs and had been decreasing on the high seas until a sharp upturn in 2019 (Table 3). VMS days fished in 2021–2023 were lower than in prior years.

Of the VMS days fished within the international waters in 2023, the most important high seas areas were Region I5, which is east of the Line Islands and French Polynesia, and Region I7, which is the region north and northeast of New Zealand (Table 9; Figure 11).

Catch per unit effort

Figure 5 presents nominal South Pacific albacore CPUE series by key longline fleets south of 10°S. Note, the values presented in Hare et al. (2024) are south of the equator, and are measured in numbers, rather than weights of fish, and will therefore differ from those presented here. Some key changes in CPUE in the recent periods were:

- Japanese longline CPUE in 2023 (13.2 kg per 100 hooks) was a 24% decrease on 2022, the 2018-2022 average was 14.1 kg per 100 hooks;
- Fiji longline CPUE in 2023 (20.2 kg per 100 hooks) was a 21% decrease on 2022, the 2018-2022 average was 18.9 kg per 100 hooks;
- Chinese longline CPUE in 2023 (31.5kg per 100 hooks) was a 20% increase on 2022, the 2018-2022 average was 20.4 kg per 100 hooks;
- Chinese Taipei longline CPUE in 2023 (28.1 kg per 100 hooks) was a 12% increase on 2022, the 2018-2022 average was 23.8 kg per 100 hooks.

Examining longer-term trends, the average nominal CPUE for the Fiji fleet was 23.7 kg per 100 hooks between 1991 and 2000, while that for the Chinese Taipei fleet was 34.9 kg per 100 hooks. In contrast, the Japanese fleet averaged 18 kg per 100 hooks over that time.

The relative spatial pattern of CPUE is presented in Figure 6 for two time periods. Over the period 2000–2020, catch rates were relatively high across much of the southern WCPFC-CA, in particular within high seas areas. Catch rates in the most recent three year period (2021–2023) were mixed when compared to that earlier period, with some $5^\circ \times 5^\circ$ squares showing reduced CPUE, while several squares displayed the opposite trend. In particular, the CPUE in the high seas east of New Zealand, towards the eastern boundary of the convention area was high in the most recent years.

Figure 7 presents nominal South Pacific albacore CPUE series for two troll fleets. The CPUE of the US fleet was highly variable with a general decline over the period 1987 to 2006, with catch rates in the most recent years of activity being comparable to that in the mid-2000s, with the exception of 2019-20 where CPUE was very high. By comparison, the nominal CPUE of the New Zealand fleet has generally been lower, but relatively stable. Both fleets showed reduced CPUE in 2023 compared to 2022.

Transshipment information

High seas transshipment data are available from July 2010 to the end of 2023, but no in-port or in-zone transshipment data are presented. Fluctuations in reported transshipments may reflect logistical or operational factors, rather than fishing activity. It is noted that South Pacific albacore would have historically 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 around September or surrounding months, in many years (Figure 8). Vanuatu has had the highest transhipment volumes in the past, as averaged over the entire period. The highest peak in the time series was in October 2017 ($\sim$ 4,000 mt) (Figure 8), of which, about 2,500 mt was attributable to China and 1,000 mt to 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 2023 should, therefore, be considered preliminary and subject to change.

Albacore stock status

A South Pacific albacore stock assessment was completed in 2021 (Castillo-Jordan et al. 2021), and used data up until the end of 2019. The Scientific Committee meeting in 2021 (SC17) 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 the recruitment distribution, stock recruitment relationship steepness, the weighting of the input length data, movement estimates (one level was down weighted for this axis) and an axis for growth/natural mortality combinations. Stock status for this uncertainty grid is shown on the Majuro plot in Figure 9.

The most recent stock assessment will be presented at SC20 and the results will be included in the versions of this report that will be presented to TCC and the commission meeting in December. In the meantime,

the latest stock status and status quo projections will only be found in Teears, Hammer, and Hampton (2024), and will be incorporated into other documents upon acceptance of the assessment by the Scientific Committee.

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Tables

Table 1: Annual southern WCPFC-CA albacore longline catch estimates (excluding archipelagic waters) by EEZ and High Seas, since 2010. 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	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
American Samoa	2,838	1,784	2,416	1,769	1,377	1,760	1,511	1,511	1,553	1,062	546	715	1,095	893
Australia	745	652	702	757	728	945	910	830	751	796	1,158	1,072	1,075	699
Cook Islands	4,910	5,559	10,627	5,985	4,483	4,556	4,757	3,324	4,716	7,302	3,610	2,319	6,732	6,501
Fiji	5,748	4,165	4,287	3,642	3,656	5,481	4,706	5,871	5,458	5,154	3,916	4,318	5,282	3,381
High seas	41,016	23,447	30,484	31,126	21,054	24,182	18,234	39,665	30,641	28,022	32,100	23,420	26,462	32,264
Jarvis (USA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kiribati	1,290	549	1,218	819	1,218	2,507	4,292	391	72	1,263	2,699	592	1,667	1,512
Matthew and Hunter	15	6	9	0	0	2	1	2	1	2	2	32	17	5
New Caledonia	1,932	1,734	1,711	1,713	1,628	1,578	1,745	1,719	1,742	2,009	1,896	1,742	2,142	2,004
Niue	196	0	0	362	197	190	86	14	364	386	163	19	1	1
New Zealand	460	418	266	302	311	223	233	181	239	117	202	102	83	70
French Polynesia	3,482	3,224	3,591	3,495	3,744	3,418	3,276	2,148	3,058	3,439	2,812	2,689	4,182	5,221
PNG	795	294	801	237	308	459	1,191	1,609	1,453	1,333	970	600	2,710	1,165
Solomon Islands	6,021	6,420	8,157	9,073	13,679	6,858	3,749	5,827	7,148	5,675	2,466	2,910	5,540	3,585
Tokelau	0	92	250	0	7	1,871	2,466	1,697	632	1,976	1,245	557	1,439	918
Tonga	57	36	760	1,471	264	710	1,111	800	842	1,352	840	896	903	1,609
Tuvalu	674	467	930	1,491	465	404	1,489	1,427	944	1,581	554	177	386	119
Vanuatu	4,787	6,071	4,281	6,813	6,287	5,444	7,317	7,874	5,689	6,167	3,746	1,560	4,853	2,744
Wallis and Futuna	0	3	0	0	0	0	0	0	0	0	0	0	0	0
Samoa	2,529	1,415	2,038	1,642	800	840	823	1,638	1,364	1,442	843	760	683	1,113
Total	77,495	56,336	72,528	70,697	60,206	61,428	57,897	76,528	66,667	69,078	59,768	44,480	65,252	63,804
EEZ percent	47	58	58	56	65	61	69	48	54	59	46	47	59	49
HS percent	53	42	42	44	35	39	31	52	46	41	54	53	41	51

Table 2: Annual southern WCPFC-CA albacore troll catch estimates by EEZ and High Seas, Since 2010. 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	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
High seas	307	472	235	390	466	177	189	855	442	874	1,926	685	1,400	328
New Zealand	1,832	2,787	2,727	2,836	1,937	2,425	1,969	1,959	2,272	1,907	2,825	3,383	2,377	864
Total	2,139	3,259	2,962	3,226	2,403	2,602	2,158	2,814	2,714	2,781	4,751	4,068	3,777	1,192
EEZ percent	86	86	92	88	81	93	91	70	84	69	59	83	63	72
HS percent	14	14	8	12	19	7	9	30	16	31	41	17	37	28

Table 3: Total longline VMS fishing days (augmented by logsheets for New Caledonia and French Polynesia) by year and geographic area in the WCPFC-CA south of 10°S.

EEZ	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
EEZ	70,294	73,452	75,492	76,765	64,034	65,427	71,520	71,519	73,096	76,217	76,487	60,888	66,506	67,147
High seas	20,771	23,223	23,347	31,346	27,151	22,719	19,548	23,858	25,533	27,803	32,037	28,054	22,243	23,167
Total	91,065	96,676	98,839	108,111	91,186	88,147	91,068	95,376	98,630	104,020	108,524	88,942	88,749	90,314
EEZ percent	77	76	76	71	70	74	79	75	74	73	70	68	75	74
HS percent	23	24	24	29	30	26	21	25	26	27	30	32	25	26

Table 4: Annual total and monthly average transshipment of albacore in the high seas of the WCPFC-CA in metric tonnes. Note that values for 2023 are probably incomplete.

Year	Annual total	Monthly average
2010	4,091	584
2011	9,458	788
2012	5,976	498
2013	10,228	852
2014	10,760	897
2015	10,264	855
2016	18,747	1,562
2017	18,434	1,536
2018	23,651	1,971
2019	25,105	2,092
2020	25,045	2,087
2021	18,314	1,526
2022	16,897	1,408
2023	17,532	1,461
2024	5,519	788

Table 5: Annual southern WCPFC-CA albacore longline catch estimates by Vessel flag (including chartered vessels), 2010 - 2023. 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 WCPFC-CA is approximated - some EEZ and high seas areas span the equator.

Flag	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Australia	745	653	709	773	737	949	916	831	752	798	1,163	1,073	1,075	704
Belize	5	52	18	7	0	0	0	0	0	0	0	0	0	0
Cook Islands	2,423	2,182	2,757	1,354	1,186	1,167	1,352	2,562	3,083	2,277	1,194	767	952	217
China	12,926	11,847	24,523	23,790	14,471	14,494	16,124	29,150	21,134	22,622	20,606	15,980	26,333	26,502
Spain (EC)	13	6	3	3	2	1	2	2	2	2	4	4	21	7
Fiji	8,603	9,947	9,369	8,708	7,057	7,041	7,285	9,763	8,854	8,343	6,405	6,250	6,866	5,734
FSM	1	1	156	634	366	1,224	1,966	250	1,461	2,098	445	756	1,269	1,784
Japan	2,745	2,136	2,230	1,866	1,186	928	1,596	1,759	1,164	1,078	1,040	773	1,138	834
Kiribati	66	200	349	40	7	357	509	653	340	1,123	1,854	985	2,158	1,612
Republic of Korea	1,027	488	892	767	691	1,013	1,387	1,134	1,064	1,692	571	359	1,028	583
Marshall Islands	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Caledonia	1,939	1,736	1,715	1,714	1,630	1,583	1,747	1,734	1,752	2,011	1,897	1,774	2,158	2,009
Niue	97	0	0	0	0	0	0	0	0	0	0	0	0	0
New Zealand	460	418	266	302	311	223	233	181	239	117	202	102	83	70
French Polynesia	3,483	3,225	3,594	3,512	3,744	3,418	3,277	2,148	3,058	3,439	2,812	2,689	4,185	5,221
PNG	791	245	693	234	305	336	48	627	92	39	18	0	260	53
Portugal (EC)	0	4	1	67	1	0	0	0	0	0	0	0	0	0
Solomon Islands	7,716	899	0	0	14,234	11,249	1,695	0	1,918	2,538	1,682	1,865	2,720	2,398
Tonga	57	34	20	13	25	29	42	26	23	29	13	10	52	34
Tuvalu	0	184	432	169	78	97	52	175	121	64	117	57	0	0
Chinese Taipei	16,969	13,380	12,116	14,686	8,293	8,806	12,481	16,766	12,804	12,627	14,082	5,734	10,575	11,179
USA	4,082	2,555	3,461	2,213	1,543	1,961	1,655	1,539	1,567	1,090	575	764	1,140	1,021
Vanuatu	10,817	4,726	7,185	8,202	3,541	5,713	4,582	4,855	5,555	4,482	3,674	3,547	1,791	1,912
Wallis and Futuna	0	3	0	0	0	0	0	0	0	0	0	0	0	0
Samoa	2,529	1,415	2,038	1,642	800	840	947	2,374	1,684	2,610	1,413	991	1,450	1,929

Table 6: Annual southern WCPFC-CA albacore longline catch estimates by Vessel flag (including chartered vessels) in each EEZ, 2013 - 2023. 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 WCPFC-CA is approximated - some EEZ and high seas areas span the equator.

EEZ	Flag	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Am. Samoa	US	1,769	1,377	1,760	1,511	1,511	1,553	1,062	546	715	1,095	893
Australia	AU	757	728	945	910	830	751	796	1,158	1,072	1,075	699
	JP	0	0	0	1	0	0	0	0	0	0	0
Cook Islands	CK	1,223	1,073	1,040	1,267	2,370	2,299	1,196	360	295	276	156
	CN	2,223	3,186	2,238	1,542	695	940	4,597	2,756	1,250	4,680	4,367
	FJ	80	0	0	0	0	0	0	0	0	0	0
	FM	573	174	1,198	1,945	248	1,437	1,491	427	748	1,257	1,783
	KI	29	0	0	0	0	0	5	41	9	0	0
	KR	0	0	1	0	0	0	0	0	0	0	0
	TW	0	0	0	0	12	39	13	26	16	519	194
	US	267	40	75	0	0	0	0	0	0	0	0
	VU	1,590	10	4	3	0	0	0	0	0	0	0
Fiji	CN	305	196	323	642	214	11	24	5	4	270	8
	FJ	3,253	3,459	5,151	4,062	5,656	5,443	5,130	3,909	4,313	5,011	3,373
	KR	38	0	0	2	0	0	0	2	0	1	0
	TV	0	0	0	0	0	0	0	0	0	0	0
	TW	3	1	0	0	0	3	0	0	0	0	0
	VU	43	0	5	0	1	0	0	0	0	0	0
High seas	AU	16	9	4	6	1	1	2	5	1	0	5
	BZ	7	0	0	0	0	0	0	0	0	0	0
	CK	28	0	1	6	110	270	165	320	215	64	61
	CN	12,956	6,141	8,308	3,360	18,566	11,064	8,474	10,806	12,143	12,457	17,472
	ES	3	2	1	2	2	2	2	4	4	21	7
	FJ	1,891	1,802	1,037	1,074	1,466	1,512	1,011	1,410	895	475	1,316
	FM	61	192	25	20	2	24	606	18	8	12	0
	JP	1,296	1,125	717	597	667	366	406	696	413	563	447
	KI	3	1	162	13	240	283	147	452	463	586	343
	KR	425	163	272	463	638	499	1,186	559	353	962	565
	MH	0	0	0	0	0	0	0	0	0	0	0
	NC	1	2	4	2	14	10	0	0	0	0	0
	NZ	0	0	0	0	0	0	0	0	0	0	0
	PF	17	0	0	1	0	0	0	0	0	3	0
	PG	0	0	0	33	139	0	0	0	0	0	9
	PT	67	1	0	0	0	0	0	0	0	0	0
	SB	0	778	1,637	239	0	17	46	796	0	58	132
	TO	0	1	0	0	1	0	0	0	0	0	0
	TV	10	1	1	1	52	15	4	112	57	0	0
	TW	10,181	7,545	7,974	9,670	13,635	11,498	11,821	13,537	5,358	9,503	9,854
	US	177	125	126	144	28	15	28	29	49	45	128
	VU	3,987	3,165	3,911	2,597	4,072	4,959	4,105	3,349	3,461	1,713	1,912
	WS	0	0	0	5	34	107	20	5	0	1	13
Jarvis (USA)	US	0	0	0	0	0	0	0	0	0	0	0
Kiribati	BZ	0	0	0	0	0	0	0	0	0	0	0
	CN	216	308	1,330	3,020	166	4	170	1,320	66	25	139
	FJ	29	164	135	140	4	0	50	0	0	0	0
	FM	0	0	0	1	1	0	0	0	0	0	1
	JP	8	6	0	0	0	0	0	0	0	0	0
	KI	3	1	54	406	207	57	971	1,361	510	1,572	1,267
	KR	187	351	612	416	11	9	38	6	3	13	0
	TV	0	0	0	0	0	0	0	0	0	0	0
	TW	351	235	192	213	2	3	34	12	12	41	105
	VU	26	152	184	95	0	0	1	1	0	16	0

Mthw-Hunter	FJ	0	0	1	1	0	1	0	0	0	2	0
	NC	0	0	1	0	1	0	2	1	32	16	5
	VU	0	0	0	0	1	0	0	0	0	0	0
New Caledonia	NC	1,713	1,628	1,578	1,745	1,719	1,742	2,009	1,896	1,742	2,142	2,004
Niue	CK	85	33	0	0	0	362	386	163	19	0	0
	FJ	277	146	187	86	14	0	0	0	0	0	0
	NU	0	0	0	0	0	0	0	0	0	0	0
	TW	0	18	3	0	0	2	0	0	0	1	1
New Zealand	NZ	302	311	223	233	181	239	117	202	102	83	70
F. Polynesia	PF	3,495	3,744	3,418	3,276	2,148	3,058	3,439	2,812	2,689	4,182	5,221
PNG	CN	1	3	0	101	0	559	578	603	239	1,873	728
	JP	0	0	105	998	1,092	796	673	344	361	574	387
	PG	234	305	336	14	488	92	39	18	0	260	44
	TW	2	0	19	78	28	6	43	4	1	3	6
Solomon Is.	CK	18	79	0	0	0	0	0	0	0	0	0
	CN	2,902	239	0	1,492	3,324	3,875	2,930	1,575	1,039	2,823	1,297
	FJ	1,783	121	0	554	163	558	213	1	0	0	0
	JP	563	55	106	0	0	1	0	0	0	1	0
	KI	5	0	0	0	1	0	0	0	2	0	2
	KR	96	57	34	2	40	11	16	2	3	48	18
	SB	0	12,713	6,718	535	0	1,901	2,492	886	1,865	2,662	2,266
	TV	0	0	0	0	0	0	0	0	0	0	0
	TW	2,424	278	0	1,166	2,180	578	1	2	0	6	2
	VU	1,282	136	0	0	119	223	23	0	0	0	0
Tokelau	CK	0	0	125	78	82	152	531	351	237	612	0
	CN	0	0	0	5	57	6	6	3	1	1	6
	FJ	0	1	1	0	0	0	0	0	0	0	0
	KI	0	5	140	91	204	0	0	0	0	0	0
	TV	0	0	0	0	0	0	0	0	0	0	0
	TW	0	0	0	286	142	0	0	3	1	53	109
	VU	0	0	1,605	1,886	510	262	291	324	86	8	0
	WS	0	0	0	119	702	212	1,147	565	231	766	803
Tonga	CN	155	107	61	1	7	13	0	0	0	2	0
	FJ	123	1	2	1	0	131	608	329	543	403	667
	TO	13	24	29	42	25	23	29	13	10	52	34
	TW	1,179	133	618	1,067	767	676	714	499	344	446	908
Tuvalu	CK	0	0	0	0	0	0	0	0	0	0	0
	CN	3	129	148	271	477	153	212	271	163	176	80
	FJ	192	139	62	662	383	140	804	277	14	203	39
	JP	0	0	0	0	0	0	0	0	0	0	0
	KI	0	0	0	0	0	0	0	0	0	0	0
	KR	21	120	94	505	445	545	453	1	1	5	0
	TV	159	77	95	51	123	106	60	5	0	0	0
	TW	87	0	0	0	0	0	0	0	0	0	0
	US	0	0	0	0	0	0	0	0	0	0	0
	VU	1,029	0	5	0	0	0	53	0	0	2	0
Vanuatu	CK	0	0	0	0	0	0	0	0	0	0	0
	CN	5,028	4,162	2,085	5,691	5,645	4,510	5,632	3,268	1,075	4,027	2,405
	FJ	1,080	1,223	464	705	2,077	1,070	527	478	485	772	339
	SB	0	743	2,894	921	0	0	0	0	0	0	0
	TW	459	83	1	0	0	0	0	0	1	3	0
	VU	246	77	0	0	152	110	8	0	0	51	0
Wal-Futuna	WF	0	0	0	0	0	0	0	0	0	0	0
Samoa	WS	1,642	800	840	823	1,638	1,364	1,442	843	760	683	1,113

Table 7: Annual South Pacific albacore troll catch estimates in the southern WCPFC-CA, by flag, 2000–2023.

Year	Canada	Cook Islands	New Zealand	USA	Total
2000	351	335	3,336	2,433	6,455
2001	206	202	2,736	2,107	5,253
2002	144	166	3,012	1,337	4,661
2003	0	688	3,721	1,574	5,984
2004	63	376	3,212	960	4,614
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	168	2,158
2017	55	0	1,959	800	2,814
2018	0	1	2,272	441	2,714
2019	0	0	1,907	874	2,781
2020	0	0	2,825	1,926	4,751
2021	31	0	3,383	654	4,068
2022	0	0	2,377	1,400	3,777
2023	0	0	864	328	1,192

Figures

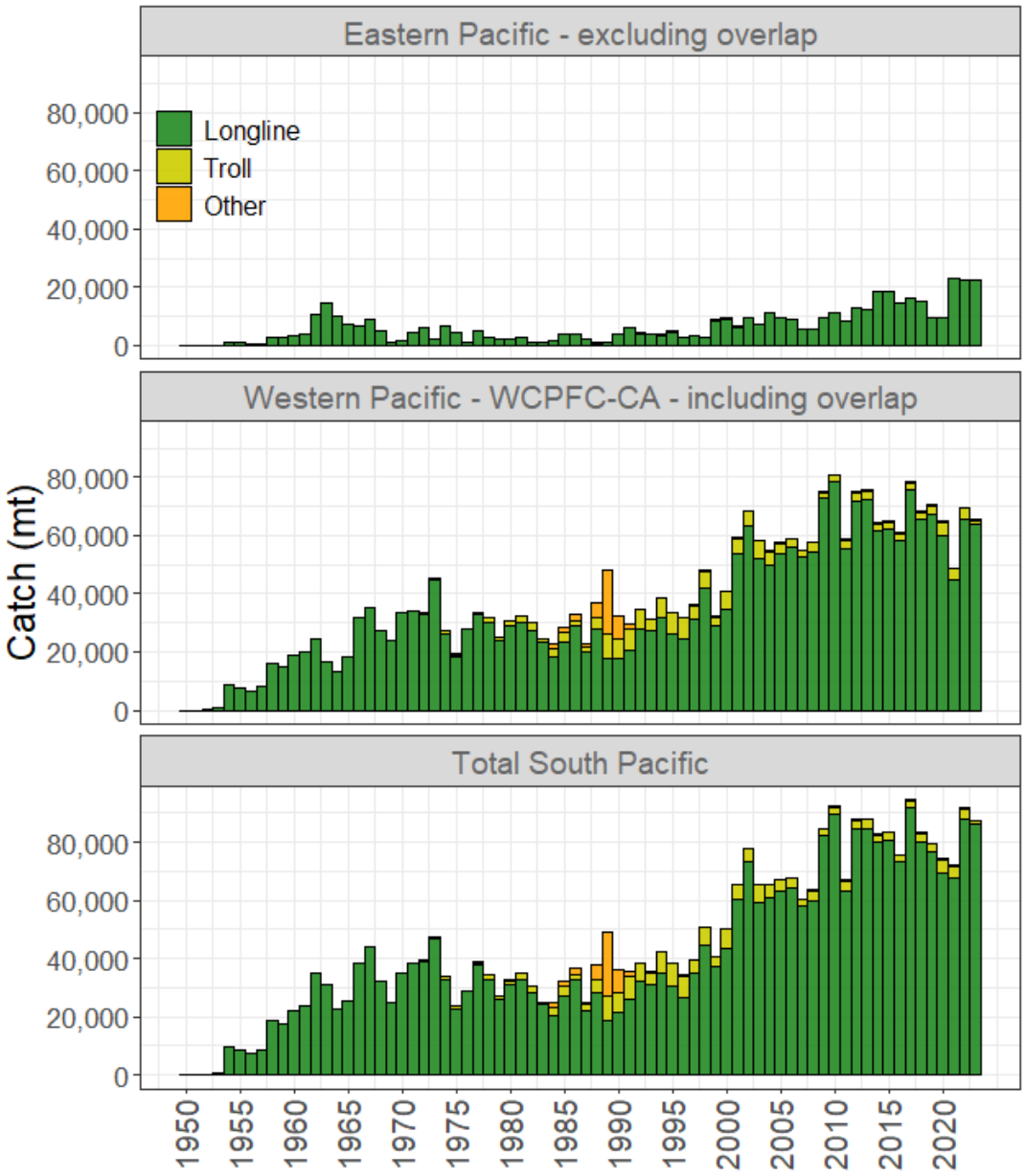

Figure 1: South Pacific albacore catch by gear (all Pacific Ocean waters south of the equator, including archipelagic waters).

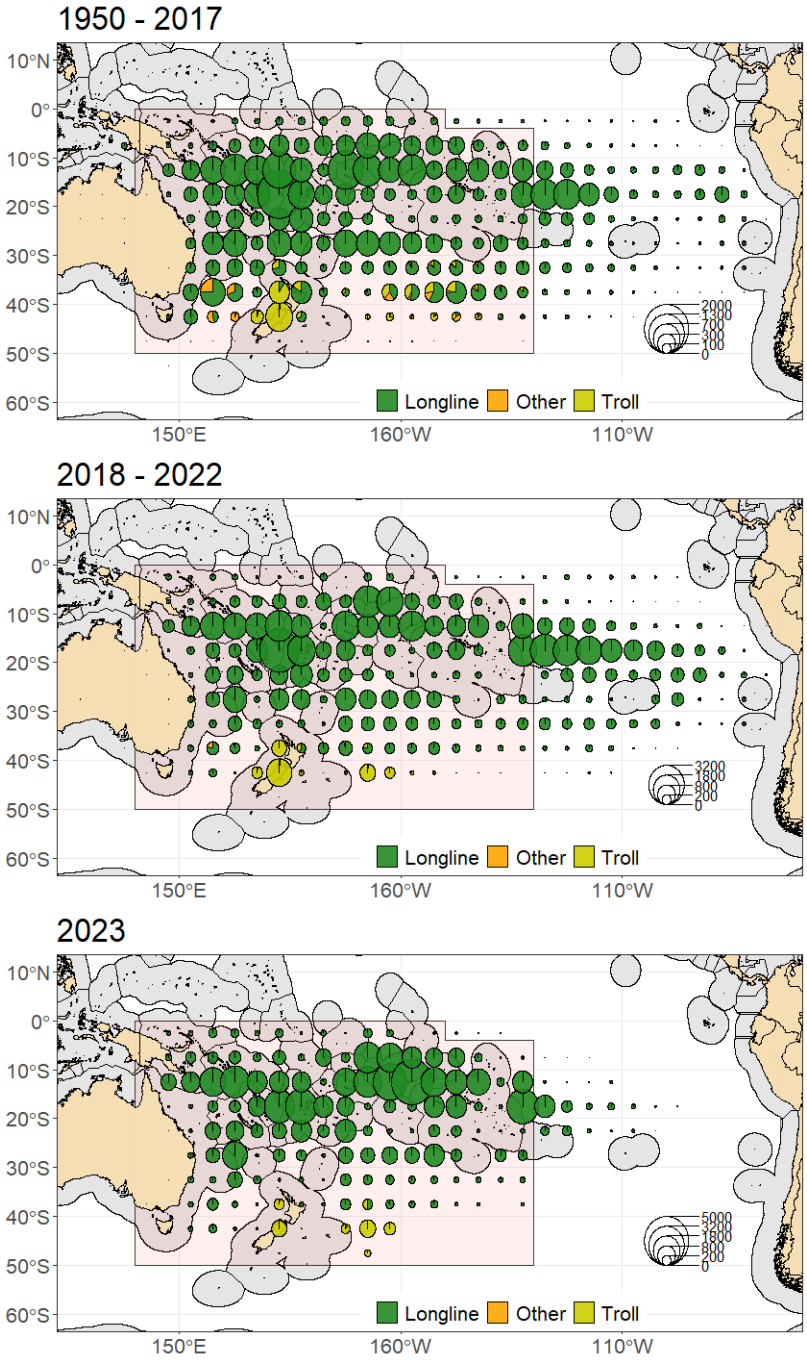

Figure 2: Albacore tuna catch distribution by gear type and 5°×5° degree region in the South Pacific Ocean for the period 1950-2017 (top), 2018 -2022 (middle) and 2023 (bottom). Circle size represents total catch volume with maximum circle size presented in the legends.

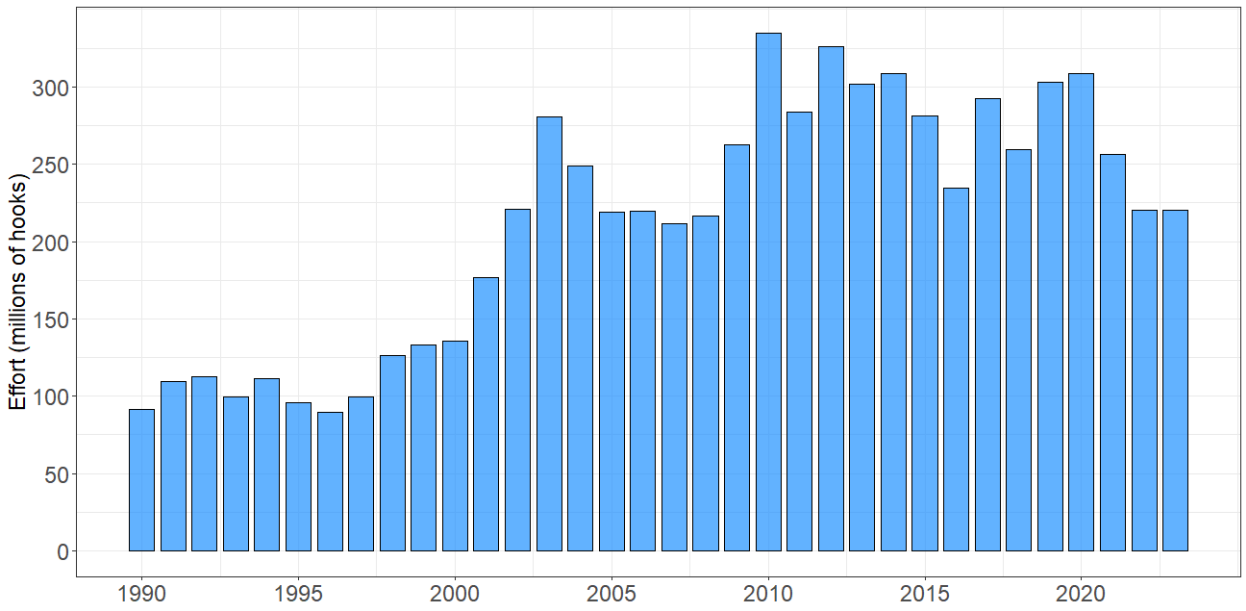

Figure 3: Temporal trends in effort (millions of hooks) in the southern longline fishery (WCPFC-CA south of 10°S).

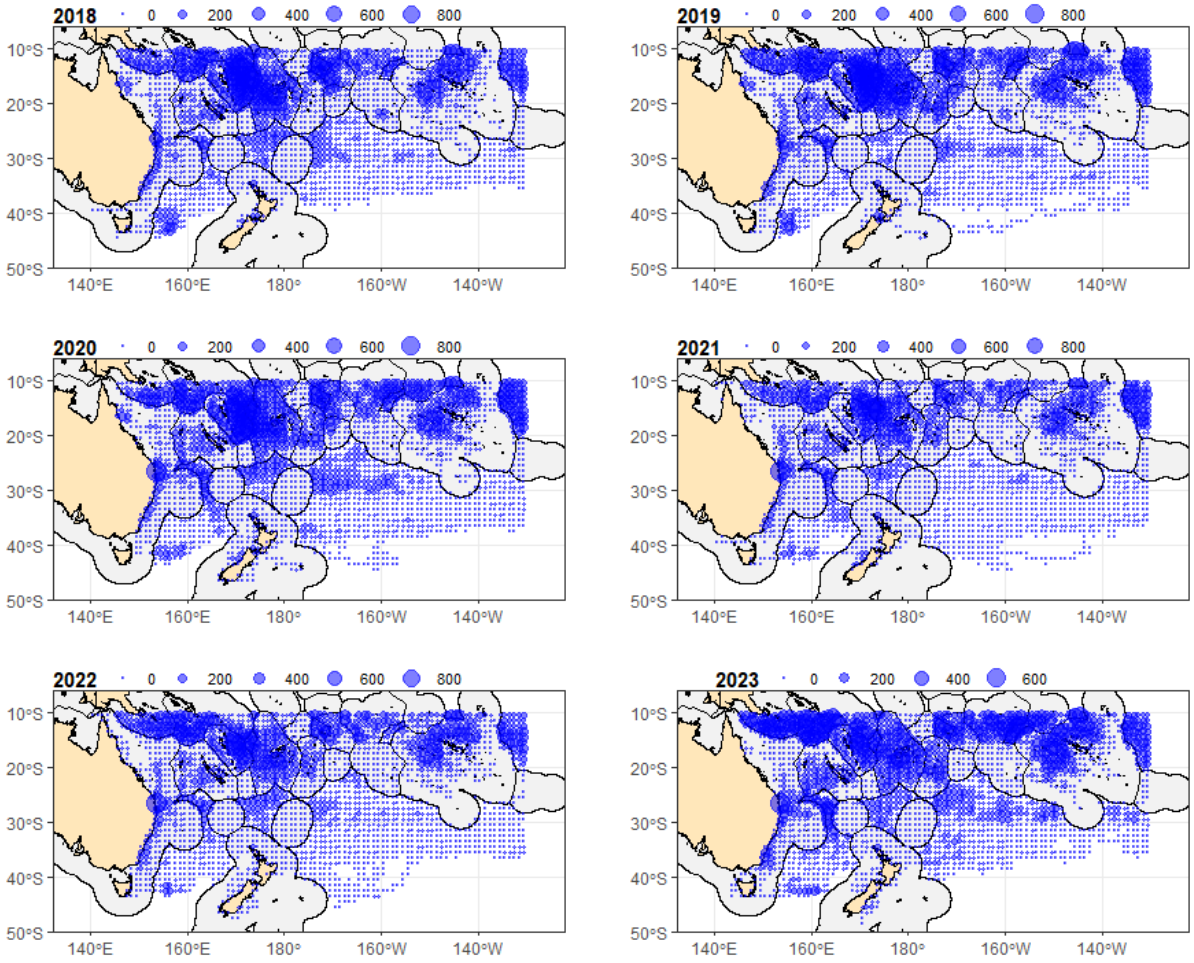

Figure 4: Longline VMS fishing days (augmented by logsheets for New Caledonia and French Polynesia) within the southern WCPFC-CA south of 10°S at the 1°×1° scale.

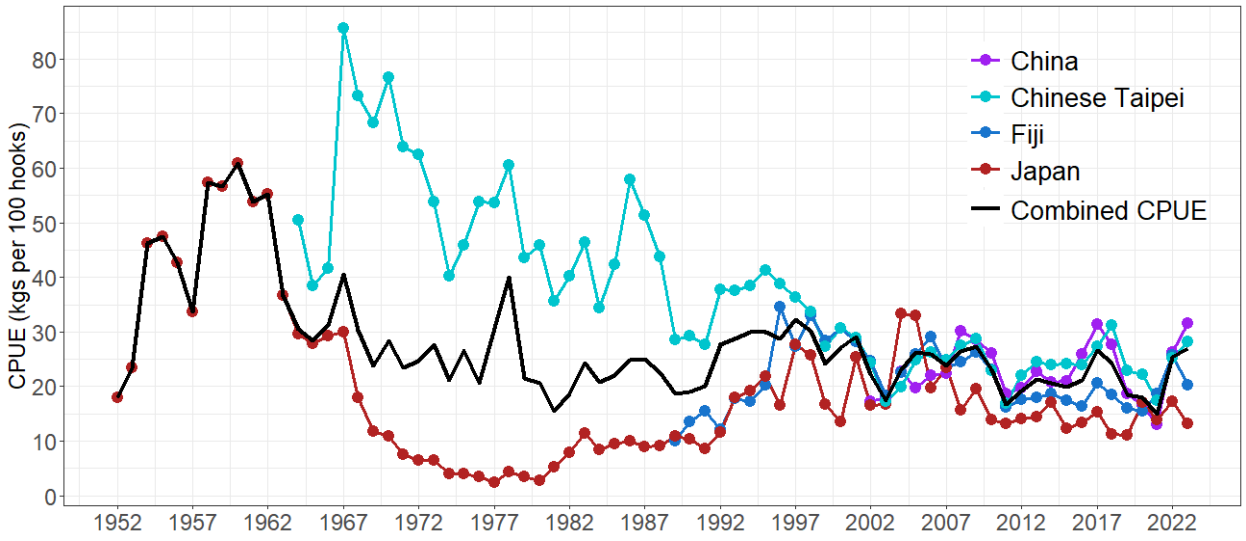

Figure 5: Trends in the nominal CPUE (kg per 100 hooks) over time for key fleets (high, widespread catches) in the southern WCPFC-CA south of 10°S. The black line is the combined CPUE over each of the fleets shown.

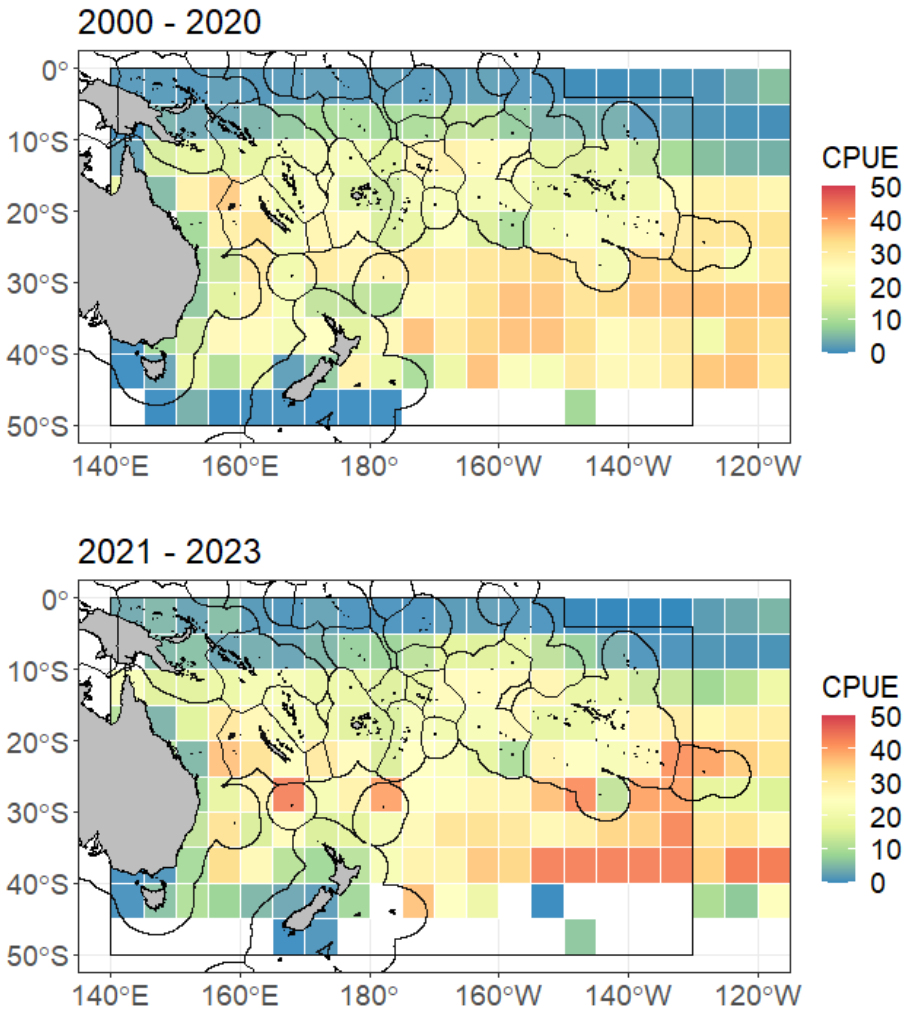

Figure 6: Albacore tuna longline CPUE distribution for the period 2000–2020 (top), and 2021–2023 (bottom). CPUE (kg/100 hooks) for a given 5°×5° square is indicated by the colour of the tile.

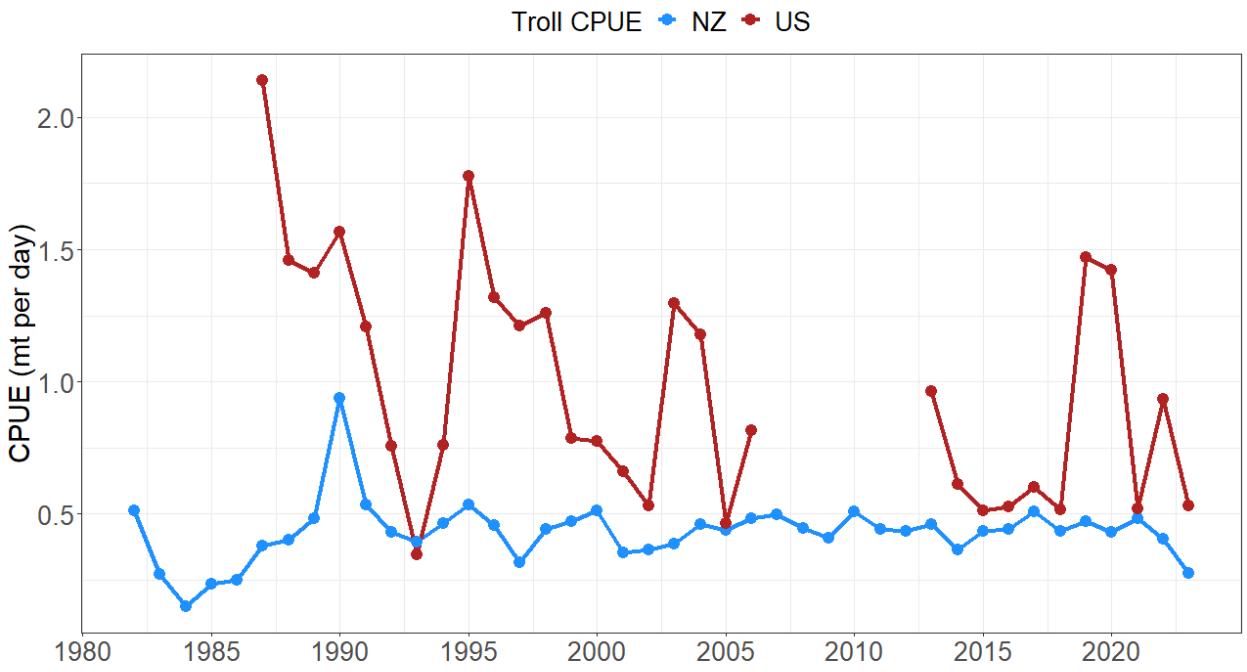

Figure 7: Trends in troll CPUE (albacore mt/day) over time in the WCPFC-CA south of 10°S for two troll fleets.

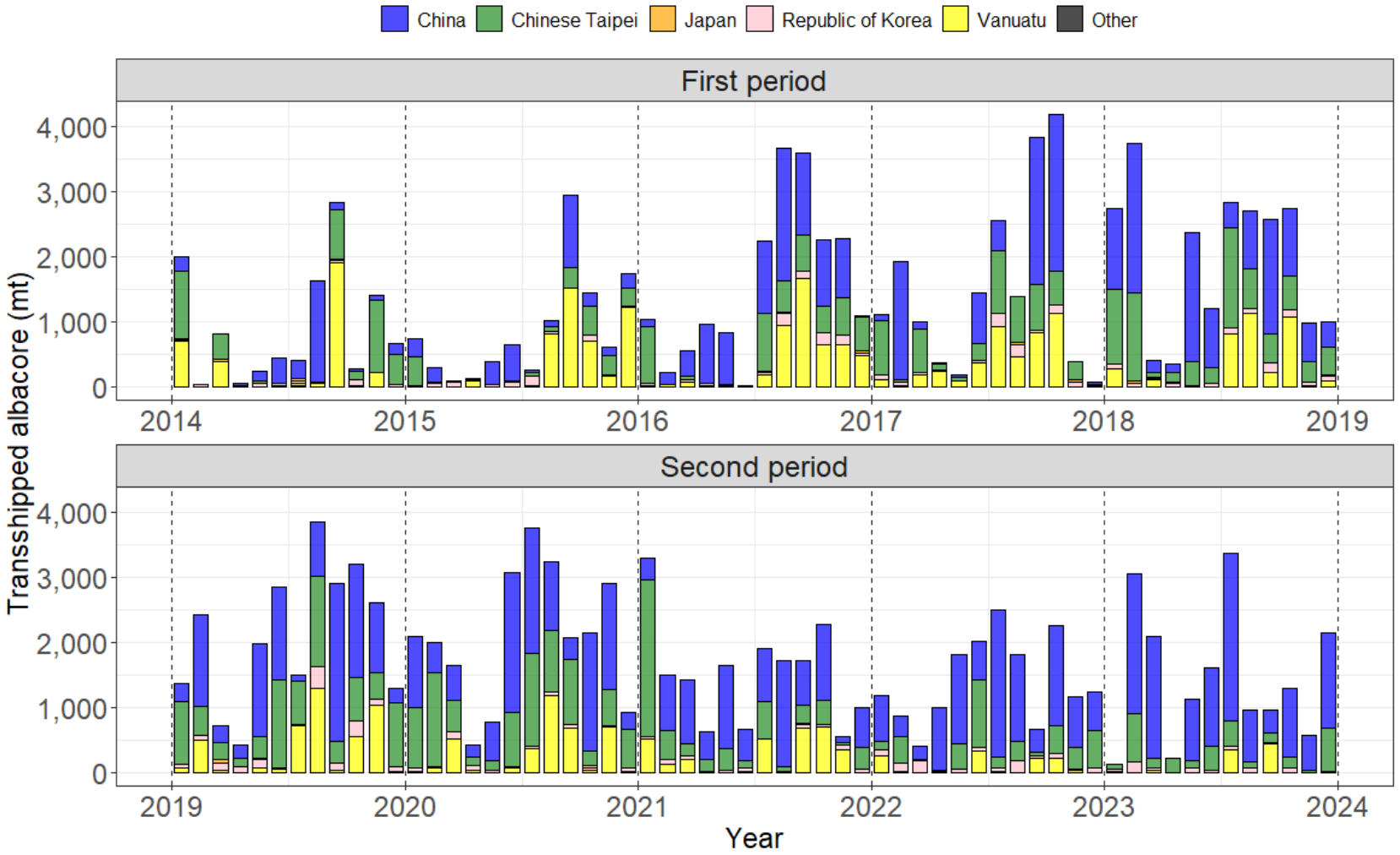

Figure 8: Reported transshipment (mt) by flag and month for 2015 to 2019 (top) and 2020 to 2024 (bottom). Source: WCPFC Transshipment Events Database (12 July 2022).

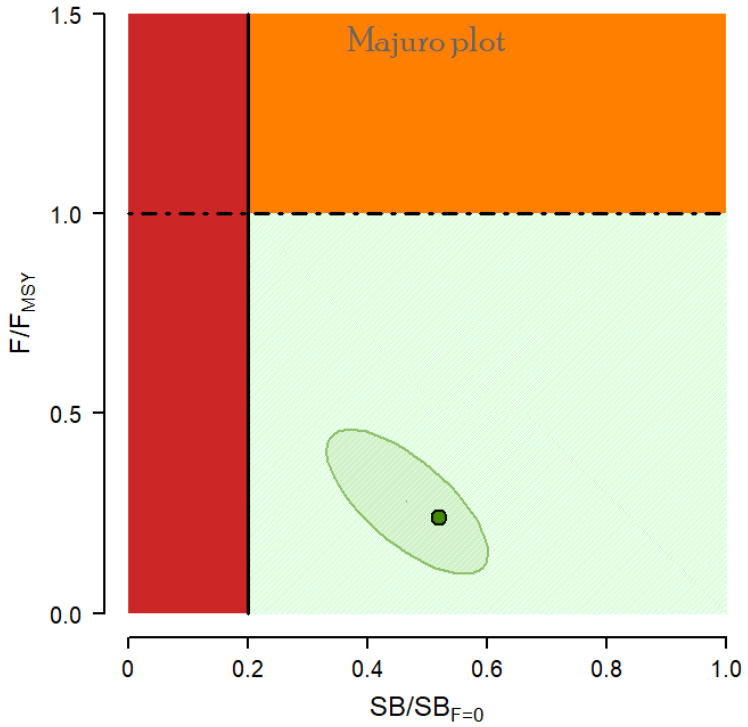

Figure 9: SPA stock status (full south Pacific stock, including EPO), as measured by $\mathrm{SB}_{recent}/\mathrm{SB}_{F=0}$, and $\mathrm{F}/\mathrm{F}_{MSY}$, shown on a Majuro plot. The green point is the median stock status for the 'recent' period and the ellipse indicates the range of uncertainty in stock status from other runs in the structural uncertainty grid.

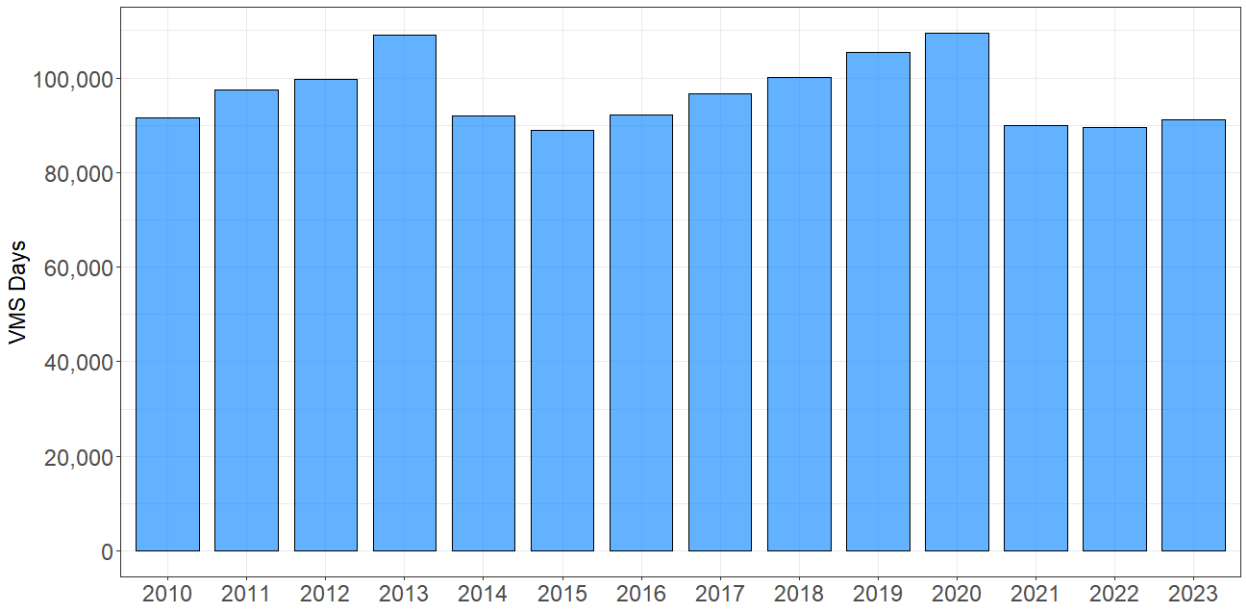

Figure 10: Longline VMS fishing days (augmented by logsheets for New Caledonia and French Polynesia) within the southern WCPFC-CA at the 1°×1° scale, south of 10°S.

Appendix 1: Notes on the time series of longline VMS information in the South Pacific

This analysis summarises the longline VMS information available to SPC through the FFA and WCPFC over the period 2010-2023, by geographic region of the southern WCPFC-CA. Effort in that database corresponds to fishing days. Please note:

- This analysis uses annual VMS data available up to and including 20 July 2024;
- 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 the FFA VMS system) will not be included within EEZ patterns;
- Effort for some countries (e.g. New Caledonia; French Polynesia) may be incomplete and so data were augmented with logsheets for those two countries;
- Some trends may result from improved VMS coverage of vessels over time;
- EEZ effort excludes the Indonesian EEZ.

Table 8: Total longline VMS fishing days (augmented by logsheets for New Caledonia and French Polynesia) by year for all EEZs and the High Seas (HS), south of 10°S (Figure 11)

EEZ	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
American Samoa	1,648	1,287	1,746	1,661	1,187	937	1,345	2,378	3,185	2,500	2,166	1,735	1,668	1,649
Australia	779	1,502	1,274	1,228	1,462	3,447	3,481	4,251	3,883	4,040	4,560	5,573	5,009	3,971
Cook Islands	4,358	5,452	9,287	7,488	5,338	3,828	4,884	5,266	4,084	4,639	5,561	4,255	4,809	6,144
Fiji	13,516	15,949	17,556	14,262	13,162	13,942	12,668	13,304	14,199	14,412	12,585	11,155	9,830	9,058
High seas	20,771	23,223	23,347	31,346	27,151	22,719	19,548	23,858	25,533	27,803	32,037	28,054	22,243	23,167
Kiribati	2,390	1,879	2,294	3,564	1,312	1,646	4,040	493	34	1,009	3,126	950	807	2,375
Matthew and Hunter	81	106	65	53	92	87	68	54	63	59	111	102	72	86
New Caledonia	2,501	2,663	2,696	2,418	2,317	2,266	2,437	2,396	2,479	2,527	2,815	2,738	2,604	2,657
Niue	241	25	51	454	387	335	587	420	834	895	978	67	78	49
New Zealand	320	548	607	269	228	344	295	257	541	831	988	790	744	648
French Polynesia	5,536	5,814	6,212	7,504	7,875	9,040	9,124	8,334	9,374	9,768	10,087	10,295	11,351	11,406
PNG	1,590	757	455	180	52	249	2,156	2,409	3,088	3,827	3,180	3,098	5,679	7,314
Solomon Islands	21,362	17,909	15,385	19,341	17,729	14,422	10,259	8,510	14,149	12,458	10,631	9,146	10,687	11,623
Tokelau	20	54	37	57	96	1,162	1,512	1,058	458	839	734	604	709	410
Tonga	131	321	1,944	4,895	1,187	1,738	2,302	1,970	960	2,935	2,398	2,276	1,713	2,422
Tuvalu	768	974	634	261	297	302	1,044	1,216	301	508	667	382	323	62
Vanuatu	14,967	17,998	14,802	12,389	10,903	9,874	12,010	15,648	11,134	11,842	12,730	5,507	8,055	4,936
Wallis and Futuna	60	139	225	243	277	300	303	183	156	198	170	140	214	188
Samoa	26	76	221	497	134	1,508	3,005	3,372	4,175	2,929	2,999	2,077	2,154	2,148
Total	91,065	96,676	98,839	108,111	91,186	88,147	91,068	95,376	98,630	104,020	108,524	88,942	88,749	90,314
EEZ percent	77	76	76	71	70	74	79	75	74	73	70	68	75	74
HS percent	23	24	24	29	30	26	21	25	26	27	30	32	25	26

Table 9: Total VMS fishing days by year in International Waters, south of 10°S (Figure 11).

EEZ	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
I2	172	195	248	303	262	380	593	555	574	215	364	210	286	158
I5	5,505	4,535	5,055	10,474	7,864	6,377	7,348	8,066	5,733	9,689	8,740	8,745	6,026	4,886
I7	10,593	12,559	10,528	13,212	13,136	11,207	7,163	9,243	13,306	12,335	17,672	13,363	12,489	13,727
I8	2,740	3,325	2,295	2,880	2,711	3,062	3,409	4,844	4,622	3,863	3,356	4,841	2,636	1,137
I9	1,760	2,608	5,221	4,478	3,178	1,693	1,036	1,150	1,298	1,702	1,905	894	805	3,259
Total	20,771	23,223	23,347	31,346	27,151	22,719	19,548	23,858	25,533	27,803	32,037	28,054	22,243	23,167

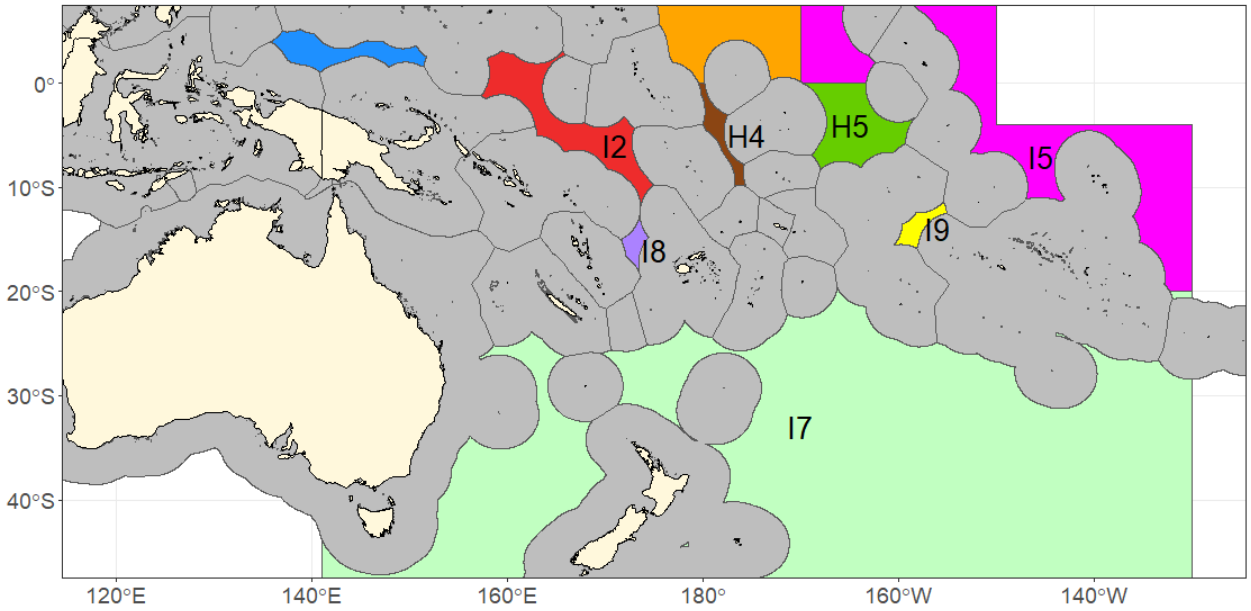

Figure 11: Map of International Waters in the southern WCPFC-CA.

Appendix 2: 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–July 2024.

Notes:

1. Responsible CCM is the country responsible for reporting for the fishing vessel
2. The requirement to report (within 15 days of transshipment) high seas transshipment activities commenced in July 2010.
3. 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.
4. Weights are in metric tonnes.

Table A3-1: Table of albacore transhipments - 2010.

Responsible CCM	Jun	Jul	Aug	Sep	Oct	Nov	Dec
China	0	0	0	166	211	247	17
Chinese Taipei	0	0	115	166	125	148	21
Japan	0	0	1	0	54	35	30
Republic of Korea	0	17	0	22	42	0	6
Vanuatu	0	0	1,435	271	232	522	149
others	0	0	0	0	8	47	6
Total	0	17	1,551	625	672	999	229

Table A3-2: Table of albacore transhipments - 2011.

Responsible CCM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
China	5	102	25	32	32	30	62	749	35	82	63	28
Chinese Taipei	818	183	899	15	52	194	713	466	347	95	321	407
Japan	11	80	22	0	2	6	1	3	0	32	57	5
Republic of Korea	43	3	46	34	6	17	4	0	1	18	99	6
Vanuatu	100	110	1,020	291	1	14	817	313	62	13	0	341
others	2	0	0	37	8	0	18	2	8	40	0	14
Total	979	478	2,012	409	101	261	1,615	1,533	453	280	540	801

Table A3-3: Table of albacore transhipments - 2012.

Responsible CCM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
China	68	96	62	151	8	20	306	248	143	29	13	11
Chinese Taipei	100	438	127	92	12	0	327	458	0	53	3	471
Japan	0	31	9	13	2	19	69	97	73	0	13	0
Republic of Korea	4	13	14	5	13	29	34	31	10	6	25	7
Vanuatu	545	108	166	90	2	0	765	185	0	165	105	0
others	3	5	7	0	0	12	1	0	19	9	0	37
Total	720	691	385	351	37	80	1,502	1,019	245	262	159	526

Table A3-4: Table of albacore transhipments - 2013.

Responsible CCM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
China	59	7	85	25	96	827	30	193	563	283	1,124	159
Chinese Taipei	39	0	5	59	52	2	163	149	541	39	548	499
Japan	0	0	9	38	3	39	60	42	3	15	11	3
Republic of Korea	0	58	61	11	30	83	30	20	38	18	59	19
Vanuatu	0	362	175	165	28	28	1,063	472	865	249	412	130
others	0	0	12	0	20	4	0	20	12	0	7	4
Total	98	427	347	298	229	983	1,346	896	2,022	604	2,161	814

Table A3-5: Table of albacore transhipments - 2014.

Responsible CCM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
China	228	4	1	32	140	381	278	1,551	116	27	74	178
Chinese Taipei	1,048	2	386	9	32	1	0	0	766	130	1,112	449
Japan	4	3	27	0	2	0	21	0	24	8	0	0
Republic of Korea	34	22	0	12	59	31	47	15	38	84	0	38
Vanuatu	691	0	389	0	0	14	38	59	1,897	1	214	3
others	2	3	0	0	0	8	12	0	0	17	0	0
Total	2,007	34	803	53	233	435	396	1,625	2,841	267	1,400	668

Table A3-6: Table of albacore transhipments - 2015.

Responsible CCM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
China	274	220	4	0	351	567	32	90	1,102	208	128	231
Chinese Taipei	449	8	13	19	0	10	62	83	330	437	294	275
Japan	2	5	6	2	0	0	1	1	0	6	7	0
Republic of Korea	2	47	61	4	26	68	149	26	0	101	22	22
Vanuatu	9	5	4	92	4	5	9	817	1,508	693	161	1,213
others	0	0	0	0	0	0	0	0	0	0	0	0
Total	736	285	88	117	381	650	253	1,017	2,940	1,445	612	1,741

Table A3-7: Table of albacore transhipments - 2016.

Responsible CCM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
China	115	189	387	898	783	2	1,116	2,046	1,261	1,028	916	4
Chinese Taipei	874	0	47	6	18	0	902	485	556	400	569	521
Japan	3	0	0	0	0	2	15	12	5	0	10	47
Republic of Korea	37	4	37	29	20	15	27	188	118	189	152	40
Vanuatu	10	28	72	20	0	3	189	937	1,658	642	641	471
others	0	0	0	0	0	0	0	0	0	0	0	0
Total	1,039	221	543	953	821	22	2,249	3,668	3,598	2,259	2,288	1,083

Table A3-8: Table of albacore transhipments - 2017.

Responsible CCM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
China	91	1,822	109	24	29	772	454	2	2,253	2,404	10	39
Chinese Taipei	841	40	665	95	60	264	972	709	708	526	265	6
Japan	0	0	0	1	0	0	0	34	0	5	43	14
Republic of Korea	72	56	49	18	8	28	193	189	34	130	66	0
Vanuatu	101	13	179	230	80	371	932	461	837	1,122	3	5
others	0	0	0	0	0	0	0	0	0	0	0	0
Total	1,105	1,931	1,002	368	177	1,435	2,551	1,395	3,832	4,187	387	64

Table A3-9: Table of albacore transhipments - 2018.

Responsible CCM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
China	1,252	2,304	185	118	1,978	907	390	886	1,768	1,043	591	389
Chinese Taipei	1,146	1,365	72	162	367	244	1,549	612	429	515	325	439
Japan	1	30	19	8	0	2	0	0	9	0	0	9
Republic of Korea	74	45	24	56	15	48	87	74	154	107	56	73
Vanuatu	271	5	107	1	0	1	814	1,137	212	1,074	12	91
others	0	0	0	0	0	0	0	0	0	0	0	0
Total	2,744	3,749	407	345	2,360	1,202	2,840	2,709	2,572	2,739	984	1,001

Table A3-10: Table of albacore transhipments - 2019.

Responsible CCM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
China	285	1,419	253	198	1,436	1,427	95	824	2,428	1,741	1,070	213
Chinese Taipei	961	433	272	140	333	1,346	666	1,407	332	669	421	991
Japan	0	0	51	0	18	0	0	0	0	0	0	0
Republic of Korea	49	81	110	77	123	15	18	324	121	226	94	69
Vanuatu	72	494	27	2	74	58	716	1,293	30	558	1,025	18
others	0	0	0	0	0	0	0	0	0	0	0	0
Total	1,367	2,427	713	417	1,984	2,846	1,495	3,848	2,911	3,194	2,610	1,291

Table A3-11: Table of albacore transhipments - 2020.

Responsible CCM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
China	1,092	454	540	195	605	2,146	1,931	1,066	333	1,826	1,627	268
Chinese Taipei	935	1,462	475	130	138	836	1,423	941	993	228	560	583
Japan	0	0	0	0	0	0	0	0	0	34	0	0
Republic of Korea	47	21	115	71	33	29	53	56	57	43	7	63
Vanuatu	12	60	511	25	1	60	357	1,185	681	23	706	8
others	0	0	0	0	0	0	0	0	0	0	0	0
Total	2,086	1,997	1,641	421	777	3,071	3,764	3,248	2,064	2,154	2,900	922

Table A3-12: Table of albacore transhipments - 2021.

Responsible CCM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
China	346	865	990	424	1,274	471	801	1,640	682	1,166	108	610
Chinese Taipei	2,401	439	192	194	343	113	576	69	265	367	37	335
Japan	0	0	0	0	0	0	0	0	20	0	0	0
Republic of Korea	45	85	58	7	27	66	9	8	68	40	60	51
Vanuatu	510	115	191	0	0	6	512	3	675	696	353	1
others	0	0	0	0	0	0	0	0	0	0	0	0
Total	3,302	1,504	1,431	625	1,644	656	1,898	1,720	1,710	2,269	558	997

Table A3-13: Table of albacore transhipments - 2022.

Responsible CCM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
China	710	311	205	966	1,356	603	2,264	1,326	360	1,532	771	594
Chinese Taipei	127	405	22	0	400	1,029	167	303	56	423	333	579
Japan	0	0	0	0	0	0	0	0	0	0	3	0
Republic of Korea	101	138	174	30	47	65	48	181	27	81	27	60
Vanuatu	248	11	0	7	0	327	17	0	222	218	23	0
others	0	0	0	0	0	0	0	0	0	0	0	0
Total	1,186	865	401	1,003	1,803	2,024	2,496	1,810	665	2,254	1,157	1,233

Table A3-14: Table of albacore transhipments - 2023.

Responsible CCM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
China	0	2,144	1,867	1	952	1,212	2,585	789	365	1,043	531	1,482
Chinese Taipei	75	739	162	220	114	370	382	103	149	176	32	667
Japan	0	0	0	0	0	0	0	0	0	0	0	0
Republic of Korea	51	169	38	0	61	33	64	58	18	64	2	5
Vanuatu	6	0	23	0	0	0	344	2	433	0	0	0
others	0	0	0	0	0	0	0	0	0	0	0	0
Total	132	3,052	2,090	221	1,127	1,615	3,375	952	965	1,283	565	2,154