COMMISSION
Twenty-First Regular Session
28 November to 3 December 2024
Suva, Fiji (Hybrid)

Overview of Tuna Fisheries in the Western and Central Pacific Ocean, including Economic Conditions – 2023

WCPFC21-2024-27a
WCPFC-SC20-2024/GN-WP-01 (Rev.01)[1]
15 November 2024

Submitted by Tiffany Vidal[2]**, Peter Williams**[2]**, and Thomas Ruaia**[3]

[1] Adjusted the y-axis limit in Figure 3.9 to capture the full distribution of the indices
[2] Oceanic Fisheries Programme, The Pacific Community (SPC-OFP)
[3] Pacific Islands Forum Fisheries Agency (FFA)

Abstract

This paper provides a broad description of the major fisheries in the WCPFC Statistical Area (WCPFC-CA) highlighting activities during the most recent calendar year (2023) and covering the most recent summary of catch estimates by gear and species.

The provisional total WCPFC–CA tuna catch for 2023 was estimated at 2,630,858 mt, slightly lower than the 2022 level (2,702,099 mt) and around 342,728 mt lower than the record catch in 2019 (2,973,586 mt). The WCPFC–CA tuna catch (2,630,858 mt) for 2023 represented 79% of the total Pacific Ocean tuna catch of 3,310,318 mt, and 52% of the global tuna catch (the provisional estimate for 2023 is 5,027,799 mt), noting that unlike other oceans, over 80% of the WCPFC–CA tuna catch occurs in the waters of coastal states.

The 2023 WCPFC–CA catch of skipjack (1,647,702 mt – 63% of the total catch) was around 397,077 mt lower than the record in 2019 (2,044,779 mt). The WCPFC–CA yellowfin catch for 2023 (746,913 mt – 28%) was a decrease of 7,457 mt from the record 2021 catch (754,370 mt), noting that 2023 yellowfin catches are the second highest on record. The recent high catches are partially due to the high catch levels from the 'other' category (primarily small-scale fisheries in Indonesia).

The WCPFC–CA bigeye catch for 2023 (140,309 mt – 5%) was again one of the lowest of the time series, but relatively consistent with the catch levels from the previous two years. The 2023 WCPFC–CA albacore catch (94,934 mt – 4%) was around 2,741 mt higher than in 2022, but catches from 2021-2023 are the lowest on record since 1997. The provisional South Pacific albacore catch in 2023 was 67,751 mt; however, this estimate is expected to increase with the addition of catches from the Eastern Pacific Ocean, which have not yet been received.

The provisional 2023 purse seine catch of 1,843,100 mt was around 257,000 mt lower than the record catch in 2019 (2,100,135 mt). With respect to species specific purse seine catches, skipjack (1,377,830 mt: 75% of the catch) was slightly below the recent 10-year average, yellowfin tuna (408,281 mt; 22% of the total purse seine tuna catch) was around 92,000 mt lower than the record catch in 2017 (500,506 mt) and the fourth highest annual catch on record, the provisional catch estimate for bigeye tuna for 2023 (56,094 mt) was about 8,500 mt lower than the 2022 catch and a only a slight increase over the notably low purse seine bigeye tuna catch in 2019 (52,081 mt). The increased bigeye tuna catches since 2020 appears to be related to a higher number of associated sets.

The provisional 2023 pole-and-line catch (143,431 mt) is the lowest annual catch since the early-1960s, due to reduced catches in the Japanese fishery, although we note as in previous years the provisional nature of the estimates at this stage

The provisional WCPFC–CA longline catch (234,894 mt) for 2023 remains lower than the average over the previous decade but a slight increase from 2022 (243,115 mt). The bigeye component of the longline fishery (56,203 mt) was similar to the 2022 catch level - which are some of the lowest

catches reported since the mid-1980s. Both albacore and yellowfin catches were higher in 2023 than in 2022.

The 2023 South Pacific troll albacore catch (1,192 mt) was the second lowest catch level since 1980 (744 mt were reported in 1983), largely owing to a contraction in NZ's troll fleet operating in the region. The New Zealand troll fleet (94 vessels catching 864 mt in 2023) and the United States troll fleet (10 vessels catching 328 mt in 2023) accounted for all of the 2023 albacore troll catch, although minor contributions also come from the Canadian, the Cook Islands and French Polynesian fleets when their fleets are active in this fishery

In 2023, market prices for purse seine-caught products increased. Thai imports averaged $1,773/mt, marking an 8% increase from 2022, while Yaizu prices increased by 12% to $1,923/mt.

Conversely, prices for longline-caught yellowfin decreased across all markets. In Yaizu, prices fell by 28% to $5.07/kg. Prices for fresh and frozen yellowfin from selected ports decreased by 17% to $7.33/kg and 26% to $5.60/kg, respectively. The price from Oceania also declined by 5% to $8.51/kg, partly due to the appreciation of the US dollar against the Japanese yen.

Prices for longline-caught bigeye also declined across most markets except Oceania. In Japan, average prices from selected ports for fresh bigeye fell by 7% to $12.29/kg, and frozen bigeye decreased by 25% to $7.11/kg. However, the price for fresh imports from Oceania increased by 8% to $14.11/kg. In the U.S, fresh bigeye import prices rose by 4% to a record high of $12.03/kg in 2022, before slightly declining by 4% to $11.19/kg in 2023. Thai import prices for albacore decreased by 10% to $3.19/kg in 2023. Similarly, US fresh prices declined by 5% to $5.63/kg, and Japanese selected ports fresh prices fell by 20% to $3.24/kg.

In 2023, the total estimated delivered value of the tuna catch in the WCPFC-CA increased marginally by 4% to $6.1 billion. The purse seine fishery, valued at $3.5 billion, saw a 7% rise from 2022, representing 56% of the total value. In contrast, the longline fishery's value decreased slightly by 1% to $1.6 billion, while the pole and line catch value dropped by 11% to $312 million, attributed to reduced catches and a decline in the Yaizu price for pole-and-line-caught skipjack. Conversely, the value of catches from other gears increased by 11%, reaching $820 million.

In 2023, the WCPFC-CA skipjack catch was valued at $3 billion, a marginal 2% increase from the previous year, and accounted for nearly half of the total tuna catch value. The value of the albacore tuna catch decreased by 9% to $304 million, while the values for yellowfin and bigeye catches increased to $2.1 billion (+10%) and $784 million (+4%), respectively.

In 2023, economic conditions across purse seine, tropical longline, and southern longline fisheries in the WCPFC-CA improved compared with 2022. The tropical purse seine index improved, remaining above average at 109, driven by rising fish prices and declining fuel costs. From 2018 to 2020, this index stayed considerably above its 20-year average, primarily due to high catch rates. In 2022, the index dropped to 98, its lowest level since 2014. However, it rebounded in 2023, driven by an

increase in fish prices, declining fuel costs and higher catch rates.

For the southern longline fishery, 2023 saw a positive trend with the index approaching its 20-year average, supported by higher catch rates and lower fuel prices. Similarly, the economic conditions for the tropical longline fishery improved, nearing the 20-year average, driven by increased catch rates and a decrease in fuel prices.

Contents

1 Introduction

The tuna fishery in the Western and Central Pacific Ocean is diverse, ranging from small-scale artisanal operations in the coastal waters of Pacific states, to large-scale, industrial purse seine, pole-and-line and longline operations in both the exclusive economic zones of Pacific states and on the high seas. The main species targeted by these fisheries are skipjack tuna (*Katsuwonus pelamis*), yellowfin tuna (*Thunnus albacares*), bigeye tuna (*T. obesus*) and albacore tuna (*T. alalunga*).

This overview provides a broad description of the major fisheries in the WCPFC Statistical Area (WCPFC–CA; see Figure 1.1), highlighting activities during the most recent calendar year – 2023. This overview draws on the latest catch estimates compiled for the WCPFC–CA, found in SC20 Information Paper: *Estimates of annual catches in the WCPFC Statistical Area* (SPC-OFP, 2024). Where relevant, comparisons with previous years' activities have been included, although data for 2023, for some fisheries, are provisional at this stage.

This paper includes sections covering the four target tuna species, as well as blue marlin (*Makaira mazara*), black marlin (*Istiompax indica*), striped marlin (*Kajikia audax*) and swordfish (*Xiphias gladius*) catch in the WCPFC–CA tuna fisheries and an overview of the WCPFC–CA tuna fisheries by gear, including economic conditions in the main fisheries. In each section, the paper comments on recent developments in each fishery, with emphasis on 2023 catches relative to those of recent years, but refers readers to the SC20 National Fisheries Reports, which offer more detail on recent activities at the fleet level.

Additional graphical information that provides more information related to the recent condition of the fishery and certain WCPFC Conservation and Management Measures (CMMs) has been provided in an Appendix of this document, and other tabular and graphical information on the fishery can be found in (Hare et al., 2024) and (WCPFC Secretariat and SPC-OFP, 2024).

This overview includes brief summaries of several fisheries in the North Pacific Ocean, including those fisheries catching albacore tuna, Pacific bluefin tuna (*T. orientalis*), striped marlin and swordfish. Information on these fisheries will be expanded in future reviews, as two additional billfish species have been included as key species to report in the SciData (i.e., sailfish *Istiophorus platypterus* and shortbill spearfish *Tetrapturus angustirostris*). The Science Services Provider (SSP) will work with CCMs to improve the availability of historical catch data for these additional species.

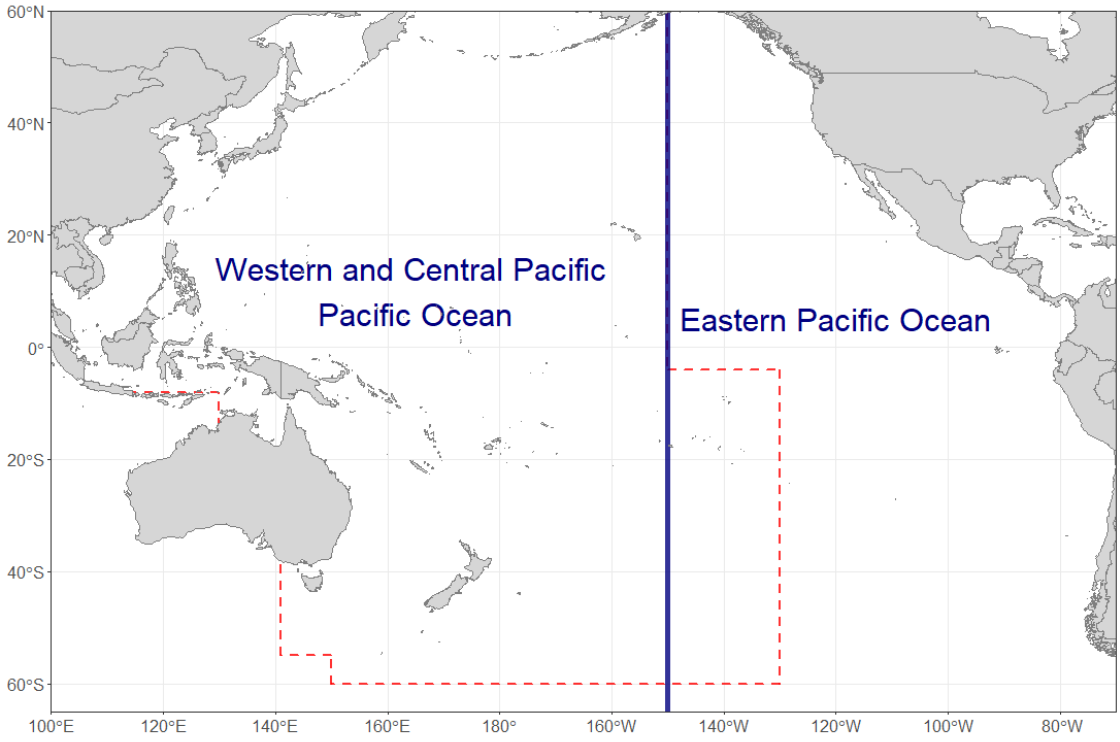

Figure 1.1: The western and central Pacific Ocean (WCPO), the eastern Pacific Ocean (EPO) and the WCPFC Convention Area (WCP–CA in dashed lines)

2 Total tuna catch and catch value for 2023

Annual total catches of the four main tuna species (skipjack, yellowfin, bigeye and albacore) in the WCPFC–CA increased steadily from 1980s through the 2000s with the purse seine fleet clearly becoming the dominant fishery in terms of catch volume. The increasing trend in total tuna catch continued through to about 2009, followed by two years (2010-2011) of reduced catches (due in part to La Niña conditions), before returning to record levels in successive years over the period 2012–2014. Catches in the period 2015–2017 were lower than 2014 but increased again over the next two years, with a record catch taken in 2019. Catches have declined since 2019, but have been relatively stable (Figures 2.1 and 2.2).

The provisional total WCPFC–CA tuna catch for 2023 was estimated at 2,630,858 mt, slightly lower than the 2022 level and around 342,728 mt lower than the record catch in 2019 (2,973,586 mt). For 2023, the purse seine fishery accounted for a catch of 1,843,100 mt (70% of the total catch), with pole-and-line taking an estimated 143,431 mt (5%), the longline fishery an estimated 234,894 mt (9%), and the remainder (16%) taken by troll gear and a variety of artisanal gears, mostly in the western Pacific-east Asia region (i.e., Indonesia, Philippines and Vietnam). The WCPFC–CA tuna

catch (2,630,858 mt) for 2023 represented 79% of the total Pacific Ocean tuna catch of 3,310,318 mt, and 52% of the global tuna catch (the provisional estimate for 2023 is 5,027,799 mt), noting that unlike other oceans, over 80% of the WCPFC–CA tuna catch occurs in the waters of the coastal states (see Figure A1 in the Appendix).

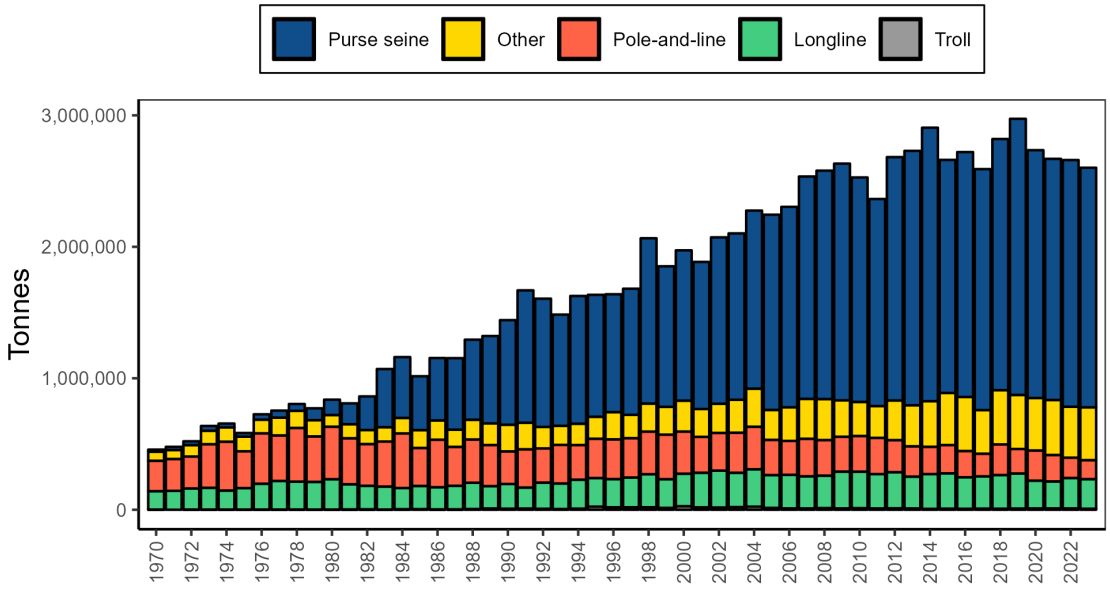

Figure 2.1: Catch (mt) of albacore, bigeye, skipjack, and yellowfin tuna in the WCPFC-CA, by longline, pole-and-line, purse seine, and other gear types

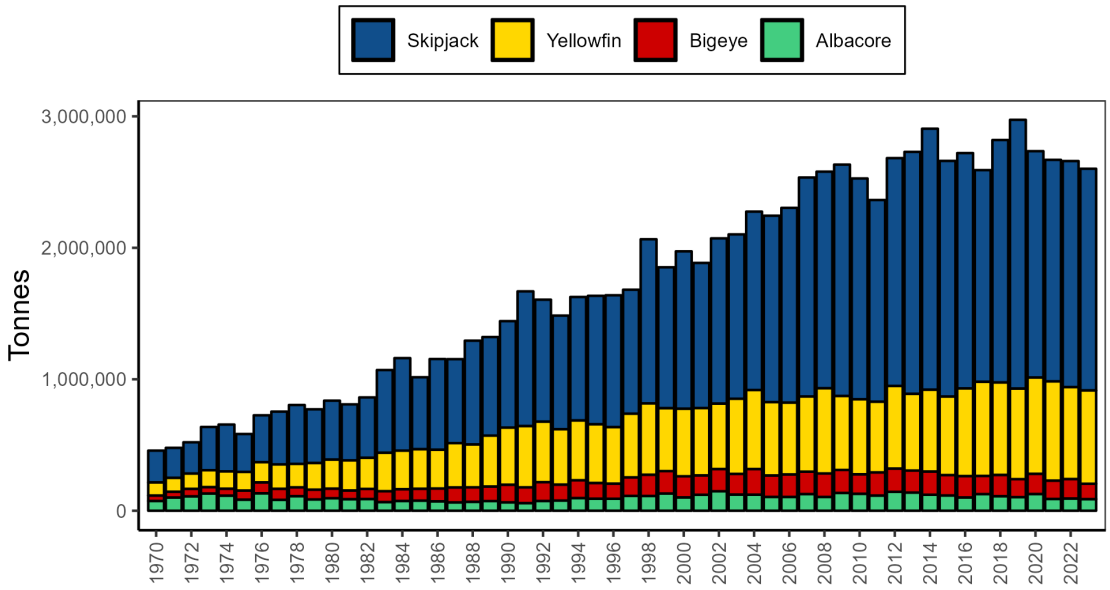

Figure 2.2: Catch (mt) of albacore, bigeye, skipjack, and yellowfin in the WCPFC–CA

The 2023 WCPFC–CA catch of skipjack (1,647,702 mt – 63% of the total catch) was around 397,077

mt lower than the record in 2019 (2,044,779 mt). The WCPFC–CA yellowfin catch for 2023 (746,913 mt – 28%) was a decrease of only 7,457 mt from the record 2021 catch (754,370 mt), noting that 2023 represents the second highest annual yellowfin catch on record, with highest annual catches of the time series coming from 2021. The WCPFC–CA bigeye catch for 2023 (140,309 mt – 5%) was among the lowest of the previous 20 years, but similar to the previous two years. The 2023 WCPFC–CA albacore catch (95,934 mt – 4%) was around 2,741 mt higher than in 2022. The albacore catches from 2021-2023 have been the lowest on record since 1997, and clearly lower than the record catch in 2002 of 148,051 mt.

In 2023, the provisional total value of the WCPFC-CA tuna catch reached approximately $6.1 billion, reflecting a 4% increase from 2022. The purse seine fishery accounted for an estimated $3.5 billion, or 56% of the total tuna catch value. The longline fishery experienced a slight decline of 1%, with its value dropping to $1.6 billion. The pole-and-line fishery also saw a decrease, falling by 11% to $312 million in 2023. However, the value of the catch taken by other gears increased to $820 million, an 11% increase from the previous year. The longline fishery's value accounted for 25% of the total value of the tuna catch, while the pole and line fishery and other gears contributed 5% and 13%, respectively.

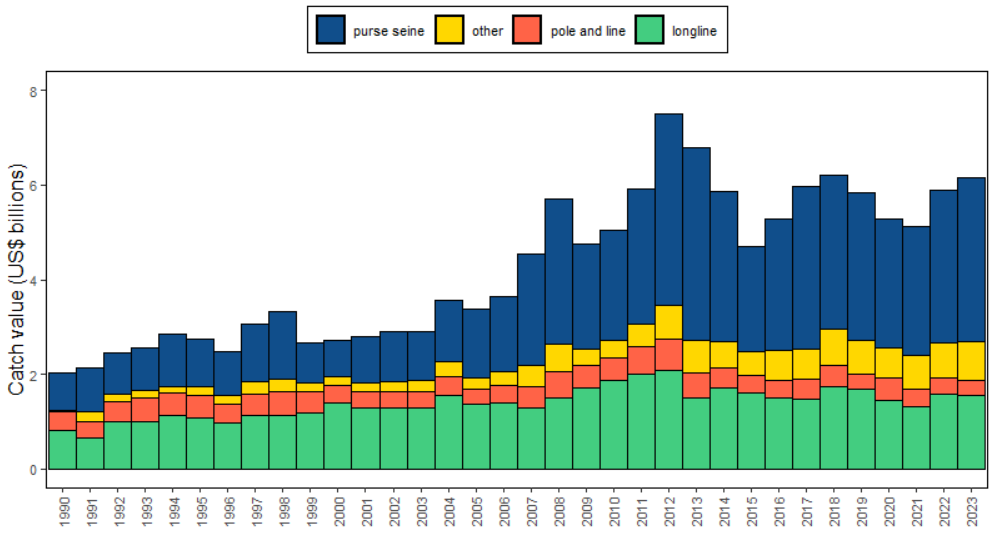

Figure 2.3: Catch value of albacore, bigeye, skipjack and yellowfin in the WCPFC–CA, by longline, pole-and-line, purse seine and other gear types

In 2023, the estimated value of the WCPFC-CA skipjack tuna catch was estimated at $3.0 billion, reflecting a marginal 2% increase from 2022, and accounting for 49% of the total tuna catch value. The value of the WCPFC-CA yellowfin tuna catch reached $2.1 billion, representing a 10% increase compared to the previous year. The WCPFC-CA bigeye tuna catch saw a 4% rise in value to approximately $784 million, or 13% of the total tuna catch value. In contrast, the value of the WCPFC-CA albacore tuna catch decreased by 9%, falling to $304 million in 2023.

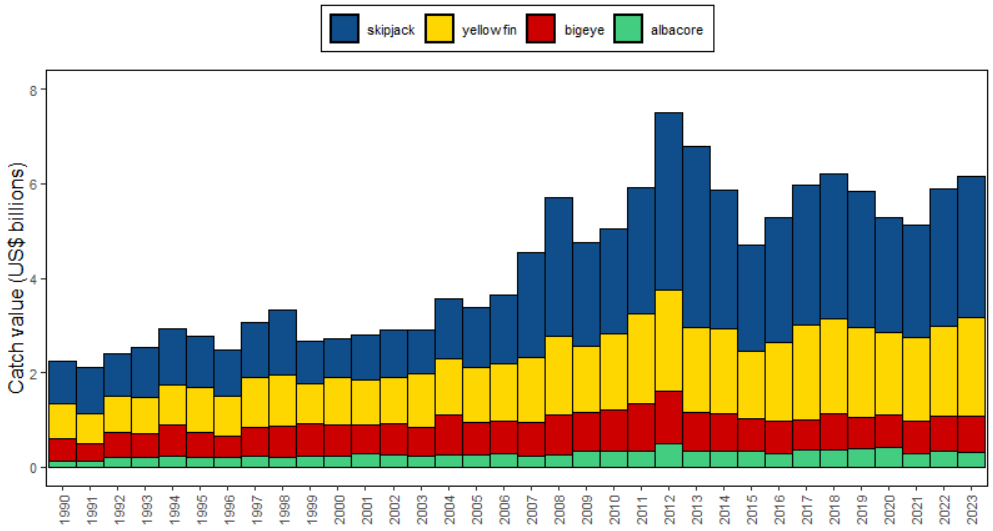

Figure 2.4: Catch value of albacore, bigeye, skipjack and yellowfin in the WCPFC–CA

3 WCPFC-CA Purse Seine Fishery

3.1 Historical Overview

During the mid-1980s, the purse seine fishery (400,000-450,000 mt) accounted for only 40% of the total catch but has grown in significance to a level now over 70% of total tuna catch volume (with more than 2,000,000 mt in 2014 and 2019). The majority of the historical WCPFC–CA purse seine catch has come from the four main Distant Water Fishing Nation (DWFN) fleets – Japan, Korea, Chinese-Taipei and USA, which numbered a combined 163 vessels in 1992 (Figure 3.1). There was a reduction in DWFN vessels from the late 1990s to the mid-2000s (due to reductions in the US fleet). There was some rebound in recent years (up to 142 vessels in 2012); however this portion of the DWFN fleet has again been reduced to 97 vessels in 2023. The Pacific Islands fleets have gradually increased in numbers over the past two decades to a level of 142 vessel in 2023 (Figure 3.1). The remainder of the purse seine fishery includes several fleets which entered the WCPFC tropical fishery during the 2000s (e.g., China, Ecuador, El Salvador, New Zealand and Spain).

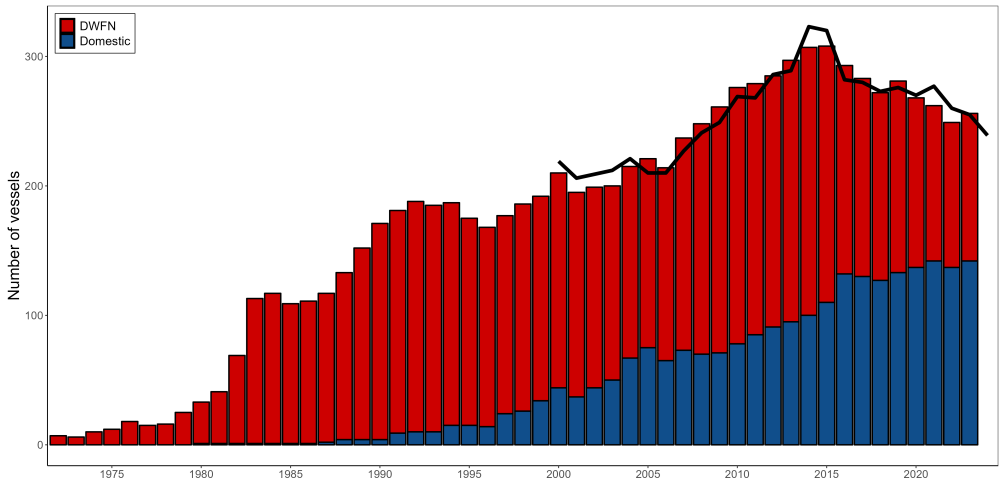

Figure 3.1: Number of purse seine vessels operating in the WCPFC-CA tropical fishery (excludes Indonesia, Philippine and Vietnam domestic purse seine/ringnet fleets; bars represent WCPFC yearbook vessel number data); line represents vessel numbers according to a combination of logbook and VMS data.

The total number of purse seine vessels was relatively stable over the period 1990-2006 (in the range of 170–250 vessels), but between 2006 and 2014, the number of vessels gradually increased, attaining a record level of 308 vessels in 2015, before steadily declining since (to 270 vessels in 2023). Further declines have occurred in recent years, with a significant reduction in vessels from one component of the US purse seine fleet. Table 4 in (WCPFC Secretariat and SPC-OFP, 2024) provides a breakdown on purse seine vessel numbers, tuna catch and effort by fleet, set type and species in the tropical tuna purse seine fishery based on raised logsheet data.

The WCPFC–CA purse seine fishery is essentially a skipjack fishery, unlike those in other ocean areas. Skipjack generally account for 65–77% of the purse seine catch, with yellowfin accounting for 20–30% and bigeye, accounting for only a small proportion – 2-5%. Small amounts of albacore tuna are also taken in temperate water purse seine fisheries in the North Pacific.

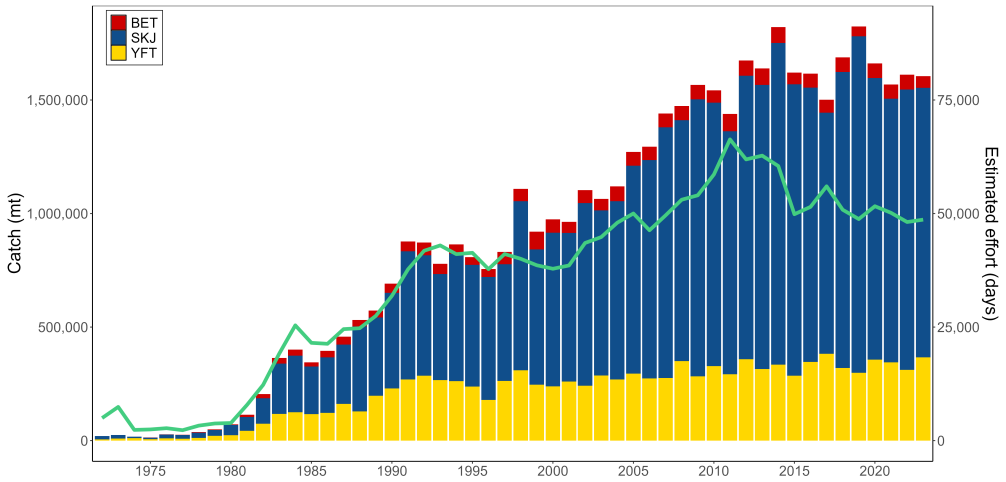

Figure 3.2: Purse seine catch (mt) of bigeye, skipjack and yellowfin (bars; left y-axis) and fishing effort (days fishing and searching; green line and right y-axis) in the WCPFC–CA (effort: excludes Indonesia, Philippine, and Vietnam domestic purse seine/ringnet fleets)

Features of the purse seine catch by species during the past two decades include:

1. Annual skipjack catches fluctuating between 600,000 and 850,000 mt prior to 2002, a significant increase in the catch during 2002, with subsequent skipjack catches maintained well above 1,200,000 mt;

2. Annual yellowfin catches fluctuating considerably between 300,000 and 400,000 mt, with a significant catch (record) of 496,000 mt taken in 2017. The proportion of large yellowfin in the catch is generally higher during El Niño years and lower during La Niña years, although other factors appear to affect purse seine yellowfin catch;

3. Increased bigeye tuna purse seine catch estimates, coinciding with the introduction of drifting Fish Aggregating Devices (dFADs) since mid-late 1990s. Significant years for bigeye catches have been 2011 (87,302 mt – record high), 2013 (84,404 mt) and 2014 (81,430 mt) which correspond to years with a relatively high proportion of associated sets, increased bigeye tuna availability to the gear, and/or strong bigeye recruitment.

Total estimated effort shows the same increasing trend as the catch over time (Figure 3.2), until around 2010 when estimated purse seine fishing days start to decline. Years of relatively high catch rates are apparent when the effort line is substantially lower than the top of the histogram bar (that is, in 1998 and 2006–2009, 2014–2023).

3.2 Provisional estimates of catch, effort, and fleet size (2023)

The provisional 2023 purse seine catch of 1,843,100 mt was around 257,035 mt lower than the record catch in 2019 (2,100,135 mt). The 2023 purse seine skipjack catch (1,377,830 mt: 75% of

the catch) was slightly below the average catch over the past decade, and around 322,000 mt lower than the catch in 2019 (∼1,700,000 mt). The 2023 purse seine catch for yellowfin tuna (408,281 mt; 22% of the total purse seine tuna catch) was the fourth highest on records and around 92,000 mt lower than the record catch in 2017 (500,506 mt). The provisional catch estimate for bigeye tuna for 2023 (56,094 mt; 3% of the total purse seine fishery) was about 8,500 mt lower than the 2022 catch and a only a slight increase over the notably low purse seine bigeye tuna catch in 2019 (52,081 mt). The increased bigeye tuna catches from 2020-2022 appear to be related to a higher number of associated sets. Figure 3.3 compares annual purse seine effort and catches for the five main purse seine fleets operating in the tropical WCPFC–CA in recent years. The combined 'main-fleet' effort was relatively stable over the period 2010–2014, before the clear decline in effort for 2015 and then relatively stable effort levels over the period 2017–2023.

The decline in effort during 2015/2016 was related to several factors including reduced access to fishing areas for some fleets, economic conditions and simply a choice to fish in areas outside the WCPFC area. In contrast, catches have generally trended upwards over this time series, suggesting increased efficiency and, in some instances, better catch rates. The 2019 catch for the 'main fleets' is consistent with the overall record catch and a year with good catch rates. The slight drop in effort from 2017 to 2023 appears to be primarily related to a decline in vessel numbers (Figure 3.1), and the drop in catches from 2020-2022, compared to 2019, maybe due to less favourable fishing conditions affecting catch rates, and also to some extent, and the impacts of COVID-19. Catch rates in 2023 have remained consistent with the past couple years, possibly reflecting the transition to El Niño conditions.

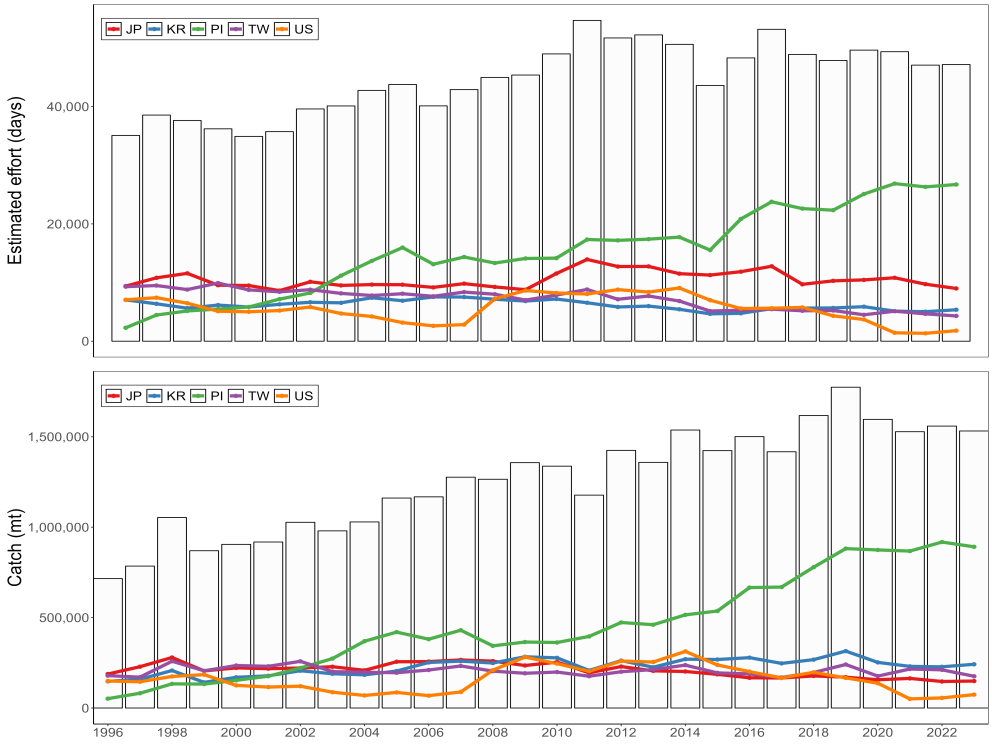

Figure 3.3: Trends in annual effort (top) and catch (bottom) estimates for the top five individual purse seine fleets operating in the tropical WCPFC–CA, 1996–2023. Individual fleets (lines; left axis) and the total values for five fleets (bars; right axis)

The combined Pacific-Islands fleet has been clearly the most dominant in the tropical purse seine fishery since 2003 and unlike the other fleets shown in Figure 3.3, their recent catches continue to increase each year. There was a hiatus in the Pacific-Islands fleet development in 2008 (when some vessels reflagged to the US purse seine fleet) but catch/effort has picked up in recent years and catch by this component of the fishery continues to be the main contributor to purse seine catches (with a record high in 2022; 917,770 mt). The combined Pacific-islands fleet catch in 2023 (881,959 mt) easily exceeded the combined catch from the other fleets shown in Figure 3.3 (combined 2023 catch for Japan, Korea, Chinese Taipei and USA was 635,280 mt). The fleet sizes and effort by the Japanese and Korean purse seine fleets have been relatively stable for most of this time series. Several Chinese-Taipei vessels re-flagged in 2002, dropping the fleet from 41 to 34 vessels, with fleet numbers relatively stable since. Since 2014, the catch/effort by most of the non-Pacific Island fleets have tended to decline while the catch/effort by the combined Pacific Islands fleet have continued to increase. This increase is related to the reflagging of vessels from these distant-water fleets to Pacific island countries.

The total number of the combined Pacific-island purse seine fleet vessels has gradually increased over the past two decades, attaining its highest level in 2021 (142 vessels); increases in these years include the reflagging and chartering of vessels from the Asian and US fleets. The combined Pacific-

islands purse seine fleet covers vessels fishing under the FSM Arrangement, bilateral agreements and domestically based vessels, and in 2023, comprised vessels from the Cook Islands (2 vessels), Federated States of Micronesia (FSM; 27 vessels), Kiribati (30 vessels), Nauru (15 vessels), Marshall Islands (11 vessels), Papua New Guinea (PNG; 34 vessels including their chartered vessels), Solomon Islands (10 vessels), Tuvalu (6 vessels) and Vanuatu (7 vessels). The Cook Islands entered the purse seine fishery in 2019 and now has 2 vessels participating in the fishery.

The domestic Philippine purse seine and ringnet fleets operate in Philippine waters and, since 2013 (as was the case prior to 2010), in the high seas pocket between Palau, Indonesia, FSM and PNG; this fleet accounted for a catch in the range 55,000-90,000 mt annually in the period since 2013. Prior to 2013, the domestic Indonesian purse seine fleet accounted for a similar catch level to the Philippines domestic fishery but generally has not fished in high seas areas. During 2013, the Indonesian fleet catch increased substantially (215,582 mt) with more on-shore processing facilities and more vessels entering the fishery. However, the purse seine catch in 2015 (∼56,000 mt) dropped considerably from this level, mainly due to the introduction of a ban on fishing and transhipment-at-sea for vessels not built in Indonesia (which, at the time, was nearly all of large vessels in their purse seine fleet). The Indonesian purse seine catch recovered (214,605 mt in 2017) apparently due to increased catches by the smaller-scale purse seine component of this fleet, although in recent years (2021-2023), the catch has varied between 156,000 and 139,000 mt. Prior to 2009, the domestic fleets of Indonesia and Philippines accounted for about 13-16% of the WCPFC-CA total purse seine catch. Since then, this proportion has ranged from about 7-17%, whilst generally around 10%.

Figure 3.4 shows annual trends in total tuna catch by set type (left) and sets by set type (right) and for the major purse seine fleets. Sets on free-swimming (unassociated) schools of tuna dominate during recent years (68% of all sets for these fleets in 2023, although it should be noted that this category includes considerable unsuccessful [zero-catch] sets). The proportion of sets on drifting FADs remained high in 2023 (29%), but was a slight a reduction from the peak in 2022 (32%). The reliance on drifting FAD sets in recent years is understood to be related to the La Niña conditions; however, the slight decrease seen in 2023 may be reflective of the shift towards El Niño conditions. The number and proportion (≤2% since 2020) of sets on natural logs was clearly the lowest in the fishery for the major fleets and reflects a move away from this type of fishing, in line with the improvements in technology/efficiency involving drifting FAD use. Associated set types, particularly drifting FAD sets, generally account for a higher average catch per set than unassociated sets, so the percentage of catch for drifting FADs (for 2023 = 41%; Figure 3.4 – left [red]) will be higher than the percentage of sets for drifting FADs (for 2023 = 29%; Figure 3.4 – right [red]). In contrast, the catch from unassociated schools in 2023 was 51% of the total catch but taken from 68% of the total sets.

For the US fleet, between 83-94% of all sets were conducted on drifting FAD in 2021 and 2022; however, in 2023, this percentage was reduced to 66%[3]. Even so, these numbers continue to highlight

[3] Noting that the SSP has only received about 70% of the logsheet data at this time

the reliance on this fishing strategy in the eastern areas of the tropical WCPO (Figure 3.4 – right). Table 4 in (WCPFC Secretariat and SPC-OFP, 2024) provides a more detailed breakdown of catch and effort by set type in 2000-2023 using available logsheet and observer data.

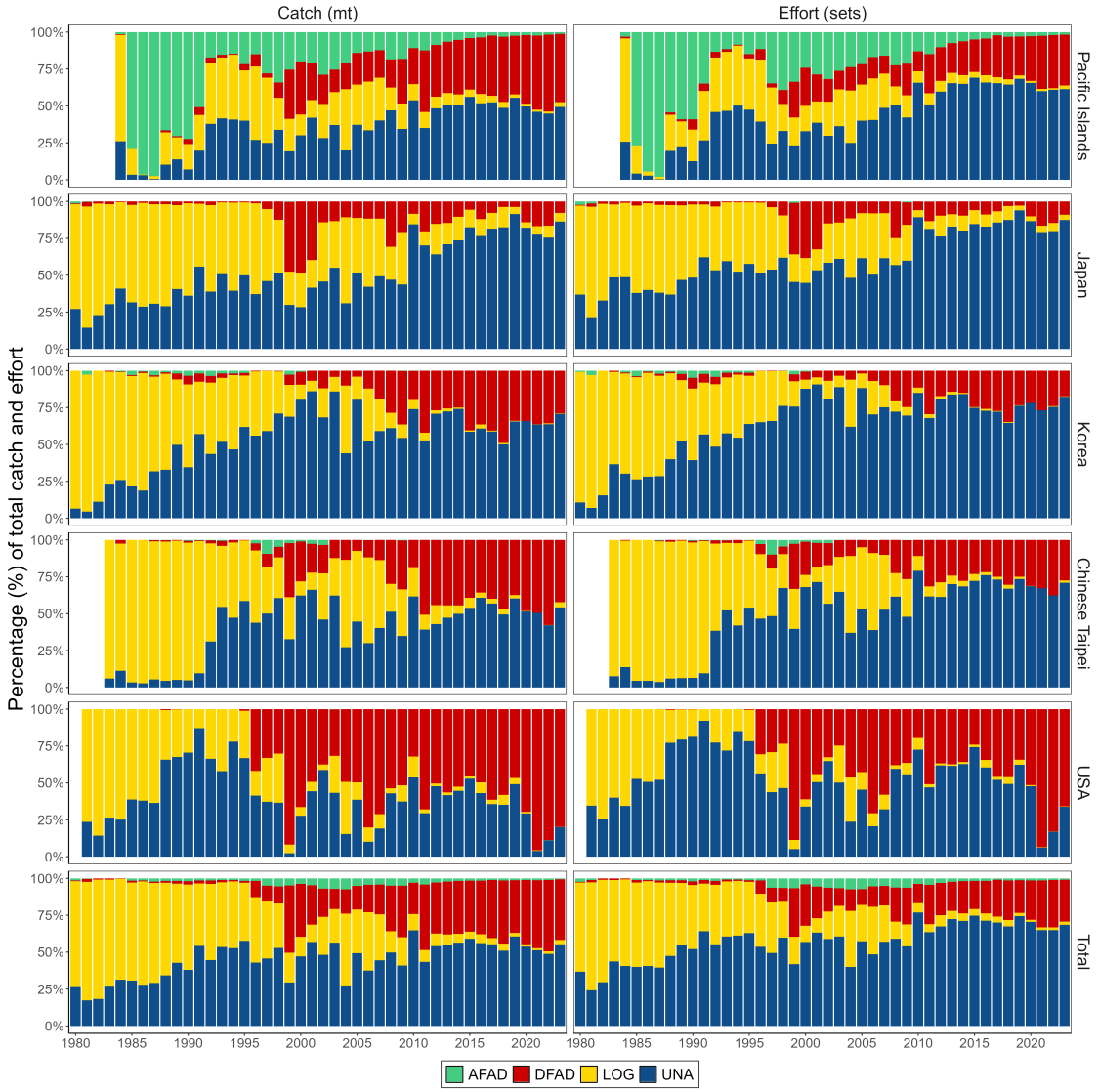

Figure 3.4: Time series showing the percentage of total sets (left) and total catch (right), by school type for the major purse seine fleets operating in the WCPFC–CA

3.3 Environmental conditions

The purse seine catch/effort distribution in tropical areas of the WCPFC–CA is strongly influenced by El Niño–Southern Oscillation Index (ENSO) events (Figure 3.5). Figure 3.6 (left) demonstrates the effect of ENSO events on the spatial distribution of the purse seine activity, with fishing effort typically expanding further to the east during El Niño years and contracting to western areas during La Niña periods.

The WCPFC–CA fishery was in an ENSO neutral state during most of 2017, but La Niña conditions developed later that year and continued into the early months of 2018, before transitioning through a neutral state which presided over the rest of 2018. Weak to moderate El Niño conditions developed in late 2018, leading into the middle of 2019, and then subsided later in the year to neutral conditions by the start of 2020. The second half of 2020 and into the early months of 2021 demonstrated relatively neutral ENSO conditions, but from early-2021 through to the end of 2022, relatively strong La Niña conditions persisted. There was a clear transition from La Niña to neutral to El Niño conditions in the first half of 2023, which persisted for the remainder of 2023 and into 2024, with weaker El Niño to ENSO neutral conditions experienced during the 2nd quarter of 2024.

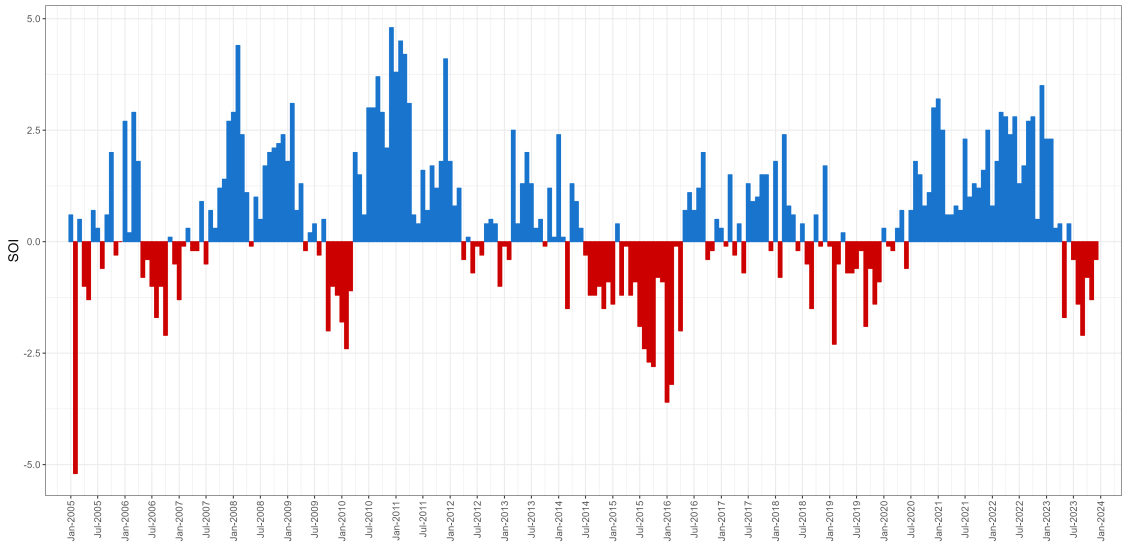

Figure 3.5: Trends in the El Niño Southern Oscillation Index (SOI), 2005-2023 (blue - La Niña; red - El Niño); data from https://www.cpc.ncep.noaa.gov/data/indices/soi

3.4 Distribution of fishing effort

Despite the FAD closure for certain periods in each year since 2010, drifting FAD sets remain an important fishing strategy (Figure 3.6), particularly to the east of 160°E. By late 2018, weak El Niño conditions presided over the fishery and relatively high catches were taken in the eastern tropical areas, in and adjacent to the waters of Tokelau and the Phoenix Group. El Niño conditions continued into 2019 with purse seine effort extending further to the east compared to recent years (Figure 3.6) and very good catches were taken in a few concentrated areas of the eastern tropical waters (see Figure 3.15). The La Niña conditions experienced in 2020 through to 2022 resulted in a general westward shift of fishing effort compared to 2019, with most of the effort in PNG, FSM, Solomon Islands (west of 160°E) during 2022. The western contraction of the warm pool in 2022 (Figure 3.6 – bottom left) resulted in more reliance on drifting FADs in the area east of 160°E which is in contrast to 2017, for example. The transition to El Niño in 2023 is evidenced by the expansion of the warm pool towards the east along with and eastward expansion of fishing effort.

The fishing strategy in 2023 shows an increase in free-school sets, as compared to 2022, especially in the eastern WCPO.

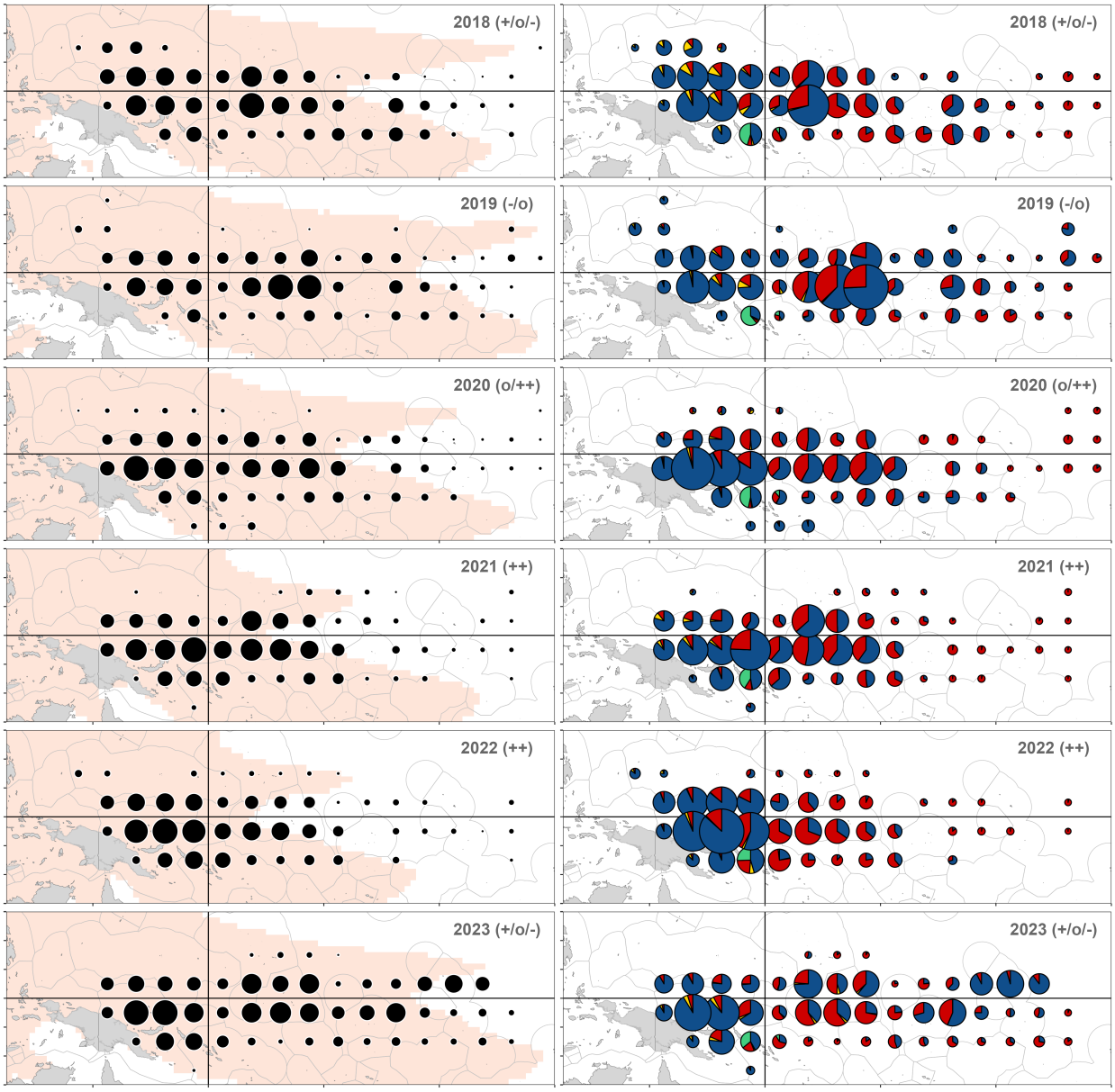

Figure 3.6: Distribution of purse seine effort (days fishing – left; sets by set type – right), 2018–2023 (blue – unassociated; yellow – log; red – drifting FAD; green – anchored FAD). Pink shading represents the extent of average sea surface temperature > 28.5° ENSO trends are denoted by '+': La Niña; '-': El Niño; 'o': transitional period

Figure 3.7 shows the distribution of purse seine effort for the five major purse seine fleets during 2022 and 2023. There is a marked eastward shift in fishing effort in 2023 as compared to 2022 for most fleets related to the shift from La Niña to El Niño conditions between 2022 and 2023. This shift toward the east is most noticeable in the Pacific Islands, Korean and Chinese Taipei fleets. The US fleet have tended to fish in the more eastern areas in recent years, mainly in the eastern high seas areas adjacent to the Phoenix and Line Islands EEZs, and to the north of the Cook Islands and French Polynesia EEZs, with no effort to the west the Phoenix Islands in these years. The difference in areas fished by the non-Pacific islands' fleets Figure 3.7 is generally related to the areas they have access to and perhaps also related to fishing strategy (e.g., use of traditional fishing grounds in FSM, PNG and the Solomon Islands by the Japan fleet).

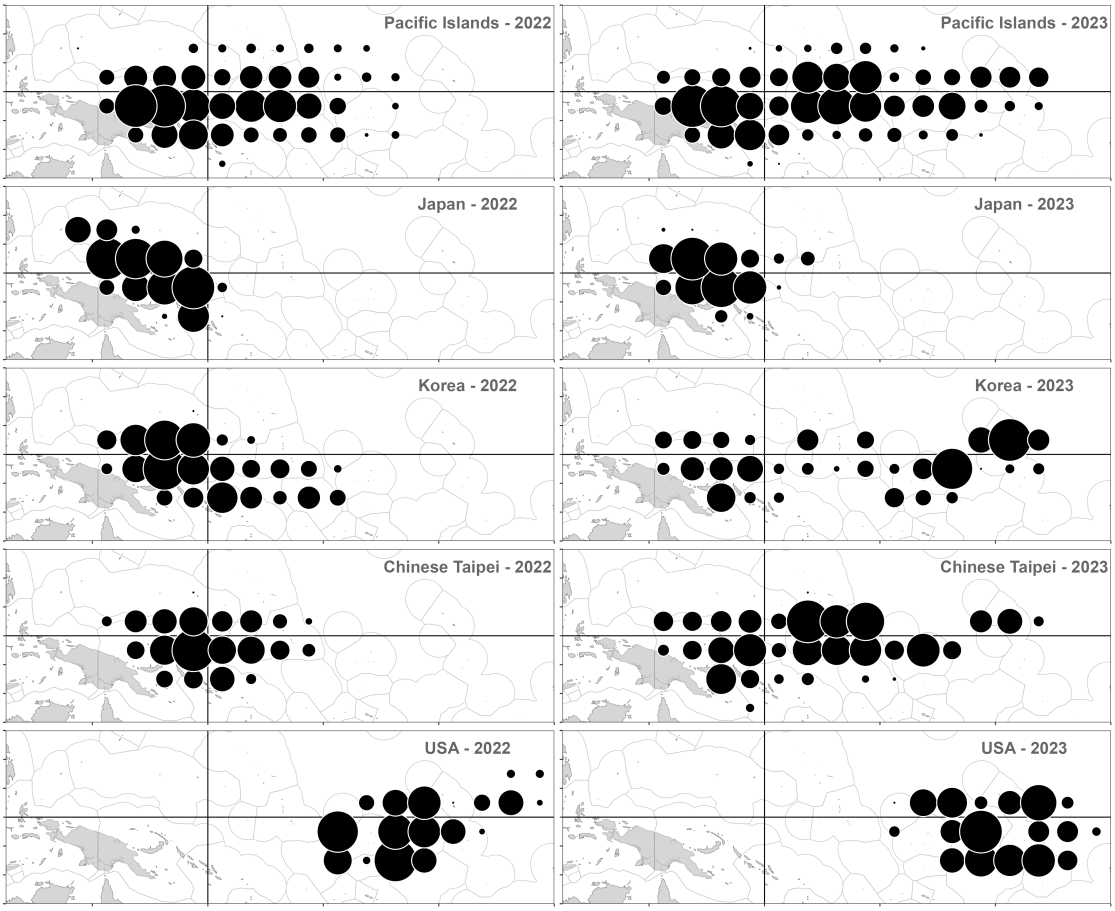

Figure 3.7: Distribution of purse seine effort by (from top to bottom) the Pacific Islands, Japanese, Korean, Chinese Taipei, and US purse seine fleets during 2022 (left) and 2023 right); lines for the equator (0° latitude) and 160°E longitude included.

3.5 Catch per unit effort

Figure 3.8 shows the annual time series of nominal CPUE by set type and vessel nation for skipjack (left) and yellowfin (right). These trends are not standardised for environmental factors or factors

that may relate to the efficiency of the fleets, e.g., technological improvements and increased vessel power, so therefore must be interpreted with caution. Recent reviews of the available logsheet data used to determine nominal CPUE highlight an apparent change in reporting behaviour, with a clear increase in the reporting of transit days (over days searching); since transit days are not included as purse seine effort (and days searching is included), this change will inevitably result in a positive bias in the nominal CPUE data presented herein (see also Vidal et al., 2024).

Purse seine skipjack CPUE in 2023 was comparable to catch rates in 2022 levels but lower than the record levels experienced in 2019, when a combination of environmental conditions and strong recruitment were contributing factors to the high catch rates in that year. Drifting FAD CPUE has increased the most notably over the time series, with increasing variability among the fleets. The log set CPUE shows increasingly high variability, due largely to the relative infrequency of this set type in recent years. Over the entire time series, the trend for skipjack CPUE has generally been increasing, although, as noted, these graphs present nominal CPUE and do not consider the increase in fishing efficiency (often referred to as 'effort creep'). A possible indicator of an increase in fishing efficiency is the gradual reduction in average trip length over time, which is apparent in the linear trend of VMS trip length, which is estimated to decrease from about 31 days in early 2009 to around 20 days by mid-2024 (Figure 3.10).

Yellowfin purse seine CPUE shows strong inter-annual variability, but lacks a directional trend in catch rates. Unassociated-set yellowfin CPUE appears influenced by ENSO variation in the WCPFC–CA, with CPUE generally higher during El Niño episodes, including in 2023 with the transition to El Niño conditions. This is believed to be related to increased catchability of yellowfin tuna due to a shallower surface-mixed layer during these periods. Associated (log and drifting FAD) sets generally yield higher catch rates (mt/day) for skipjack than unassociated sets, while unassociated sets sometimes yield a higher catch rate for yellowfin than associated sets. The higher yellowfin CPUE from free-schools occurs when 'pure' schools of large, adult yellowfin are more available to the gear in the more eastern areas of the tropical WCPFC-CA, and so account for a larger catch (by weight) than the (mostly) juvenile yellowfin encountered in associated sets.

The purse seine yellowfin CPUE for free-schools by the US fleet rebounded in 2022 from the very low levels experienced in both 2020 and 2021, and continued to increase into 2023. The US fleet is active in the eastern areas compared to the other 'main' fleets shown in these CPUE trends (refer to Figure 3.7). The yellowfin tuna free school CPUE in 2023 was higher for all fleets than in 2022 with effort shifted a bit eastward as El Niño conditions prevailed. Figure 3.12 shows that for unassociated sets, the 'pure' schools of large, adult yellowfin were not present in the east during 2022, perhaps related to the prevailing ENSO conditions and/or different fishing strategies related to market demands, although the paucity of observer data for this area may also explain the absence. In 2023, the larger yellowfin appear once again in the observer size data.

Yellowfin tuna contributed approximately 22% to the total 2023 tuna purse seine catch (SPC-OFP, 2024). Catch rates on drifting FADs in 2023 declined compared to 2022, with a decrease in drifting

FAD sets (Figure 3.4). The long-term time series for yellowfin CPUE shows more inter-annual variability and overall, a flatter trend than the skipjack tuna CPUE. It is unknown whether these trends reflect an increasing ability to target skipjack tuna at the expense of yellowfin, or reflect a change in yellowfin abundance, given that fishing efficiency has increased.

The difference in the time of day that sets are undertaken is thought to be one of the main reasons why bigeye tuna are rarely taken in unassociated schools compared to log and drifting FAD schools, which have catch rates of this species an order of magnitude higher (Figure 3.9). The CPUE time series for bigeye tuna since 2000 varies greatly by fleet and set type with no clear pattern evident, but with drifting FADs accounting for the highest catches and most variability. The bigeye tuna CPUE levels in 2023 were lower overall compared to the previous couple years and comparable to the low levels experienced during 2019, perhaps due to increased focus on free-school sets during 2023 (Figure 3.6). The bigeye tuna CPUE for drifting FADs for the US fleet has been clearly higher in recent years, no doubt related to this fleet's move further east, to areas adjacent to the Eastern Pacific tropical fishery which is acknowledged to have higher proportions of bigeye tuna in their catches.

Figure 3.10 shows the inverse relationship between monthly CPUE (total tuna catch (mt) per day) and average trip length estimates (from logsheets and VMS); logsheet trip length tends to fluctuate in synchrony with CPUE, with shorter trips corresponding to higher CPUE. Average trip length (from VMS data) generally compares well to average trip length (from logsheet data), but as logsheet coverage declines (e.g., early 2024), estimates from these two sources tend to diverge since available logsheets are probably not representative. The FAD closure period each year (commencing in 2010) generally coincides with a decline in total tuna CPUE, with longer trips and apparent difficulties obtaining consistent catches from free-swimming schools. The drop in CPUE from late 2016 into the first 6-8 months of 2017 may simply be due to a return to conditions prior to the most recent El Niño of 2014–2016. The pattern in high CPUE in the months immediately following the FAD closure periods is understood to be mainly due to the build-up of unexploited biomass which then becomes available through FADs, although in 2022, the fishery had an increase in CPUE before the FAD closure period (that is, from months May-June 2022). The record high catch rates in the months following the FAD closure in 2023 appears to be related to good catches in the more eastern tropical waters under El Niño conditions (Figure 3.15, 4th quarter 2023).

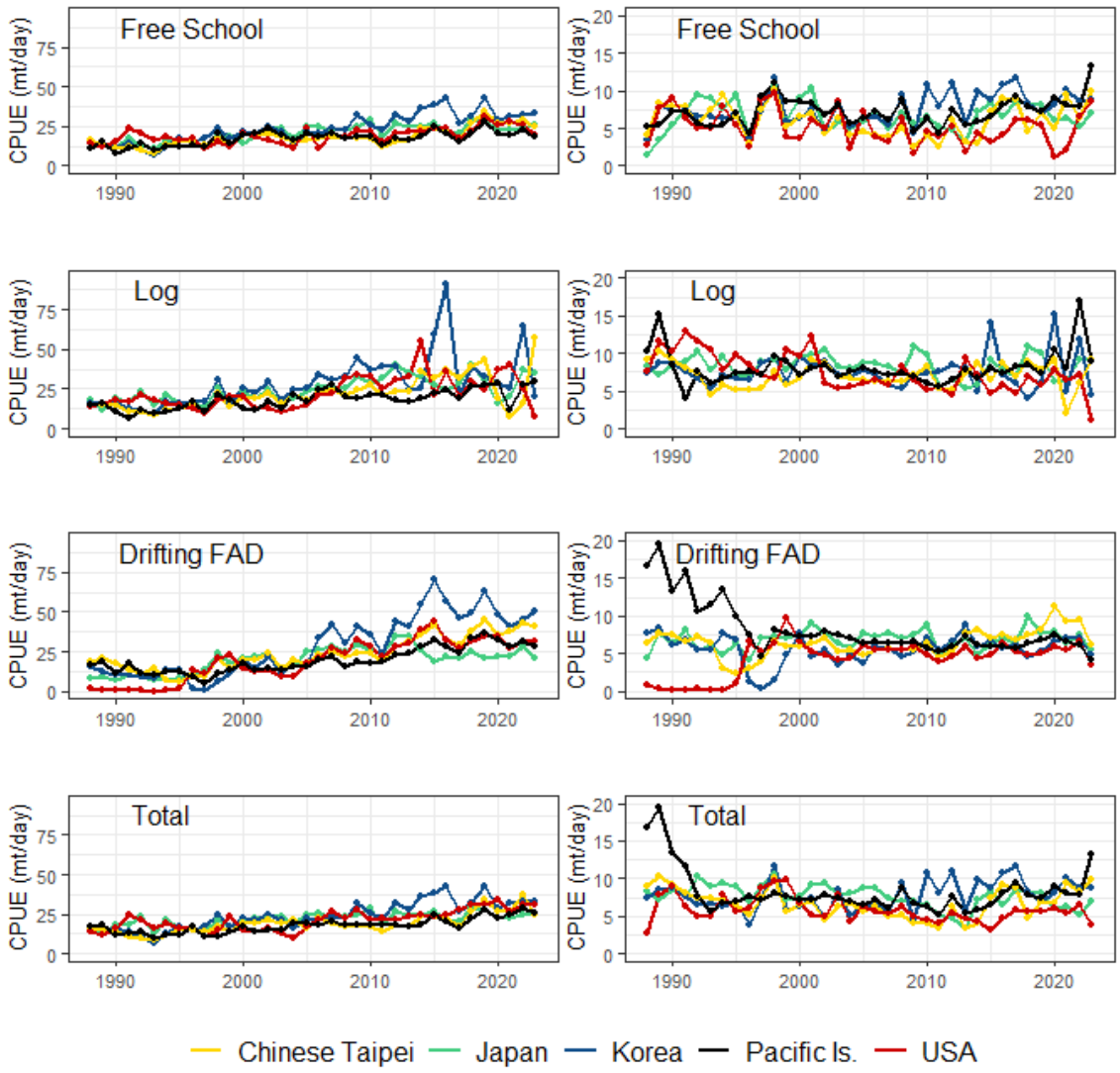

Figure 3.8: Skipjack tuna CPUE (mt per day–left) and yellowfin tuna CPUE (mt per day–right) by set-type, and all set types combined, for selected purse seine fleets fishing in the tropical WCP–CA. Effort and CPUE were partitioned by set type according to the proportions of total sets attributed to each set type. The black line represents the Pacific Islands purse seine fleets combined.

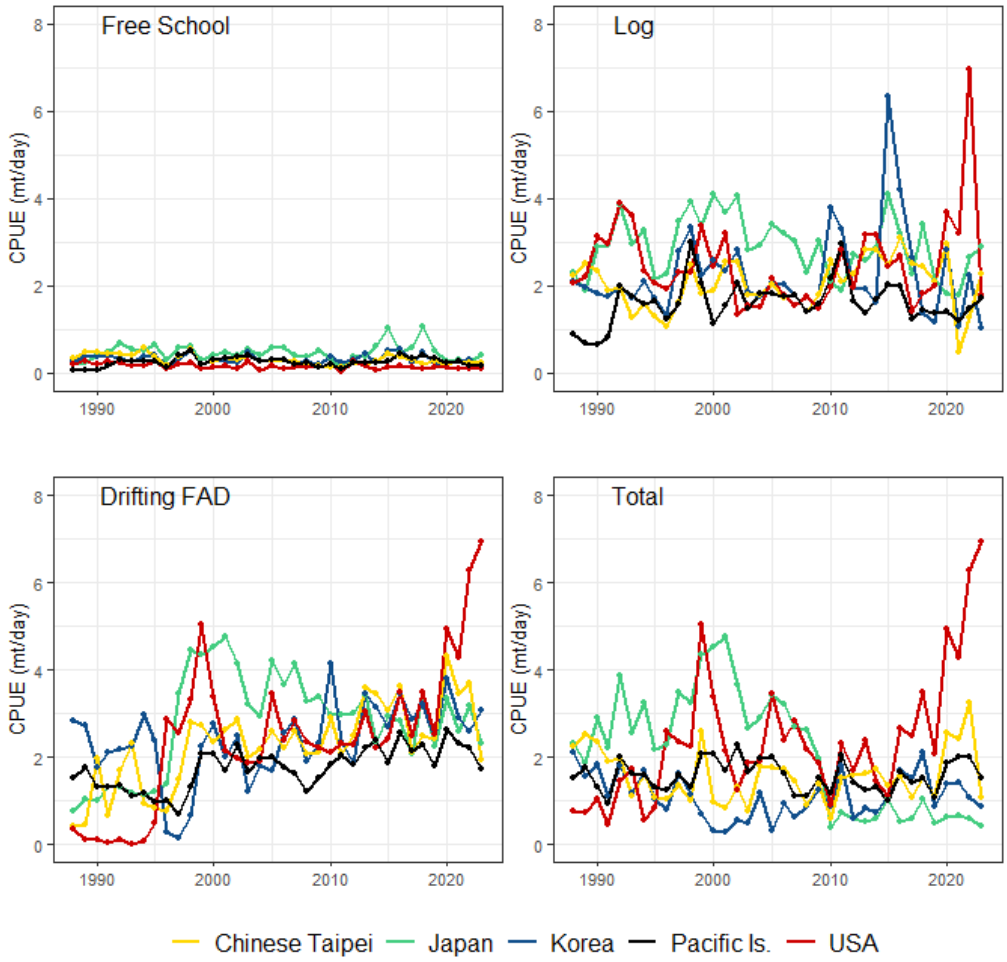

Figure 3.9: Estimated bigeye tuna CPUE (mt per day) by major set-type categories (free-school, log and drifting FAD sets) and all set types combined for Japanese, Korean, Chinese-Taipei and US purse seiners fishing in the tropical WCP–CA. Effort and CPUE were partitioned by set type according to the proportions of total sets attributed to each set type. The black line represents the Pacific Islands purse seine fleets combined.

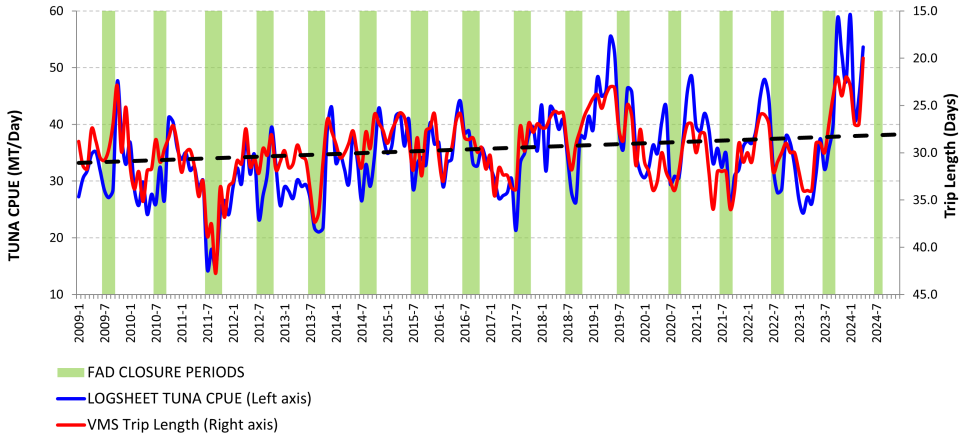

Figure 3.10: Monthly purse seine tuna CPUE (mt/day) and average trip length (VMS days), 2009–2024. Dashed, black line represents the linear trend on VMS Trip length. VMS Trip length axis (right) is reversed/inverted. For 2020 - 2023, only the full-fishery, mandatory FAD closure period (i.e., July-Sept for 2020-2023; July - 15 August for 2024) is shown and acknowledges that flag states must choose an additional two (2020-203) or one-month (2024) FAD closure period as per the requirements in CMM 2018-01, 2020-01, 2021-01, and 2023-01.

3.6 Species and size composition of the catch

Figures 3.11 and 3.12 show the species and size composition of the purse seine catch for 2022 and 2023, by set type and broad area of the tropical fishery, noting that observer coverage in the purse seine fishery between 2020-2022 is incomplete and biased to the few fleets where observer deployment was possible. Points of interest in the comparison of these graphs include:

1. Larger tuna catches for the associated set-type categories in both 2022 and 2023 for the tropical area east of 170°E, even considering the shift to El Niño conditions in 2023 and decreased reliance for drifting FADs, as compared to 2022;

2. Slightly larger skipjack tuna in the area west of 170°E from unassociated sets in 2023 compared with 2022;

3. A higher proportion of the bigeye tuna in associated sets east of 170°E (compared to the west), and the presence of larger (90-140 cm) bigeye tuna in the eastern area, which appear to be absent from catches in the west;

4. The absence of large yellowfin tuna in the unassociated set catch in the area east of 170°E in 2022, compared to 2023, although there were large yellowfin and bigeye tuna in the associated-set catch in this area for 2022. The lack of large-yellowfin tuna in the unassociated-set catch in this eastern area during 2022 could be due to a combination of factors, for example, fewer unassociated sets conducted in this area (see Figure 3.6 – bottom right) and the lack of size data from observers in this area.

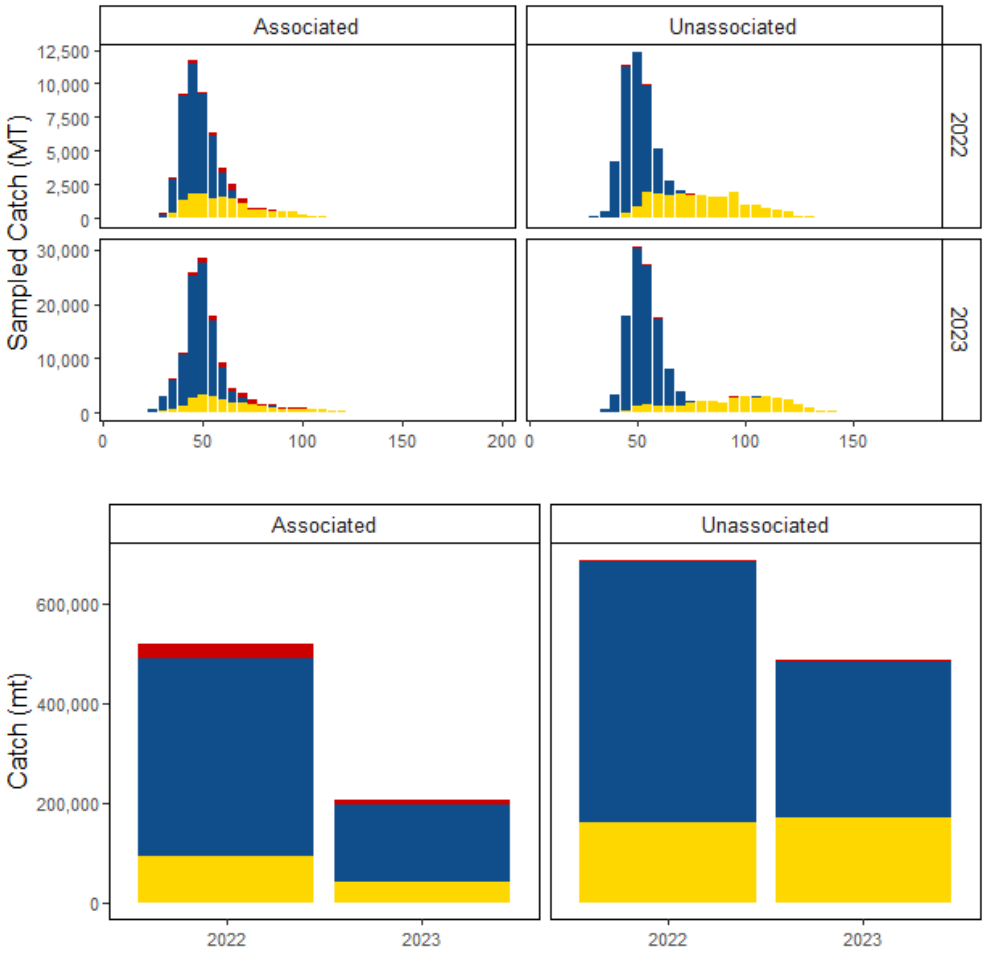

Figure 3.11: Species composition (mt: y-axis) of the 2022 and 2023 purse seine catch, by set type category and 5cm size categories (x-axis) for the tropical fishery, west of 170°E (skipjack – blue; yellowfin – yellow; bigeye – red)

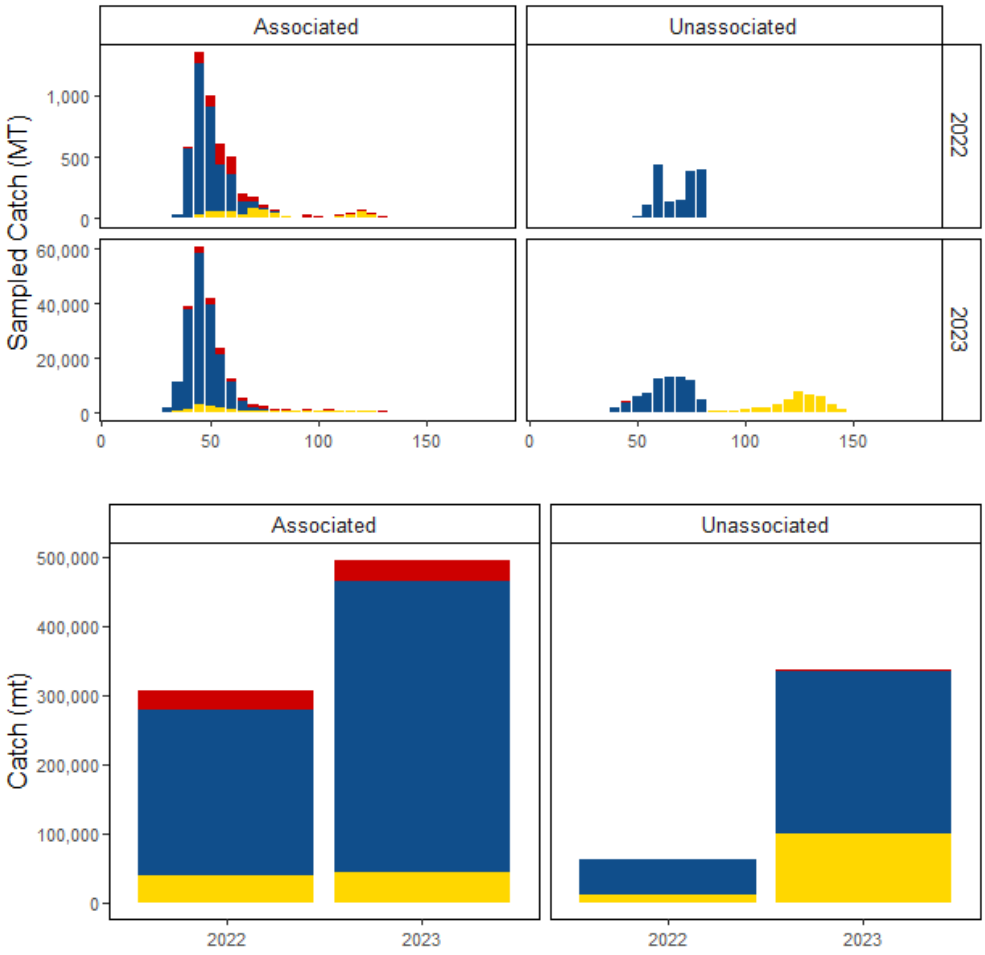

Figure 3.12: Species composition (mt: y-axis) of the 2022 and 2023 purse seine catch, by set type category and 5cm size categories (x-axis) for the tropical fishery, east of 170°E (skipjack – blue; yellowfin – yellow; bigeye – red)

3.7 Seasonality

Figure 3.13 and 3.14 show the seasonal average CPUE for skipjack and yellowfin tuna in the purse seine fishery for the period 2019–2023, respectively. Figure 3.15 shows the distribution of effort by quarter for the period 2018-2022 in comparison to effort by quarter in 2023. From 2019-2022, there is a weak seasonal signal in skipjack CPUE, showing slightly higher catch rates toward the first half of the year and slightly reduced catch rates, on average, toward the second half of the year. In 2023, however, there is a strong seasonal pattern showing an opposite trend where catch rates are below the recent average during first six months and increase substantially in the second half of the year, to be above the 2019-2022 average catch rates.

For yellowfin tuna, the patterns are similar to skipjack in that from 2019-2022 there is a fairly weak seasonal signal with a slight increase in catch rates toward the end of the year following the FAD

closure period. In 2023, there is a strong seasonality of increased catch rates during the middle of the year, and depressed rates toward the beginning and end of the year. Figure 3.15 shows that during quarter 3 of 2023, there is a concentration of catch in the western and eastern regions of the WCPO, near the boundary of the warm pool, with reduced catches in the central region. Whereas in the 4th quarter, the catches are more concentrated in the central/eastern regions with a higher proportion of skipjack.

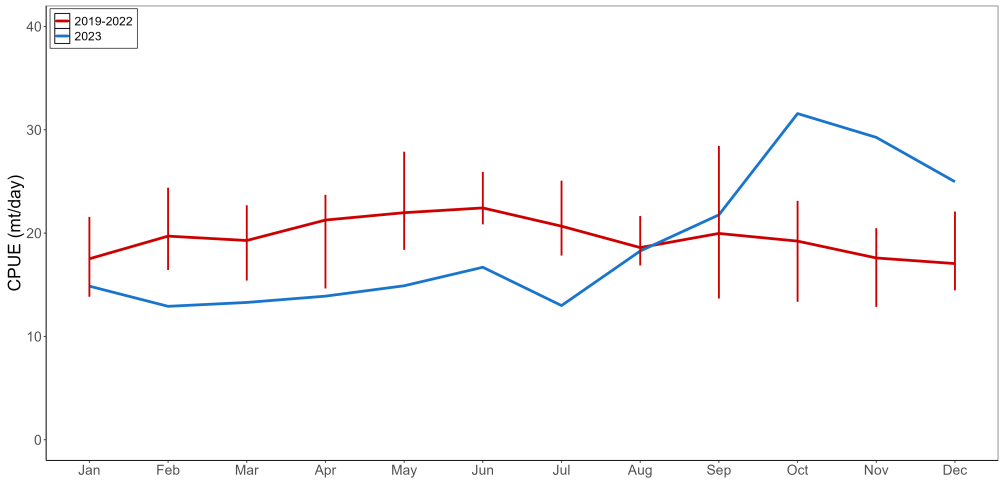

Figure 3.13: Average monthly skipjack tuna CPUE (mt per day) for purse seiners fishing in the tropical WCPFC–CA, 2019–2023 (red line represents the period 2019–2022; blue line represents 2023; the red bars represent the range (i.e., minimum and maximum) of monthly values for the period 2019–2022

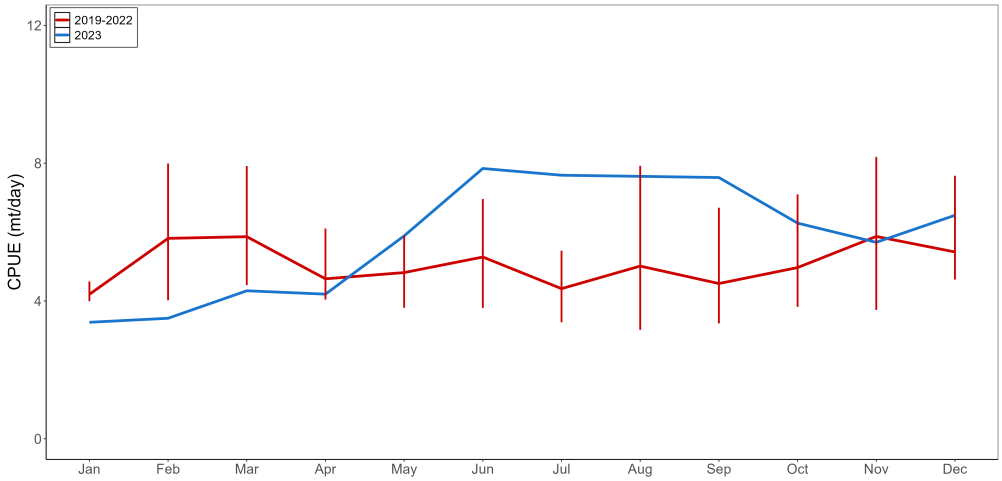

Figure 3.14: Average monthly yellowfin tuna CPUE (mt per day) for purse seiners fishing in the tropical WCPFC–CA, 2019–2023 (red line represents the period 2019–2022; blue line represents 2023; the red bars represent the range (i.e., minimum and maximum) of monthly values for the period 2019–2022

The FAD closure implementation since 2009 has tended to reduce CPUE during the closure period, with relatively high catch rates experienced immediately following the last FAD closure month.

The quarterly extent of the warm pool (i.e., surface water >28.5°C on average) in 2023 compared to the average for 2018-2022 (Figure 3.15) shows that the La Niña conditions during 2021-2022 restricted the warm pool to the western areas compared to 2023, where there is greater eastern expansion of the warm pool, especially during the second half of the year.

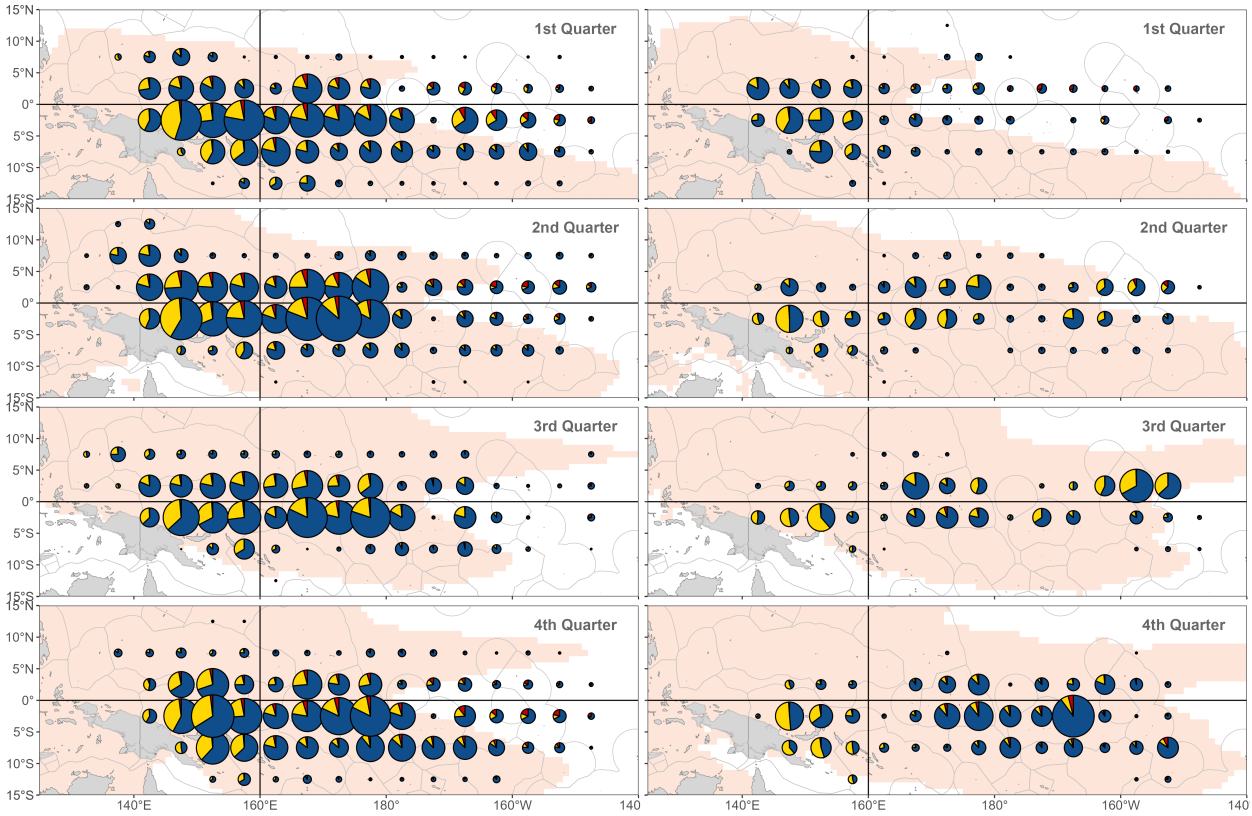

Figure 3.15: Quarterly distribution of purse seine catch by species for 2018–2022 (left) and 2023 (right; blue – skipjack; yellow – yellowfin; red – bigeye). Pink/light brown shading represents the extent of average sea surface temperature >28.5°C by quarter for the period 2018–2022 (left) and 2023 (right)

3.8 Prices, catch value, and overall economic conditions

3.8.1 Prices

Skipjack

Between 2017 and 2020, global skipjack prices experienced a general decline after a notable increase in 2017. Prices stabilized in 2021, with Thai import prices rising by 1% to $1,379/mt, while Yaizu purse seine caught skipjack prices (ex-vessel) declined slightly by less than 1% to ¥156/kg ($1,423/mt). However, there was a significant upswing in prices in 2022, with Thai import prices

increasing by 19% to $1,644/mt and Yaizu prices surging by 44% to ¥225/kg ($1,710/mt). This upward trend continued in 2023, with Thai import prices rising by 8% to $1,773/mt and Yaizu prices increasing by a further 20% to ¥270/kg ($1,923/mt). In real terms, accounting for inflation, the 2023 Thai import and Yaizu purse seine caught USD skipjack prices were 5% and less than 1% lower than their respective 20-year averages. Over the period up to June 2023, Thai skipjack import prices averaged $1,474/mt, while Yaizu prices averaged around $1,519/mt up to May 2023.

In 2022, reports from Bangkok markets indicated that skipjack prices (4-7.5 lbs, c&f) rose from $1,600/mt to $1,900/mt in the first quarter, before dropping to $1,425/mt by the end of the second quarter. In the third quarter, prices stabilized, fluctuating between $1,600/mt and $1,800/mt. A slight increase was observed in the last quarter, bringing prices to $1,700/mt. In the following year, prices climbed to $1,980/mt by the end of the first quarter and reached $2,000/mt, remaining steady until the end of the first half of 2023. However, the second half of 2023 saw a downward trend, with prices falling from $1,900/mt to $1,450/mt by the end of the year.

In 2024, the downward trend in skipjack prices continued, dropping from $1,400/mt to $1,300/mt in the first quarter. However, prices began to recover, rising to $1,375/mt and reaching $1,580/mt by the end of June.

In 2023, the Bangkok skipjack price index (4-7.5 lbs, c&f) exceeded the FAO Food Price Index, which had reached its highest level since 2011 following a significant increase in 2022. However, by June 2024, the Bangkok skipjack price index had fallen below the FAO Food Price Index.

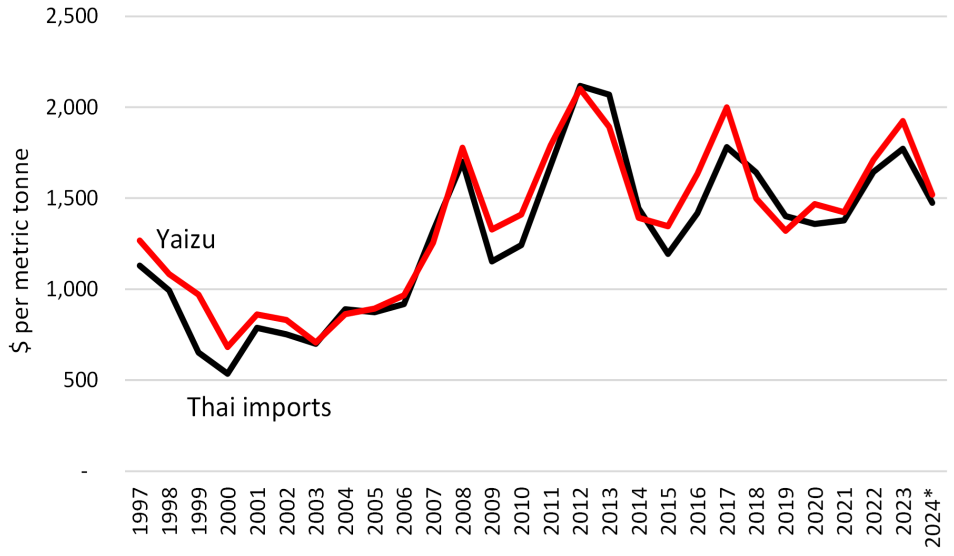

Figure 3.16: Annual skipjack prices, Thai imports (c&f) and Yaizu (ex-vessel) (for the period January to June)

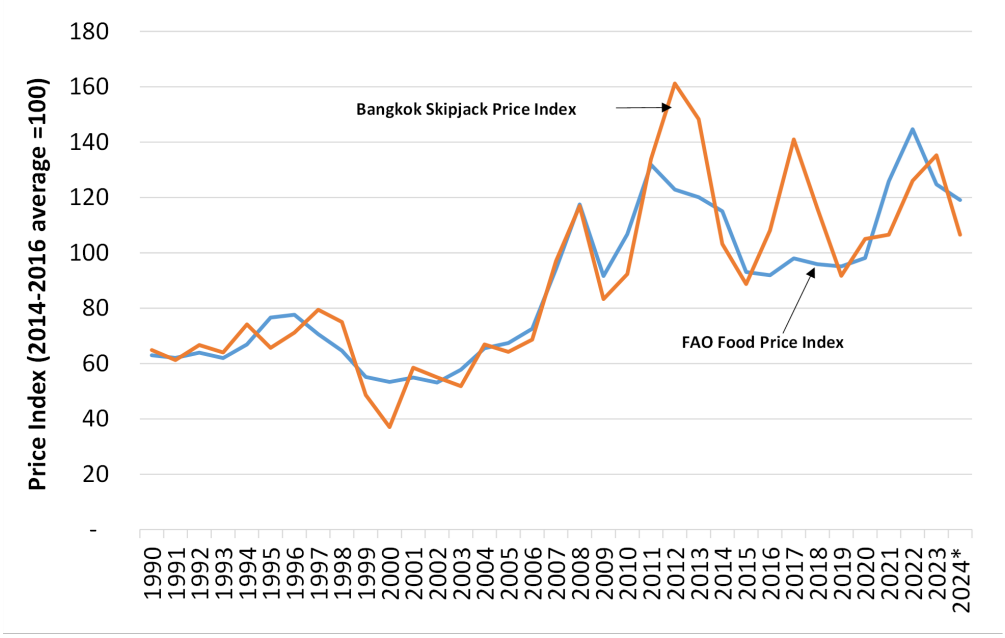

Figure 3.17: FAO Food Price Index and Bangkok 4-7.5lbs skipjack price (c&f) index (for the period January to June)

Yellowfin

In 2023, the Thai import price for yellowfin (c&f) increased by 9%, averaging $2,157/mt compared to the previous year. Similarly, the Yaizu purse seine caught yellowfin prices (ex-vessel) rose by 7% to ¥384/kg ($2,733/mt). In real terms, the 2023 Thai import prices were 6% lower than the 20-year average, while the Yaizu real prices were 12% below the 20-year average.

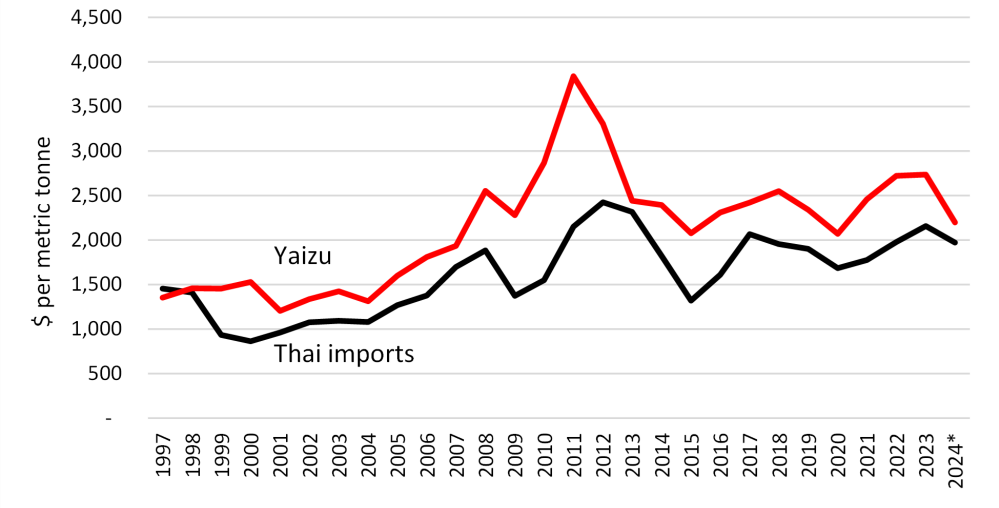

Figure 3.18: Annual yellowfin prices, Thai imports (c&f) and Yaizu (ex-vessel) (for the period January to June)

By the end of June 2024, the average yellowfin price had declined by 4% compared to the same period in 2023, with Thai import prices averaging $1,970/mt. Similarly, up to the end of May 2024, Yaizu prices averaged ¥334/kg ($2,196/mt), representing a 13% decrease from the previous year. Additionally, Thai import volumes for yellowfin were 7% lower during the first half of 2024 compared to the same period in 2023.

3.8.2 Catch value

The estimated delivered value of the purse seine tuna catch in the WCPFC-CA area for 2023 amounted to $3.5 billion, marking a 7% increase, or $223 million, compared to 2022[4]. However, this is approximately 15% lower than the values observed in 2012 and 2013, when the purse seine fishery catch exceeded $4 billion due to high prices for raw materials used in canning. Notably, the 2023 value is similar to that of 2017 and has consistently exceeded $3 billion in recent years, including 2019, 2022, and 2023.

The value of the skipjack catch rose by 3%, from $2.39 billion in 2022 to $2.46 billion in 2023, representing 71% of the total purse seine tuna catch value. This increase was primarily driven by an 8% rise in the Thai import price and a 12% increase in the Yaizu purse seine caught skipjack price in 2023. Similarly, the value of the yellowfin catch saw a significant 21% increase, reaching $902 million in 2023, which accounted for 26% of the total purse seine catch value. This growth was attributed to an 8% increase in the yellowfin catch and a 9% rise in the Thai import price for yellowfin.

[4] The delivered value of each year's catch is estimated as the sum of the product of the annual purse catch of each species, excluding the Japanese purse seine fleet's catch, and the average annual Thai import price for each species (bigeye was assumed to attract the same price as for skipjack) plus the product of the Japanese purse seine fleet's catch and the average Yaizu price for purse seine caught fish by species. Thai import and Yaizu market prices were used as they best reflect the actual average price across all fish sizes as opposed to prices provided in market reports which are based on benchmark prices, for example, for skipjack the benchmark price is for fish of size 4-7.5lbs. In deriving these estimates certain assumptions were made due to data and other constraints that may or may not be valid and as such caution is urged in the use of these figures.

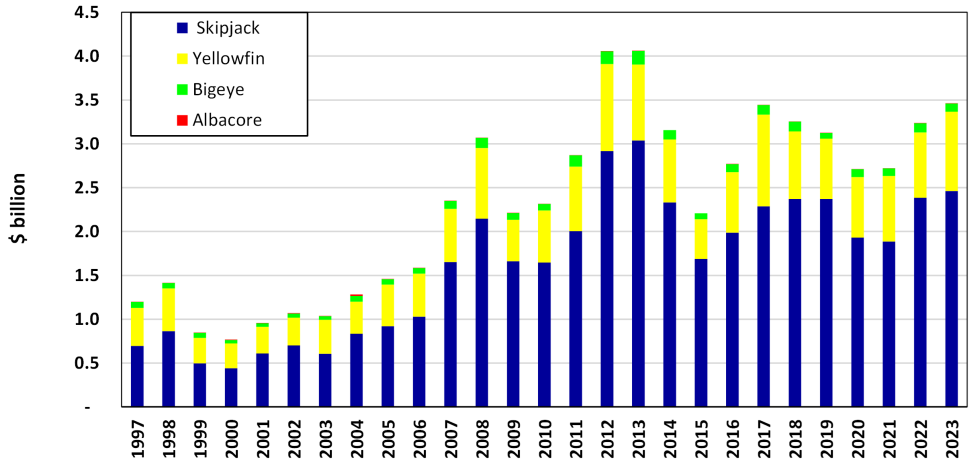

Figure 3.19: Value of the WCPFC-CA purse seine fishery tuna catch by species

3.8.3 Economic Conditions in the tropical purse seine fishery

The assessment of economic condition indexes for the major WCPFC-CA tuna fisheries has been presented to the Scientific Committee (SC) for several years. These indexes evaluate the economic conditions in a fishery based on factors such as relative fish price, fishing costs (excluding license and access fee payments), and catch rates over the past 20 years (from 2003 to 2024).

The data from these components is combined into a single index value, expressed relative to the average value over the preceding 20 years, which is set at 100. This index provides a relative measure of changes in economic conditions over time. Values below 100 indicate below-average economic conditions in the fishery, while values above 100 indicate relatively favorable economic conditions[5]. It is important to note that these indexes pertain to the fishery as a whole and not to individual vessels operating within it. While favorable economic conditions suggest the fishery's potential to generate significant profits, the indexes do not specify which parties, such as vessel owners or coastal states, benefit from these profits. Since 2012, the economic conditions index for the tropical purse seine fishery[6] has consistently remained above average, with the exception of 2014. In recent years, the contributions of different index components have varied considerably. For example, in 2017, high index readings were primarily driven by high fish prices, while from 2018 to 2022, high catch rates were the main driver. In 2022, the index hovered around the average at 98, marking its lowest level since 2014. This decline was mainly due to a significant increase in Marine Diesel Oil (MDO) prices, exacerbated by the Russia-Ukraine conflict. In 2023, the index improved, driven by an increase in fish prices, declining fuel costs compared to the previous year, and higher catch rates.

[5] Full details of the methodology used to derive the economic conditions indexes presented can be found in Skirtun and Reid (2018).

[6] The tropical purse seine fishery economic conditions index is based on the fishery that lies between 10°N and 10°S of the WPCFC-CA, excluding the waters of Indonesia, Philippines and Vietnam.

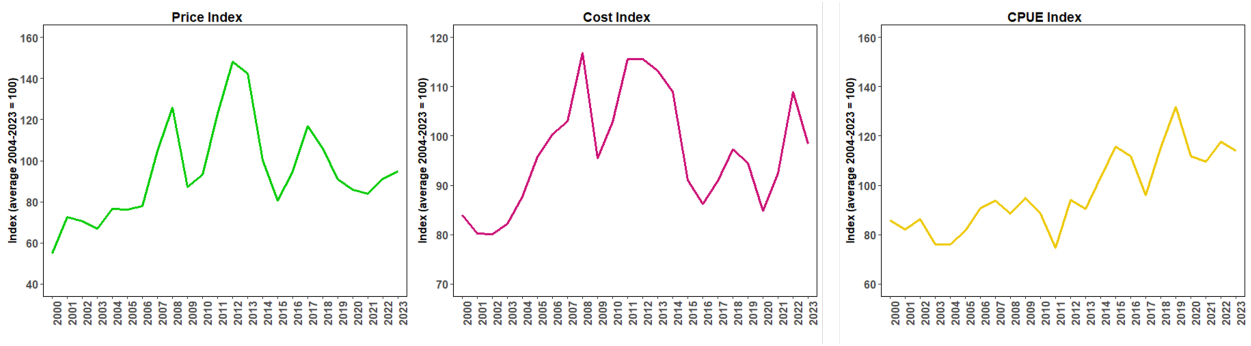

Figure 3.20: Tropical purse seine fishery economic conditions component indexes

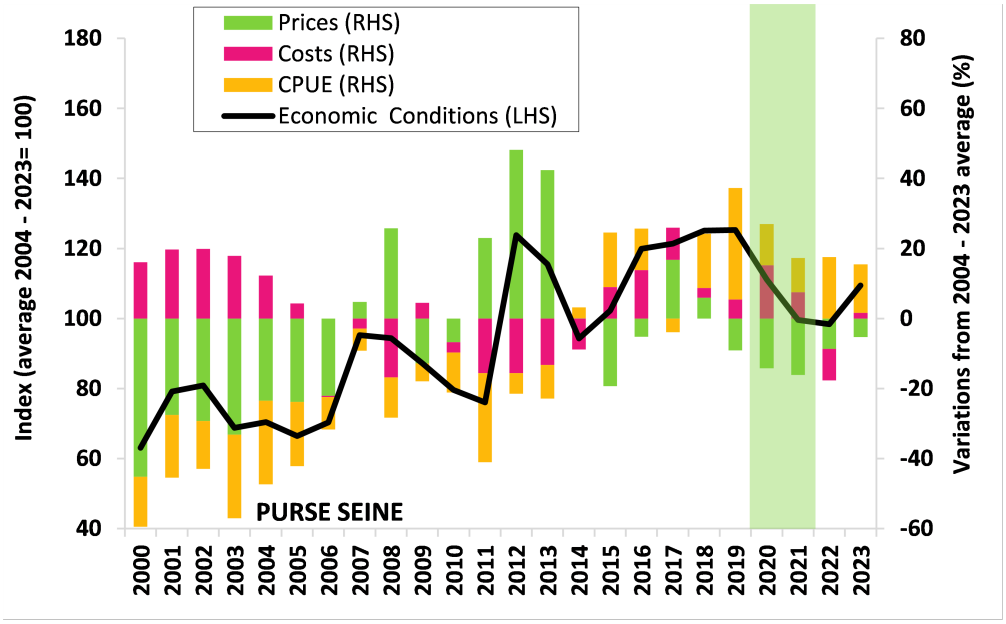

Figure 3.21: Tropical purse seine fishery economic conditions index (LHS) and variance of component indices against average (2004-2023) conditions (RHS)

4 WCPFC-CA Pole-and-Line fishery

4.1 Historical Overview

The WCP–CA pole-and-line fishery has several components:

- the year-round tropical skipjack fishery, mainly involving the domestic fleets of Indonesia, Solomon Islands and French Polynesia, and the distant water fleet of Japan
- seasonal sub-tropical skipjack fisheries in the domestic (home) waters of Japan, Australia, Hawaii and Fiji (although no recent activity in the last three fisheries)
- a seasonal albacore/skipjack fishery east of Japan (largely an extension of the Japanese home-

water fishery).

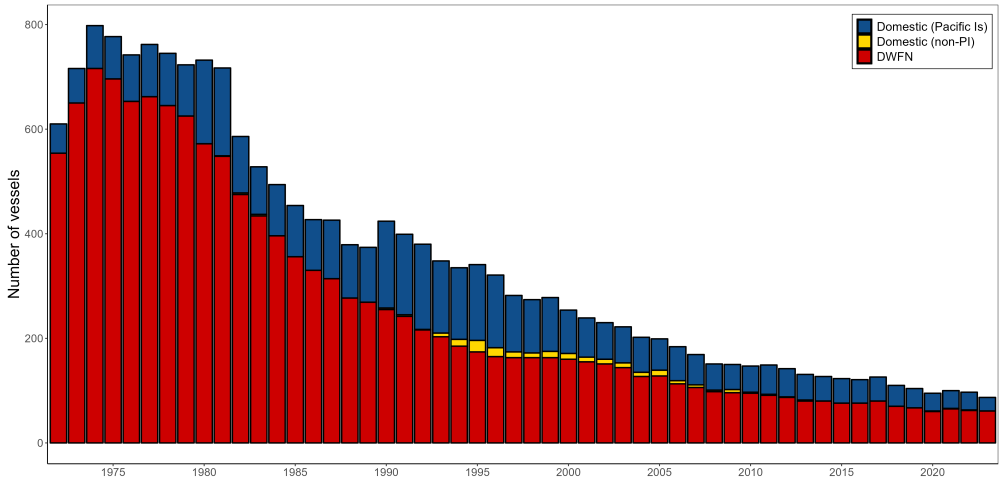

Figure 4.1: Pole-and-line vessels operating in the WCPFC–CA (excludes pole-and-line vessels from the Japanese Coastal and Indonesian domestic fisheries)

4.2 Provisional catch estimates (2023)

The provisional 2023 pole-and-line catch (143,431 mt) is the lowest annual catch since the early-1960s, due to reduced catches in the Japanese fishery, although we note as in previous years the provisional nature of the estimates at this stage (Figure 4.2).

Skipjack accounts for the majority of the catch (∼70-84% in recent years, but typically more than 85% of the total catch in tropical areas) and albacore (5–10% in recent years, with a reduction to 3% in 2023) is taken by the Japanese coastal and offshore fleets in the temperate waters of the north Pacific. Yellowfin tuna (recently 10–13%) and a small component of bigeye tuna (∼1% in recent years) make up the remainder of the catch. There were four pole-and-line fleets active in the WCPO in 2023 (Japan, Indonesia, French Polynesia, and Solomon Islands). Japanese distant-water and offshore fleets (58,057 mt in 2023), and the Indonesian fleets (85,098 mt in 2022, carried over to 2023 at this stage), account for nearly all of the WCPFC–CA pole-and-line catch (98% in 2023). The catches by the Japanese distant-water and offshore fleets in recent years have been the lowest for several decades and this is no doubt related to the continued reduction in vessel numbers (61 vessels in 2023; although the vessel numbers have been stable at around 60-70 over the past 5 years). The Solomon Islands, resumed activity in this fishery in 2011 and participated until 2022, and have continued to participate in the fishery since then with a catch of 533 mt in 2023.

Figure 4.3 shows the average distribution of pole-and-line effort for the period 1995–2023. Effort in tropical areas is usually year-round and includes domestic fisheries in Indonesia and the Solomon Islands, and the Japanese distant-water fishery. The pole-and-line effort in the vicinity of Japan by both offshore and distant-water fleets is seasonal (highest effort and catch occurs in the 2nd and

3rd quarters). There was also some seasonal effort by pole-and-line vessels in Fiji, New Zealand, and Australia during this period. The effort in French Polynesian waters is essentially the bonitier fleet. Effort by the pole-and-line fleet based in Hawaii is not shown in this figure because spatial data are not available.

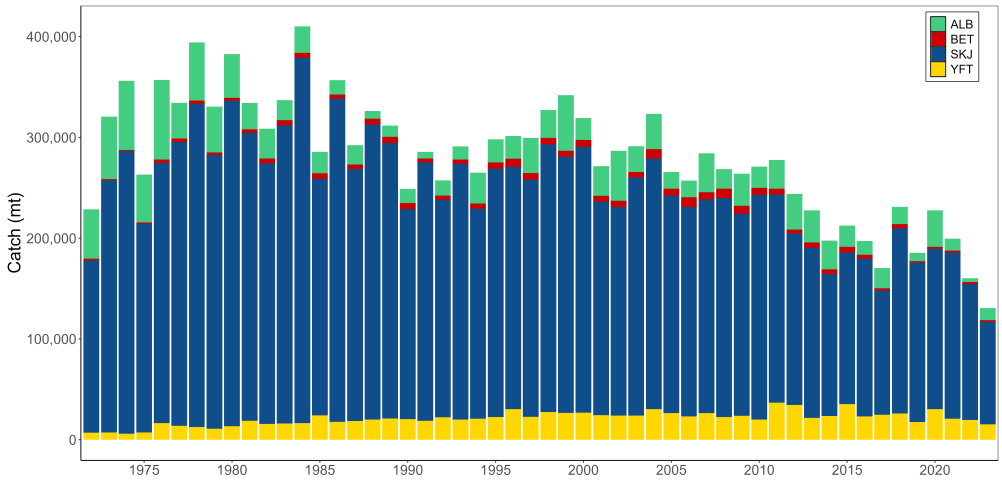

Figure 4.2: Pole-and-line catch in the WCPFC–CA

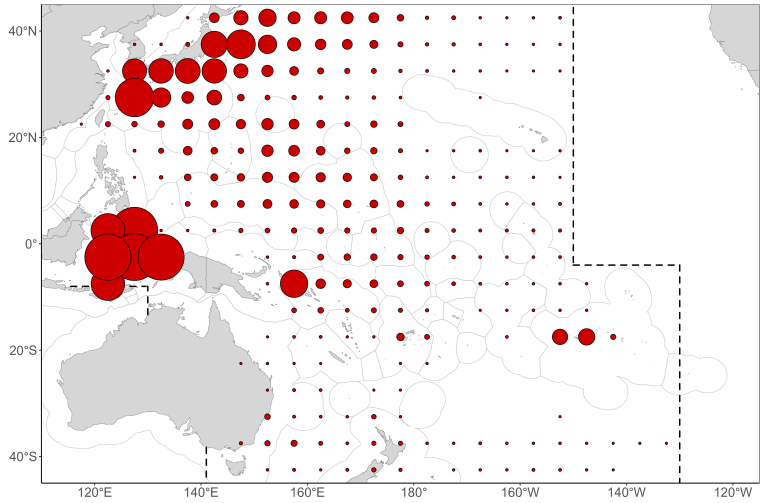

Figure 4.3: Average distribution of WCP–CA pole-and-line effort (1995–2023)

4.3 Prices and catch value

4.3.1 Prices

The pole-and-line fishery in the WCPFC-CA region is predominantly operated by the fleets of Japan and Indonesia, with smaller catches from the fleets of the Solomon Islands and French Polynesia. The Japanese fleet follows a seasonal pattern in skipjack pole and line fishing, typically targeting

southern skipjack from November to June. In contrast, both nearshore albacore and eastern offshore skipjack fishing primarily occur from July to October.

In 2023, the Yaizu price for pole-and-line-caught skipjack averaged $2,633/mt, marking a 13% decline compared to the previous year. The price for skipjack caught in waters off and south of Japan also decreased, averaging $2,840/mt (¥399/kg) and $2,554/mt (¥359/kg), respectively. Notably, while the price in yen for skipjack caught off Japan increased to ¥399/kg in 2023 from ¥389/kg in 2022, the value in US dollars decreased due to the appreciation of the US dollar against the Japanese yen. Additionally, these prices were lower compared to 2022, with skipjack caught off Japan being around 4% lower and those from the southern fishery being 16% lower. Up to May 2024, the prices for skipjack caught in waters off and south of Japan averaged ¥368/kg and ¥376/kg, respectively, which were lower than the prices during the same period in 2023.

In 2023, the volume of pole and line-caught skipjack brought into Yaizu port from waters off Japan saw a significant increase of 73% compared to the previous year. Similarly, the volume of skipjack caught in waters south of Japan also rose, increasing by 8% from 2022 levels.

4.3.2 Catch value

In 2023, the estimated delivered value of the pole-and-line tuna catch[7] in the WCPFC-CA area amounted to $312 million, an 11% decrease from the previous year. This decline was attributed to a 7% reduction in catch and a 13% drop in the Yaizu price for pole-and-line-caught skipjack. The value of the skipjack catches decreased by $40 million (14%), reaching $254 million and accounting for 72% of the total pole-and-line tuna catch value. Similarly, the value of bigeye and albacore tuna declined by 9% and 11%, respectively, from the previous year. In contrast, the value of yellowfin tuna increased by 7% to $40 million. In terms of contribution to the total pole-and-line tuna catch value, yellowfin, bigeye, and albacore accounted for 10%, 2%, and 16%, respectively.

[7] Delivered skipjack prices for the Japanese pole and line fleet are based on a weighted average of the Yaizu 'south' and 'other' pole-and-line caught skipjack prices. Delivered yellowfin price for the Japanese pole-and-line fleet are based on the Yaizu purse seine caught yellowfin price. All other prices are based on Thai import prices. All prices are converted into USD using representative exchange rates provided by the IMF.

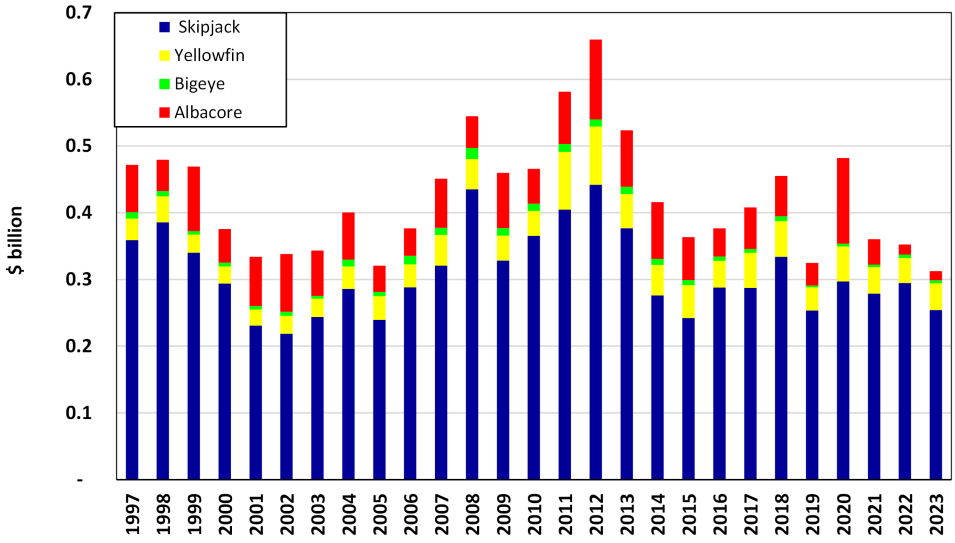

Figure 4.4: Value of the WCPFC-CA pole and line fishery tuna catch by species

5 WCPFC-CA Longline fishery

5.1 Overview

The longline fishery now accounts for only 8–10% of the total WCPFC–CA catch (SPC-OFP, 2024), but approaches the much larger purse seine catch in landed value. It provides the longest time series of catch estimates for the WCPFC–CA, with estimates available since the early 1950s. The total number of vessels involved in the fishery has generally fluctuated between 3,000 and 6,000 for the period 1970–2004 (Figure 5.1), although for some distant-water fleets, vessels operating in areas beyond the WCPFC–CA could not be separated out, and more representative vessel numbers for WCPFC–CA have only become available in recent years[8]. Total longline vessel numbers have slowly declined over the past 20 years, but have stabilized over the past 5 years with the provisional estimate of 2,355 vessels in 2023.

[8] Since 2005, more detailed information on fleet/vessel number breakdown has been required through WCPFC reporting requirements and are therefore more representative of WCPFC–CA longline activity.

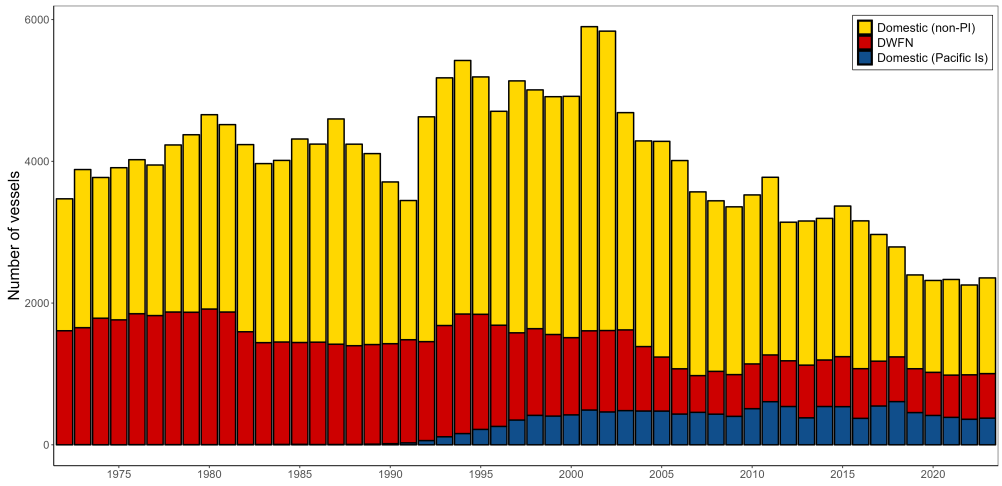

Figure 5.1: Longline vessels operating in the WCPFC–CA (available data does not make the distinction between foreign 'distant-water' and 'offshore')

The fishery involves two main types of operation:

- large (typically >250 GRT) distant-water freezer vessels which undertake long voyages (months) and operate over large areas of the region. These vessels may target either tropical (yellowfin, bigeye tuna) or subtropical (albacore tuna) species. Voluntary reduction in vessel numbers by at least one fleet has occurred in recent years;
- smaller (typically <100 GRT) offshore vessels which are usually domestically-based, undertaking trips of less than one month, with ice or chill capacity, and serving fresh or air-freight sashimi markets, or canneries. There are several foreign offshore fleets based in Pacific Island countries.

The following broad categories of longline fishery, based on type of operation, area fished and target species, are currently active in the WCPFC–CA:

- South Pacific offshore albacore fishery comprises Pacific-Islands domestic 'offshore' vessels, such as those from American Samoa, Cook Islands, Fiji, French Polynesia, Kiribati, New Caledonia, PNG, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu; these fleets mainly operate in subtropical waters, with albacore the main species taken. Two new entrants, Tuvalu and Wallis and Futuna, joined this category during 2011, although the latter fleet has not fished recently. Vessel numbers have stabilised in recent years, but they may also vary depending on charter arrangements. More information on this fishery is provided in (McKechnie et al., 2024).
- Tropical offshore bigeye/yellowfin-target fishery includes 'offshore' sashimi longliners from Chinese-Taipei, based in Micronesia, Guam, Philippines and Chinese vessels based in Micronesia, and domestic fleets based in Indonesia, Micronesian countries, Philippines, PNG,

the Solomon Islands and Vietnam.

- Tropical distant-water bigeye/yellowfin-target fishery comprises 'distant-water' vessels from Japan, Korea, Chinese-Taipei, China and Vanuatu. These vessels primarily operate in the eastern tropical waters of the WCP–CA (and into the EPO), targeting bigeye and yellowfin tuna for the frozen sashimi market.
- South Pacific distant-water albacore fishery comprises 'distant-water' vessels from Chinese-Taipei, China and Vanuatu operating in the south Pacific, generally below 20°S, targeting albacore tuna destined for canneries.
- Domestic fisheries in the sub-tropical and temperate WCP–CA comprise vessels targeting different species within the same fleet depending on market, season and/or area. These fleets include the domestic fisheries of Australia, Japan, New Zealand and Hawaii. For example, the Hawaiian longline fleet has a component that targets swordfish and another that targets bigeye tuna.
- South Pacific distant-water swordfish fishery is a relatively new fishery and comprises 'distant-water' vessels from Spain and Portugal (one vessel started fishing in 2011).
- North Pacific distant-water albacore and swordfish fisheries mainly comprise 'distant-water' vessels from Japan (swordfish and albacore), Chinese-Taipei (albacore only) and Vanuatu (albacore only).

Additionally, small vessels in Indonesia, Philippines and Vietnam use the handline gear, usually fishing around the numerous arrays of anchored FADs in home waters and generally fishing at night, some using intense lights to attract prey for the tuna (these types of vessels are not included in Figure 5.1). The commercial handline fleets target large yellowfin tuna which comprise the majority of their overall catch ($> 90\%$). The WCPFC-CA large-fish (yellowfin target) handline fisheries in these south-east Asian countries took over 45,000 mt in 2023 (see Section 6.1).

The WCPFC–CA longline tuna catch steadily increased from the early years of the fishery (i.e., the early 1950s) to 1980 (230,625 mt), but declined to 162,111 mt in 1984 (Figure 5.2). Since then, catches steadily increased over the next 15 years until the late 1990s, when catch levels were again similar to 1980. Annual catches in the longline fishery since 2000 have been amongst the highest ever, but the composition of the catch in recent years (e.g., ALB–35%; BET–25%; YFT–39% in 2023) differs from the period of the late 1970s and early 1980s, when yellowfin tuna contributed a higher proportion of catch (e.g., ALB–18%; BET–27%; YFT–54% in 1980).

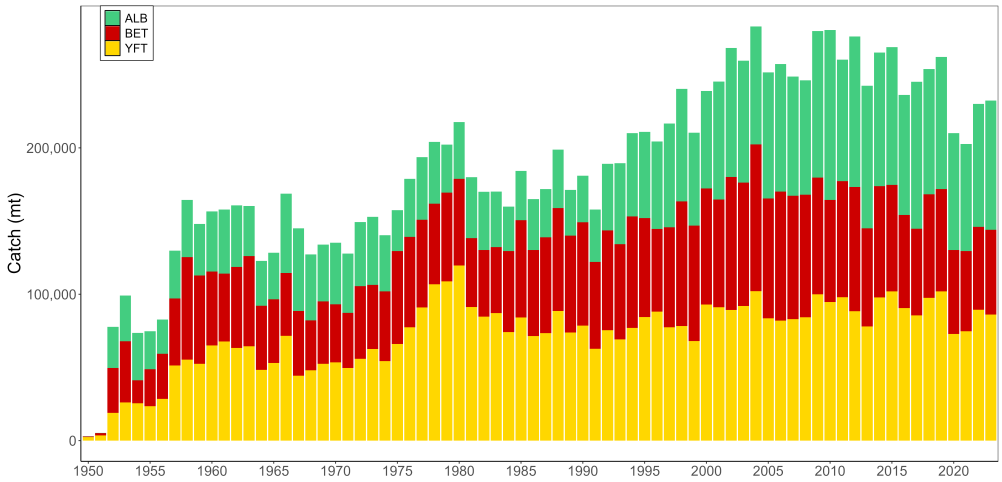

Figure 5.2: Longline catch (mt) of target tunas in the WCPFC–CA

5.2 Provisional estimates of catch, effort, and fleet size (2023)

The provisional WCPFC–CA longline catch (234,894 mt) for 2023 remains lower than the recent ten-year average but a slight increase from 2022 (243,115 mt). The COVID-19 restrictions played a role in the general reduction of effort in the longline fishery from 2020-2022, with clear declines in effort in both the South Pacific Albacore fishery (Figure A4) and in the tropical longline fishery (Figure A5). The prevailing La Niña conditions from 2021-2022 may also have contributed to changes in the catch by species throughout the extent of the longline fishery.

The WCPFC–CA albacore longline catch (86,957 mt – 37%) for 2023 exceeded the catch in 2022 and was the highest since 2019, but about 19,000 mt lower than the record of 106,141 mt attained in 2010. The provisional bigeye catch (56,203 mt – 24%) for 2023 was similar to the 2022 catch level which are some of the lowest catches reported since the mid-1980s, and well below on the bigeye catch levels experienced in the 2000s (e.g., the 2004 longline bigeye catch was 99,709 mt). The yellowfin catch for 2023 (89,975 mt – 38%), was higher than the previous three years, but a significant drop from the high catch level in 2019 (104,426 mt).

A significant change in the WCPFC–CA longline fishery over the past two decades has been the growth of the Pacific Islands domestic albacore fishery, which has risen from taking 33% of the total South Pacific albacore longline catch in 1998 to accounting for around 50-60% of the catch in recent years. The combined national fleets (including chartered vessels) mainly active in the Pacific Islands domestic albacore fishery have numbered more than 500 (mainly small 'offshore') vessels in some years over the past decade with catches at a similar level to the distant-water longline vessels active in the south WCPFC–CA.

The distant-water fleet dynamics have continued to evolve in recent years, with catches down from record levels in the mid-2000s initially due to a reduction in vessel numbers, although vessel

numbers for some fleets appear to be on the rise again in recent years, but with variation in areas fished and target species. The Japanese distant-water and offshore longline fleets have experienced a substantial decline in both bigeye catches (from 18,172 mt in 2004 to 3,329 mt in 2023) and vessel numbers (366 in 2004 to 74 in 2023). The Chinese-Taipei distant-water longline fleet had a peak bigeye tuna catch of 22,154 mt in 2004 but has stabilised at a lower level in recent years, with 9,203 mt taken in 2023 (809 vessels). The Korean distant-water longline fleet experienced some decline in bigeye and yellowfin catches since the period of highest catches 15–20 years ago in line with a reduction in vessel numbers – from 184 vessels active in 2002 reduced to 96 vessels in 2023.

In contrast, the China longline fleet catches of albacore tuna have been amongst the highest ever in recent years, with a range of 16,000–29,000 mt of albacore tuna in the south WCPFC-CA area over the past six years; their 2023 albacore tuna catch was 25,732 mt, the second highest catch for this fleet.

With domestic fleet sizes continuing to increase as foreign-offshore and distant-water fleets decrease (Figure 5.1), this evolution in fleet dynamics no doubt has some effect on the species composition of the catch. For example, the increase in effort by the Pacific Islands domestic fleets has primarily been in albacore fisheries, although this had been balanced to some extent by the switch to targeting bigeye tuna (from albacore) by certain vessels in the distant-water Chinese-Taipei fleet almost a decade ago. More detail on individual fleet activities during recent years is available in the WCPFC–SC20 National Fisheries Reports.

5.3 Catch per unit effort

Time series of nominal CPUE provide a broad indication of the abundance and availability of target species to the longline gear, and as longline vessels target larger fish, the CPUE time series should be more indicative of adult tuna abundance. However, as is the case with nominal purse seine CPUE, the interpretation of nominal longline CPUE is confounded by various factors, such as the changes in fishing depth that occurred as longliners progressively switched from primarily yellowfin tuna targeting in the 1960s and early 1970s to bigeye tuna targeting from the late 1970s onwards. Such changes in fishing practices will have changed the effectiveness of longline effort with respect to one species over another, and such changes need to be accounted for if the CPUE time series are to be interpreted as indices of relative abundance.

Nominal CPUE graphs are provided in the other papers (see Hare et al., 2024; WCPFC Secretariat and SPC-OFP, 2024), and this paper does not attempt to explain trends in longline CPUE or effective effort, as this is referenced and dealt with more appropriately in specific studies on the subject and CPUE standardisation papers regularly prepared as WCPFC Scientific Committee (SC) papers.

5.4 Distribution of fishing effort and catch

Figure 5.5 shows the distribution of effort by category of fleet for the period 2017–2023. Effort by the large-vessel, distant-water fleets of Japan, China, Korea and Chinese-Taipei account for most effort on the high seas in the eastern WCPFC Area, noting the reduction in vessel numbers for some fleets over the past two decades. Effort is widespread as sectors of these fleets target bigeye and yellowfin for the frozen sashimi market in central and eastern tropical waters, and albacore for canning in the more temperate waters (see Figure 5.5).

Activity by the foreign-offshore fleets from Japan, China, and Chinese-Taipei is restricted to tropical waters, targeting bigeye and yellowfin for the fresh sashimi market; these fleets tend to have limited overlap with the distant-water fleets. The substantial 'domestic fleet' effort in the west of the WCPFC Area is primarily by the Indonesian and Chinese-Taipei domestic fleets targeting yellowfin and bigeye in the lower latitudes, and the Japanese offshore and coastal fleets in their home fishery and adjacent high seas.

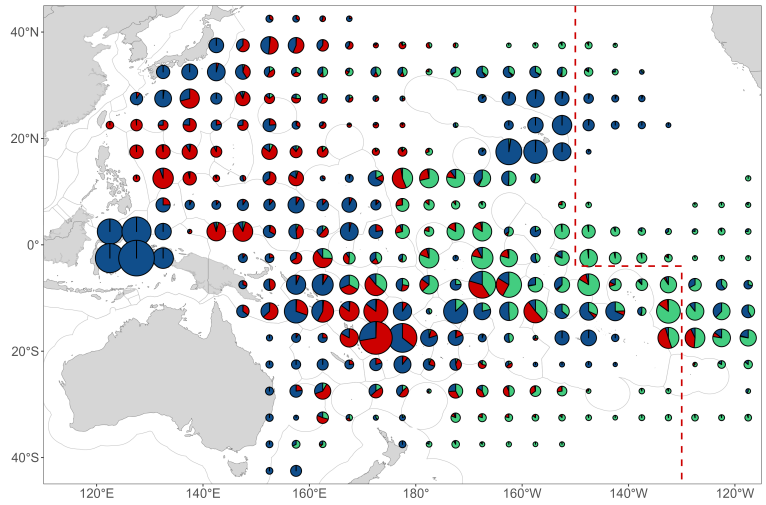

Figure 5.3: Distribution of longline effort (100s of hooks) by fleet, 2017–2023. Distant-water fleets (green), foreign-offshore fleets (red), and domestic fleets (blue) (Note that distant-water effort for Chinese-Taipei and other fleets targeting albacore for the entire North Pacific are poorly covered)

The growth in Pacific Islands domestic fleets targeting albacore tuna in the South Pacific has been noted; the most prominent fleets in this category are the Cook Islands, Samoa, Fiji, French Polynesia, Solomon Islands (when chartering arrangements are active), Tonga and Vanuatu fleets (Figure 5.4). More information on this fishery is provided in (McKechnie et al., 2024).

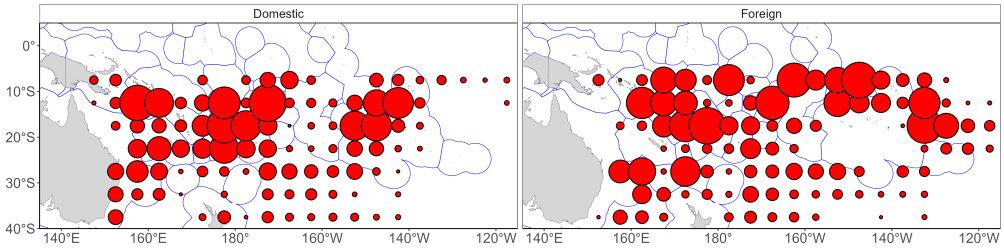

Figure 5.4: Distribution of effort for South Pacific albacore-target domestic (left) and foreign (right) longline fleets in 2023

Figure 5.5 shows quarterly species composition by area for the period 2010–2022 and 2023. The majority of the yellowfin catch is taken in tropical areas, especially in the western parts of the region, with smaller amounts in seasonal subtropical fisheries. The majority of the bigeye catch is also taken from tropical areas, but in contrast to yellowfin, mainly in the eastern parts of the WCPFC–CA, adjacent to the traditional EPO bigeye fishing grounds. The albacore catch is mainly taken in subtropical and temperate waters in both hemispheres. In the North Pacific, albacore are primarily taken in the 1st and 4th quarters. In the South Pacific, albacore are taken year round, although they tend to be more prevalent in the catch during the 3rd quarter. Species composition also varies from year to year in line with changes in environmental conditions, particularly in waters where there is some overlap in species targeting, for example, in the latitudinal band from 0°–20°S.

Similar to 2022, there were relatively large catches of the three main target species in the northern Cook Islands and adjacent high seas area (0-10°S, 160°-170°W; Figure 5.5 – right) in the second quarter and to a lesser extent the third quarter of 2023, when compared to the 2010-2022 quarterly averages (Figure 5.5 – left). In the 4th quarter of 2023, there is a notable reduction in the proportion of bigeye catches in the South Pacific extending from the Solomon Islands to French Polynesia, relative to the 2010-2022 average.

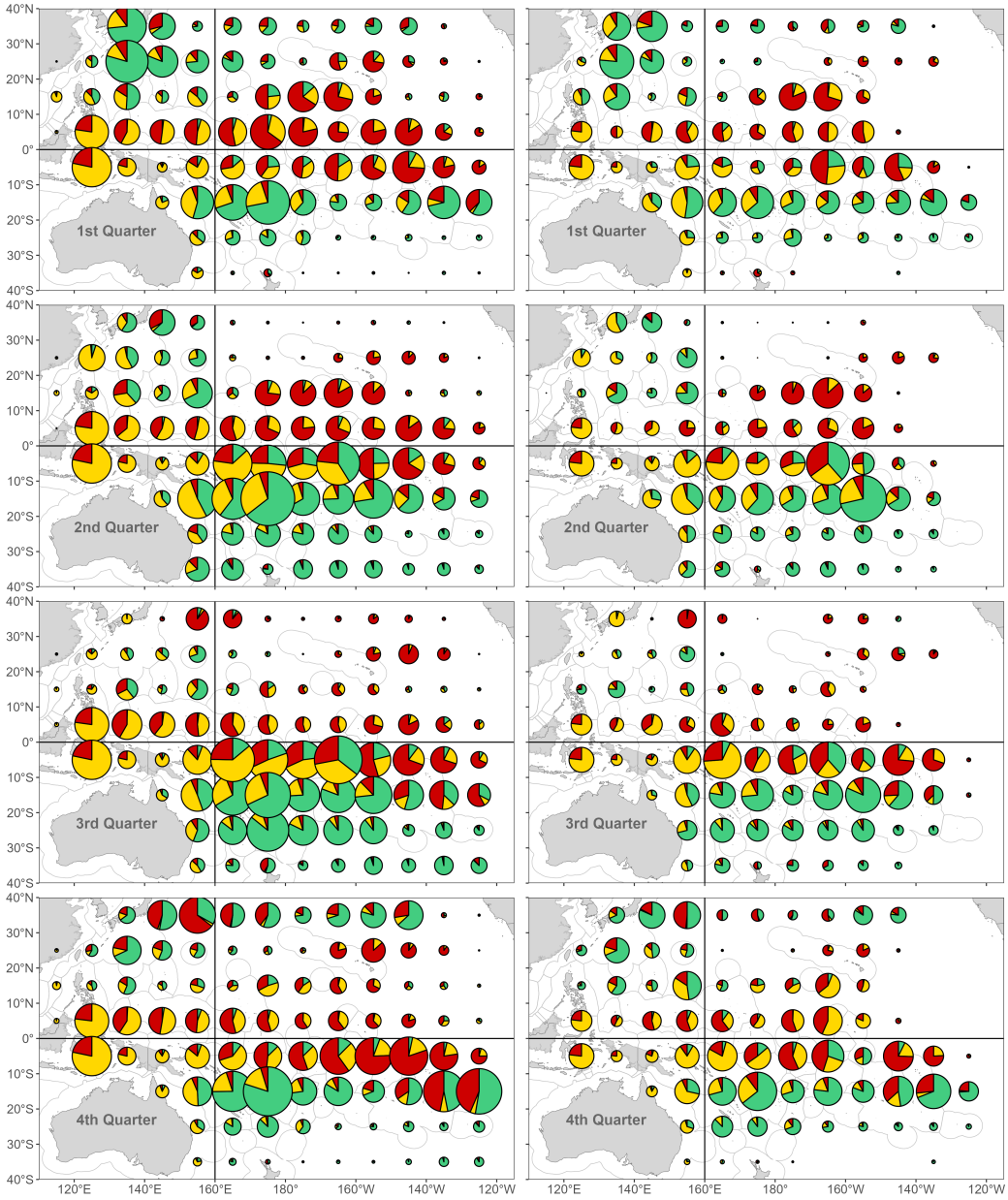

Figure 5.5: Quarterly distribution of longline tuna catch by species, 2010-2022 (left) and 2023 (right) (yellow - yellowfin; red – bigeye; green – albacore) (Note that catches from some distant-water fleets targeting albacore in the North Pacific may not be fully covered; excludes the Vietnam HL/LL fishery)

5.5 Prices and catch value

In this section, we present trends in price data for selected longline fisheries, focusing on yellowfin, bigeye, albacore, swordfish, and striped marlin. These species are marketed in various forms and across different markets.

Yellowfin

In 2023, the prices of yellowfin tuna in Japanese yen decreased across all markets except for those from Oceania, compared to the previous year. Notably, the prices for longline-caught yellowfin in Yaizu fell by 23%, from ¥922/kg in 2022 to ¥712/kg. Additionally, prices for fresh and frozen yellowfin from selected ports decreased by 11% to ¥1,030/kg and 21% to ¥787/kg, respectively. In contrast, the price from Oceania experienced a slight increase of 1%, reaching ¥1,196/kg.

In 2023, prices for fresh yellowfin imports into the U.S. decreased to $10.32/kg compared to the previous year. In U.S. dollar terms, yellowfin prices declined across all markets. Notably, while the price in yen from Oceania rose to ¥1,196/kg in 2023 from ¥1,183/kg in 2022, the value in U.S. dollars fell to $8.51 from $8.99, due to the appreciation of the U.S. dollar against the Japanese yen.

Similarly, the U.S. dollar price for longline-caught yellowfin in Yaizu fell by 28%, from $7.02 in 2022 to $5.07 in 2023. Fresh and frozen yellowfin prices at selected ports also declined, with fresh prices dropping by 17% to $7.33/kg and frozen prices decreasing by 26% to $5.60/kg compared to 2022. Furthermore, fresh yellowfin imports into Japan and the U.S experienced significant declines, with Japan seeing a 75% reduction and the U.S. a 67% reduction in 2020, largely due to supply-chain disruptions caused by the COVID-19 pandemic. In 2021, Japan's fresh imports declined further by 39%, while U.S. imports began a slow recovery. In 2022, U.S. import volumes continued to recover, though Japan's imports increased by 37% compared to 2021, they significantly declined by 66%, totaling around 117,000 metric tonnes in 2023. Up to June 2024, Japan saw a substantial 72% increase compared to the same period in 2022, although volumes remained significantly lower than pre-COVID-19 levels. Conversely, U.S. fresh import volumes showed a strong recovery from the severe impacts of the pandemic, increasing by 31% in 2022 and more than doubling in 2021 compared to 2020. However, 2023 saw a 26% decline in imports, although levels remained higher than in 2020 when the pandemic severely disrupted global supply chains. Over the period up to May 2024, U.S. import volumes were 35% higher than during the same period in 2023.

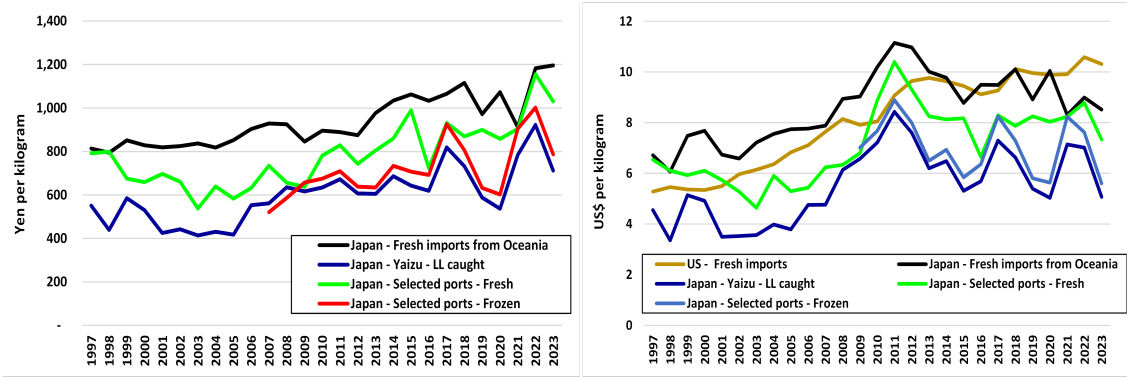

Figure 5.6: Japan and US yellowfin in yen (LHS) and US dollars (RHS) (Japan fresh imports from Oceania are c.i.f prices, Yaizu and Japan selected port are ex-vessel prices and US imports are f.a.s prices. Frozen at selected ports excludes purse seine caught landings)

Bigeye

In 2023, fresh bigeye prices declined across all markets except for those from Oceania. In Japan, the average prices at selected ports for fresh and frozen bigeye were ¥1,726/kg, a 1% decrease, and ¥999/kg, a 20% decrease, respectively from 2022. However, the price for fresh imports from Oceania increased by 15% to ¥1,983/kg. In the U.S, fresh bigeye imports prices continued their upward trend, rising by 4% to reach a record high of $12.03/kg in 2022, before slightly declining by 4% to $11.19/kg in 2023.

Import volumes into Japan and the U.S. have shown divergent trends. In the U.S, there was a significant recovery from the COVID-19-related low of 2020, with import volumes more than doubling in both 2022 and 2023. In contrast, Japan's fresh imports of bigeye continued to decline, falling by 32% in 2022 and a further 20% in 2023.

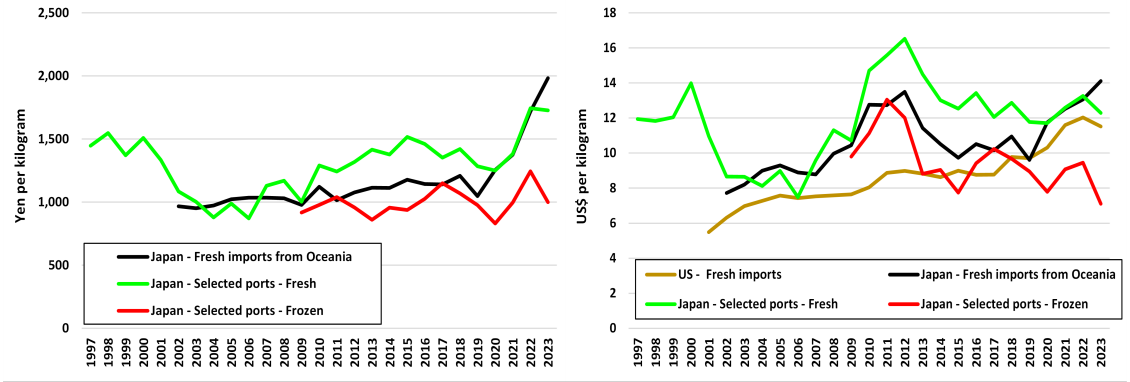

Figure 5.7: Japan and US bigeye prices in yen (LHS) and US dollars (RHS) (Japan fresh imports from Oceania are c.i.f prices, Japan selected ports are ex-vessel prices and US imports are f.a.s prices. Frozen at selected ports excludes purse seine caught landings)

Albacore

In 2022, U.S. fresh prices rebounded, rising 7% to reach a record high of $5.94/kg, before slightly declining by 5% to $5.63/kg in 2023. Similarly, Thai frozen imports saw an increase in 2022, increasing by 7% to $3.55/kg, the second-highest price on record, before dropping by 10% to $3.19/kg in 2023. Meanwhile, Japan's selected ports experienced a significant increase in fresh prices, rising by 24% to $4.04/kg in 2022, before declining by 20% to $3.24/kg in 2023.

In 2020, Thai import volumes increased by 20%. However, this growth was followed by a significant decline of 33% in 2021, with import volumes dropping from approximately 63,000 metric tonnes in 2020 to around 42,000 metric tonnes. The decline continued in 2022, with volumes falling by 19% to approximately 34,000 metric tonnes. However, 2023 saw a slight recovery with a marginal increase of 3%, bringing the total to 35,000 metric tonnes. In contrast, the period leading up to May 2023 showed a 15% decrease in import volumes, falling to around 14,000 metric tonnes compared to the same period in 2022.

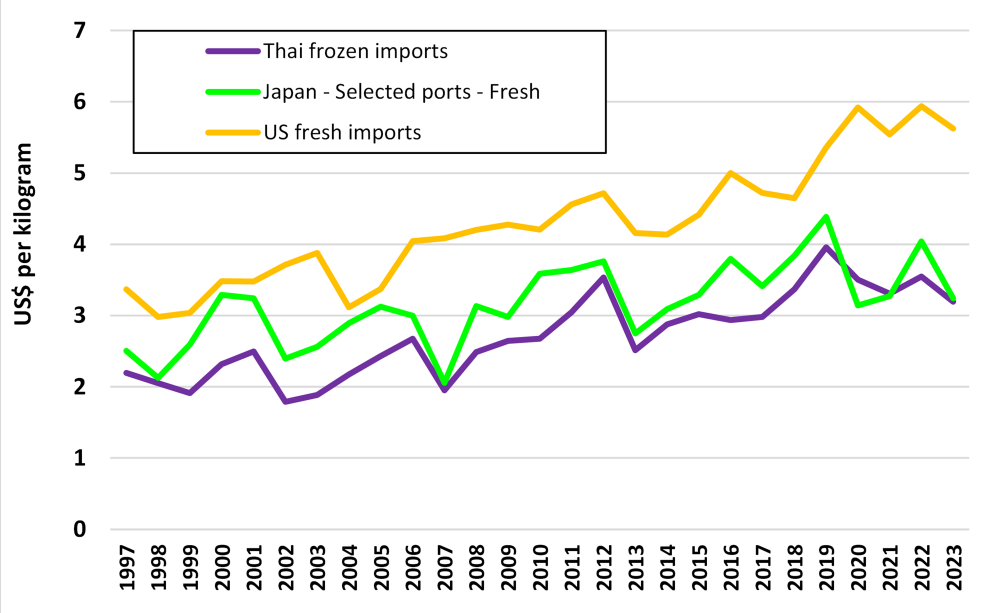

Figure 5.8: Albacore prices in US dollars (Thai frozen imports are c&f prices, Japan selected ports are ex-vessel prices and US imports are f.a.s prices.)

Swordfish and striped marlin

In 2022, fresh striped marlin prices at selected ports saw a notable increase of 47%, rising to ¥752/kg, followed by a further 10% increase to reach a record high of ¥826/kg. Similarly, fresh swordfish in Japan experienced a significant 15% surge to ¥1,308/kg in 2022, before declining slightly by 4% to ¥1,250/kg in 2023. In the U.S, fresh swordfish prices also rose by 9% in 2022, averaging $8.82/kg, the third-highest price recorded to date, before decreasing by 8% to $8.12/kg in 2023.

In U.S. dollar terms, prices for fresh striped marlin at selected ports saw a marginal increase of 3% in 2023, reaching $5.88/kg. In contrast, prices for fresh swordfish in Japan decreased by 11% to $8.90/kg in 2023. This decline was partly due to the depreciation of the Japanese yen against the U.S. dollar.

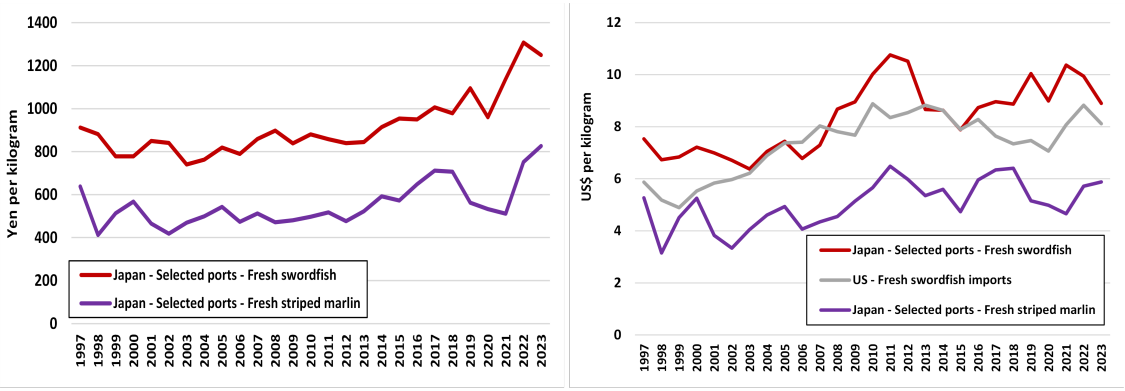

Figure 5.9: Japan and US swordfish and striped marlin prices in yen (LHS) and US dollars (RHS) (Japan selected ports are ex-vessel prices and US imports are f.a.s prices.)

5.5.1 Catch value

In 2023, the estimated value of the total catch in the WCPFC longline fishery[9] was $1.55 billion, representing approximately 25% of the total value of the WCPO tuna catch, which was $6.1 billion. This reflects a marginal 1% decline from the previous year, equating to a decrease of around $19 million in the value of the longline catch.

In 2023, the value of the catch for all target species showed negative growth, except for bigeye, which saw a 6% increase to $638 million. Conversely, the values for yellowfin and albacore catches declined, with yellowfin dropping by $33 million (5%) and albacore decreasing by $23 million (8%). These declines were primarily driven by the 28% reduction in yellowfin Yaizu longline caught price, a 25% decrease in frozen bigeye prices at selected Japanese ports, and a 10% drop in albacore Thai import prices.

[9] For the yellowfin and bigeye caught by fresh longline vessels it is assumed that 80% of the catch is of export quality and 20% is non-export quality. For export quality the annual prices for Japanese fresh yellowfin and bigeye imports from Oceania are used, while it is simply assumed that non-export grade tuna attracted $1.50/kg throughout the period 1997-2013. For yellowfin caught by frozen longline vessels the delivered price is taken as the Yaizu market price for longline caught yellowfin. For bigeye caught by frozen longline vessels the delivered price is taken as the frozen bigeye price at selected major Japanese ports. For albacore caught by fresh and frozen longline vessel the delivered prices are taken as the Thai import price. The frozen longline catch is taken to be the catch from the longline fleets of Japan and Korea and the distant water longline fleet of Chinese Taipei.

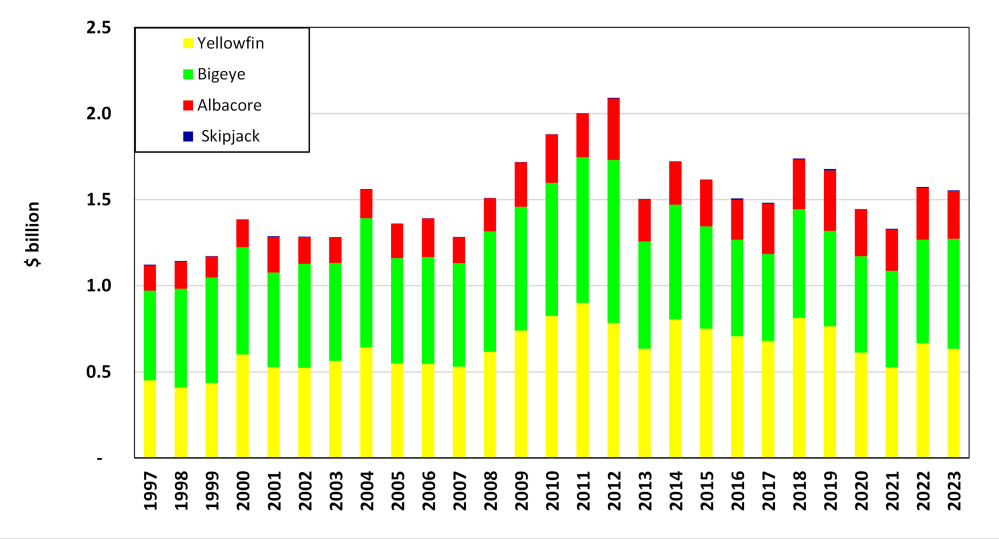

Figure 5.10: Value of the WCPFC-CA longline fishery tuna catch by species

5.5.2 Economic conditions

The analysis of economic conditions within the longline fishery covers two distinct regions: the southern longline fishery, located south of 10°S in the WCPFC Convention Area (WCPFC-CA), and the tropical longline fishery, which includes the area between 10°N and 10°S in the WCPFC-CA, excluding the waters of Indonesia, the Philippines, and Vietnam.

It is important to note a significant caveat regarding the longline fisheries in 2020 and 2021. The impact of the COVID-19 pandemic on the cost structure may have been underestimated in the economic conditions index. This is because the index's fishing cost does not account for changes beyond fuel costs, such as shipping, air freight, and imported equipment and gear, which were all affected by the pandemic. Therefore, when interpreting the index figures for 2020 and 2021 (as shown in the shaded graphs of Figures 5.12 and 5.14), caution is advised.

Southern Longline

Since 2010, the southern longline fishery index has consistently remained below the average. Despite the exceptionally high fish prices experienced in 2011 and 2012, economic conditions during the period from 2011 to 2014 were notably challenging due to a combination of low catch rates and high fuel prices. However, between 2014 and 2017, as catch rates improved and fuel prices declined, while fish prices remained close to their long-term average, there was a substantial improvement in economic conditions, surpassing the 20-year average during 2015 to 2017.

The index subsequently declined due to decreasing catch rates, despite high fish prices in 2018 and particularly in 2019, along with lower fuel prices in 2019. Economic conditions further deteriorated in 2020 and 2021, driven by significant drops in catch rates, which caused the index to reach its lowest level since 2013. However, in 2022, the economic index showed a notable increase,

approaching its 20-year average, despite rising fuel costs related to the Russia/Ukraine conflict. This improvement was primarily driven by increased catch rates. The positive trend continued into 2023, with the index nearing its 20-year average, supported by higher catch rates and lower fuel prices.

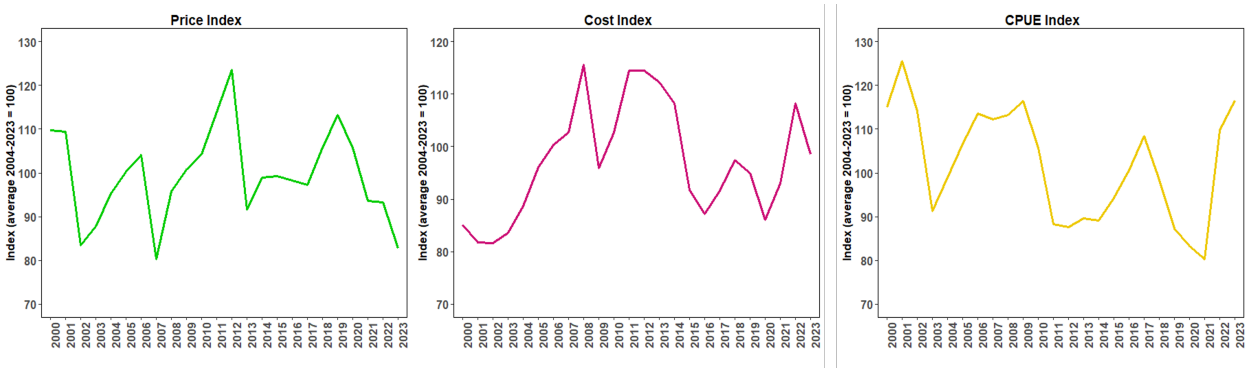

Figure 5.11: Southern longline fishery economic conditions component indexes

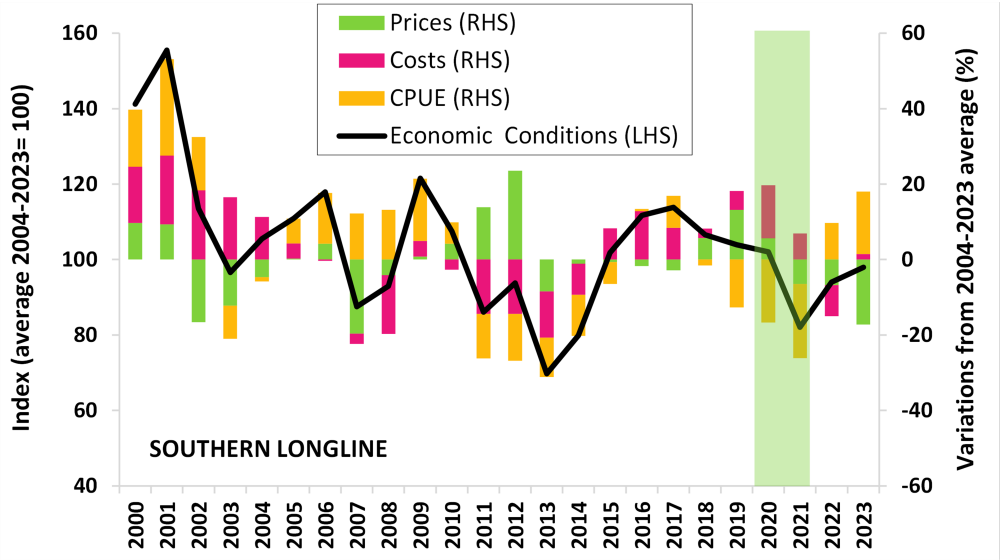

Figure 5.12: Southern longline economic conditions index (LHS) and variance of component indices against average (2001-2020) conditions (RHS)

Tropical longline

Following a downturn in the economic index during 2017 and 2018, which fell below the 20-year long-term average, the decline was primarily due to rising fuel prices and decreased catch rates. However, from 2019 to 2020, economic conditions stabilized around the 20-year long-term average, despite challenges such as declining fish prices and catch rates in 2020. This stabilization was largely attributed to reduced fuel costs, which were influenced by the impact of the COVID-19 pandemic in 2020.

In 2021 and 2022, the economic index continued to decline, remaining below the average, largely due to rising fuel prices. In 2022, the index fell to its lowest level since 2013, highlighting the severity of the challenges faced during that period. However, in 2023, the index improved, nearing the 20-year average, driven by increased catch rates and a decrease in fuel prices.

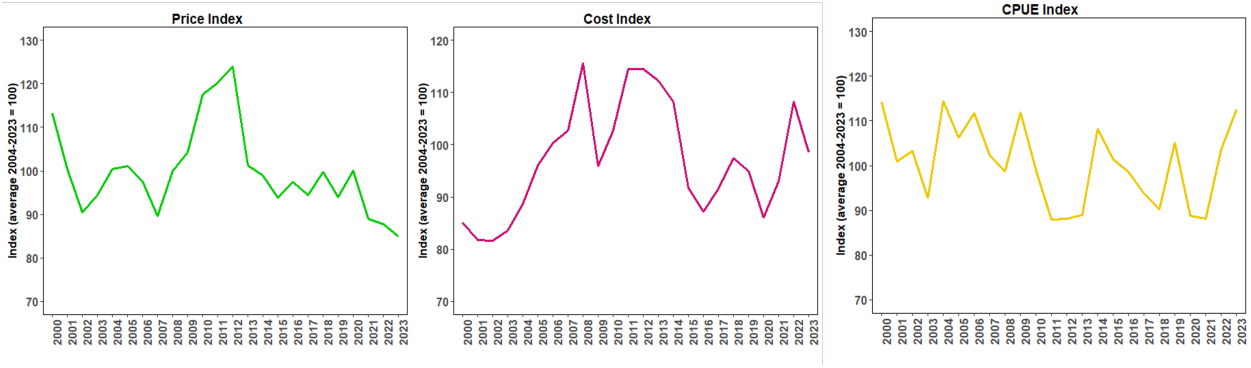

Figure 5.13: Tropical longline fishery economic conditions component indexes

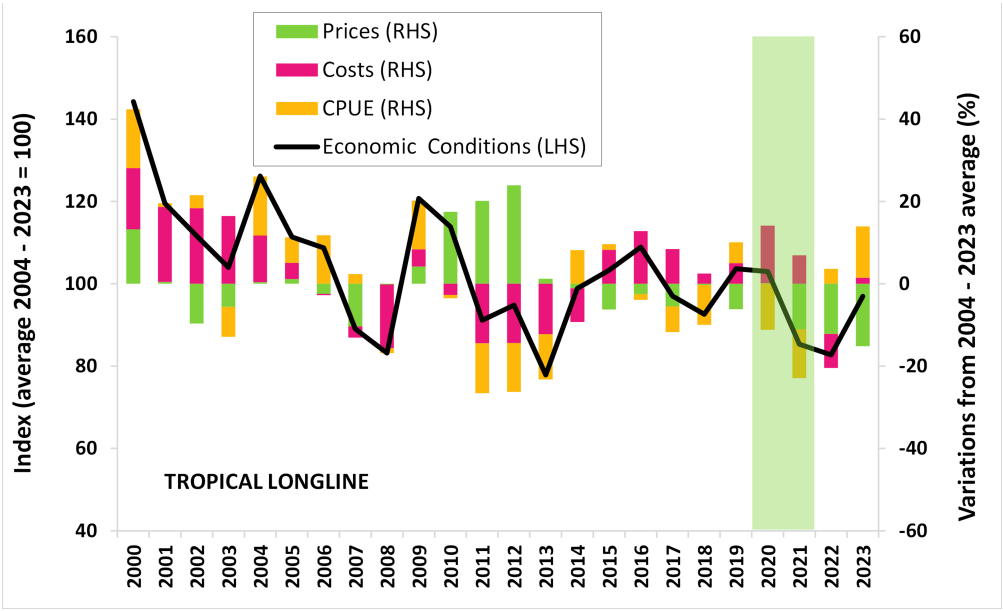

Figure 5.14: Tropical longline economic conditions index (LHS) and variance of component indices against average (2001-2020) conditions (RHS).

5.6 South Pacific Troll fishery

5.7 Overview

The South Pacific troll fishery is based in the coastal waters of New Zealand, and along the Sub-tropical Convergence Zone (STCZ, east of New Zealand waters located near 40°S). The fleets of New Zealand and the United States have historically accounted for the great majority of the catch

that consists almost exclusively of albacore tuna.

The fishery expanded following the development of the STCZ fishery after 1986, with the highest catch attained in 1989 (8,370 mt). Over the past decade, catches have declined to range from 1,000-5,000 mt. The level of effort expended by the troll fleets each year can be driven by the price conditions for the product, and by expectations concerning likely fishing success.

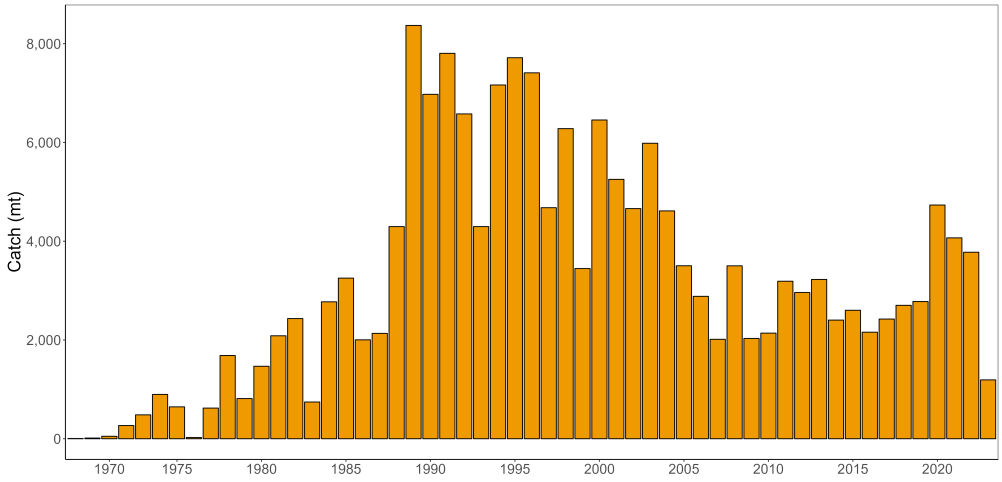

Figure 5.15: Troll catch (mt) of albacore in the south Pacific Ocean

5.8 Provisional estimates of catch, effort, and fleet size (2023)

The 2023 South Pacific troll albacore catch (1,192 mt) was the second lowest catch level since 1980 (744 mt were reported in 1983), largely owing to a contraction in NZ's troll fleet operating in the region. The New Zealand troll fleet (94 vessels catching 864 mt in 2023) and the United States troll fleet (10 vessels catching 328 mt in 2023) accounted for all of the 2023 albacore troll catch, although minor contributions also come from the Canadian, the Cook Islands and French Polynesian fleets when their fleets are active in this fishery.

Effort by the South Pacific albacore troll fleets is concentrated off the coast of New Zealand and across the Sub-Tropical Convergence Zone (STCZ) (see Figure 5.16).

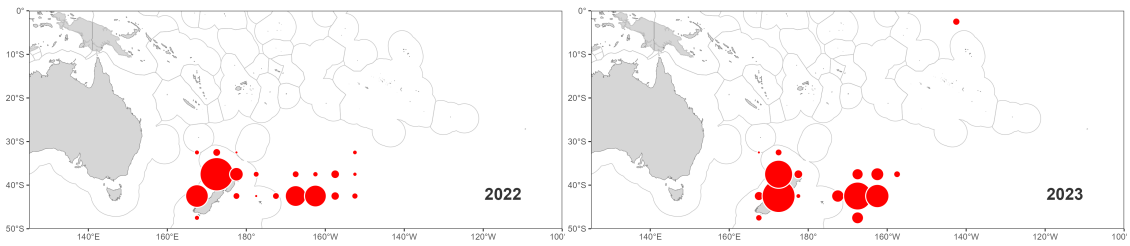

Figure 5.16: Distribution of South Pacific troll effort (days) during 2022 (left) and 2023 (right)

6 Other fisheries

There are a number of other, mainly small-scale, fisheries in the WCPFC–CA that target the key tuna species, including handline gear that targets large yellowfin tuna, small-scale troll/hook-and-line fisheries, small-scale gillnet and a range of other artisanal gears. The following sections attempt to provide some information on some of these 'other' fisheries.

A description of most of these fisheries is provided in recent Scientific Committee papers – (MOMAF and SPC-OFP; MOMAF and SPC-OFP; MOMAF and SPC-OFP; SPC-OFP).

6.1 Large-fish Handline fishery

Large-fish handline fisheries exist in the Philippines, Indonesia and Hawaii, where the target is essentially large yellowfin tuna (and also bigeye tuna in the case of Hawaii). In the Philippines and Indonesia, this fishery can be comprised of both small craft and larger vessels (>24m or >20 GRT). The larger vessels can have several small associated one-person boats (called pakura in the Philippines) used to fish in the vicinity of the larger vessel. The vessels that target large yellowfin tuna with the handline gear are also referred to as 'pump boats' in the Philippines. The general characteristics that distinguish the vessels targeting small-fish with the 'hook-and-line' gear to those targeting large yellowfin tuna in the Philippines and Indonesia is that the latter fishery is conducted at night, at a depth typically greater than 50 metres with larger hooks. However, this distinction is not always clear, for example, there are instances when small craft can target both large yellowfin at night and small tunas in the day within one trip. Large yellowfin tuna dominates the catch from this gear type in the Philippines and Indonesia (typically $\geq$ 95% of the total catch) and the catches are landed locally where it is processed and available for export or the high-end local markets.

Over the past two decades, annual catch estimates from the large-fish handline fishery have been in the range of 20,000–57,000 mt (Figure 6.1), although the estimates prior to 2013 are acknowledged to exclude the catches from the Indonesian fishery. Estimates for Indonesia were compiled for the period 2013–2016, but were again lacking from 2017 onward, and only represent carried over values for this fishery since this time. The 2023 (45,496 mt) catch was similar 2022 (43,647 mt), but with a notable increase in albacore catches (1,369 mt), primarily coming from the Philippines, compared to the historical time series where albacore catches varied between 30-400 mt.

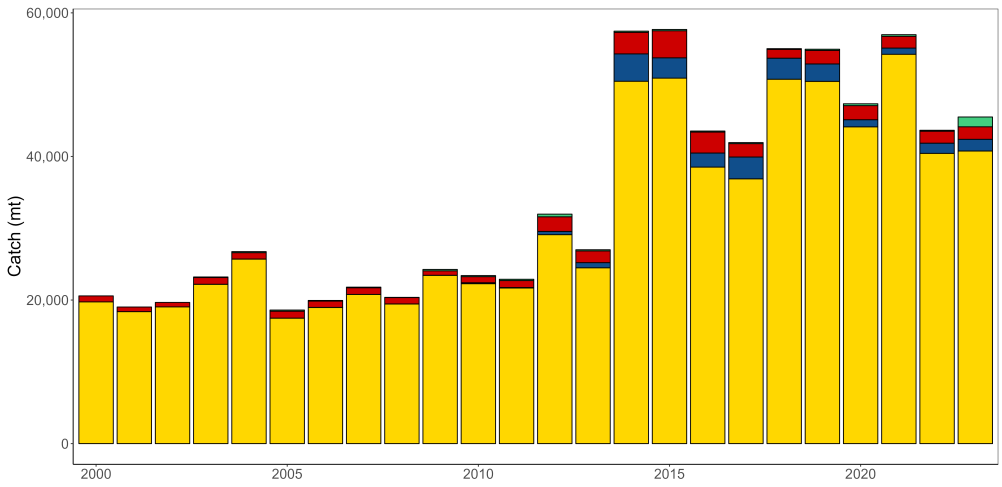

Figure 6.1: WCPFC–CA large-fish handline catch (mt) by species (albacore - green; bigeye - red; skipjack - blue; yellowfin - yellow)

6.2 Small-scale troll and hook-and-line fishery

The small-scale troll and hook-and-line fishery comprises small craft that, due to their size and concerns on safety, conduct trips that do not usually exceed one day and are restricted to coastal waters, rarely venturing beyond territorial seas and/or archipelagic waters (where relevant). The method of fishing is varied and includes trolling, and surface fishing in the vicinity of FADs with one or multiple hooks per line. Small skipjack and yellowfin tuna are the main species taken in this fishery and most coastal states in the tropical and sub-tropical WCPFC-CA have vessels in this fishery, with the highest catches reported from the Indonesia and the Philippines domestic fisheries, followed by Kiribati, Japan, French Polynesia and Tuvalu (catches from some countries, while only minor, have yet to be compiled and provided to the WCPFC). The catches from this fishery are typically for subsistence or sold at local markets.

Over the past two decades annual catch estimates from the small-scale troll and hook-and-line fishery have been in the range of 170,000–300,000 mt (Figure 6.2), although the trends in some years may be a result of the lack of resources to compile or confirm estimates, rather than changes in the fishery. The increasing trend over the past decade may be related to improvements in estimates in some fisheries (noting the provisional 2023 estimate (310,947 mt) is the highest of the time series, but comparable to the past five years). The species composition tends to fluctuate with some years having a high proportion of small yellowfin tuna (e.g., in recent years, the catch of small yellowfin tuna was estimated to have been at least 50% of the total tuna catch for this fishery). Over the past five years, the proportion of small bigeye tuna has increased, relative to historical catches.

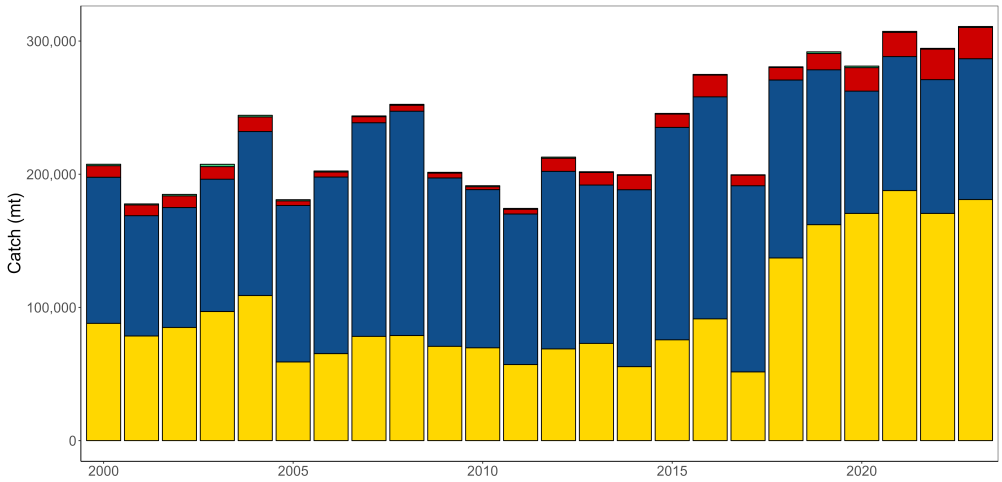

Figure 6.2: WCPFC–CA troll/hook-and-line catch (mt) by species (bigeye - red; skipjack - blue; yellowfin - yellow)

6.3 Small-scale gillnet fishery

The main small-scale gillnet fisheries operate in coastal waters of Vietnam and Indonesia, with smaller catches from this gear in Japan and in the archipelagic waters of the Philippines. This fishery targets skipjack tuna but also take small amounts of other pelagic species.

The available annual catch estimates (Figure 6.3) are only representative of Vietnam, Philippines and Japan fisheries at this stage; the total tuna catch from these drift gillnet fisheries has ranged from 10,000 mt to 48,000 mt over the past decade. Indonesia first separated out the gillnet catch by species from their 'other/unclassified gear' tuna catch estimates in 2013 and these have yet to be included in this time series; the Indonesia small-scale gillnet catch has ranged from 5,000–40,000 mt over this period. The decline in catch for the Vietnam fishery is driving the trend in recent years (catch of 12,784 mt in 2023, one of the lowest in recent history).

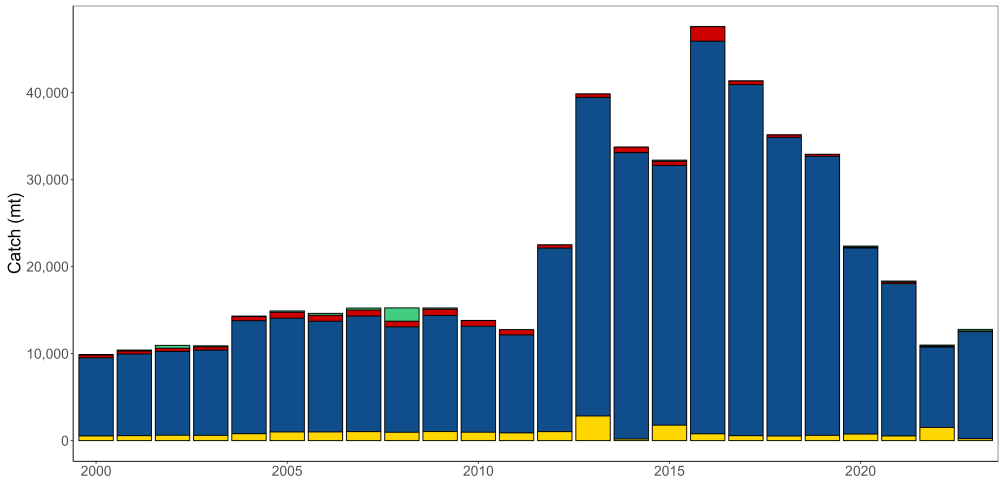

Figure 6.3: WCP–CA small-scale gillnet catch (mt) by species (albacore - green; bigeye - red; skipjack - blue; yellowfin - yellow)

7 Summary of catch by species

7.1 Skipjack

Total skipjack catches in the WCP–CA have increased steadily since 1960, more than doubling during the 1980s, and continuing to increase in subsequent years. Annual catches have exceeded 1.5 million mt in the last decade (Figure 7.1). Pole-and-line fleets, primarily Japanese, initially dominated the fishery, with the catch peaking at 380,000 mt in 1984. The relative importance of the pole-and-line fishery, however, has declined over the years primarily due to economic constraints. The skipjack catch increased during the 1980s due to growth in the international purse seine fleet, combined with increased catches by domestic fleets from Philippines and Indonesia (which have made up around 10% of the total skipjack catch in WCPFC–CA.

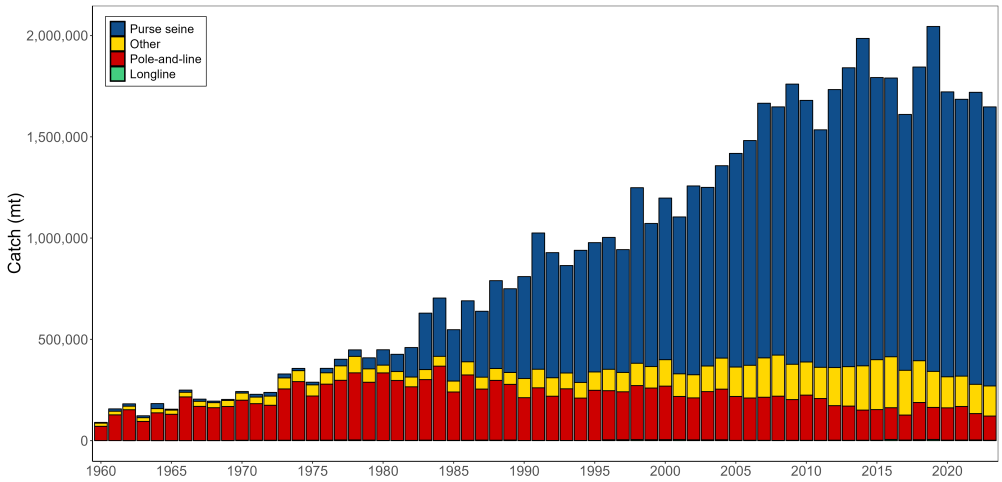

Figure 7.1: WCPFC–CA skipjack catch (mt) by gear

The 2023 WCPFC–CA skipjack catch of 1,647,702 mt was a modest reduction from 2022, and around 400,000 mt lower than the record in 2019 (2,044,779 mt). Catch in the purse seine fishery for 2023 (1,377,830 mt – 81%) was among the highest ten years on record, noting that the trend in purse seine skipjack catch typically drives the trends in overall skipjack catch. The pole-and-line catch for 2023 (119,507 mt – 7%) was amongst lowest catches since 1963, with reductions in both the Japanese and the Indonesian catches (noting 2023 estimates for this fishery are provisional). The various 'artisanal' gears in the domestic fisheries including Indonesia, Philippines and Japan took 148,606 mt in 2023 (9% of the total catch) was the lowest since 2005. The longline fishery accounted for less than 1% of the total catch.

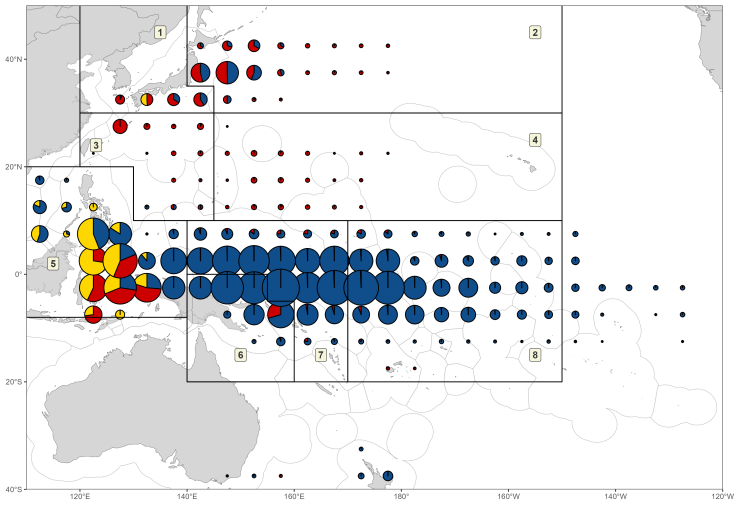

Figure 7.2: Distribution of skipjack tuna catch by gear, 1990–2023 (pole-and-line - red; purse seine - blue; other fisheries - yellow). The eight-region spatial stratification used in stock assessment is shown.

The majority of the skipjack catch is taken in equatorial areas, and most of the remainder is taken in the seasonal domestic (home-water) fishery of Japan, with seasonal catches in the NZ fishery (Figure 7.2). The domestic fisheries in Indonesia (purse seine, pole-and-line and unclassified gears) and the Philippines (e.g., ring-net and purse seine) account for the majority of the skipjack catch in the western equatorial portion of the WCP–CA. As mentioned in Section 3, the spatial distribution of skipjack catch by purse seine vessels in the central and eastern equatorial areas is influenced by the prevailing ENSO conditions. The Philippines and Indonesian domestic fisheries (archipelagic waters) generally account for most of the skipjack catch in the 20–40 cm size range (Figure 7.3), although associated purse seine catch also contribute to this range (e.g., in 2020). Most of the WCPFC–CA skipjack catch (by weight) is in the range 40–70 cm (corresponding to 1–2+ year-old fish – Figure 7.4). Medium-large (60–70 cm) skipjack typically make up the greater proportion of the catch from unassociated, free swimming school sets. The overall purse seine skipjack size distribution in 2023 from associated sets (light blue) shows a broader distribution across size classes from about 25 to 60 cm, as compared to 2022, where the majority of the catch was concentrated between 35-50 cm. For the unassociated sets (dark purple), there is a reduction in overall catches of skipjack at the larger sizes, with the catches distributed more evenly between 45-80 cm, compared to previous years, but these patterns could be influenced by the bias in spatial coverage of observer data. The skipjack size distributions in the Philippine/Indonesia archipelagic fisheries have been relatively constant for a number of years (Figure 7.3 – yellow).

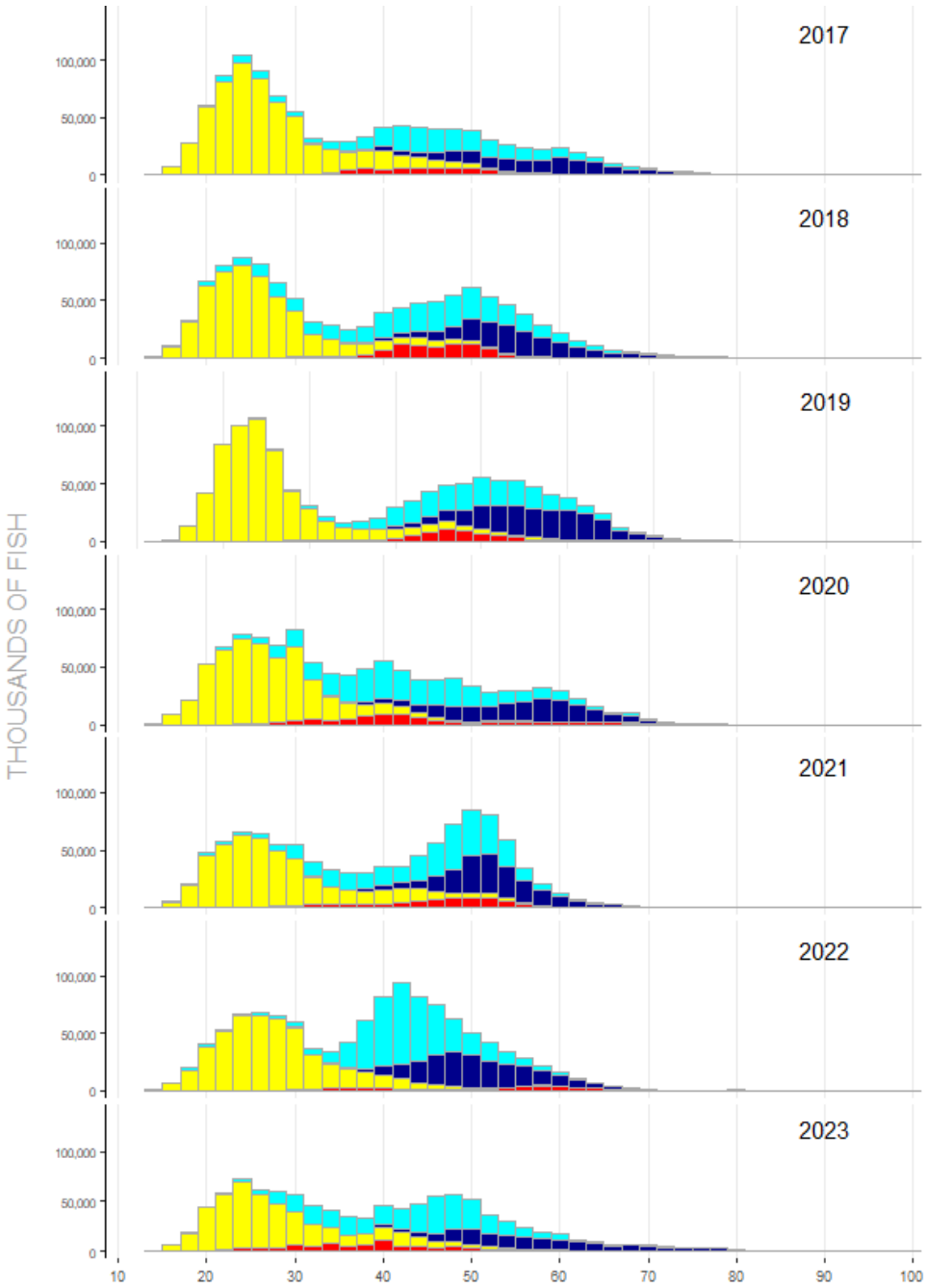

Figure 7.3: Annual catches (no. of fish) of skipjack tuna in the WCPO by size (2 cm intervals) and gear type, 2017–2023 (red – pole-and-line; yellow – Philippine-Indonesia archipelagic fisheries; light blue – purse seine associated; dark blue – purse seine unassociated)

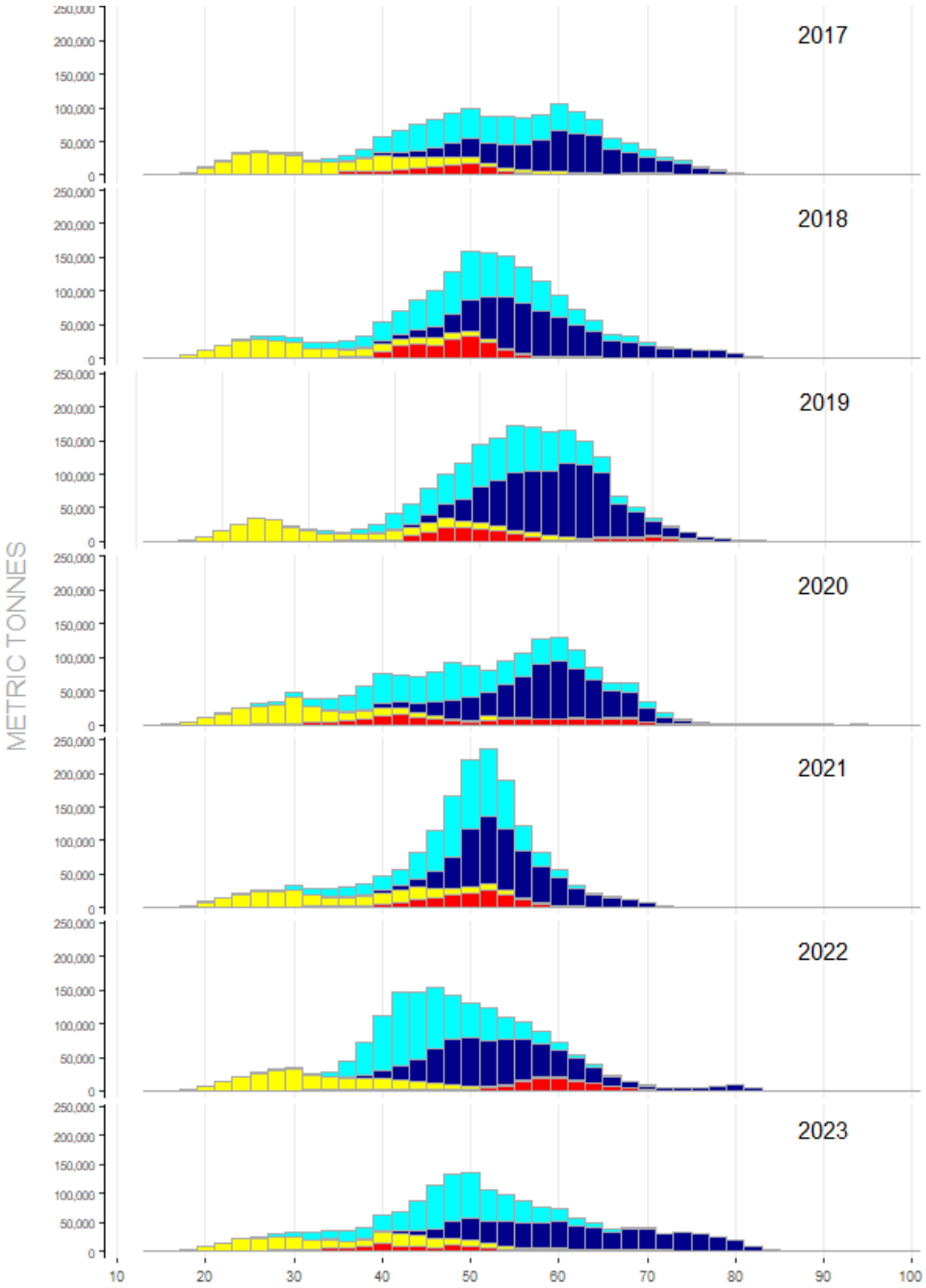

Figure 7.4: Annual catches (mt) of skipjack tuna in the WCPO by size (2 cm intervals) and gear type, 2017–2023 (red – pole-and-line; yellow – Philippine-Indonesia archipelagic fisheries; light blue – purse seine associated; dark blue – purse seine unassociated)

7.2 Yellowfin

The total yellowfin tuna catch in the WCPFC–CA has slowly increased over time but since 1998, jumped to a new level with annual catches regularly exceeding 500,000 mt (Figure 7.5), mainly due to increased catches in the purse seine fishery. The 2023 yellowfin catch (746,913 mt) was

the second highest catch on record, coming in just under the catch in 2021 (754,370 mt). The recent high yellowfin tuna catches are related to some extent to recent high catch levels from the 'other' category (primarily small-scale fisheries in Indonesia – provisional 2023 estimate for 'other' is 230,999 mt – 31% of the total catch).

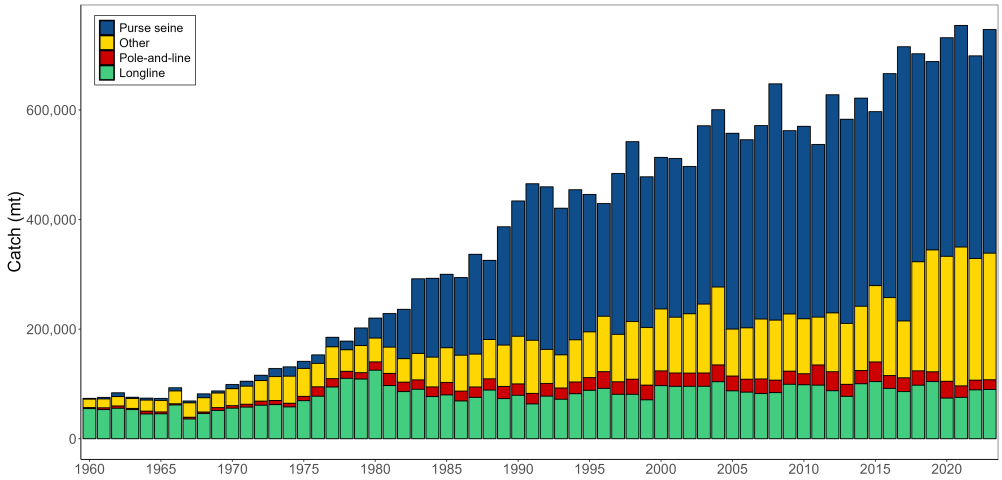

Figure 7.5: WCPFC–CA yellowfin catch (mt) by gear

The WCPFC–CA longline catch for 2023 (89,975 mt–12%) was a slight increase compared to 2022, and comparable to the average catch in this fishery over the past two decades. Since the late 1990s, the purse seine catch of yellowfin tuna (408,281 mt in 2023 – 55%) has accounted for about 3-5 times the longline yellowfin tuna catch.

The pole-and-line fisheries took only 17,658 mt during 2023 (∼2% of the total yellowfin catch), which was similar to the 2022 catch level, but amongst the lowest since the 1970s. Catches in the 'other' category are largely composed of yellowfin taken by various assorted gears (e.g., troll, ring-net, bagnet, gillnet, large-fish handline, small-fish hook-and-line and seine net) in the domestic fisheries of the Philippines and eastern Indonesia. Figure 7.6 shows the distribution of yellowfin catch by gear type for the period 1990–2023. As with skipjack, the great majority of the catch is taken in equatorial areas by large purse seine vessels, and a variety of gear types in the Indonesian and Philippine fisheries.

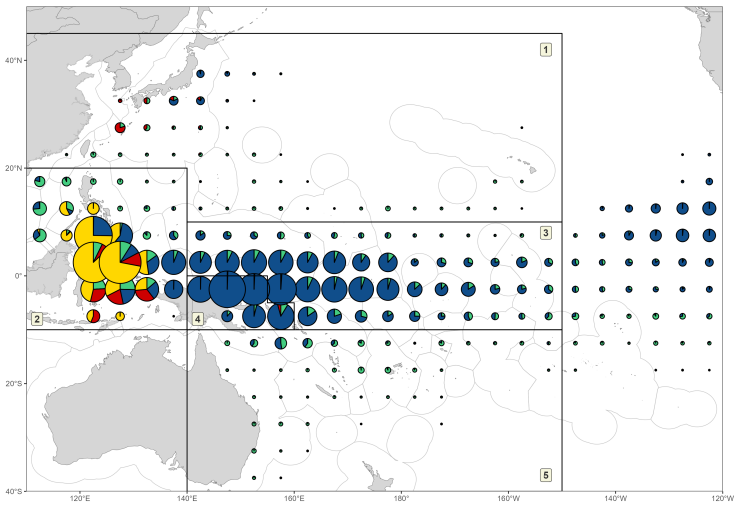

Figure 7.6: Distribution of yellowfin tuna catch by gear, 1990–2023 (longline - green; pole-and-line - red; purse seine - blue; other fisheries - yellow). The five-region spatial stratification used in stock assessment is shown.

The domestic surface fisheries of the Philippines and Indonesia (archipelagic waters) take large numbers of small yellowfin in the 20–50 cm range (Figure 7.7), and their deep-water handline fisheries take smaller quantities of large yellowfin tuna (> 110 cm). In the purse seine fishery, smaller yellowfin are caught in log and FAD sets than in unassociated sets. A major portion of the purse seine catch is typically adult (> 100 cm) yellowfin tuna, to the extent that the purse seine catch (by weight) of adult yellowfin tuna is usually higher than the longline catch. Most of the catch of large yellowfin tuna in the size range 120–140 cm from the purse seine unassociated sets is typically taken in the eastern tropical WCPFC-CA. The proportion of fish >130cm from unassociated sets during 2023 notable increased from 2021-2022 where there was only a small proportion of the catch at these larger sizes (Figure 7.8). The apparent mode of small fish around 45-50 cm in the purse seine associated catch during both 2022 did not appear to progress into the 2023 catches. The differences in size distribution for 2022 and 2023 may be due to the transition from La Niña to El Niño conditions and the associated increase in unassociated sets farther to the eastern WCPO; however, these patterns could also be due in part to some bias in the spatial representativeness in the available size data for these years (since there was clearly reduced observer coverage during some years). Section 3.6 also provides some insights into the distribution of purse seine yellowfin catch by area and size.

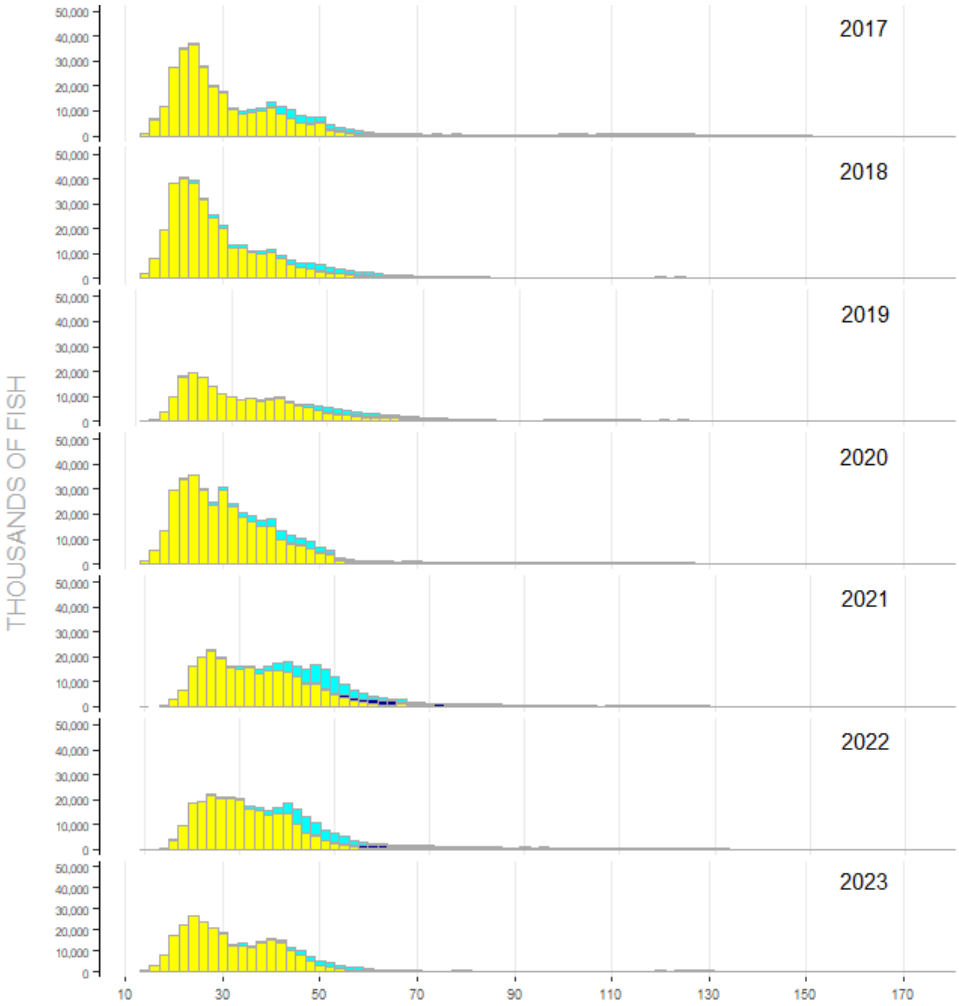

Figure 7.7: Annual catches (no. of fish) of yellowfin tuna in the WCPO by size (2 cm intervals) and gear type, 2017–2023 (green – longline; yellow – Philippine-Indonesia archipelagic fisheries; light blue – purse seine associated; dark blue – purse seine unassociated)

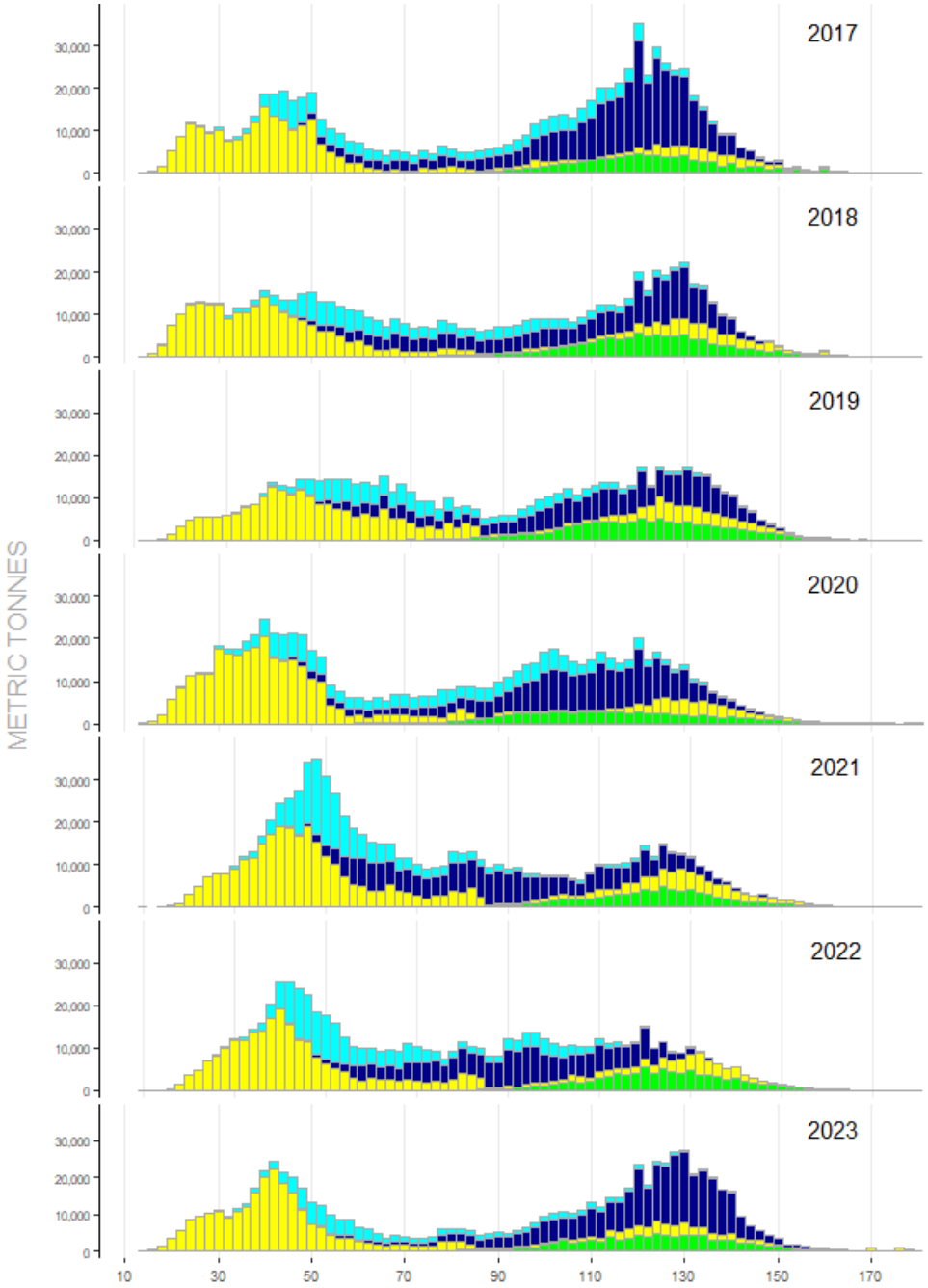

Figure 7.8: Annual catches (mt) of yellowfin tuna in the WCPO by size (2 cm intervals) and gear type, 2017–2023 (green – longline; yellow – Philippine-Indonesia archipelagic fisheries; light blue – purse seine associated; dark blue – purse seine unassociated)

7.3 Bigeye

The provisional WCPFC-CA bigeye catch (140,309 mt) for 2023 was similar to the 2022 level and around 55,000 mt lower than the record in 2004 (195,052 mt). The provisional WCPFC-CA longline bigeye catch (56,203 mt) was similar to the 2022 catch and clearly lower than the recent ten-year

average. The reduction in longline catches of bigeye in recent years were initially attributed, in part, to the COVID-19 pandemic, but a rebound following the peak impacts of the pandemic have not yet been observed. The provisional WCPFC–CA purse seine bigeye catch for 2023 was estimated to be 56,094 mt, which was a reduction of about 8,500 mt from the 2022 catch, and lower than the recent ten-year average (Figure 7.9). The WCPFC-CA purse seine bigeye catch has exceeded the longline catch for most of the past ten years. The purse seine and longline fisheries have accounted for an average of 85% of the total WCPFC-CA bigeye catch over the past ten years, a percentage that has decreased in recent years due to the bigeye catches reported from 'other' gears in the Indonesia/Philippine/Vietnam regions of the western WCPO (Figure 7.10).

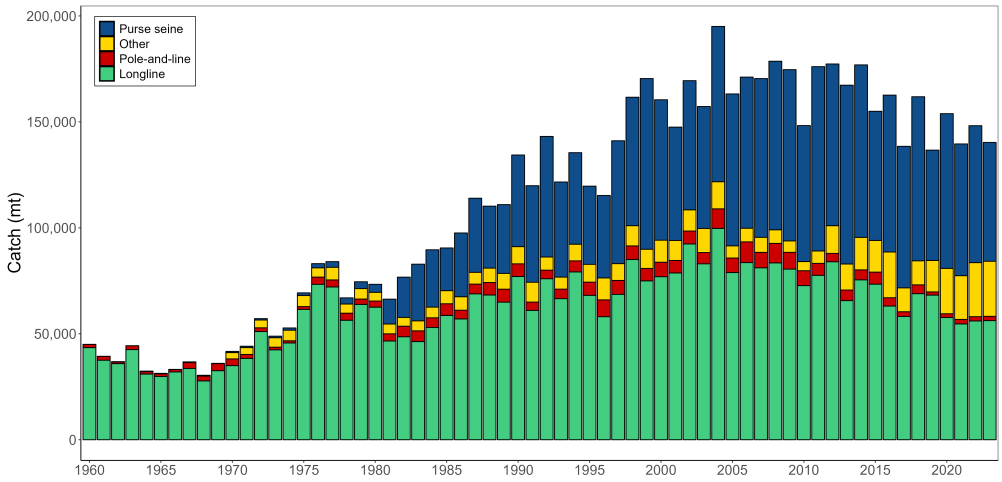

Figure 7.9: WCPFC–CA bigeye catch (mt) by gear

The WCPFC–CA pole-and-line fishery has generally accounted for between 1,000–5,000 mt (1- 4%) of bigeye catch annually over the past decade (2,021 mt in 2023). The 'other' category, representing various gears (including troll) in the Philippine, Indonesia[10], Vietnam and Japanese domestic fisheries has fluctuated between an estimated 11,000–26,000 mt (7–15% of the total WCPFC–CA bigeye catch) over the past decade, with the 2023 catch of 25,991 mt representing the highest catch of the time series.

Figure 7.10 shows the spatial distribution of bigeye catch in the Pacific for the period 1990–2023. The majority of the WCPFC–CA catch is taken in equatorial areas, both by purse seine and longline, but with some longline catch in sub-tropical areas (e.g., east of Japan and off the east coast of Australia). In the equatorial areas, much of the longline catch is taken in the central Pacific, continuous with the important traditional bigeye longline area in the eastern Pacific

[10] Bigeye tuna estimates in the Indonesian troll fishery were provided for the first time for 2013 but have subsequently (since 2017) been included in the 'other' category.

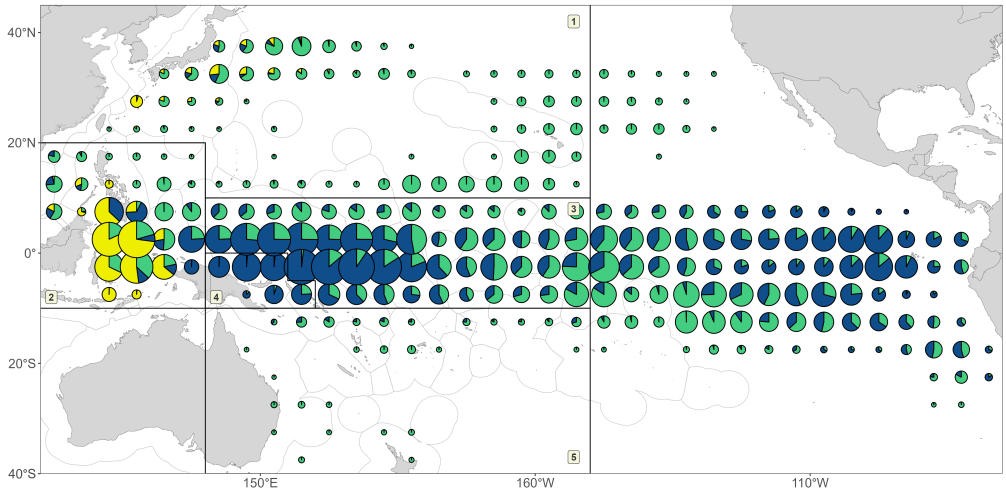

Figure 7.10: Distribution of bigeye tuna catch, 1990-2023. The five-region spatial stratification used in stock assessment for the WCPFC–CA is shown (longline - green; purse seine - blue; other fisheries - yellow).

As with skipjack and yellowfin tuna, the domestic surface fisheries of the Philippines and Indonesia (archipelagic waters) take relatively large numbers of small bigeye in the range 20–60 cm (Figure 7.11). The longline fishery clearly accounts for most of the catch (by weight) of large bigeye in the WCPFC–CA (Figure 7.12). This contrasts with large yellowfin tuna, which (in addition to longline gear) are also taken in significant amounts from unassociated (free-swimming) schools in the purse seine fishery and in the Philippines handline fishery. Large bigeye tuna are very rarely taken in the WCPO purse seine fishery and only a relatively small amount come from the handline fishery in the Philippines. Bigeye tuna sampled in the longline fishery are predominantly adult fish with a mean size of ∼130 cm FL (range 80-170+ cm FL). Associated sets account for nearly all the bigeye catch in the WCPFC–CA purse seine fishery with considerable variation in the sizes from year to year, but the majority of associated-set bigeye tuna are generally in the range of 45–75 cm.

The 2023 bigeye length size classes are dominated by small fish 25-35 cm from the Indonesia/Philippine archipelagic fisheries, with the associated purse seine mode from 2022 all but disappearing in 2023. (Figure 7.11).

The graphs for 2023 potentially show several distinct modes (i) at 25 cm and 45 cm for the Philippines/Indonesia domestic fisheries, (ii) around 50 cm for the purse seine associated fishery (although the distribution is more broad in 2023 than years prior), and (iii) the typical broad mode at around 130-145 cm for the longline fishery.

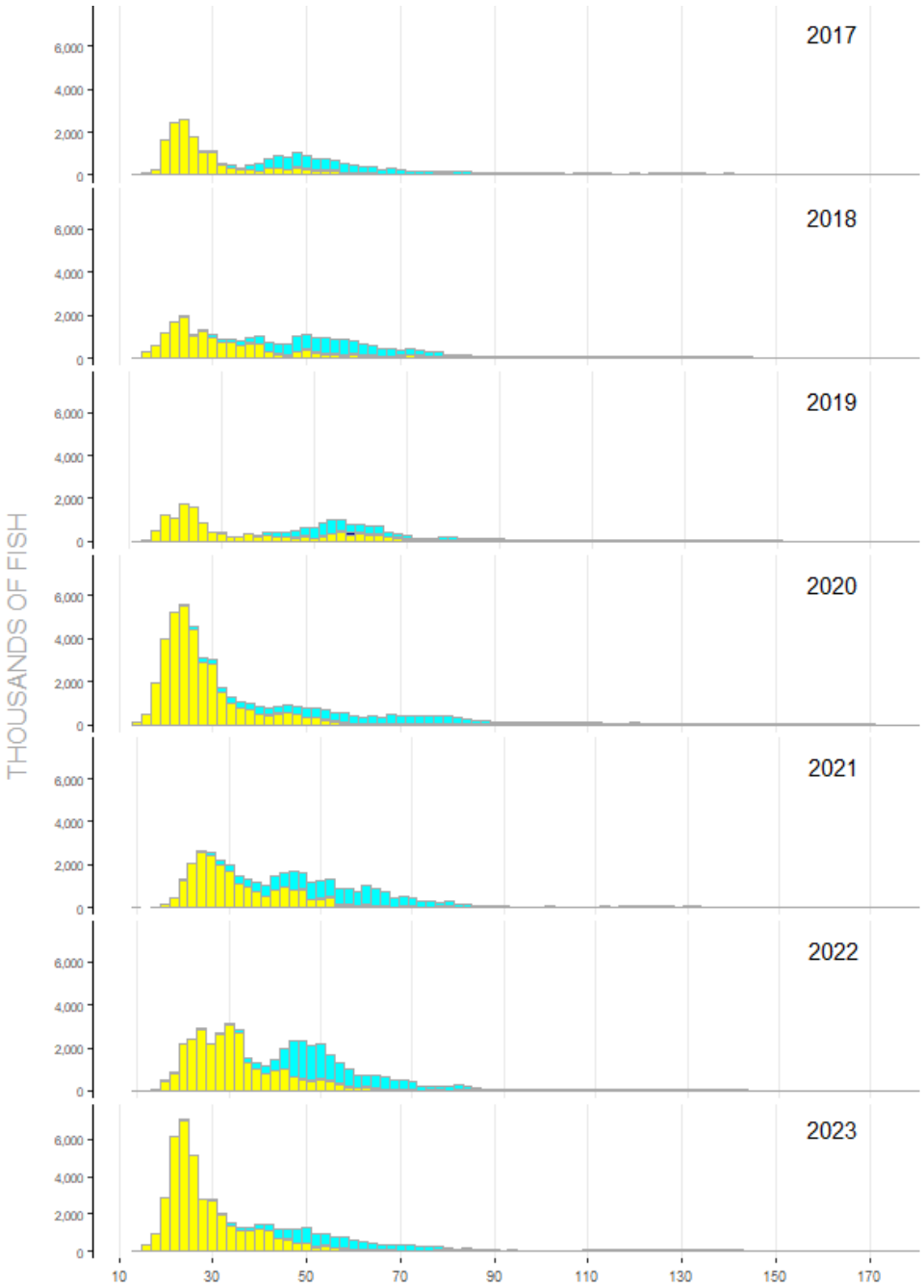

Figure 7.11: Annual catches (no. of fish) of bigeye tuna in the WCPO by size (2 cm intervals) and gear type, 2017–2023 (green – longline; yellow – Philippine-Indonesia archipelagic fisheries; light blue – purse seine associated; dark blue – purse seine unassociated)

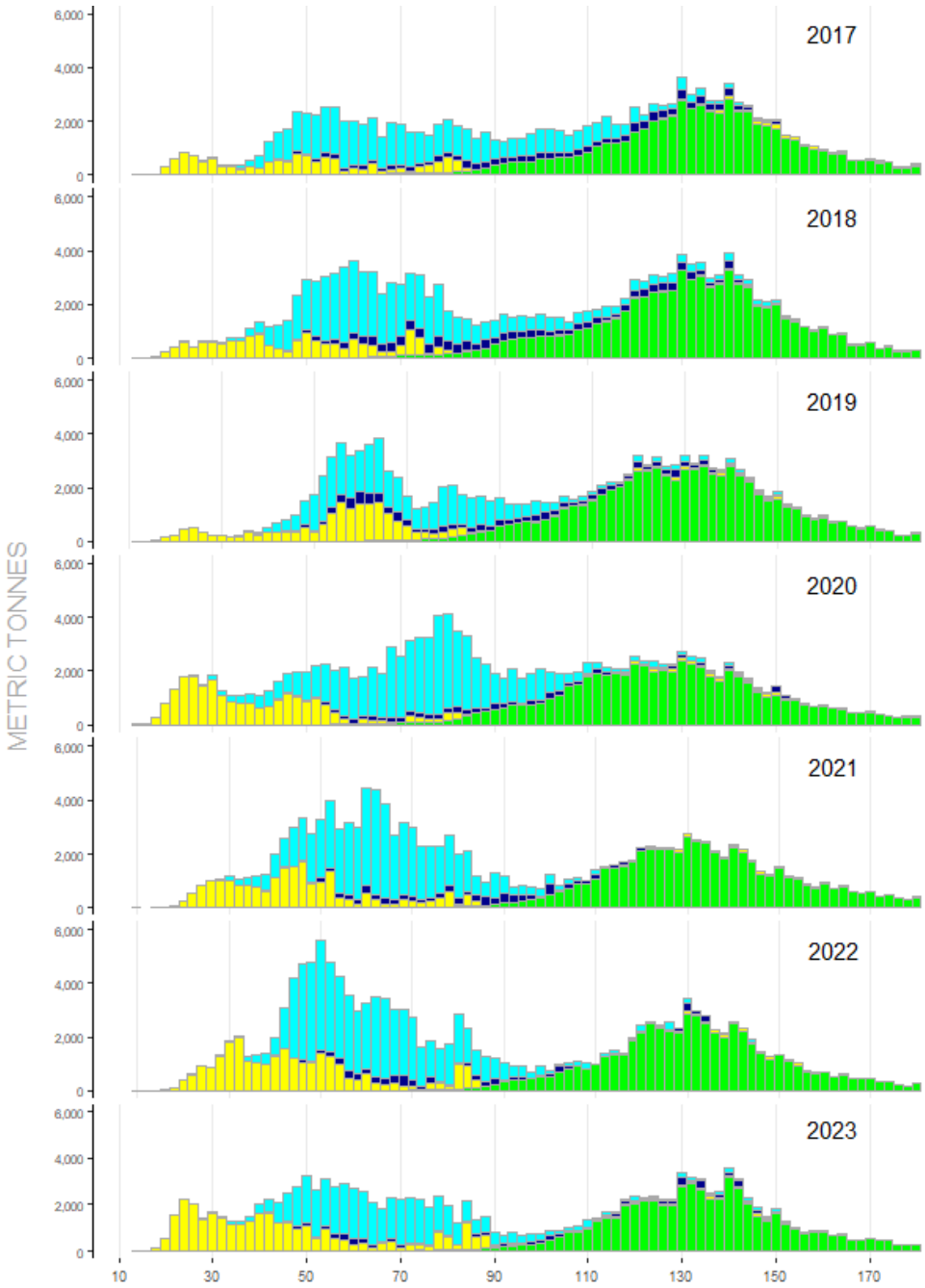

Figure 7.12: Annual catches (mt) of bigeye tuna in the WCPO by size (2 cm intervals) and gear type, 2017–2023 (green – longline; yellow – Philippine-Indonesia archipelagic fisheries; light blue – purse seine associated; dark blue – purse seine unassociated)

7.4 Albacore

Prior to 2001, South Pacific albacore catches were generally in the range 25,000–50,000 mt, with a significant peak in 1989 (49,076 mt) when driftnet fishing was in existence. Since 2001, catches have greatly exceeded this range, primarily as a result of the growth in several Pacific Islands domestic

longline fisheries. The provisional South Pacific albacore catch in 2023 (67,715 mt) does not yet account for the catches from the Eastern Pacific Ocean, and therefore these catches will increase once all data have been consolidated.

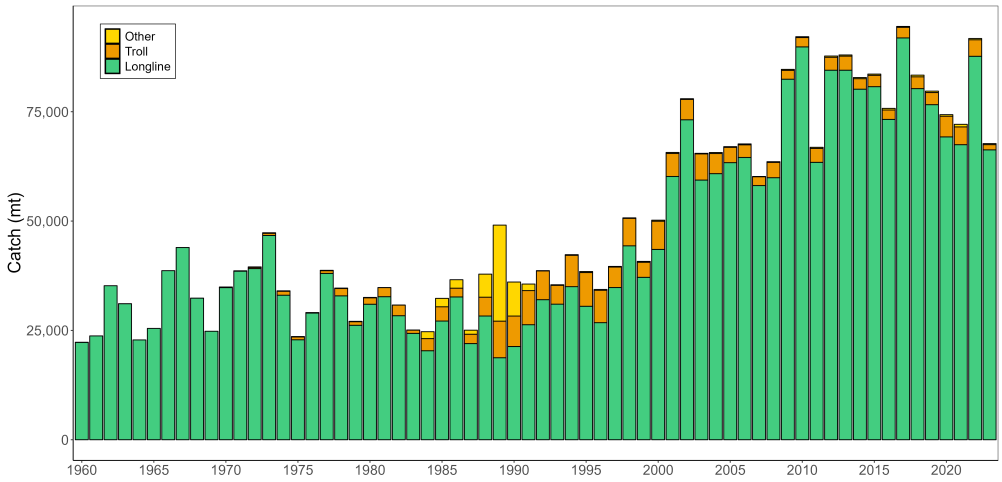

Figure 7.13: South Pacific albacore catch (mt) by gear ('Other' is primarily represented by catches from the driftnet fishery)

In the post-driftnet era, longline has accounted for most of the South Pacific albacore catch (> 75% in the 1990s, but > 90% in recent years). The annual South Pacific Albacore troll catch (with a season spanning November–April) dropped from a range between 4,000–8,000 mt during the 1990s, to a range of 1,000–5,000 mt (Figure 5.15) with 2023 representing one of the lowest catches since 1980. The provisional WCPFC–CA albacore catch for 2023 (95,934 mt), a modest increase over the prior two years but still around 52,000 mt lower than the record (148,051 mt in 2002). The WCPFC–CA albacore catch (which includes catches from fisheries in the North Pacific Ocean west of 150°W) typically contributes around 80%–90% of the Pacific catch of albacore (provisional Pacific Ocean albacore tuna catch for 2023 is 101,759 mt).

The longline catch of albacore is distributed over a large area of the south Pacific (Figure 7.14) but concentrated in the west. The Chinese-Taipei distant-water longline fleet catch is taken in all regions, while the Pacific Island domestic longline fleets catches are restricted to the latitudes 10°–25°S. Troll catches are distributed in New Zealand's coastal waters, mainly off the South Island, and along the Sub-tropical Convergence Zone (STCZ). Less than 20% of the overall South Pacific albacore catch is usually taken east of 150°W.

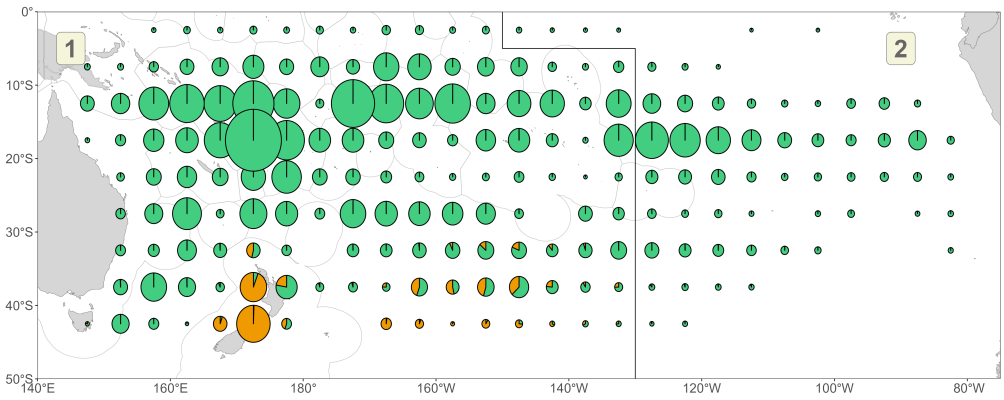

Figure 7.14: Distribution of South Pacific albacore tuna catch, 1988–2023. The four-region spatial stratification used in stock assessment is shown (longline - green; troll - orange).

The longline fishery takes adult albacore in the narrow size range of 90–105 cm and the troll fishery take juvenile fish in the range of 45–80cm (Figures 7.15 and 7.16). Juvenile albacore also appear in the longline catch from time-to-time (e.g., fish in the range 60–70 cm sampled from the longline catch). The size distribution in the South Pacific albacore catch for recent years shows a clear mode in each year of small albacore around 50 cm (in 2023) to 65-70 cm (2021-2022) from the troll fishery and slightly larger fish (95-105 cm modes) for recent years in the longline fishery.

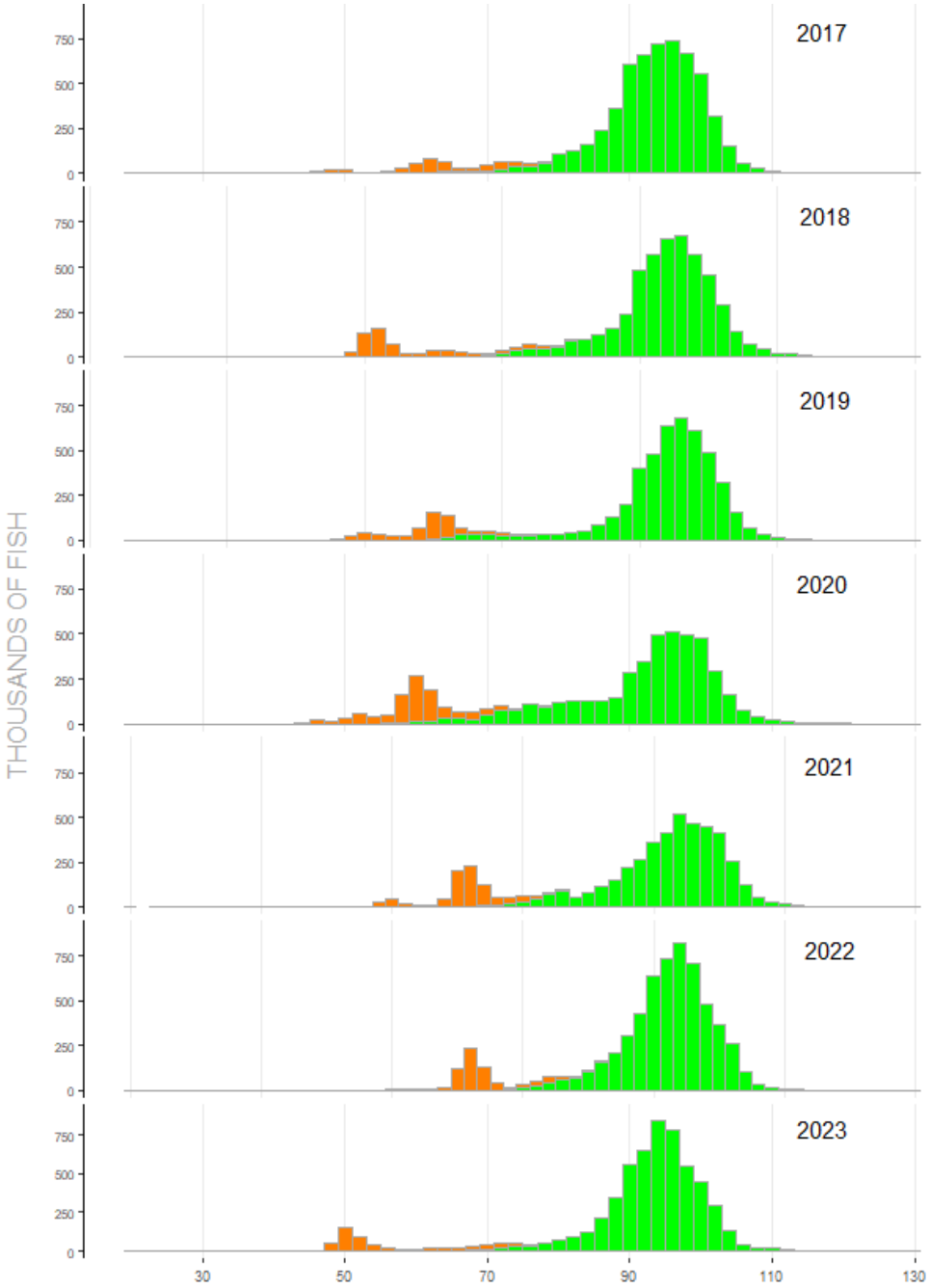

Figure 7.15: Annual catches (no. of fish) of albacore tuna in the South Pacific Ocean by size (2 cm intervals) and gear type, 2017–2023 (green – longline; orange – troll)

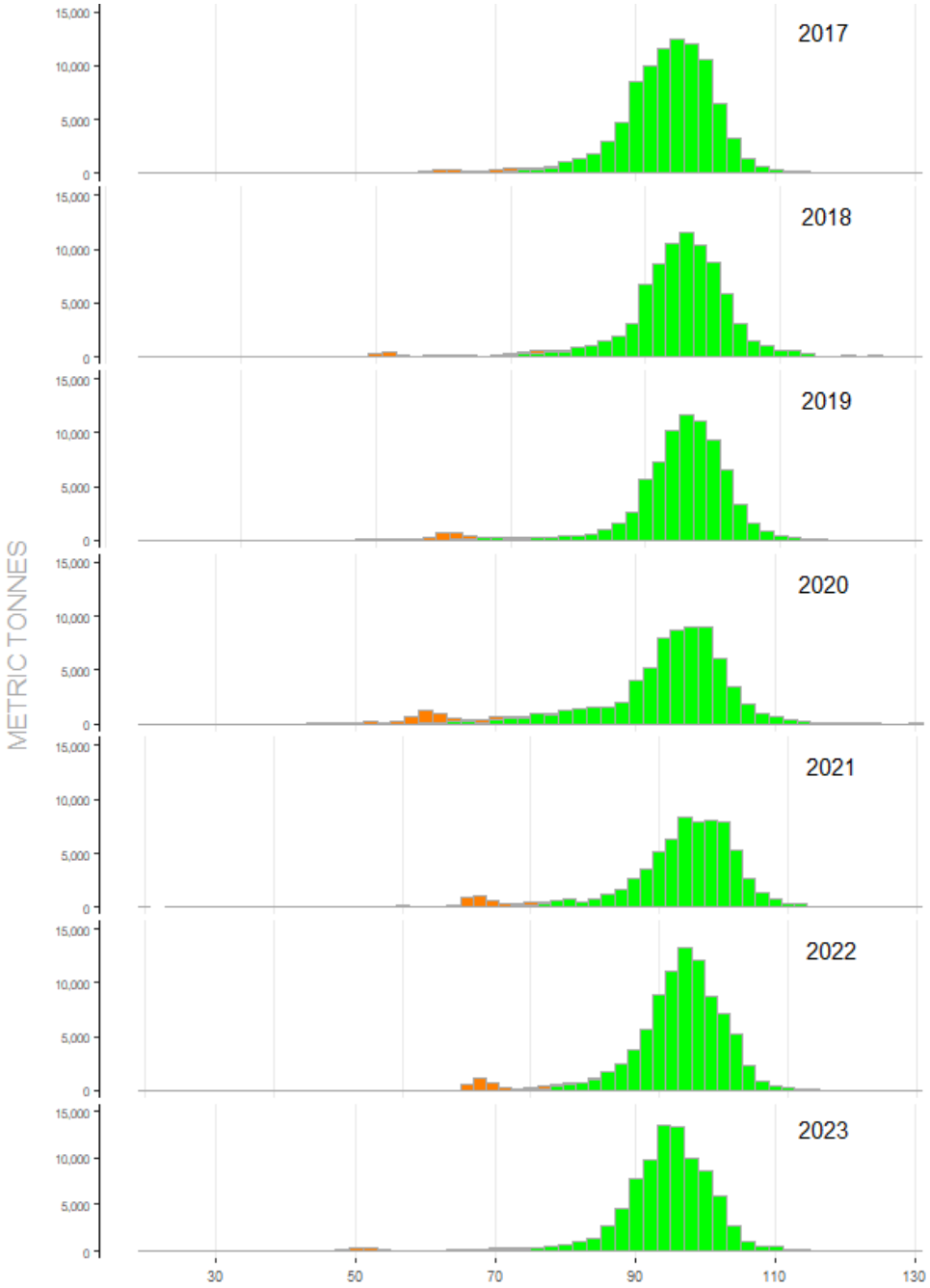

Figure 7.16: Annual catches (mt) of albacore tuna in the South Pacific Ocean by size (2 cm intervals) and gear type, 2017–2023 (green – longline; orange – troll)

7.5 South Pacific swordfish

The distant-water and offshore Asian fleets (Japan, Chinese Taipei, and Korea) accounted for most of the South Pacific swordfish catch from 1972 to the mid-1990s (Figure 7.17), with catches slowly increasing from 2,500 mt to about 5,000 mt. The development of target (domestic) fisheries in Australia and New Zealand accounted for most of the increase in total catch to around 10,000 mt

in early 2000s, with burgeoning Pacific Island domestic fleets also contributing. The EU-Spanish longline fleet targeting swordfish entered the fishery in 2004 and resulted in total swordfish catches increasing significantly to a new level of around 15,000 mt, and then to more than 20,000 mt over the period 2011-2018, with contributions from the EU-Portuguese fleet and distant-water and offshore Asian fleet catches (Figure 7.18). The provisional 2023 catch estimate for the South Pacific swordfish (8,792 mt) was a significant decrease from the 2022 catch and one of the lowest catches on records since the 1990s, mainly due to the absence of the EU fleet 2023 catch estimate for South Pacific swordfish in the IATTC area at this stage (noting that 2023 estimates for some fleets are provisional at this time).

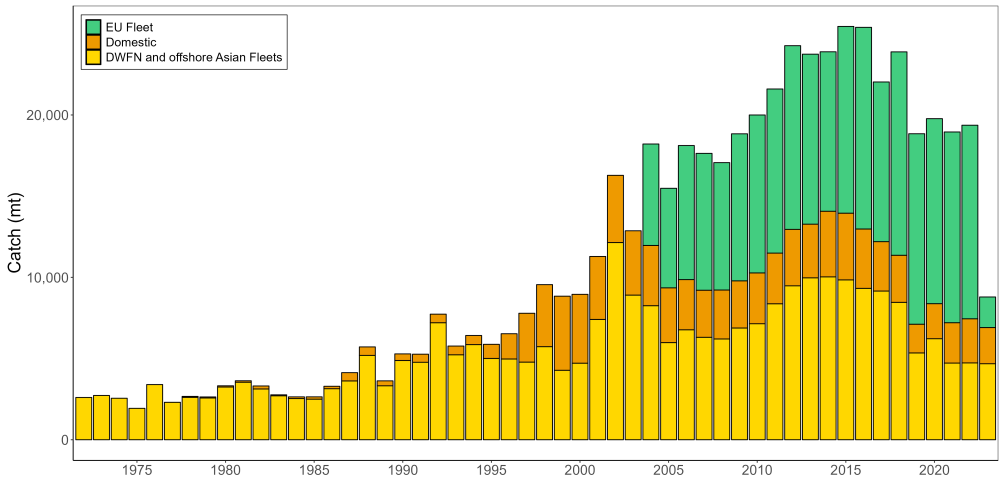

Figure 7.17: South Pacific longline swordfish catch (mt) by fleet

The catch of swordfish for the WCPFC-CA south of the equator (Figure 7.18) in 2023 was 7,106 mt, slightly higher than 2022 but clearly lower than the peak years of 2012-2014, with a notable decrease in the DWFN and Asian fleet catches compared to a decade prior.

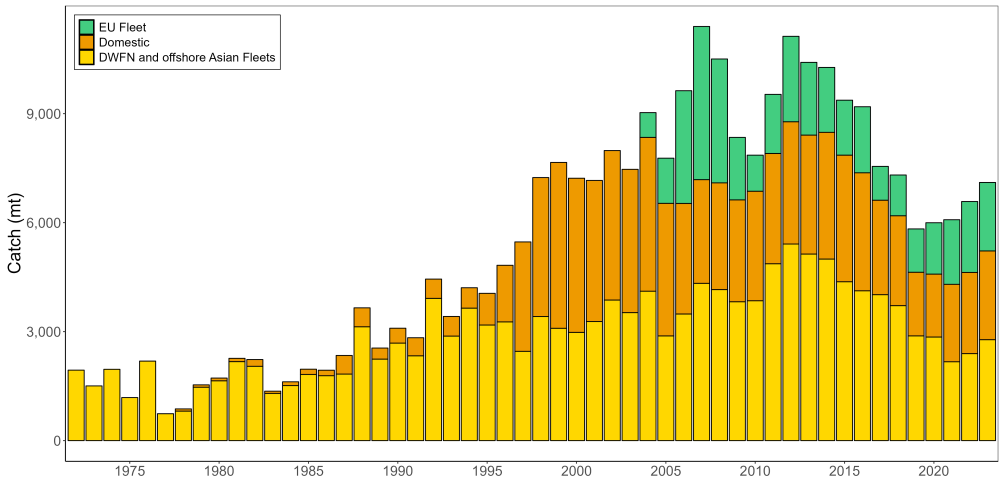

Figure 7.18: WCPFC–CA (south of equator) longline swordfish catch (mt) by fleet

The longline catch of swordfish is distributed over a large area of the South Pacific (Figure 7.19). There are four main areas of catches (i) the far eastern Pacific Ocean off Chile and Peru, where most of the EU-Spanish fleet catch comes from but also some of the distant-water and offshore Asian catches; (ii) the south central Pacific Ocean region south of the Cook Islands and French Polynesia, predominantly covered by the EU-Spanish fleet; (iii) the coastal waters of New Zealand, Australia and adjacent Pacific Island countries (domestic fleets); and (iv) the equatorial Pacific Ocean between 130–160°W, covered by the distant-water and offshore Asian fleets.

The swordfish caught throughout the South Pacific Ocean are generally in the range of 110–250 cm, with a mean around 180 cm (lower jaw-fork length). In previous years, there has been evidence of inter-annual variation in the size of swordfish taken by fleet and variation in the size of fish by fleet, for example, the EU-Spanish fleet generally catch larger swordfish than the distant-water and offshore Asian fleets, which could be related to area fished. There have been no size data collected for the EU-Spanish longline fleet for the past few years; although, data from 2023 have been received recently, they were not processed in time for inclusion into this paper.

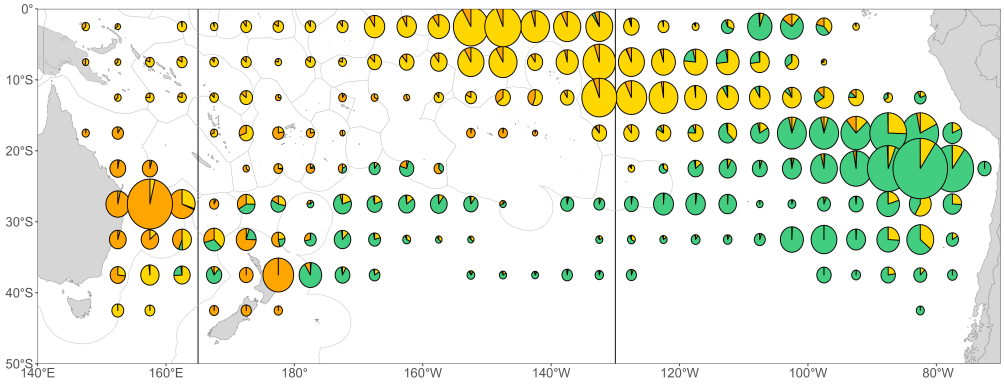

Figure 7.19: Distribution of South Pacific longline swordfish catch, 1995–2023 (DWFN and offshore Asian fleets - yellow; Spanish fleet - green; others - orange)

7.6 Other billfish

7.6.1 Blue Marlin

Blue marlin are mainly taken by the longline gear in the tropical WCPFC-CA with relatively small amounts also taken by purse seine, troll, handline and a range of other small-scale gears (e.g., gillnet). WCPFC-CA catches of blue marlin have ranged from around 8,000–25,000 mt since the 1970s although there remains some uncertainty around some of the estimates by fleet and gear. The provisional WCPFC-CA blue marlin catch (10,918 mt) for 2023 was similar to the 2022 level, but amongst the lowest catches since the 1980s (Figure 7.20). Figure 7.21 shows the distribution of longline-caught blue marlin highlighting that they are more prevalent in the western tropical waters of the WCPFC–CA (complete aggregate data stratified by area are not available for the other gears at this stage).

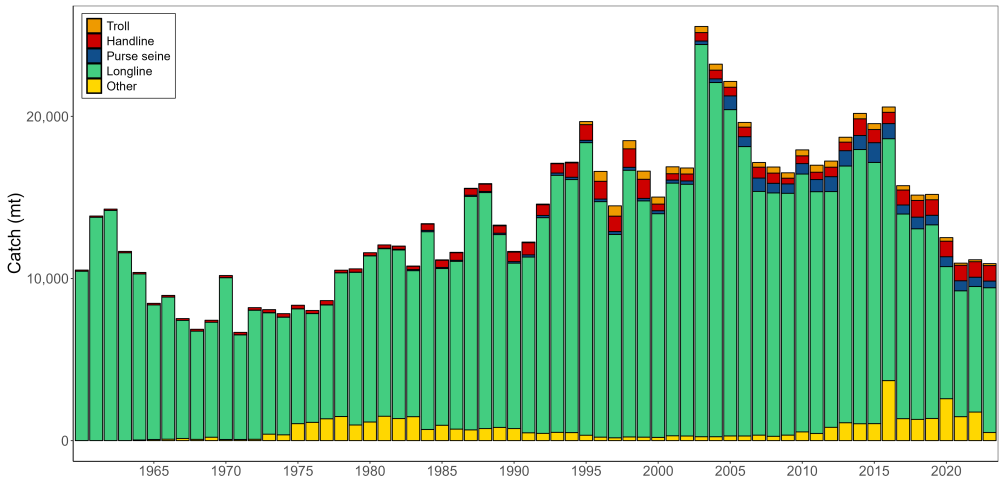

Figure 7.20: WCPFC–CA blue marlin catch (mt) by gear

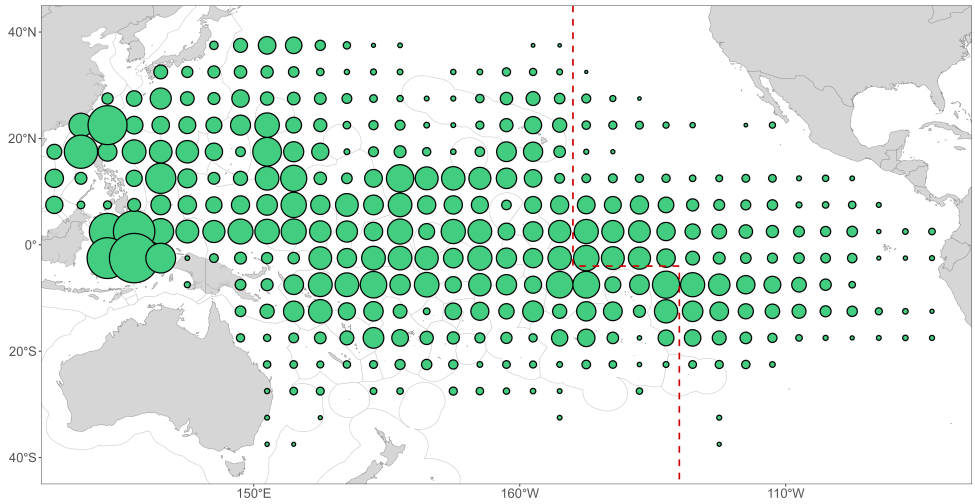

Figure 7.21: Distribution of longline blue marlin catch in the Pacific Ocean, 1990–2023.

7.6.2 Black Marlin

Black marlin are mainly taken by the longline gear in the tropical WCPFC-CA but also catches by purse seine, handline and a range of other small-scale gears (e.g., gillnet). WCPFC-CA catches of black marlin have ranged from around 1,300– 3,800 mt since the early 1970s (when catches were at their highest), although there remains some uncertainty around some of the estimates by fleet and gear. The recent increase in catches have come from several south-east Asian fisheries (including domestic purse seine) and further review is required, although these increases may reflect more reliable estimates from these fisheries. The provisional WCPFC-CA black marlin catch (1,673 mt) for 2023 was a reduction from the 2022 catch (Figure 7.22); however, this reduction is understood to be in part due to the level of species reporting (e.g., catches reported as billfishes (BIL), as opposed to finer resolution at the species level), as opposed to a reduction in catches. Figure 7.23 shows

the distribution of longline-caught black marlin highlighting that their distribution does not extend to the eastern areas as much as blue marlin and they are clearly more prevalent in the western tropical waters of the WCP–CA, and to a lesser extent in the waters of PNG, Solomon Islands, New Caledonia and north-east Australia. Complete aggregate data stratified by area are not available for the other gears at this stage, but black marlin catches by Indonesia and Philippines handline and Vietnam gillnet overlap the main areas of the longline catch for this species.

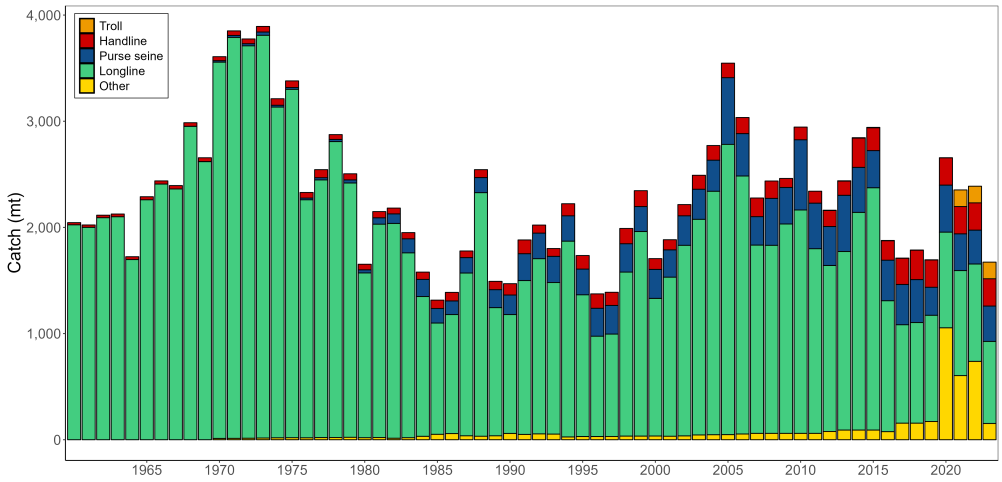

Figure 7.22: WCPFC–CA black marlin catch (mt) by gear

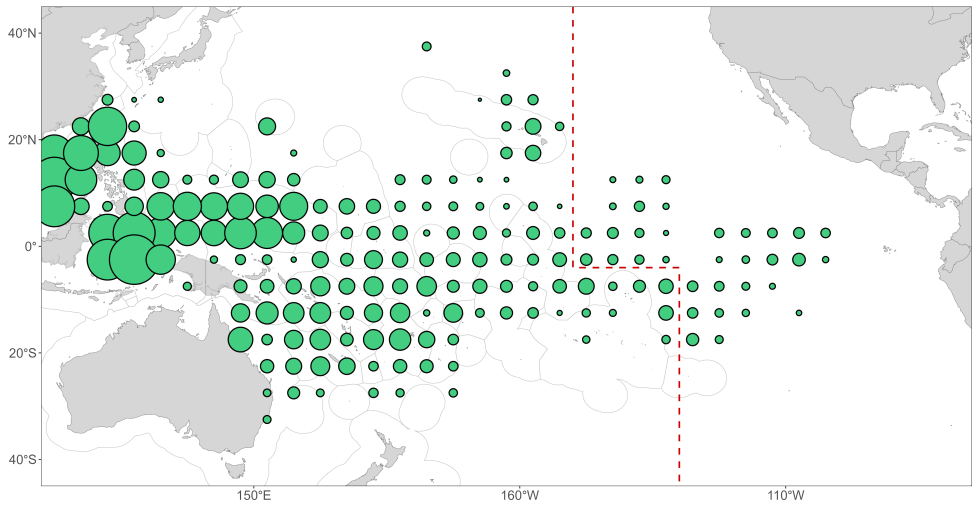

Figure 7.23: Distribution of longline black marlin catch in the Pacific Ocean, 1990–2023.

7.6.3 Striped Marlin

Striped marlin are mainly taken by the longline gear in the subtropical areas of the WCPFC-CA with minor catches by other gears, principally several gillnet fisheries. WCPFC-CA annual catches of striped marlin often exceeded 8,000 mt prior to 1990, with the gillnet fishery catch comprising

a significant proportion of this catch during the 1970s. Since 2000, catches have been generally below 6,000 mt., although there remains some uncertainty around the availability and quality of estimates for some fleets and gears. Species identification is also acknowledged to be an issue in some fisheries. The provisional WCPFC-CA striped marlin catch (3,353 mt) for 2023 is an increase from 2022; however, recent catches remain some of the lowest of the time series (Figure 7.24).

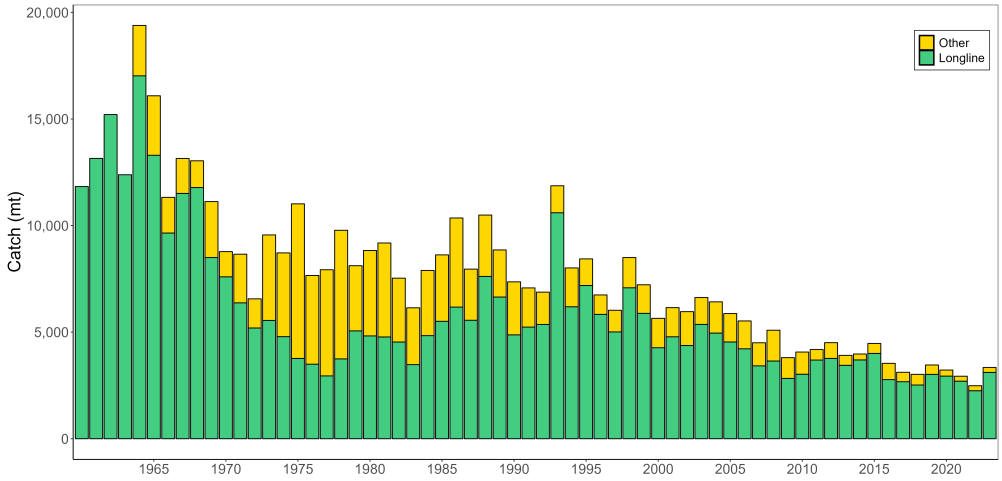

Figure 7.24: WCPFC–CA striped marlin catch (mt) by gear

Figure 7.25 shows the distribution of longline-caught striped marlin, with catches concentrated in the waters off the east coast of Japan, the Coral and Tasman Seas between eastern Australia, New Caledonia and New Zealand, and in the eastern areas, in and around Hawaii and French Polynesia. Complete aggregate data stratified by area are not available for the other gears at this stage.

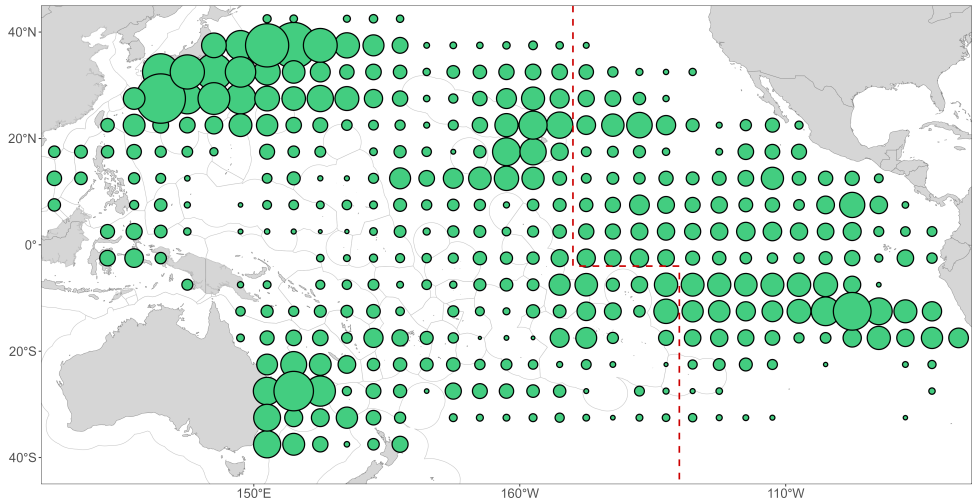

Figure 7.25: Distribution of longline striped marlin catch in the Pacific Ocean, 1990–2023.

7.6.4 North Pacific Swordfish

Swordfish are mainly taken by the longline gear in the north Pacific Ocean with minor catches by other gears, including gillnet fisheries. Annual catches of North Pacific swordfish have generally exceeded 10,000 mt since 1972 (Figure 7.26). In recent years, the catches have been amongst the highest recorded (after the record catch in 1993), although there remains some uncertainty around the availability and quality of estimates for some fleets and gears, and these estimates have yet to be reconciled with estimates from the ISC and the IATTC. The provisional North Pacific swordfish catch (9,621 mt) for 2023 suggests a continuation of the recent period of relatively low catches, compared to those from the decades prior (Figure 7.26). As with the catches of other species, the recent decline in the North Pacific swordfish catch from 2021 and through to 2023 may be related to the general decline in the longline catch in the areas where swordfish are usually taken due to the impacts of COVID-19.

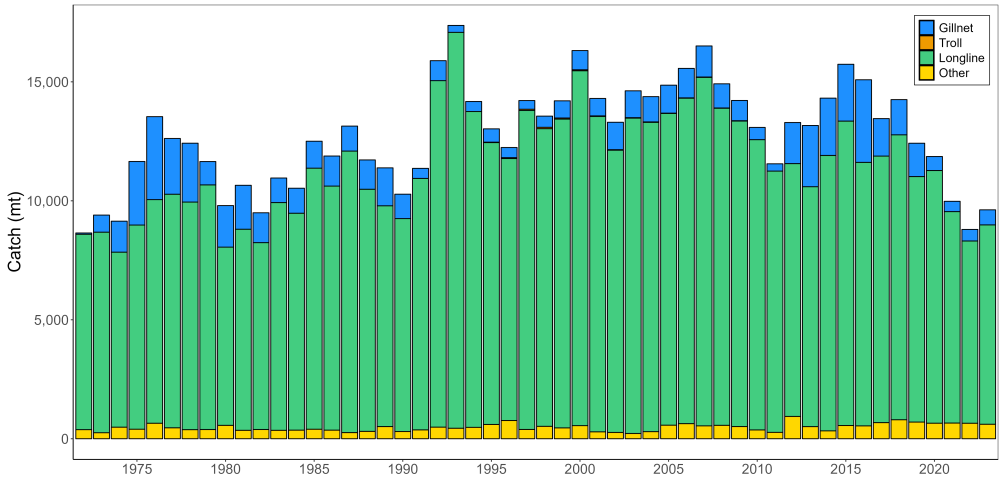

Figure 7.26: North Pacific swordfish catch (mt) by gear

Figure 7.27 shows the distribution of longline-caught swordfish in the Pacific Ocean, with catches concentrated across the Pacific Ocean, north of 20°N, including the waters off the east coast of Japan, and adjacent to the Hawaii EEZ. Swordfish catches in the north Pacific Ocean are also prevalent in Indonesia and in the waters bounded by China, Chinese Taipei, Philippines and Vietnam. Complete aggregate data stratified by area are not available for the other gears at this stage.

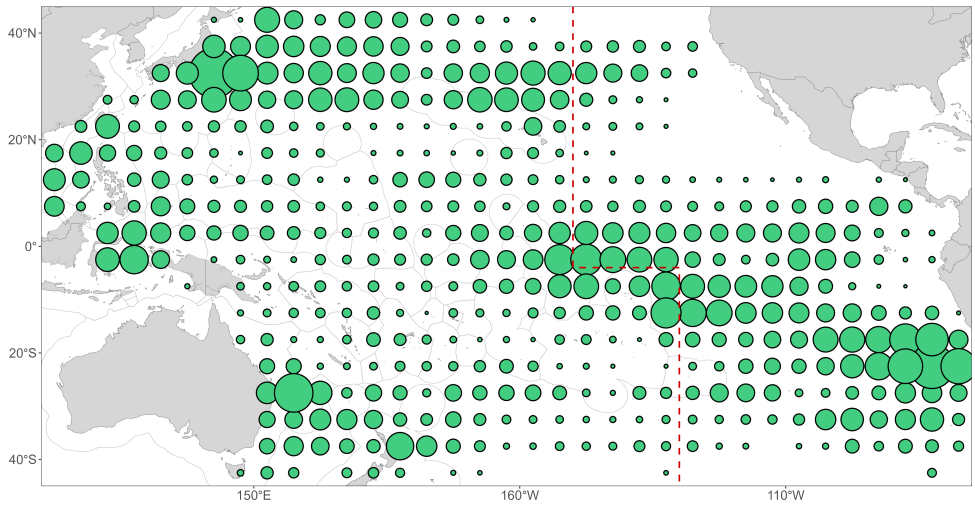

Figure 7.27: Distribution of longline swordfish catch in the Pacific Ocean, 1990–2023.

7.7 North Pacific albacore

Albacore tuna are mainly taken by the longline, pole-and-line and troll gears in the north Pacific Ocean, with minor catches by purse seine; albacore tuna was also the target of the driftnet fishery in the 1980s. Annual catches of North Pacific albacore have fluctuated since the 1950s, with peak periods in the 1970s and then again in the late 1990s into the early 2000s (Figure 7.28). In recent years, catches have been lower, due to declines in the pole-and-line and longline catches. There remains some uncertainty around the availability and quality of estimates for some fleets and gears, and these estimates have yet to be reconciled with estimates from the ISC and the IATTC. The North Pacific albacore catch for 2023 (provisional 34,044 mt) has continued to decline, and at this stage is the lowest since the beginning of the time series in 1950 (Figure 7.28).

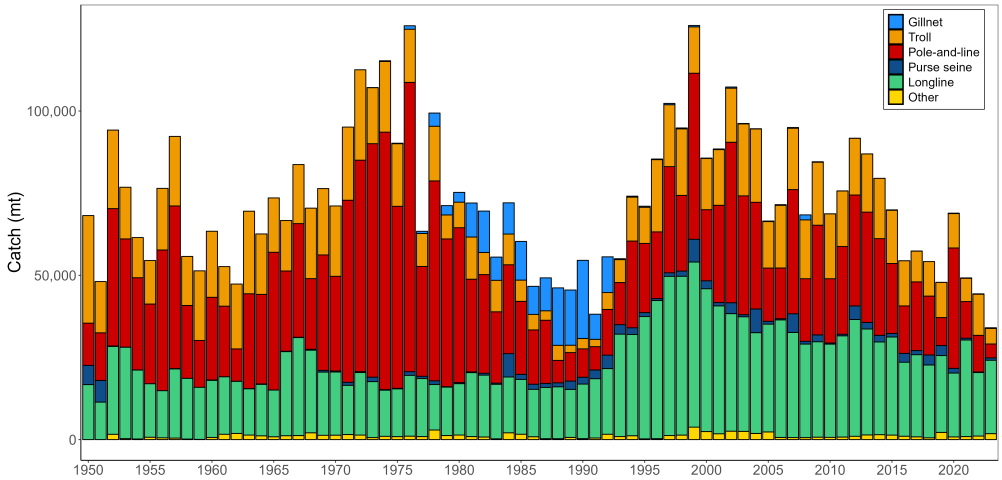

Figure 7.28: North Pacific albacore catch (mt) by gear

7.8 North Pacific bluefin

Bluefin tuna are mainly taken by purse seine gear in the North Pacific Ocean with minor catches from the longline, troll and by other small-scale gears in Japan waters; there have also been significant historic catches from the troll and pole-andline gears. Annual catches of North Pacific bluefin tuna have fluctuated since the 1970s, with peak periods in the early 1980s and for certain years in the mid-late 1990s and into the first decade of 2000s (Figure 7.29). Catches declined over the period 2012–2015 but have increased in recent years. There remains some uncertainty around the availability and quality of estimates for some fleets and gears, and these estimates have yet to be reconciled with estimates from the ISC and the IATTC. The provisional North Pacific bluefin tuna catch (11,169 mt) for 2023 was comparable to the catches over the past two years (Figure 7.29), but clearly lower than the long-term average catch.

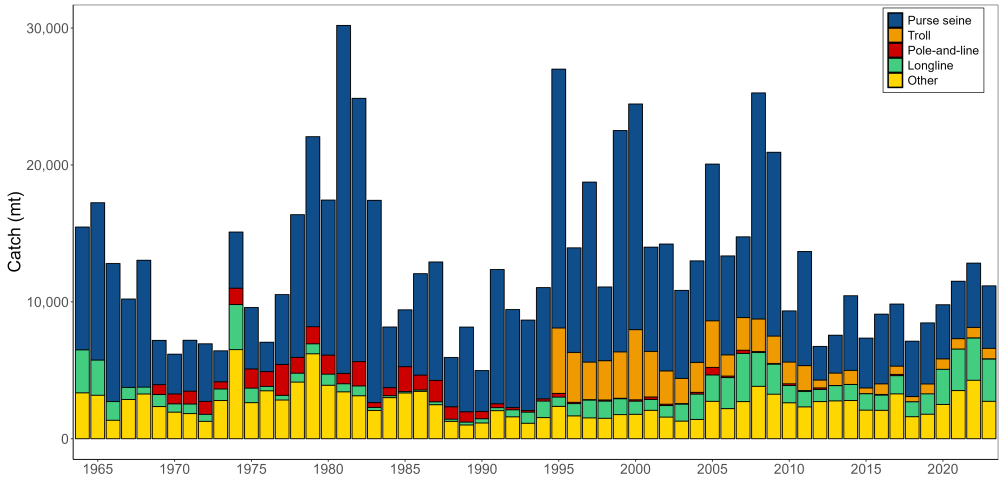

Figure 7.29: North Pacific bluefin catch (mt) by gear

8 References

Hare, S., Pilling, G., Scott, R., Vidal, T., and Williams, P. (2024). A compendium of fisheries indicators for target tuna stocks in the WCPFC Convention Area. *WCPFC-SC20-2024/SA-WP-07, Manila, Philippines, 14-21 August.*

McKechnie, S., Williams, P., Pilling, G., Vidal, T., and WCPFC Secretariat (2024). Trends in the South Pacific albacore longline and troll fisheries. *WCPFC-SC20-2024/SA-IP-07, Manila, Philippines, 14-21 August.*

Ministry of Marine Affairs and Fisheries, Indonesia (MOMAF) and SPC-OFP (2021a). Availability of catch estimates from the other commercial fisheries in Indonesia. *WCPFC-SC17-2021/ST-IP-09, Online, 11-19 August.*

Ministry of Marine Affairs and Fisheries, Indonesia (MOMAF) and SPC-OFP (2021b). Options for a baseline of the 'large-fish' Handline fishery fishing in Indonesia's EEZ (IEEZ) with vessels >30GT for the WCPFC Tropical Tuna Measure. *WCPFC18-2021-24, Online, 1-7 December.*

National Fisheries Research and Development Institute (NFRDI), Bureau of Fisheries and Aquatic Resources (BFAR), Department of Agriculture, Philippines and SPC-OFP (2021). Estimates of annual catches of tropical tuna by the Philippines relevant to WCPFC CMM on Tropical Tunas 'other commercial fisheries' . *WCPFC-SC17-2021/ST-IP-08, Online, 11-19 August.*

Skirtun, M. and Reid, C. (2018). Analyses and projections for economic condition in WCPO fisheries. *WCPFC-SC14-2018 ST- IP-06, Busan, Republic of Korea, August 8-16.*

SPC-OFP (2021). An assessment of available information to address the WCPFC17 recommendation on the Tropical Tuna CMM para 51 (other commercial fisheries). *WCPFC-SC17-2021/ST-WP-02, Online, 11-19 August.*

SPC-OFP (2024). Estimates of annual catches in the WCPFC Statistical Area. *WCPFC-SC20-2024/ST-IP-01, Manila, Philippines, 14-21 August.*

Vidal, T., Williams, P., and Hamer, P. (2024). Evaluation of activities in the purse seine fishery relative to the effort-based management framework. *WCPFC-SC20-2024/ST-WP-03, Manila, Philippines, 14-21 August.*

WCPFC Secretariat and SPC-OFP (2024). Catch and effort data summaries to support discussions on Tropical Tuna CMMs . *WCPFC-SC20-2024/MI-IP-05, Manila, Philippines, 14-21 August.*

Appendix - Additional information

All Fisheries

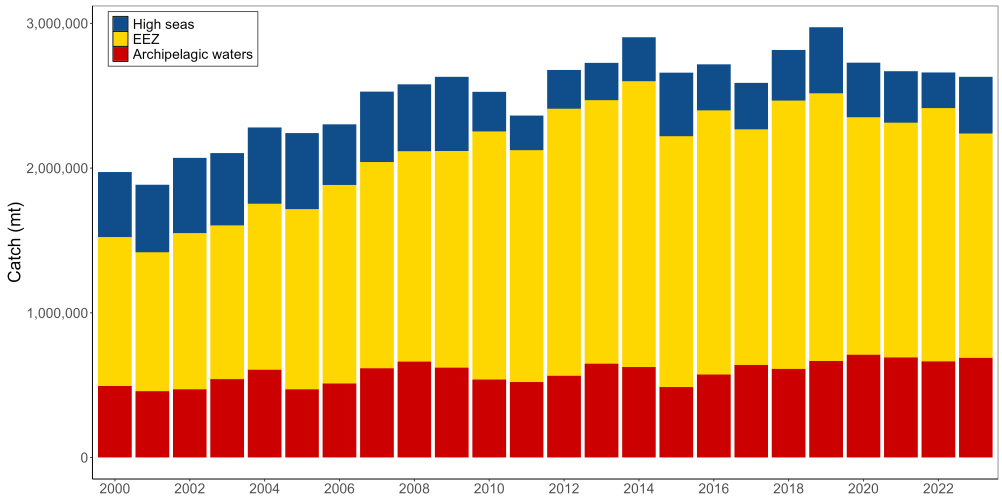

Figure A1: Catch estimates (mt) of the tropical tuna species (albacore, bigeye, skipjack and yellowfin) in the WCPFC–CA, by archipelagic waters (AWs), national waters (EEZs, excluded AWs) and the high seas for all gear types combined

Purse seine fisheries

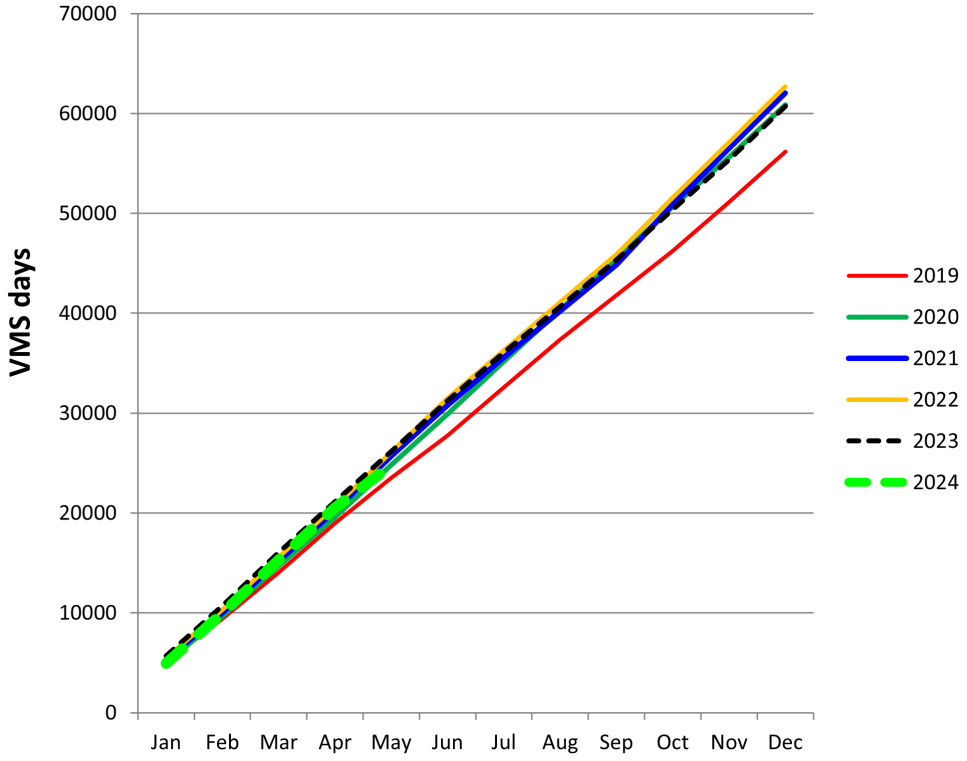

Figure A2: Cumulative tropical purse seine effort by month, 2009-2024, as measured by VMS (excludes days in port and an estimation of days in transit)

Longline fisheries

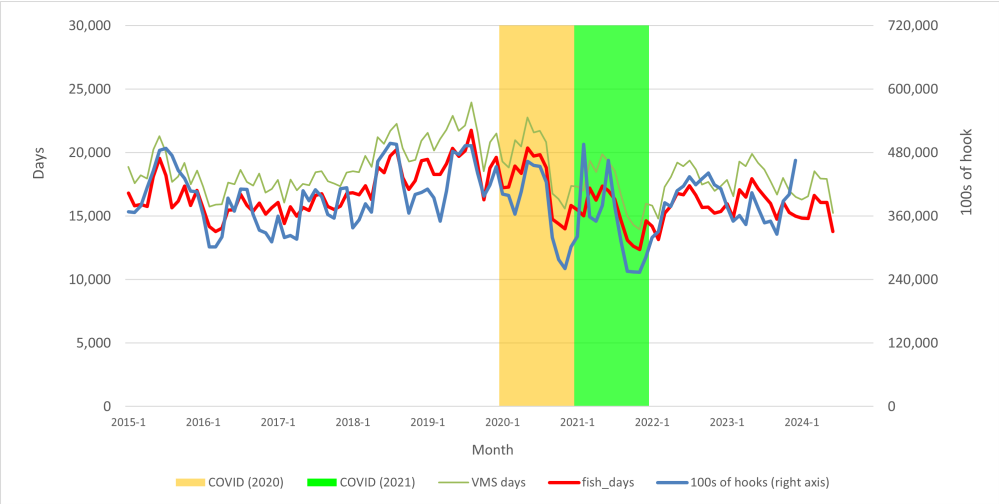

Figure A3: Monthly WCPFC longline fishery effort (VMS fishing days and 100s of hooks, 2015-2023 (WCPFC Area; longline fishery effort only considers VMS and logbook effort data for the main domestic, domestic-based foreign and distant-water fleets where VMS data with high coverage are available consistently over recent years)

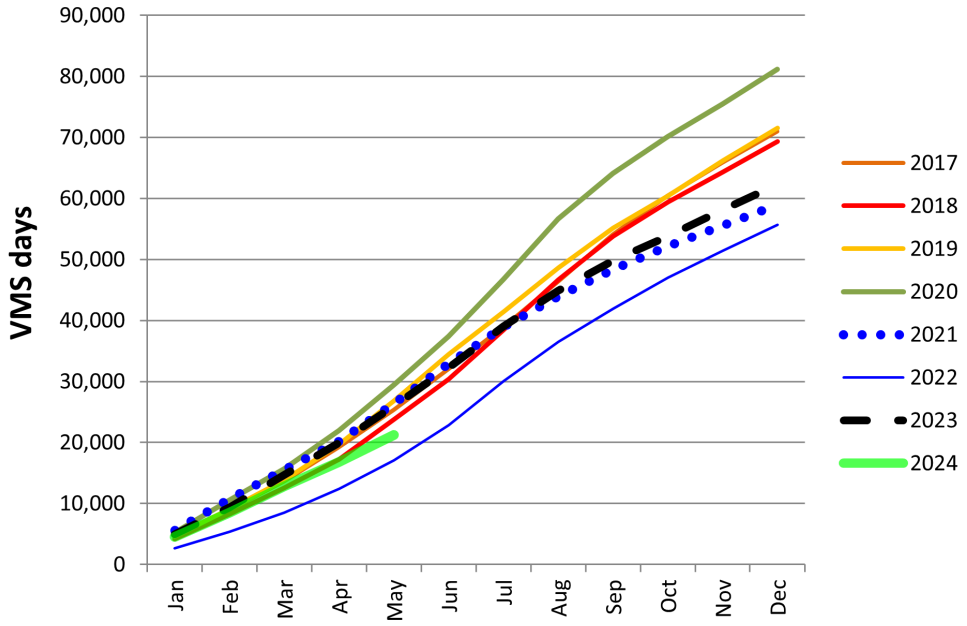

Figure A4: Cumulative South Pacific Albacore longline fishery effort by month, 2016-2024, as measured by VMS (WCPFC Area south of 10°S; VMS estimated fishing days; only includes VMS data for the main domestic, domestic-based foreign and distant-water fleets where VMS data have been provided with high coverage consistently over recent years)

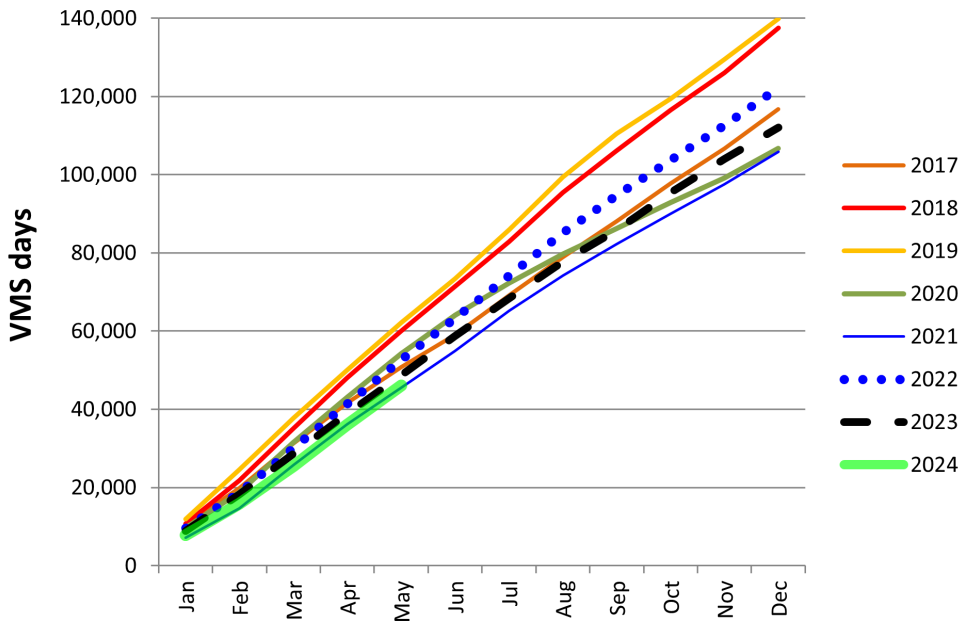

Figure A5: Cumulative Tropical longline fishery effort by month, 2016-2024, as measured by VMS (WCPFC Area 20°N–10°S, 130°E–150°W; VMS estimated fishing days; only includes VMS data for the main domestic, domestic-based foreign and distant-water fleets where VMS data have been provided with high coverage consistently over recent years)