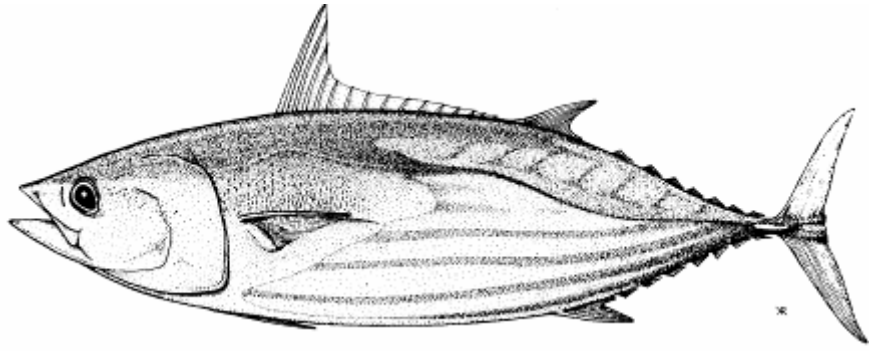
WCPFC–SC1 **GN WP–1**

1st Meeting of the Scientific Committee of the Western and Central Pacific Fisheries Commission
WCPFC–SC1
Noumea, New Caledonia
8–19 August 2005

OVERVIEW OF TUNA FISHERIES IN THE WESTERN AND CENTRAL PACIFIC OCEAN, INCLUDING ECONOMIC CONDITIONS – 2004



Peter Williams and Chris Reid

Oceanic Fisheries Programme (OFP)
Secretariat of the Pacific Community
Noumea, New Caledonia

Forum Fisheries Agency (FFA)
Honiara, Solomon Islands

August 2005

CONTENTS

1. INTRODUCTION 1

2. TOTAL TUNA CATCH FOR 2004 2

3 WCP–CA PURSE SEINE FISHERY 3

3.1 Historical Overview 3
3.2 Provisional catch estimates, fleet size and effort (2004) 4
3.3 Distribution of fishing effort and catch 6
3.4 Catch per unit of effort 10
3.5 Economic overview of the purse seine fishery 13
3.5.1 World market prices – Skipjack 13
3.5.2 World market prices – Yellowfin 14
3.5.3 Value of the purse seine catch 15

4 WCP–CA POLE-AND-LINE FISHERY 17

4.1 Historical Overview 17
4.2 The Year 2004 Fishery (provisional) 18
4.3 Economic overview of the pole-and-line fishery 19
4.3.1 Market conditions – Skipjack 19
4.3.2 Value of the pole-and-line catch 19

5 WCP–CA LONGLINE FISHERY 20

5.1 Overview 20
5.2 Provisional catch estimates and fleet sizes (2004) 21
5.3 Catch per unit effort 21
5.4 Geographic distribution 22
5.5 Economic overview of the longline fishery 24
5.5.1 Japanese market prices – Yellowfin 24
5.5.2 Japanese market prices – Bigeye 25
5.5.3 US market prices for longline-caught Albacore, Bigeye and Yellowfin tuna 26
5.5.4 Market prices – Frozen Albacore 27
5.5.5 Value of the longline catch 28

6 SOUTH-PACIFIC TROLL FISHERY 30

6.1 Overview 30
6.2 The Year 2004 Fishery (provisional) 30

7. SUMMARY OF CATCH BY SPECIES 31

7.1 SKIPJACK 31
7.2 YELLOWFIN 33
7.3 BIGEYE 35
7.4 ALBACORE 38

References 39

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 targetted by these fisheries are skipjack tuna (*Katsuwonus pelamis*), yellowfin tuna (*Thunnus albacares*), bigeye tuna (*T. obesus*) and albacore tuna (*T. alalunga*).

Prior to this meeting, catch estimates were compiled for the Western and Central Pacific Ocean (WCPO), which is separated from the eastern Pacific Ocean (EPO) by 150°W longitude (Figure 1). With the establishment of the Western and Central Pacific Fisheries Commission (WCPFC), catch estimates are now compiled for the WCPFC Convention Area[1] (**WCP–CA**), and can be found in Information Paper ST IP–1 *(Estimates of annual catches in the WCPFC Convention Area)*. The estimates for the calendar year 2004 represent the best available information at the time of writing this paper, but should be considered provisional at this stage.

This paper includes sections covering a summary of total catch in the WCP–CA tuna fisheries, an overview of the WCP–CA tuna fisheries by gear, including economic conditions in each fishery, and a summary of catches by species. In each section, the paper makes some observations on recent developments in each fishery, with emphasis on 2004 catches relative to those of recent years, where information is currently available.

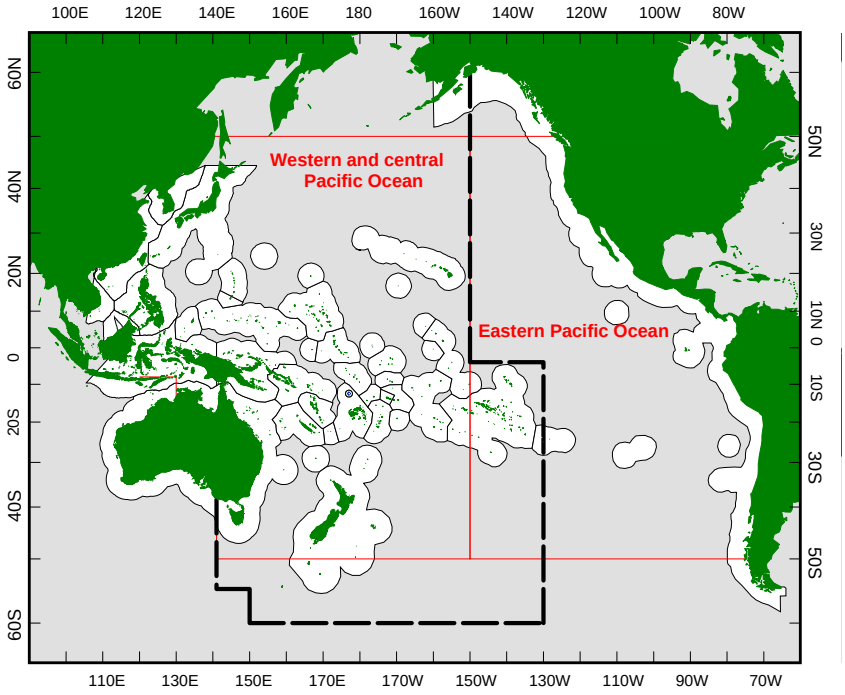


Figure 1. The western and central Pacific Ocean (WCPO), the eastern Pacific Ocean (EPO) and the WCPFC Convention Area (WCP–CA in dashed lines)

[1] *"The Convention Area is defined in the text of the Western Central Pacific Fisheries Commission (WCPFC) Convention as follows: From the south coast of Australia due south along the 141° meridian of east longitude to its intersection with the 55° parallel of south latitude; thence due east along the 55° parallel of south latitude to its intersection with the 150° meridian of east longitude; thence due south along the 150° meridian of east longitude to its intersection with the 60° parallel of south latitude; thence due east along the 60° parallel of south latitude to its intersection with the 130° meridian of west longitude; thence due north along the 130° meridian of west longitude to its intersection with the 4° parallel of south latitude; thence due west along the 4° parallel of south latitude to its intersection with the 150° meridian of west longitude; thence due north along the 150° meridian of west longitude.*

The western boundary of the Convention Area north of the north coast of Australia has not been defined in the text of the Convention. Therefore, for statistical purposes, the western boundary of the WCPO Area, which was established at the Twelfth Meeting of the Standing Committee on Tuna and Billfish in June 1999, will be used in this regard. The coordinates are as follows: from the north coast of Australia due north along the 129° meridian of east longitude to its intersection with the 8° parallel of south latitude, thence due west along the 8° parallel of south latitude to the Indonesian peninsula, and from the Indonesian peninsula due east along the 2°30' parallel of north latitude to the Malaysian peninsula."

2. TOTAL TUNA CATCH FOR 2004

Annual total catches of the four main tuna species (skipjack, yellowfin, bigeye and albacore) in the WCP–CA increased steadily during the 1980s as the purse seine fleet expanded, remained relatively stable during most of the 1990s, increased sharply in 1998 and has remained at this elevated level since (Figure 2 and Figure 3). The provisional total WCP–CA catch of tunas during 2004 was estimated at **2,021,773 mt**, the highest annual catch recorded (the previous record was in 1998 – 2,009,546 mt). During 2004, the purse seine fishery accounted for an estimated 1,263,161 mt (62% of the total catch–the highest catch ever for this fishery), with pole-and-line taking an estimated 297,515 mt (15%), the longline fishery an estimated 225,786 mt (11%), and the remainder (11%) taken by troll gear and a variety of artisanal gears, mostly in eastern Indonesia and the Philippines.

The WCP–CA tuna catch (2,021,773 mt) for 2004 represented 78% of the total Pacific Ocean catch of 2,582,774 mt, and 51% of the global tuna catch (the provisional estimate for 2004 is just under 4,000,000 mt).

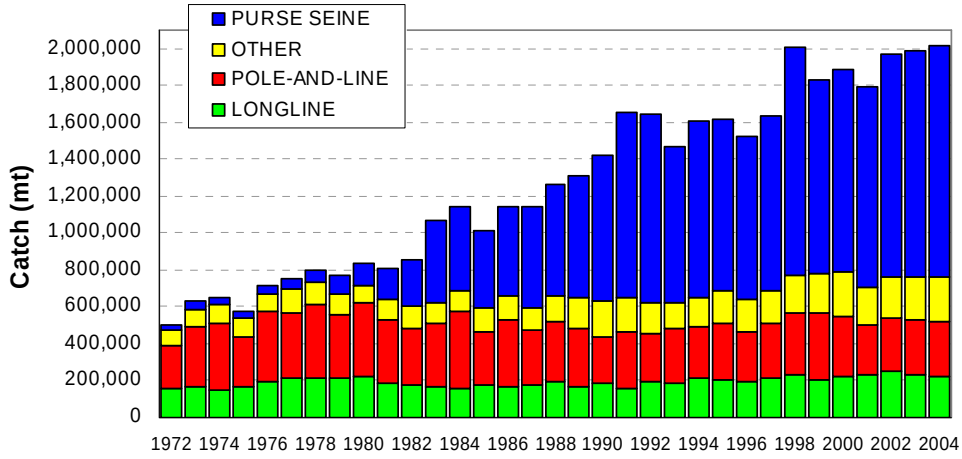


Figure 2. Catch (mt) of albacore, bigeye, skipjack and yellowfin in the WCP–CA, by longline, pole-and-line, purse seine and other gear types

The 2004 WCP–CA catch of skipjack (1,376,670 mt) and the proportion of skipjack in the total WCP–CA catch for 2004 (68%) were the highest ever. In contrast, the WCP–CA yellowfin catch for 2004 (413,201 mt; 20%) was relatively low compared to recent years. The WCP–CA bigeye catch for 2004 (125,940 mt; 6%) was the second highest on record, and the WCP–CA albacore[1] (105,962 mt; 5%) catch was the lowest for four years.

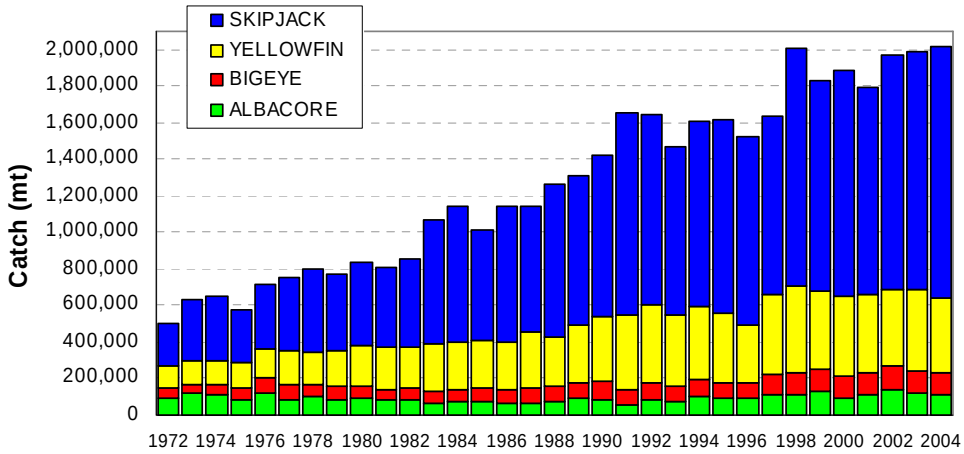


Figure 3. Catch (mt) of albacore, bigeye, skipjack and yellowfin in the WCP–CA.

[1] includes catches of North and South Pacific albacore west of 150^0 W, which comprised 72% of the total Pacific Ocean albacore catch of 147,088 mt in 2004; the section 7.4 “Summary of Catch by Species - Albacore” is concerned only with catches of South Pacific albacore, which make up approximately 50% of the WCP–CA albacore catch.

3 WCP–CA PURSE SEINE FISHERY

3.1 Historical Overview

The purse seine fishery has accounted for around 55–60% of the WCP–CA total catch by volume since the early 1990s, with annual catches in the range 790,000–1,260,000 mt. The majority of the WCP–CA purse seine catch is taken by the four main DWFN fleets – Japan, Korea, Chinese-Taipei and USA, which currently number around 120 vessels (Figure 4), although there has been an increasing contribution from the growing number of Pacific Islands fleets (60 vessels in 2004), with balance from the Philippines and a variety of other fleets, including several new distant-water entrants into the tropical fishery (e.g. China and New Zealand).

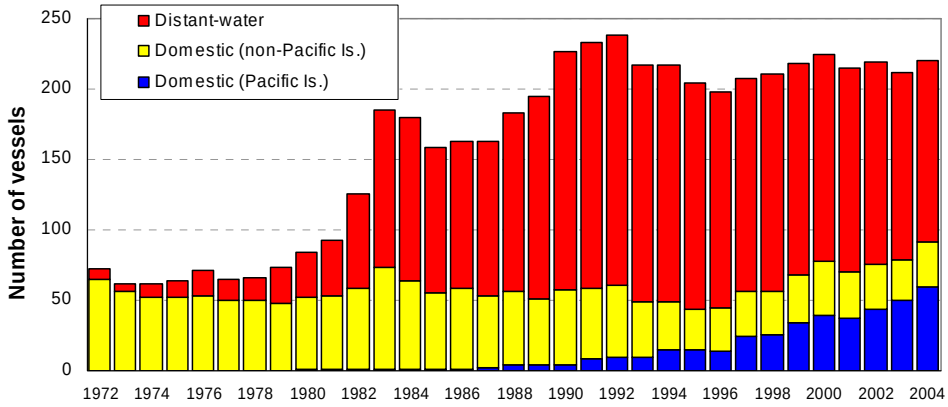


Figure 4. Number of purse seine vessels operating in the WCP–CA
(this does not include the Philippines domestic purse seine/ringnet vessels which number over 400)

The WCP–CA purse-seine fishery is essentially a skipjack fishery, unlike those of other ocean areas. Skipjack regularly account for 70–75% of the purse seine catch, with yellowfin accounting for 20–25% and bigeye accounting for only a small proportion (Figure 5). Features of the purse seine catch by species during the past decade include:

- Annual skipjack catches fluctuating between 600,000 and 700,000 mt prior to 1998. Catches increased in 1998 and were maintained above 800,000 mt in all subsequent years;
- Annual yellowfin catches fluctuating considerably between 120,000 and 270,000 mt The proportion of yellowfin in the catch is generally higher during El Niño years and lower during La Niña years (1995/96 and to a lesser extent 1999/2000);
- Increased bigeye tuna purse seine catches, first in 1997 (33,458 mt) and then again in 1999 (38,327 mt) due to increased use of drifting FADs since 1996. In recent years, there has been a gradual decline in both the use of drifting FADs and the catch of bigeye.

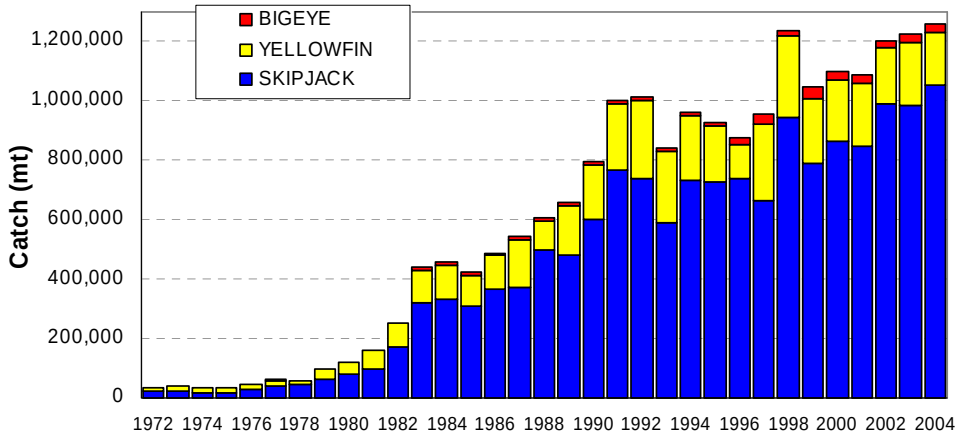


Figure 5. Purse seine catch (mt) of bigeye, skipjack and yellowfin in the WCP–CA

3.2 Provisional catch estimates, fleet size and effort (2004)

The provisional 2004 purse-seine catch of 1,263,161 mt was the highest on record and maintained the catch in excess of 1,200,000 mt for the past three years.

The purse seine skipjack catch for 2004 (1,059,061 mt – 84%) was the highest on record, although the yellowfin catch for 2004 (179,310 mt – 14%) was the lowest since 1996. The estimated purse seine bigeye catch for 2004 (24,790 mt – 2%) continues the declining trend in catches since the record 1999 catch (38,327 mt), primarily due to the gradual reduction in fishing effort on drifting FADs over recent years.

Figure 6 compares annual purse seine catches for the five main purse seine fleets operating in the tropical WCP–CA in recent years. The 2004 total catch for these fleets (approximately 800,000 mt) was slightly higher than in 2003, but more than 50,000 mt less than in 2002. Chinese-Taipei has been the highest producer in the tropical purse seine fishery since 1996. The 2004 provisional catch estimate (198,240 mt) for this fleet was similar to the level taken in 2003, but less than 50,000 mt compared to 2002, mainly due to several vessels changing flag at the end of 2002. Catches by the Japanese and Korean purse seine fleets have been stable for most of this time series.

The number of Pacific-island domestic vessels continued to grow in 2004 and is now at its highest level ever (Figure 4); this category is made up of vessels fishing under the FSM Arrangement and domestically-based purse seine vessels operating in PNG and Solomon Islands waters. The FSM Arrangement fleet comprises vessels managed by the Pacific Island "Home Parties" of PNG (17 vessels), the Marshall Islands (6 vessels), FSM (6 vessels), Kiribati (1 vessels) and the Solomon Islands (2 vessels) which fish over a broad area of the tropical WCP–CA. The increase in annual catch by the FSM Arrangement fleet since 2000 corresponds to the increase in vessel numbers, and coincidently, mirrors the decline in US purse seine catch and vessel numbers over this period (Figure 6).

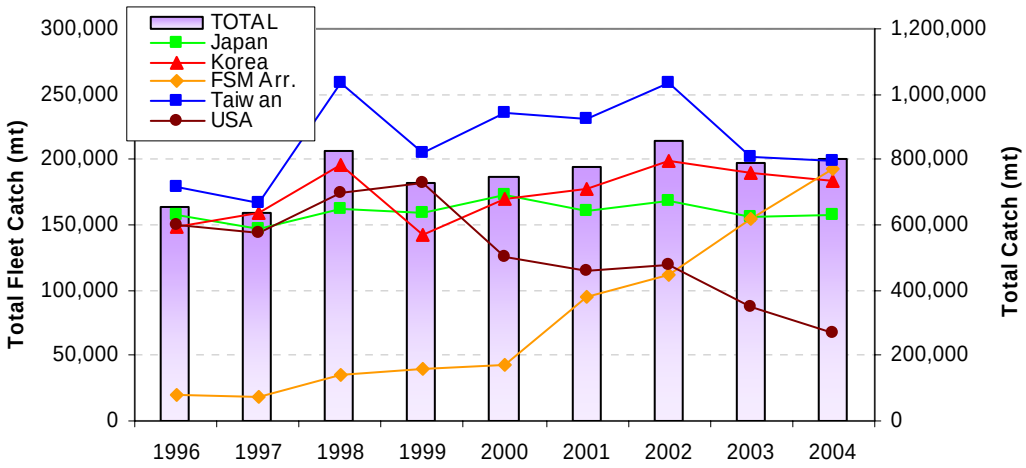


Figure 6. Trends in annual catches for the top five purse seine fleets operating in the tropical WCP–CA, 1996–2004.

The distant-water Philippine fleet, which operates almost exclusively in PNG waters, comprises 11 vessels and accounted for close to 35,000 t. during 2004. The domestic Philippine purse-seine and ring-net fleets operate in Philippine and northern Indonesian waters, and continued to take in excess of 100,000 t. during 2004 (Lawson & Williams, 2005). The recently-established New Zealand (4 vessels in the tropical fishery) and Chinese (6 vessels) purse seine fleets continued to expand their activities in the WCP–CA during 2004. The Spanish fleet was active in the eastern regions of the tropical WCP–CA during 2004, with a provisional catch estimate of around 5,517 mt provided.

Figure 7 shows the annual trends in the school types set on by each fleet. As in recent years, the Korean fleet continued to concentrate on unassociated, free-swimming schools during 2004 (~60% of all sets by this fleet). In contrast, log sets were the most predominant set type used by the Japanese, FSM Arrangement and Chinese-Taipei fleets during 2004, and drifting FAD sets for the US purse seine fleet. During 2004, the total number of

associated sets (log and FAD sets) in the WCP–CA purse seine fishery exceeded the number of unassociated sets for the first time since 1999. The increase in associated sets is typical of El Nino years, when natural floating objects (i.e. logs) are more prevalent and tuna schools associated to floating objects appear to be more available to the purse seine gear.

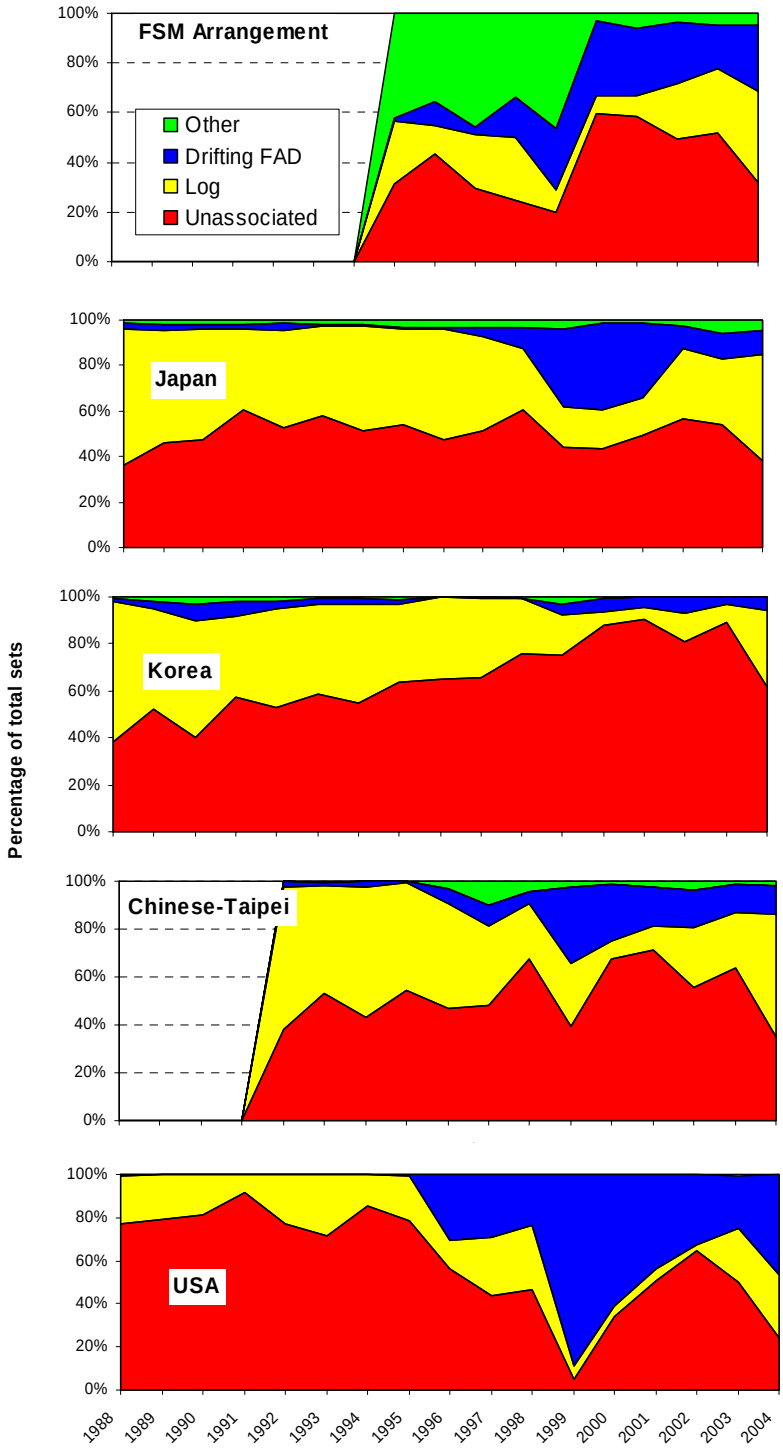


Figure 7. Time series showing the percentage of total sets by school type for the major purse-seine fleets operating in the WCP–CA.

3.3 Distribution of fishing effort and catch

Catch distribution in tropical areas of the WCP–CA is strongly influenced by El Nino–Southern Oscillation Index (ENSO) events. Figure 8 demonstrates the effect of ENSO events on the spatial distribution of the purse-seine activity, with fishing effort typically distributed further to the east during El Nino years and a contraction westwards during La Nina periods. The WCP–CA experienced an ENSO-transitional (or neutral) period during 2001, an El Nino period during 2002 and into the first quarter of 2003, then a return to an ENSO-transitional (netural) period for the remainder of 2003. The ENSO-neutral state continued into the first half of 2004 and then moved to a weak El Nino state in the second half of 2004. There was a significant westwards shift in purse seine effort during 2003 (compared to previous years) and fishing activity was again concentrated in the western areas (PNG, FSM and the Solomon Islands) during 2004. Fishing activity in the first quarter of 2005 remained concentrated in this area with no significant change from the ENSO-neutral state as yet observed.

The distribution of effort by set type Figure 8 (right) for the past seven years shows that the establishment of the El Nino event during 2002 resulted in a higher proportion of log-associated sets east of 160°E than in the previous three years when drifting FADs were used to better aggregate schools of tuna in the absence of logs, and/or where unassociated schools were not as available in this area. The reduction in the use of drifting FAD sets over recent years is probably related to the displacement of effort further west to an area where free-swimming and log-asssociated tuna schools were more available to purse seine fleets, and therefore less of a need to use drifting FADs. As mentioned in the previous section, there was a significant increase in the number of log sets made during 2004 suggesting that, for one reason or another, more logs had moved into the main fishing area and had successfully aggregated tuna schools.

Figure 9 through 13 show the distribution of purse seine effort for the five major purse seine fleets during 2003 and 2004. As noted, there was a clear shift in fishing activities to the broad area west of 160°E longitude by all fleets in 2003 compared with effort in the previous two years (Figure 8 – left). The distribution of effort by the Asian fleets in 2004 was more concentrated than in 2003, with the majority of fishing activities occurring in the area 05°N–05°S and 150°E–170°E. In 2004, the US fleet fished in an area further to the south and east, and with little overlap to the main area fished by the Asian fleets (Figure 13– left). The FSM Arrangement fleet tends to fish in a similar area to the Asian fleets, although there is also activity in the home waters of some vessels (Figure 9).

Figure 14 shows the distribution of catch by species for the past six years, and Figure 15 shows the distribution of skipjack and yellowfin catch by set type for the past six years. There are some instances where the composition of the skipjack catch by set type is clearly different to the composition of the yellowfin catch by set type; for example, during 2001, associated sets accounted for a far greater proportion of the total yellowfin catch in the area to the east of 160°E than they did for the total skipjack catch.

Higher proportions of yellowfin in the overall catch (by weight) usually occur during El Nino years as fleets have access to “pure” schools of large yellowfin that are more available in the eastern tropical areas of the WCP–CA. There was evidence of this in the most recent El Nino year (2002), despite it being considered an overall poor year for yellowfin catch (Langley et al., 2005). As noted in the previous section, there were poor yellowfin catches throughout the fishery during 2004, with most of the catch coming from unassociated sets. In contrast, log sets clearly accounted for most of the skipjack catch during 2004. Anchored FADs are used consistently in the PNG and Solomon Islands domestic purse seine fisheries, and take mainly juvenile skipjack and yellowfin.

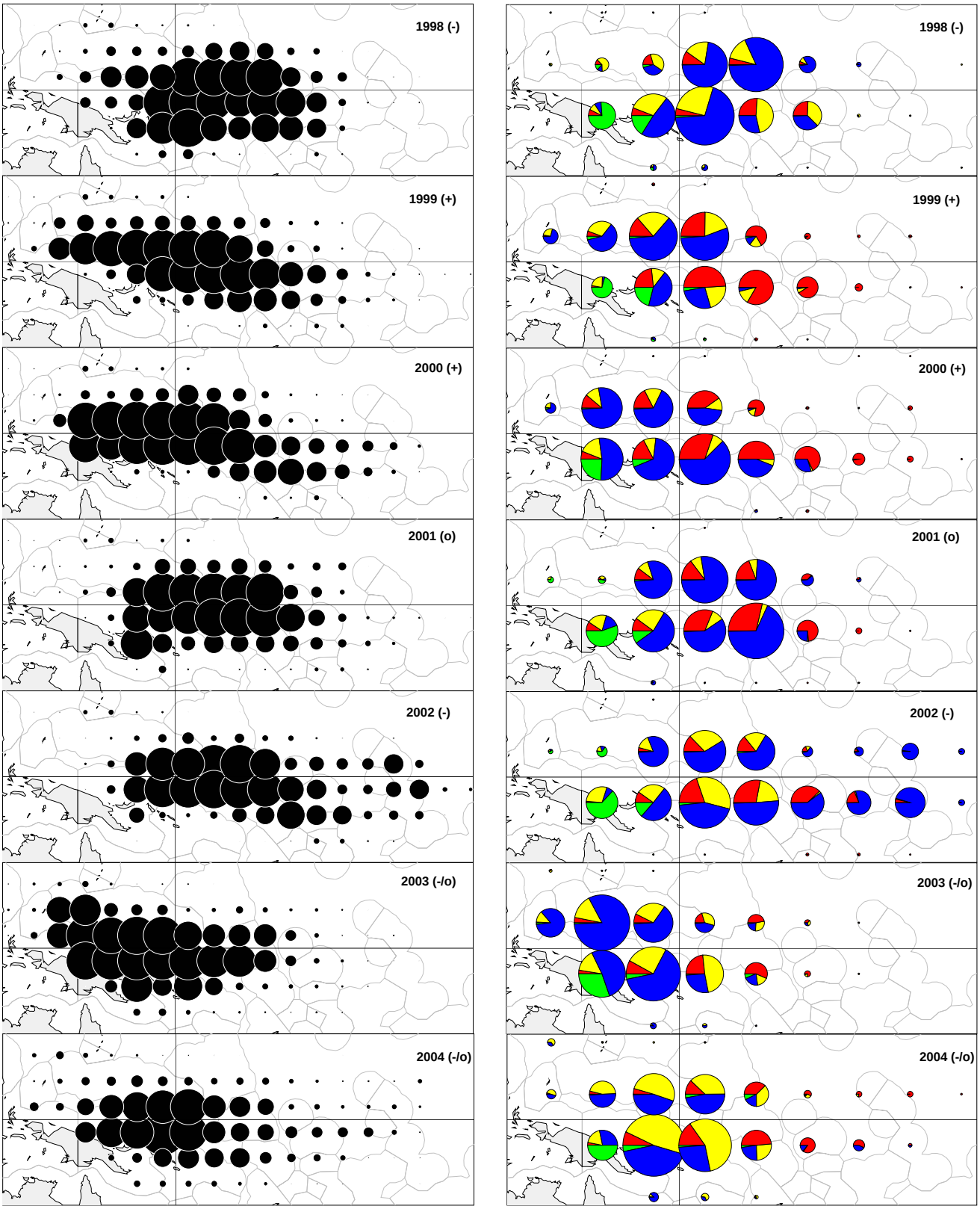


Figure 8. Distribution of purse-seine effort (days fishing – left; sets by set type – right), 1998–2004. (Blue–Unassociated; Yellow–Log; Red–Drifting FAD; Green–Anchored FAD).

ENSO periods are denoted by "+": La Niña; "-": El Niño; "--": strong El Niño; "o": transitional period.

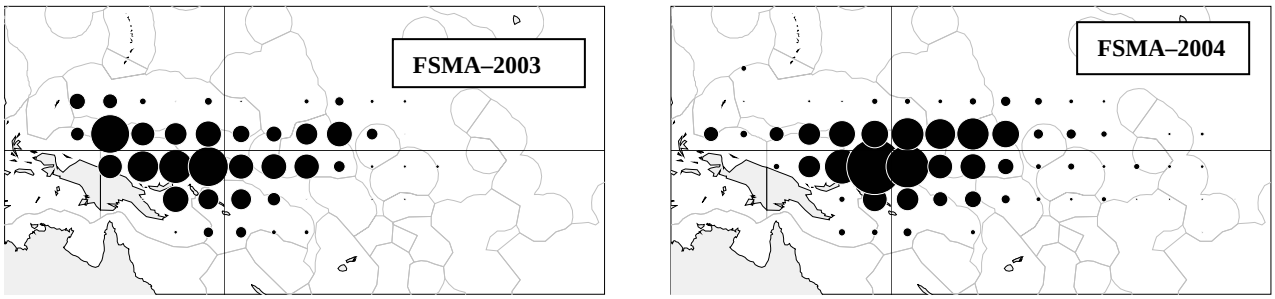


Figure 9. Distribution of effort by fleets operating under the FSM Arrangement during 2003 and 2004
lines for the equator (0° latitude) and 160°E longitude included.

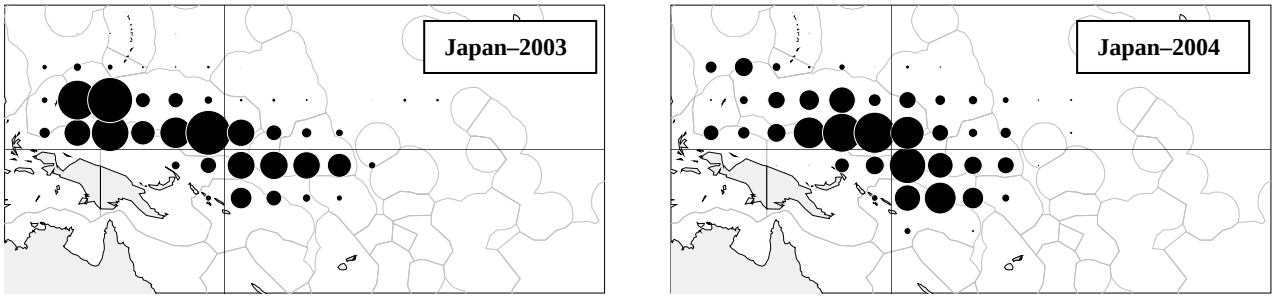


Figure 10. Distribution of effort by the Japanese purse seine fleet during 2003 and 2004
lines for the equator (0° latitude) and 160°E longitude included.

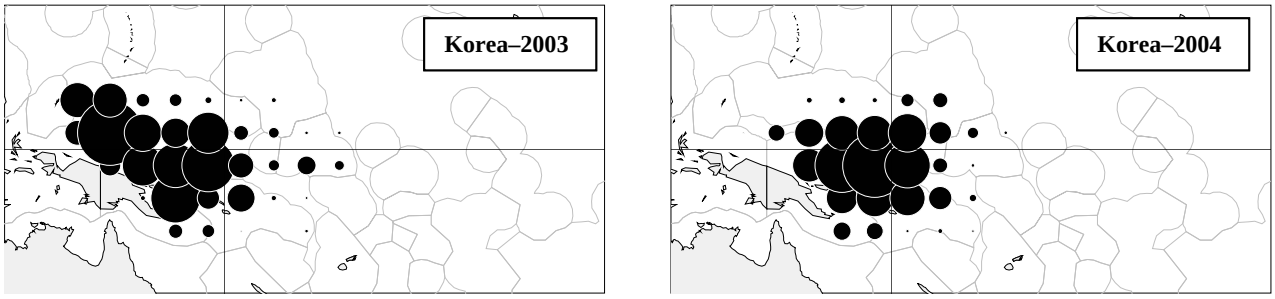


Figure 11. Distribution of effort by the Korean purse seine fleet during 2003 and 2004
lines for the equator (0° latitude) and 160°E longitude included.

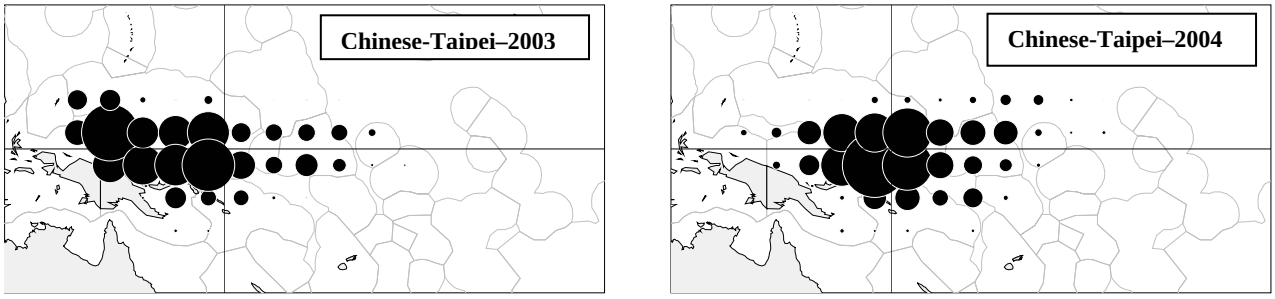


Figure 12. Distribution of effort by the Chinese-Taipei purse seine fleet during 2003 and 2004
lines for the equator (0° latitude) and 160°E longitude included.

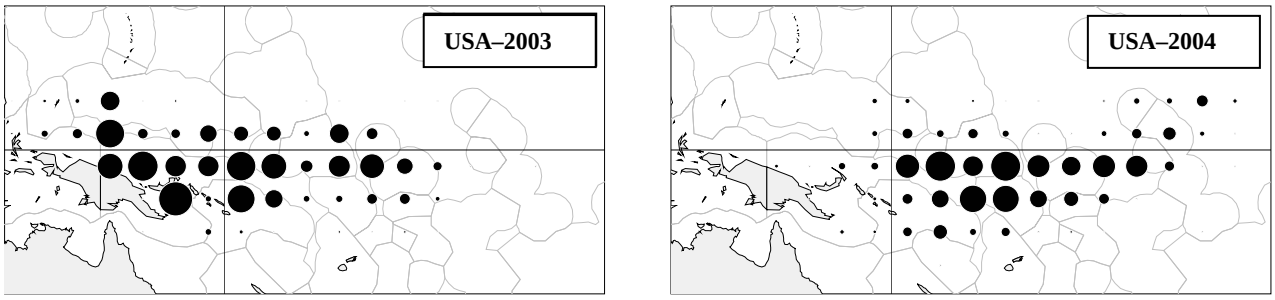


Figure 13. Distribution of effort by the US purse seine fleet during 2003 and 2004
lines for the equator (0° latitude) and 160°E longitude included.

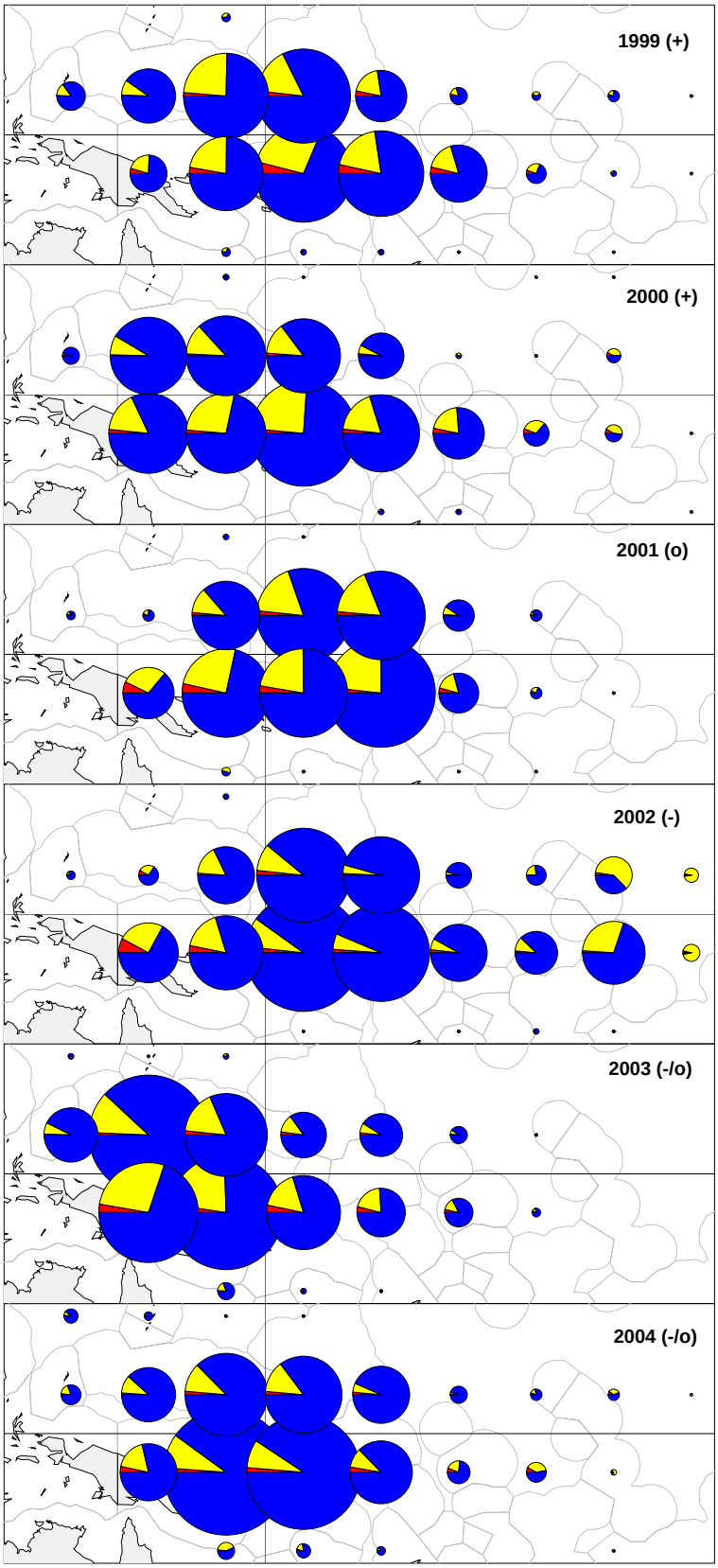


Figure 14. Distribution of purse-seine catch by species, 1999–2004 (Blue–Skipjack; Yellow–Yellowfin; Red–Bigeye).

ENSO periods are denoted by "+": La Niña; "-": El Niño; "--": strong El Niño; "0": transitional period.

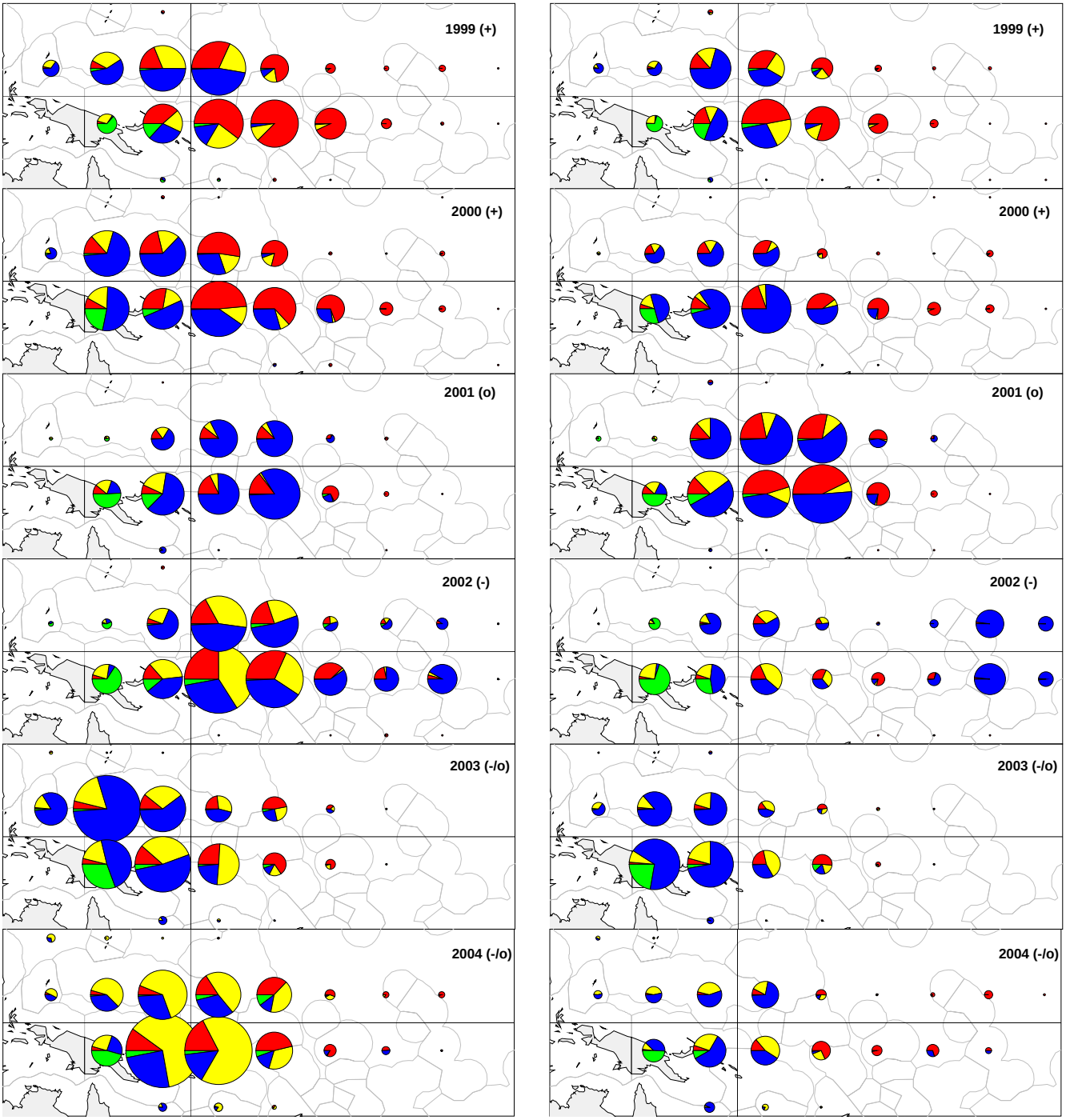


Figure 15. Distribution of skipjack (left) and yellowfin (right) catch by set type, 1999–2004 (Blue–Unassociated; Yellow–Log; Red–Drifting FAD; Green–Anchored FAD).

ENSO periods are denoted by "+": La Niña; "-": El Niño; "--": strong El Niño; "0": transitional period. Sizes of circles for all years are relative for that species only.

3.4 Catch per unit of effort

Figure 16 shows the annual time series of skipjack (left) and yellowfin CPUE (right) by vessel nation and set type, respectively. The 2004 skipjack CPUE for **unassociated** sets for all of the major fleets was clearly lower than in recent years (the lowest in five years for the Korean and Chinese-Taipei fleets). In contrast, the skipjack CPUE for **associated** sets for most fleets increased in 2004, and skipjack CPUE for all set types was therefore similar to the level in 2003. The exception was the US fleet, which experienced very low skipjack CPUE for drifting FAD sets, contributing to a drop in the overall skipjack CPUE for 2004.

As noted in previous sections, yellowfin catches in 2004 were generally poor and this is reflected in the CPUE graphs (Figure 16–left). Yellowfin CPUE for nearly all fleets and set types dropped in 2004, and were generally on par with the level of 2002, which was acknowledged to be a year of unusually low yellowfin catches. The exception was the yellowfin CPUE for US fleet on drifting FAD sets, which was the highest for five years. This fleet fished in a different area (further to the east and south) than the Asian fleets during 2004 (Figure 13) and, for one reason or another, this resulted in a different species composition (i.e. skipjack to yellowfin) in the catch taken primarily from drifting FAD sets than that experienced by the Asian fleets.

Associated (log and drifting FAD) sets generally produce higher catch rates (mt/day) for skipjack than unassociated sets (Figure 16), yet unassociated sets produce a higher catch rates for yellowfin than associated sets. This is mainly due to unassociated sets taking large, adult yellowfin, which account for a larger catch (by weight) than the mostly juvenile yellowfin encountered in associated sets.

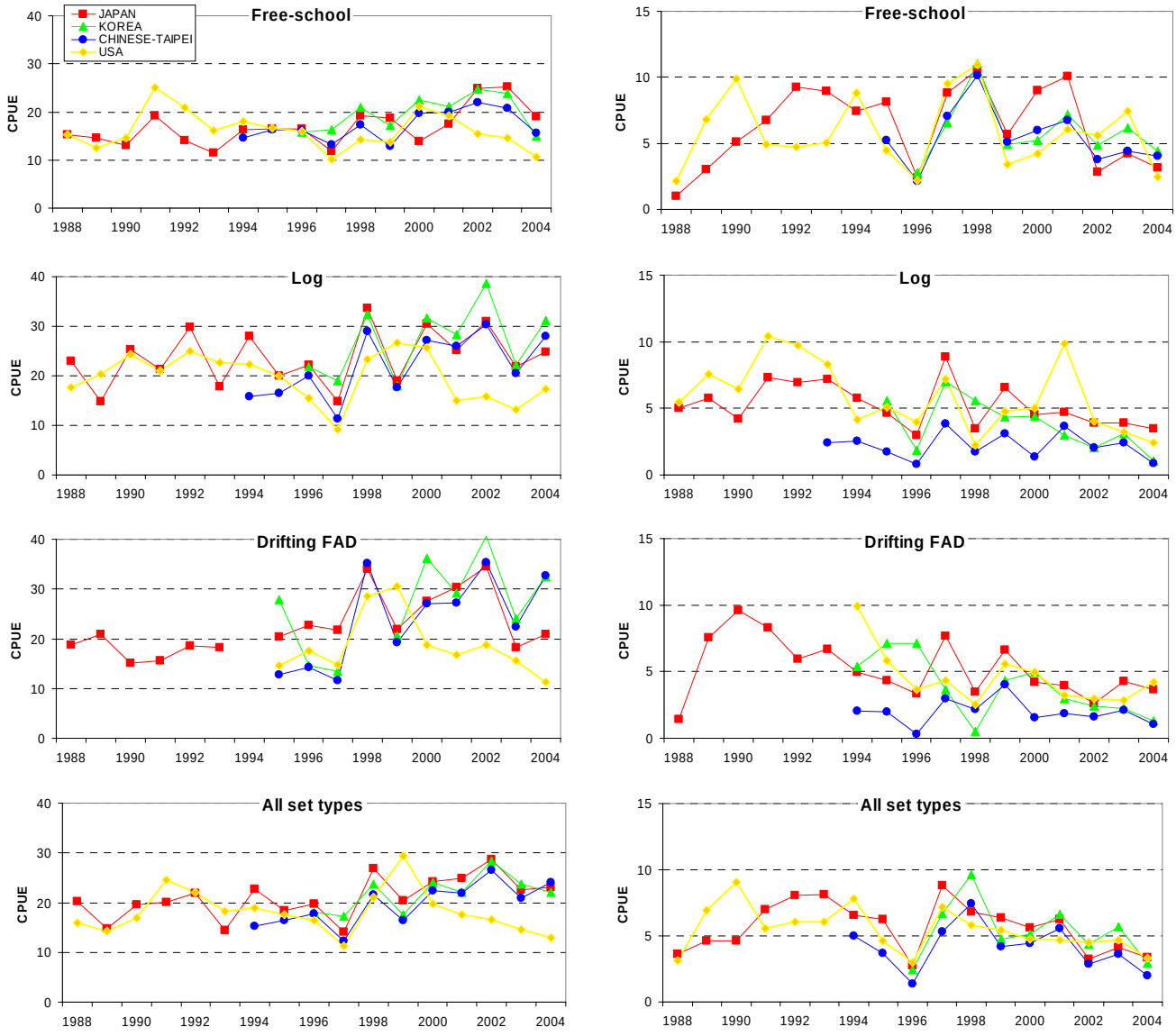


Figure 16. Skipjack tuna CPUE (mt per day – left) and yellowfin tuna CPUE (mt per day – right) by major set-type categories (free-school, log and drifting FAD sets) and all set types combined for Japanese, Korean, Chinese-Taipei and US purse seiners fishing in the WCP–CA. Effort and CPUE were partitioned by set type according to the proportions of total sets attributed to each set type.

The relatively poor skipjack catch (experienced by all fleets) in the middle half of 2004 is reflected in Figure 17, although, as in 2003, there was clear evidence of a recovery by the end of the year. The consistency in the

skipjack CPUE trends for the Korean and Chinese-Taipei fleets in recent years is understood to be mainly due to the similar area fished by these fleets. The trend for the Korean and Chinese-Taipei fleets is sometimes evident in the skipjack CPUE trend for the US fleet, although the skipjack CPUE for the US fleet is clearly lower for most of this time series, and is thought to reflect the availability of skipjack in the different areas fished by these fleets (see Figure 11–13 for the distribution of effort by these fleets during 2003 and 2004).

The trends in monthly yellowfin CPUE for the US fleet is more similar to that of the Korean and Chinese-Taipei fleets than for skipjack CPUE (Figure 18). There are several months where very high yellowfin CPUE were experienced by the Korean and US fleets, but not for the Chinese-Taipei fleet. In the past year, and as noted above, the yellowfin CPUE for the US fleet was higher than the two Asian fleets, further suggesting that the different area fished by the US fleet in the past year was better for yellowfin catches, but poorer for skipjack catches, than the area fished by the Asian fleets.

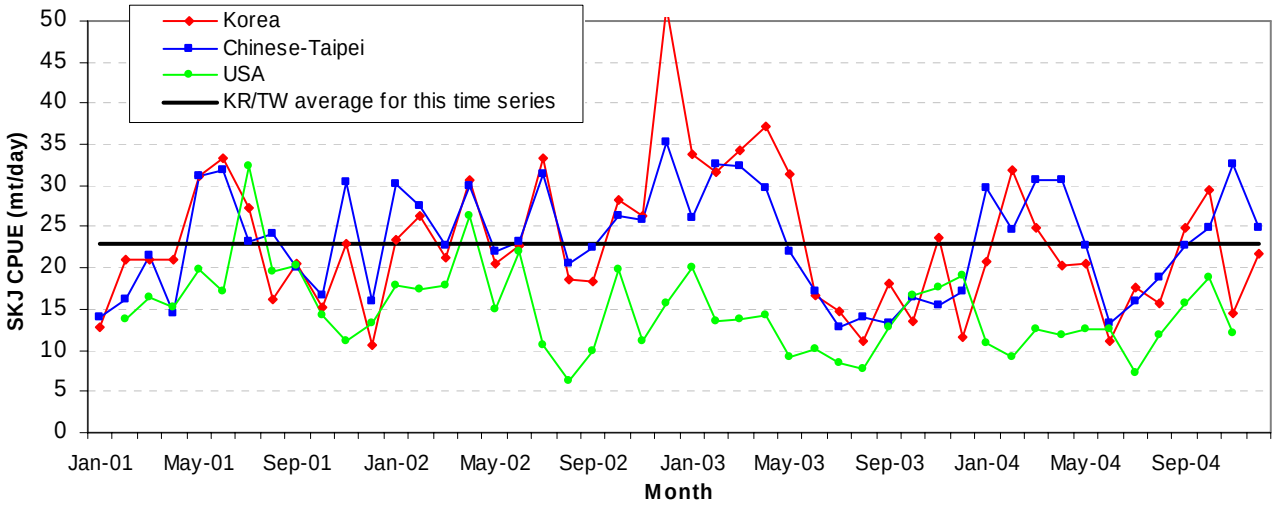


Figure 17. Monthly trends in nominal skipjack CPUE (mt per day) for Korean, Chinese-Taipei and US purse seine fleets fishing in the WCP–CA, 2001–2004.

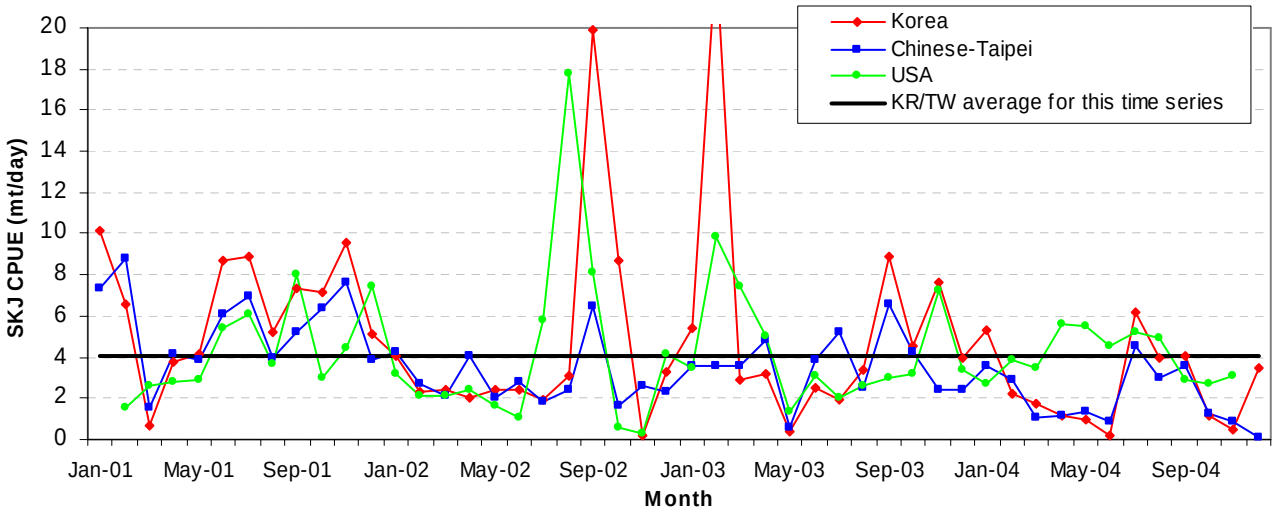


Figure 18. Monthly trends in nominal yellowfin CPUE (mt per day) for Korean, Chinese-Taipei and US purse seine fleets fishing in the WCP–CA, 2001–2004.

3.5 Economic overview of the purse seine fishery

This section provides an overview of price trends on various world tuna markets for purse seine caught tuna and estimates of the value of the purse seine catch in the WCPFC Area. A more detailed discussion of price trends on world markets for purse seine caught tuna and related products can be found in the FFA publication FFA Tuna Market News: Annual Review 2004 (http://www.ffa.int/node/515).

3.5.1 World market prices – Skipjack

Bangkok skipjack prices remained volatile in 2004. The Bangkok price (c&f) for 4-7.5lb skipjack started the year at US$820-850/Mt and fell through most of the 1st quarter, troughing at around US$650/Mt in mid-March. From this low the Bangkok price then embarked on a rapid upward movement through to late August when it peaked at around US$1170/Mt, 80 per cent higher than the mid-March level. According to FFA data at this level the price was the highest seen in six years. From mid-September through to end of 2004 the 4-7.5lb price fell rapidly finishing the year marginally above its mid-March lows at around US$680/Mt.

The price of purse seine caught skipjack at Yaizu port in Japan in 2004 followed a similar path to that seen in Bangkok, falling during the 1st quarter, and then recovering strongly to reach 6 year highs in both JPY and US$ terms in August before declining rapidly to finish the year marginally above its March lows. As for Bangkok, the Yaizu price varied over a wide range with average monthly prices ranging from a low of 70JPY/kg (US$647/Mt)[2] in March to a high of 135JPY/kg (US$1225/Mt) in August. The average price for skipjack at Yaizu over the whole of 2004 was 93JPY/kg (US$862/Mt) 14 per cent higher (22 per cent for USD prices) than the average price for 2003 of 82JPY/kg (US$708/Mt).

Reported prices in Spain were higher and less volatile then Bangkok ranging from a low of about US$800/Mt in March to a high of US$1200/Mt in the late August/early September. While the skipjack price in Spain also declined in the latter part of the year the decline was around half that seen in Bangkok and Yaizu with prices falling by around US$250/Mt between August and December compared with declines of the order of US$500/Mt in Bangkok and Yaizu.

While Bangkok skipjack prices were volatile in 2004 the running 12 month average price of skipjack (4-7.5bs, c&f) in Bangkok has been on a reasonably steady upward trend since mid-2003 when it stood at around US$660/Mt. In late 2004 the running 12 month average price of skipjack in Bangkok had risen to US$890/Mt and continued to rise through to mid-2005 reaching around US$910/Mt in May/June, its highest level since March 1999.

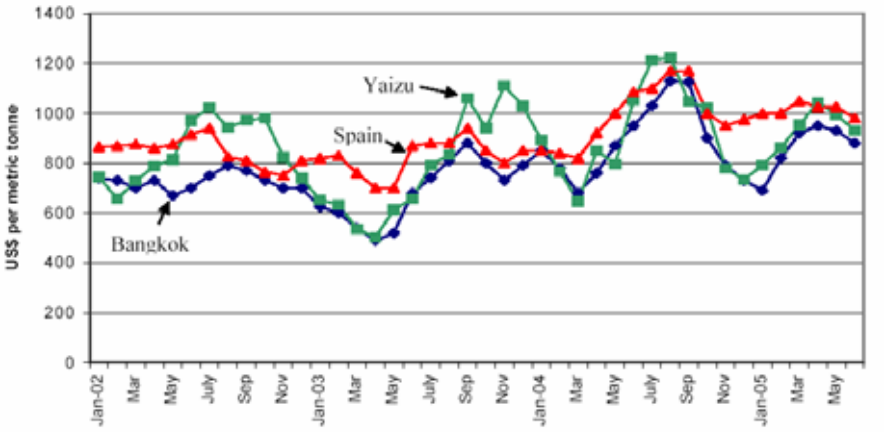


Figure 19. Monthly skipjack prices: Bangkok (4-7.5lbs, c&f), Spain (4-7.5lbs, c&f), and Yaizu (ex-vessel).
Note: The Bangkok and Spain prices shown in the above figure are indicative figures only. They reflect estimates of the mid-point of prices paid during the respective month based on information received from a range of sources.

[2] Yaizu prices presented in this report are obtained in JPY and converted to US$ based on inter-bank exchange rates as given by www.oanda.com/convert/fxhistory.

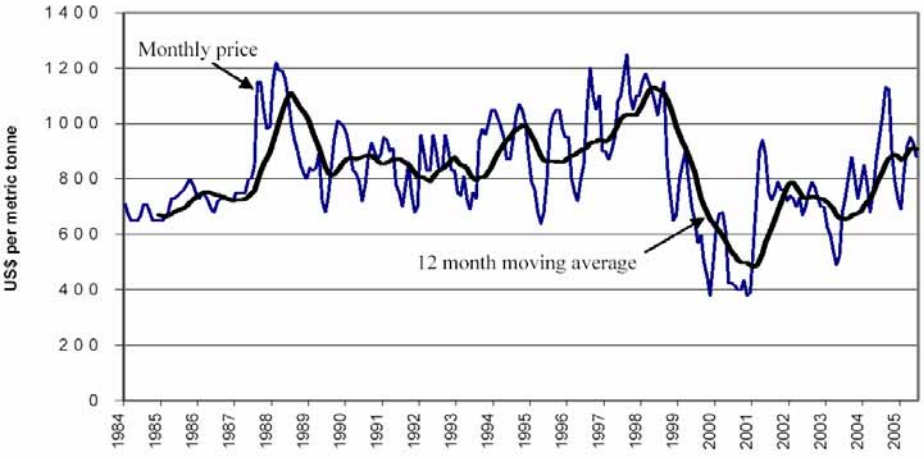


Figure 20. Bangkok monthly skipjack price (4-7.5lbs, c&f)

Note: The prices for shown in the above figure are indicative figures only. They reflect mid-point estimates of prices paid during the respective month as obtained from a range of sources.

3.5.2 World market prices – Yellowfin

Yellowfin for canning prices in Bangkok and Spain and purse seine caught yellowfin prices at Yaizu in 2004 all rose significantly in the first half of 2004. The Bangkok price (c&f) for 20lbs and up sized fish rose from US$970-1000Mt in early January to US$1450-1500/Mt in late June, the price in Spain for the same sized fish rose from around US$1000/Mt to US$1600-1700/Mt over the same period, while average prices at Yaizu rose from an average 121JPY/kg (US$1135/Mt) in January to 163JPY/kg (US$1488/Mt) in June. Through to early August the price in Bangkok and Spain remained steady while the Yaizu average monthly price continued to move higher peaking in August at 184JPY/kg (US$1671/Mt). According to FFA data the Bangkok price from late June to early August of US$1450-1500/Mt was the highest seen since March 1998. From August to November prices declined before remaining steady or increasing marginally in December but finished the year at significantly higher levels than at the start of the year. The Bangkok price for 20lbs and up sized fish at the end of December was US$1250/Mt, while the price for the same sized fish in Spain was US$1450-1500/Mt. For December the average price at Yaizu for purse seine caught yellowfin was 138JPY/kg (US$1325/Mt). Over 2004 the average Yaizu price was 142JPY/kg (US$1313/Mt) down 14 per cent (8 per cent in US$ terms) on 2003.

After declining throughout much of the 2nd half of 2003 and 1st of 2004 – the first time a prolonged decline has been seen since prices reached decade lows in May 2000 - the 12 month moving average price of Bangkok yellowfin (20lbs and up) trended up throughout the last 3 quarters of 2004 and the 1st half of 2005. The 12 month moving average price as at June 2005 stood at around US$1370/Mt the highest level seen since September 1998.

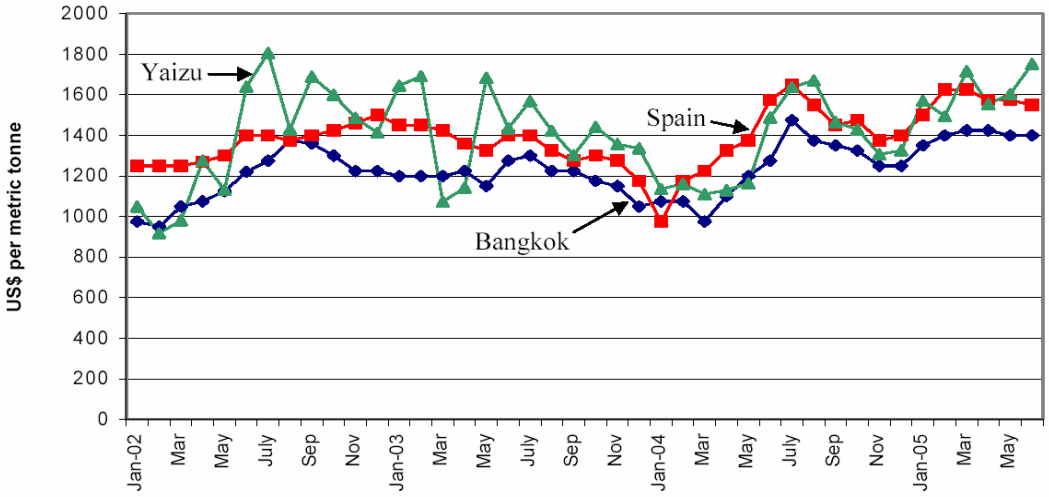


Figure 21. Monthly yellowfin prices: Bangkok (20lbs and up, c&f), Spain (20lbs and up, c&f), and Yaizu (ex-vessel)

Note: The Bangkok and Spain prices shown in the above figure are indicative figures only. They reflect estimates of prices paid during the respective month based on information received from a range of sources.

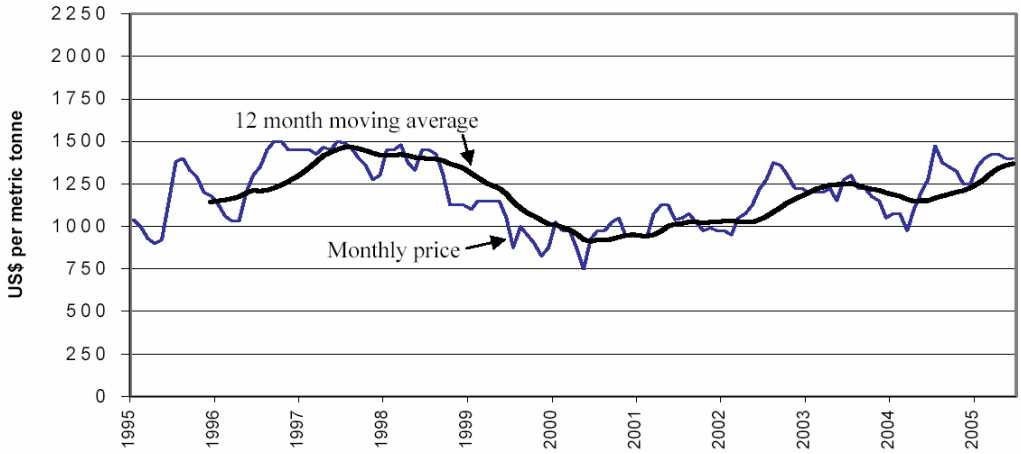


Figure 22. Bangkok monthly yellowfin price (20lbs and up, c&f)

Note: The prices for shown in the above figure are indicative figures only. They reflect mid-point estimates of prices paid during the respective month as obtained from a range of sources.

3.5.3 Value of the purse seine catch

As a means of examining the effect of the changes to prices and catch levels since 1996 a rough estimate of the delivered value of the purse seine fishery tuna catch in the WCPFC Area from 1996 to 2004 are obtained (Figure 23–25). 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.[3]

The estimated delivered value of the purse seine tuna catch in the WCPFC area for 2004 is US$1,158 million. This represents an increase of US$195 million or 20 per cent on the estimated delivered value of the catch in 2003. This increase was driven a US$245 million (35 per cent) increase in delivered value of the skipjack catch, which was estimated to be worth US$934 million in 2004, resulting from a 26 per cent increase in the composite delivered price and a 7 per cent increase in catch. This was partially offset by a US$46 million (19 per cent)

[3] The delivered value of each years catch was 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 yellowfin) 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 where 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.

decline in the value of the yellowfin catch, which was estimated to be worth US$198million in 2004., resulting from a 17 per cent decline in catch and a 2 per cent decline in the composite delivered price.

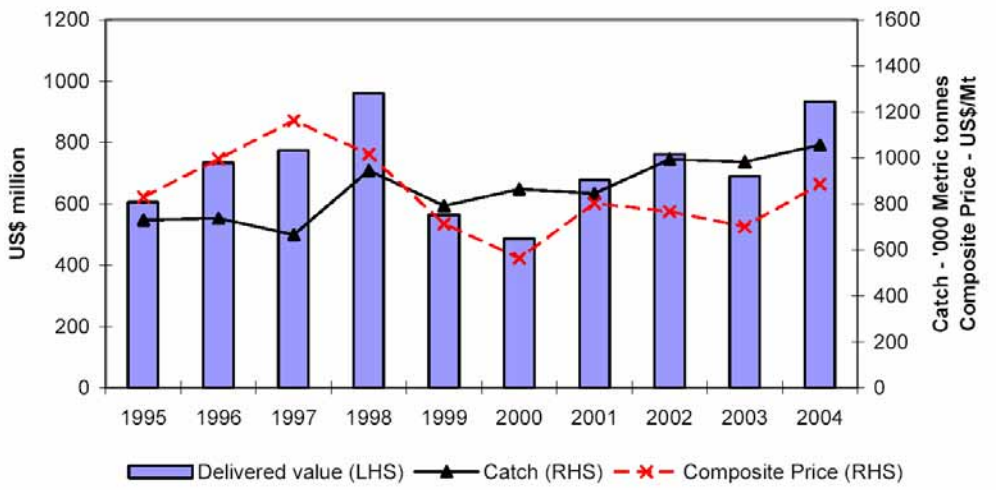


Figure 23. Skipjack in the WCPFC purse seine fishery – Catch, delivered value of catch and composite price

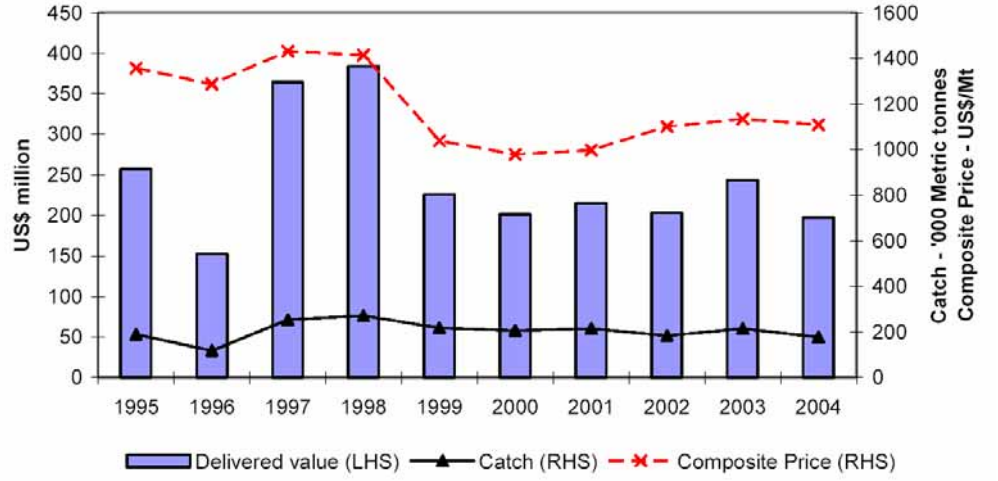


Figure 24. Yellowfin in the WCPFC purse seine fishery – Catch, delivered value of catch and composite price

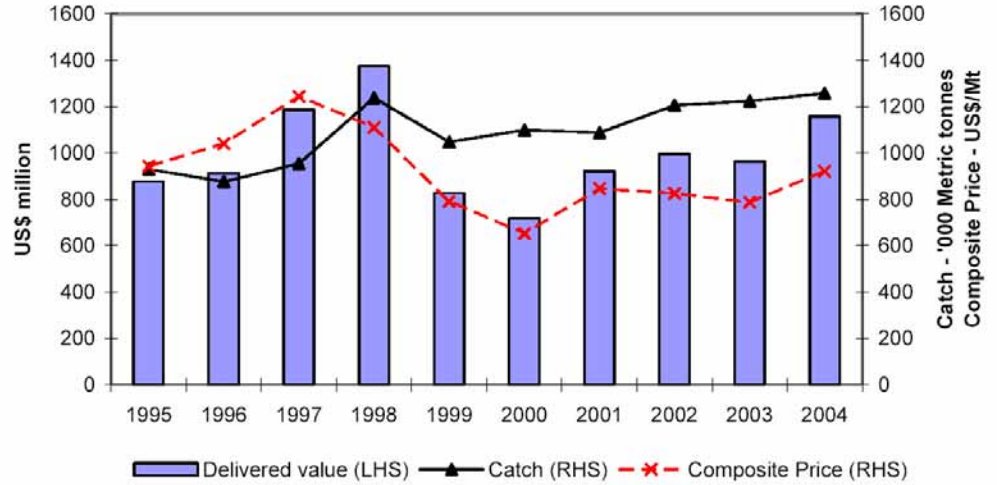


Figure 25. All tuna in the WCPFC purse seine fishery – Catch, delivered value of catch and composite price

4 WCP–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 home waters of Japan, Australia, Hawaii and Fiji
- a seasonal albacore/skipjack fishery east of Japan (largely an extension of the Japan home-water fishery).

Economic factors and technological advances in the purse seine fishery (primarily targeting the same species, skipjack) have seen a gradual decline in the number of vessels in the pole-and-line fishery (Figure 26; note that distinction between troll and pole-and-line gears in the Japanese coastal fleet was not possible for years prior to 1995) and stabilisation in the annual pole-and-line catch during the past 15–20 years (Figure 27). The gradual reduction in numbers of vessels has occurred in all pole-and-line fleets over the past decade. Pacific Island domestic fleets have declined in recent years – fisheries formerly operating in Palau, Papua New Guinea and Kiribati are no longer active, only one or two vessels are now operating (seasonally) in Fiji, and fishing activities are only now starting to improve after problems in the Solomons fishery in recent years. Several vessels continue to fish in Hawai'i, and the French Polynesian *bonitier* fleet remains active, but more vessels have turned to longline fishing. Against this trend, there has been a reported increase in Indonesian catches since 1999, apparently as a result of increased demand for catch and, possibly, technological advances.

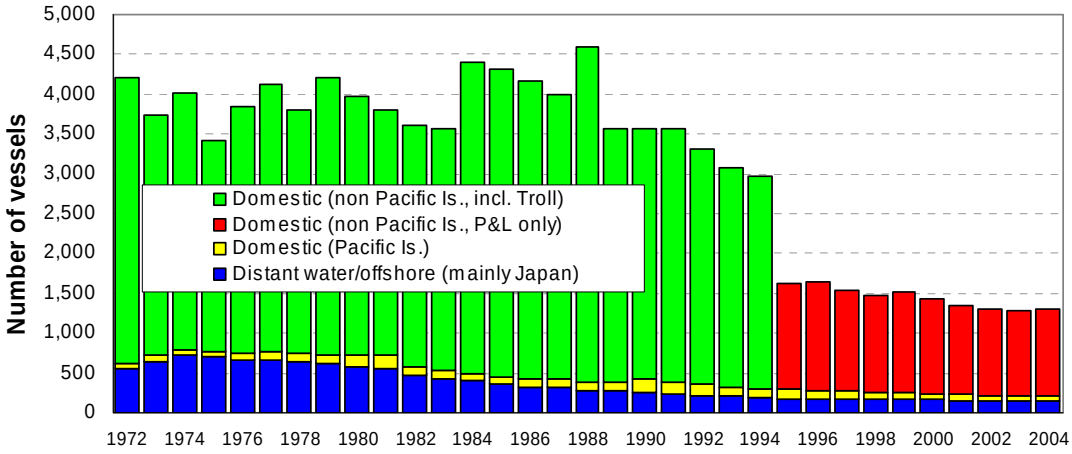


Figure 26. Pole-and-line vessels operating in the WCP–CA

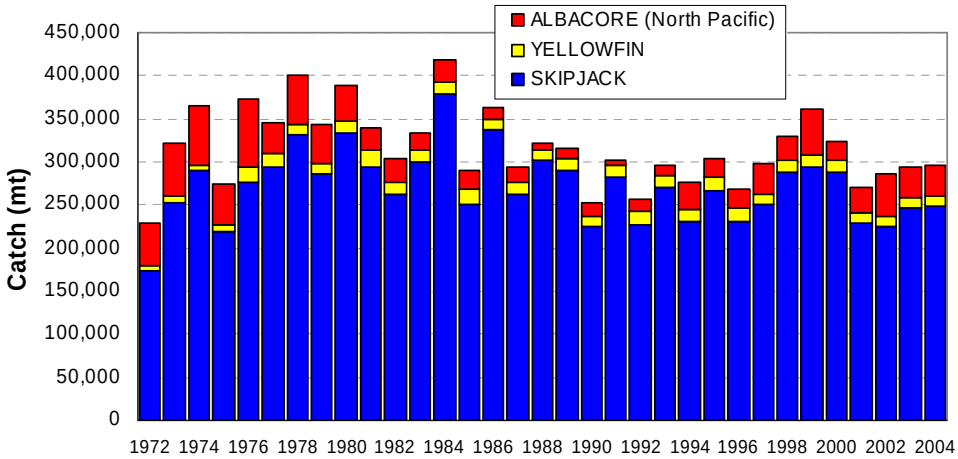


Figure 27. Pole-and-line catch in the WCP–CA

4.2 The Year 2004 Fishery (provisional)

The 2004 catch estimates for most pole-and-line fleets operating in the WCP–CA have yet to be provided, although the total catch estimate is expected to be similar to the level of recent years (i.e. 270,000–300,000 mt). Skipjack tends to account for the vast majority of the catch (84% in 2003), while albacore, taken by the Japanese coastal and offshore fleets in the temperate waters of the north Pacific (12% in 2003), yellowfin (4% in 2003) and a small component of bigeye (1% in 2003) make up the remainder of the catch. The Japanese distant-water and offshore (152,748 mt in 2003) and the Indonesian fleets (122,820 mt in 2003) typically account for most of the WCP–CA pole-and-line catch. The Solomon Islands fleet (10,797 mt in 2003) continues to recover from low catch levels experienced in recent years (only 2,778 mt in 2000), but is still far from the level (of over 20,000 mt annually) experienced during the 1990s.

Figure 28 shows the average distribution of pole-and-line effort for the period 1995–2002, which is likely to reflect effort patterns in recent years (2003 data are incomplete). Effort in tropical areas is usually year-round and includes the 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 in the 2nd and 3rd quarters). There was also some seasonal effort by pole-and-line vessels in Fiji 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 absent from this figure.

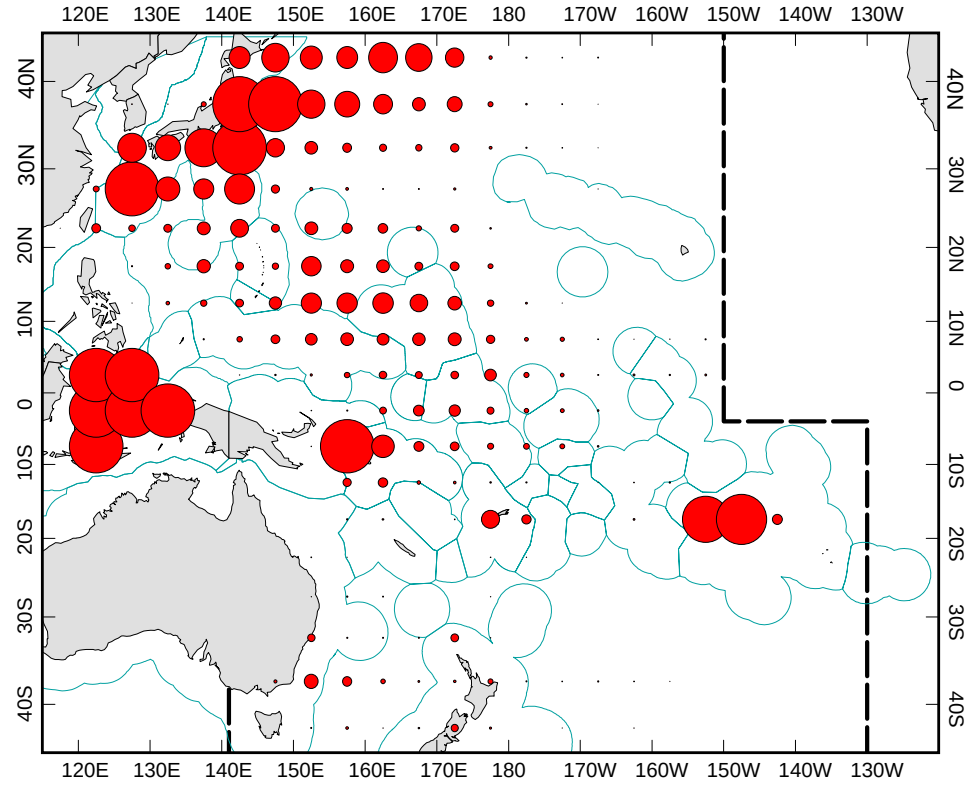


Figure 28. Average distribution of WCP–CA pole-and-line effort (1995–2002).

4.3 Economic overview of the pole-and-line fishery

4.3.1 Market conditions – Skipjack

During 2004 the Yaizu price of pole and line caught skipjack in waters off Japan averaged 191JPY/kg (US$1763/Mt) an increase of 6 (14) per cent on 2003. The Yaizu price of pole and line caught skipjack in waters south of Japan averaged 153JPY/kg (US$1419/Mt) during 2004 an increase of 10 (17) per cent on 2003.

4.3.2 Value of the pole-and-line catch

As a means of examining the effect of the changes to prices and catch levels over the period 1995-2003 a rough estimate of the annual delivered value of the tuna catch in the pole and line fishery in the WCPFC Area are provided in Figure 29–30. As catch estimates for the Japanese pole and line fleet for 2004 were not available at the time of writing of this report no catch value estimates have been derived for this year.

The estimated delivered value of the total catch in the WCPFC pole and line fishery for 2003 is US$324 million. This represents a decline of US$9 million or 3 per cent on the estimated value of the catch in 2002. The estimated delivered value of the skipjack catch in the WCPFC pole and line fishery for 2003 is US$243 million. This represents an increase of US$16 million or 7 per cent on the estimated value of the catch in 2002 and resulted from a 7 per cent increase in the composite delivered price with catch levels remaining steady.

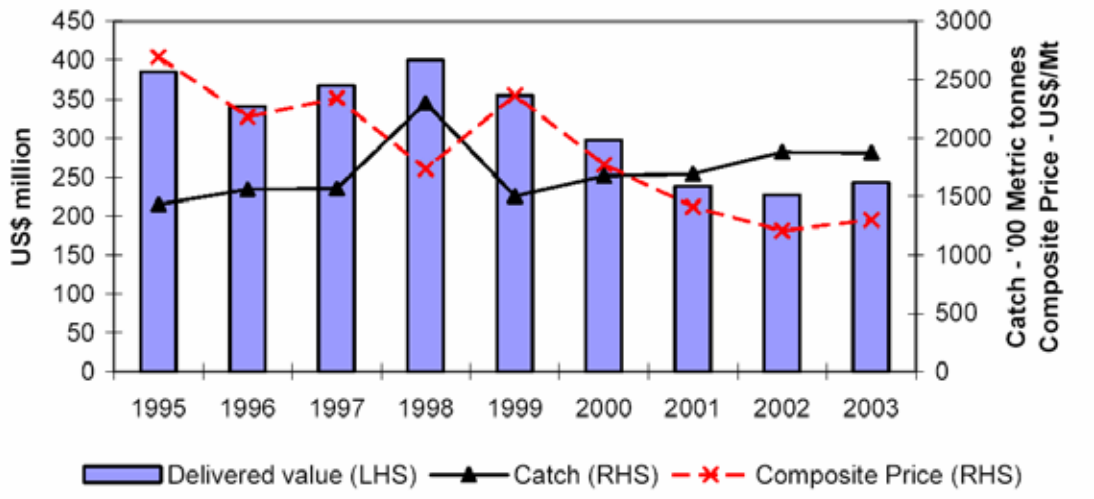


Figure 29. Skipjack in the WCPFC pole and line fishery – Catch, delivered value of catch and composite price

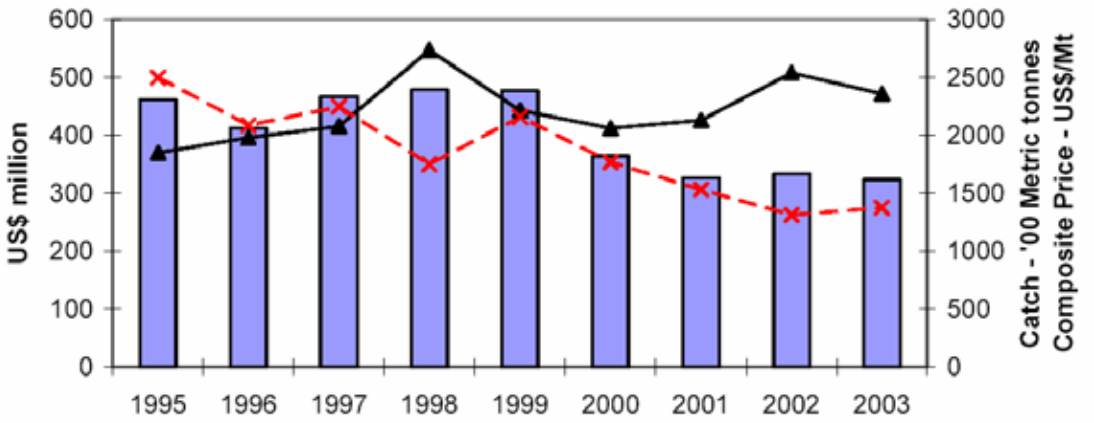


Figure 30. All tuna in the WCPFC pole and line fishery – Catch, delivered value of catch and composite price

5 WCP–CA LONGLINE FISHERY

5.1 Overview

The longline fishery continues to account for around 10–12% of the total WCP–CA catch (Lawson & Williams, 2005), but rivals the much larger purse seine catch in landed value. It provides the longest time series of catch estimates for the WCP–CA, with estimates available since the early 1950s (Lawson & Williams, 2005). The total number of vessels involved in the fishery has fluctuated between 4,000 and 5,000 for much of this period (Figure 31).

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. Some voluntary reduction by one major fleet (Japan distant-water) has occurred in recent years;
- smaller (typically <100 GRT) **offshore** vessels which are usually **domestically-based**, with ice or chill capacity, and serving fresh or air-freight sashimi markets. These vessels operate mostly in tropical areas.

Additionally, small vessels in Indonesia and Philippines (not included in Figure 31) target yellowfin and bigeye by handlining and small vertical longlines, usually around the numerous arrays of anchored FADs in these waters. These fisheries have similar species composition as longliners operating in the same area.

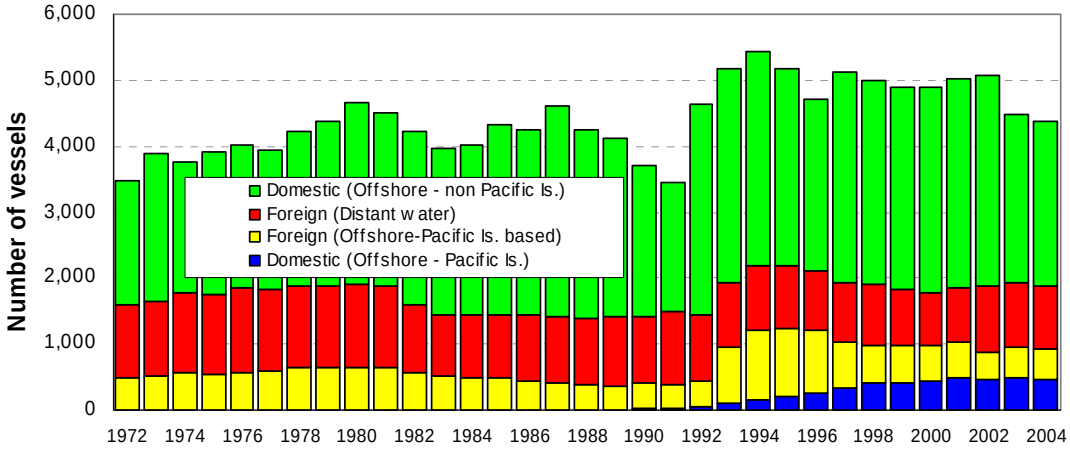


Figure 31. Longline vessels operating in the WCP–CA

There have been significant changes in fleet operations during the past two decades. For example, a feature of the 1980s was an increase in depth deployment of the longline gear to target higher-valued bigeye in preference to yellowfin. During the 1990s, there was a gradual increase in the number of **Pacific-Islands domestic vessels**, such as those from American Samoa, Cook Islands, Fiji, French Polynesia, New Caledonia, Samoa, Solomon Islands and Tonga; these fleets mainly operate in subtropical waters, with **albacore** the main species taken. The entrance into the fishery and subsequent decline of the smaller "offshore" sashimi longliners of Chinese-Taipei and mainland-China, based in Micronesia, during the past decade is also noteworthy. There has also been a trend towards flexibility in species targetting in some fleets, notably those with ultra-low temperature freezing capacity – for example, some vessels in the distant-water Chinese-Taipei fleet have recently switched from albacore targeting in the South Pacific to targeting bigeye and yellowfin in the eastern regions of the tropical WCP–CA. Large Chinese longliners targeting albacore in the high seas areas of the South Pacific and bigeye/yellowfin tuna in the eastern areas of the tropical WCP–CA, are a recent addition to the fishery. There has also been rapid development of the longline fishery in at least one south-east Asian country (i.e. Vietnam, although catch estimates for this fleet are not yet available).

The WCP–CA longline tuna catch steadily increased from the early years of the fishery (i.e. the early 1950s) to 1980 (227,212 mt), but declined in the five years after this to 156,608 mt in 1984 (Figure 32). Since 1984,

catches steadily increased over the next 15 years until the late 1990s, when catch levels were again similar to 1980. However, the composition of the catch in the late 1970s and early 1980s, a period when yellowfin tuna were targeted (e.g. ALB–19%;BET–27%;YFT–54% in 1980), has since become more balanced, particularly in recent years (e.g. ALB–34%;BET–33%;YFT–32% in 2003).

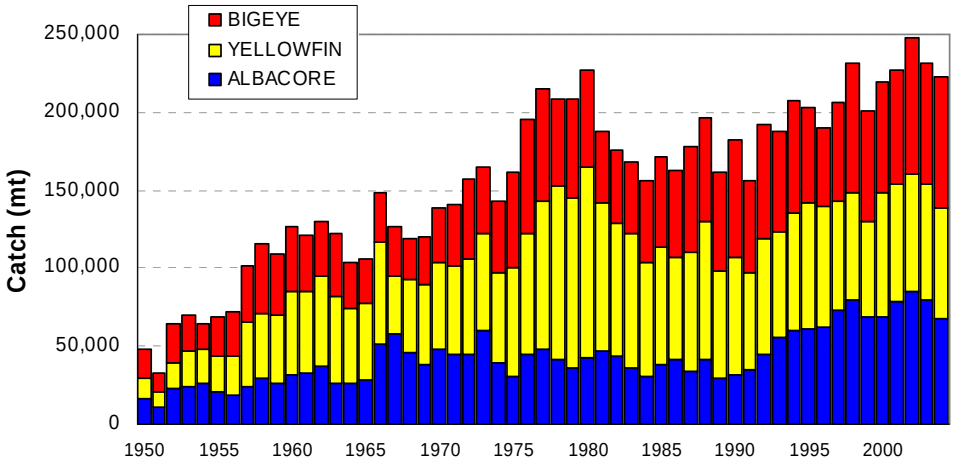


Figure 32. Longline catch (mt) of target tunas in the WCP–CA

5.2 Provisional catch estimates and fleet sizes (2004)

The provisional WCP–CA longline catch (225,786 mt) for 2004 was around 26,000 mt lower that the highest on record, which was attained in 2002 (231,968 mt). The WCP–CA albacore longline catch (65,865 mt – 30%) in 2004 was lower than in recent years and primarily due to a drop in catches by a number of key fleets. The provisional bigeye catch (84,394 mt – 37%) for 2004 was the second highest on record, and the yellowfin catch (70,757 mt – 31%) was the lowest since 1999. The yellowfin catch (61,384 mt) in 1999 was the lowest for nearly 30 years, and is understood to be related to the age class showing poor recruitment into the purse seine fishery in 1996 (see Figure 16– yellowfin tuna CPUE for all set types).

The most significant change in the WCP–CA longline fishery over the past 5 years has been the growth of Pacific-Islands domestic albacore fisheries, which went from taking 22% of the total south Pacific albacore longline catch in 1999, to accounting for over 45% of the catch in the past three years (i.e. 2002–2004). The clear shift in effort by some vessels in the Chinese-Taipei distant-water longline fleet to targeting bigeye in the eastern equatorial waters of the WCP–CA has resulted in a reduced contribution to the overall albacore catch in recent years and a significant increase in bigeye catches. During the 1990s, this fleet consistently took less than 2,000 mt of bigeye tuna each year, but in 2002 the bigeye catch went up to 8,741 mt, and by 2004 it was up to 16,888 mt.

Domestic fleet sizes continue to increase at the expense of foreign-offshore and distant-water fleets (Figure 31), although the Chinese-Taipei distant-water longline fleet increased by ~80% over the period 2000–2003 (from 78 in 2000 to 142 vessels in 2003). The 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 has been balanced to some extent by the switch to targeting bigeye tuna (from albacore) by certain vessels in the distant-water Chinese-Taipei fleet.

5.3 Catch per unit effort

Time series of nominal CPUE provides a broad indication of the availability of target species to the longline gear, and as longliners target larger fish, the CPUE time series should be more indicative of adult tuna abundance. However, more so than 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 on. 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.

This paper does not attempt to present or explain trends in longline CPUE, as this is dealt with more appropriately in specific studies on the subject. For example, SC1 Working Paper **SA WP–5** (Unwin et al., 2005) describes standardized CPUE for the New Zealand albacore troll and longline fisheries, and SC1 Working Paper **SA WP–8** (Langley et al., 2005) deals with longline CPUE indices for yellowfin and bigeye in the Pacific Ocean using GLM and statistical habitat standardisation methods.

5.4 Geographic distribution

Figure 33 shows the distribution of effort by category of fleet for the period 2000–2003 (representing the most recently available data for all fleets, but reflecting the likely distributions for 2004).

Effort by the large-vessel, distant-water fleets of Japan, Korea and Chinese-Taipei account for most of the effort but this has declined to some extent over the past decade. Effort is widespread as sectors of these fleets target bigeye and yellowfin for the frozen sashimi market, and albacore in the more temperate waters for canning. Activity by the foreign-offshore fleets from Japan, mainland China and Chinese-Taipei are restricted to the tropical waters, targetting bigeye and yellowfin for the fresh sashimi market; these fleets have limited overlap with the distant-water fleets. The substantial "offshore" effort in the west of the region is primarily by the Indonesian and Chinese-Taipei domestic fleets targeting yellowfin and bigeye. The growth in domestic fleets in the South Pacific over recent years has been noted; the most significant examples are the increases in the American Samoan, Fijian and French Polynesian fleets and the recent establishment of the Cook Islands fleet (Figure 34). As noted above, some vessels in the distant-water Chinese-Taipei longline fleet are now targeting bigeye in the eastern equatorial areas of the WCP–CA.

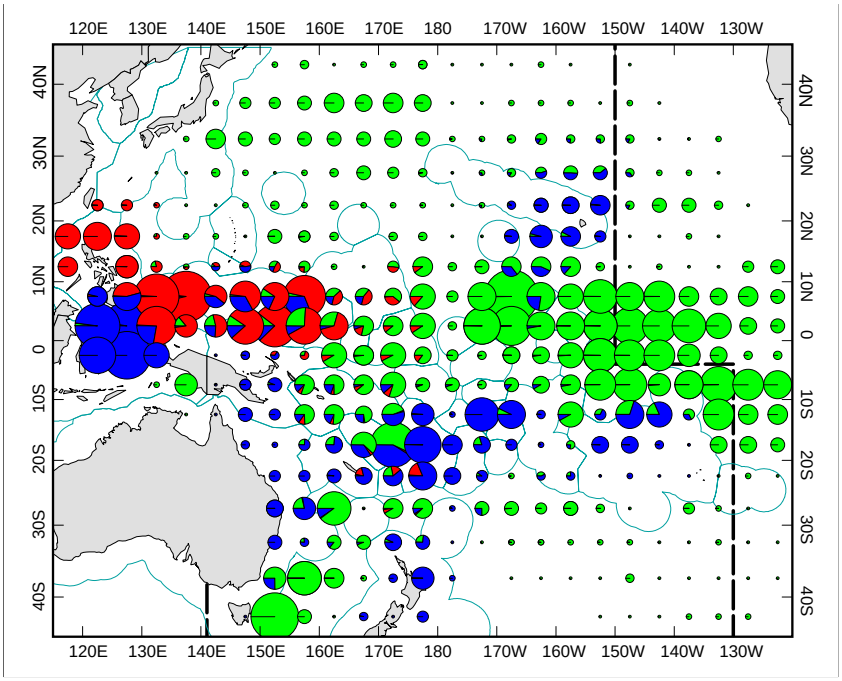


Figure 33. Distribution of longline effort for distant-water fleets (green), foreign-offshore fleets (red) and domestic fleets (blue) for the period 2000–2003.

(Note that the domestic fleet effort excludes the Japanese coastal fishery and the Vietnam fishery; distant-water effort for Chinese-Taipei and other fleets targeting albacore in the North Pacific are not covered)

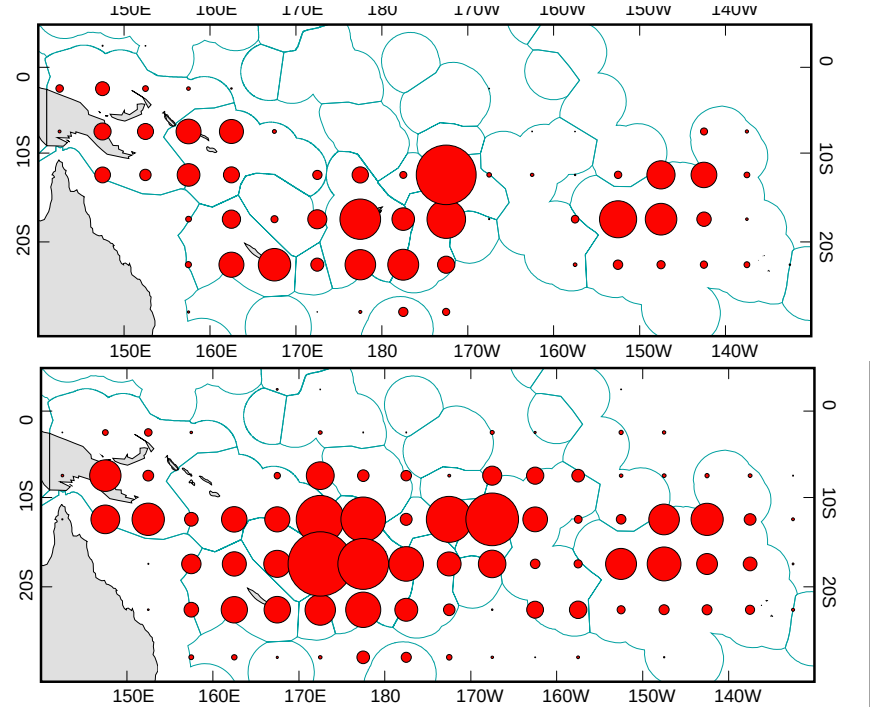


Figure 34. Distribution of Pacific-islands domestic longline effort for 1999 (top) and 2004 (bottom).

Figure 35 shows species composition by area for 2003 (2004 data incomplete). 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 WCP–CA, adjacent to the traditional EPO bigeye fishing grounds. The albacore catch, in contrast, is taken in subtropical and temperate waters in both hemispheres.

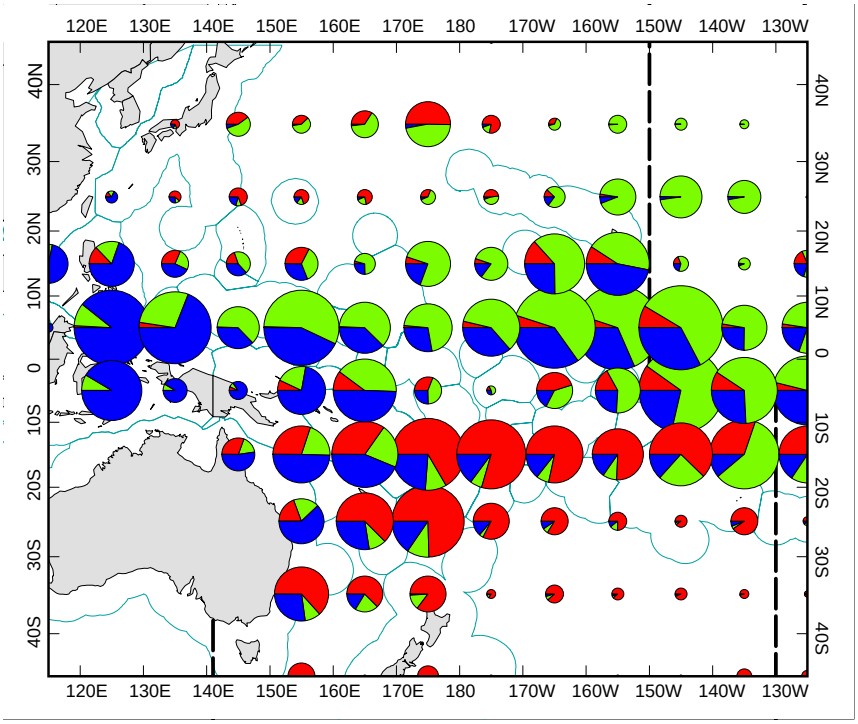


Figure 35. Distribution of longline tuna catch by species during 2003
(Blue–yellowfin; Green–bigeye; Red–albacore)
(Note that the domestic fleet effort excludes the Japanese coastal fishery and the Vietnam fishery; catches from some distant-water fleets targeting albacore in the North Pacific are not covered)

5.5 Economic overview of the longline fishery

This section provides an overview of price trends at Japanese and US markets for longline caught yellowfin and bigeye and in Bangkok for albacore during 2004 and in prior years. Estimates of the value of the longline catch in the WCPFC Convention Area are also provided. A more detailed discussion of price trends on world markets for longline caught yellowfin, bigeye and albacore can be found in FFA Tuna Market News: Annual Review 2004 (http://www.ffa.int/node/515).

5.5.1 Japanese market prices – Yellowfin

In 2004 fresh yellowfin prices at 10 major Japanese wholesale markets rose by 2 per cent to 1007JPY/kg, while frozen yellowfin prices fell by 3 per to 703JPY/kg. Longline caught yellowfin prices (ex-vessel) landed at Yaizu rose by 4 per cent to 431JPY/kg, average fresh yellowfin prices (ex-vessel) at selected Japanese ports rose by 13 per cent to 639JPY/kg and fresh yellowfin import prices (c.i.f.) were steady at 714JPY/kg. While prices for imported fresh yellowfin in JPY were steady the appreciation of the JPY against the US$ saw prices in US$ increase by 7 per cent to US$6.60/kg.

Sales volumes at 10 major Japanese in 2004 declined with fresh yellowfin volumes declining by 8 per cent to 20,116Mt and frozen yellowfin volumes declined 13 per cent to 17,512Mt. Longline caught yellowfin volumes at Yaizu rose 5 per cent to 4,625Mt in 2004. After steadily increasing over the period 1997 to 2001, Japanese imports[4] of fresh yellowfin fell sharply in 2002 and continued to decline in 2003 and 2004. Japanese imports of fresh yellowfin were 24,059Mt in 2004 down 13 per cent compared with 2003 and at their lowest level since 1990.

Following a significant rise in the price (c.i.f.) of imports of fresh yellowfin from the Oceania region in 2003 (up 8 per cent to 837JPY/kg and in US$ terms up 17 per cent to US$7.22/kg) prices declined by 2 per cent in 2004 to 818JPY but rose in US$ by 5 per cent to US$7.56/kg.

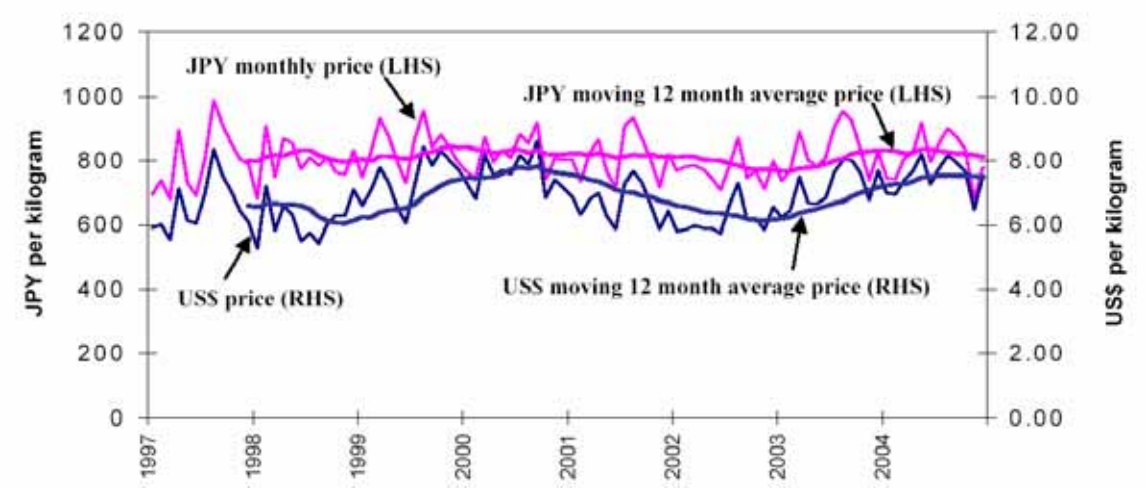


Figure 36. Japanese import prices (c.i.f.) for fresh yellowfin from Oceania in JPY and US$, Source: Ministry of Finance (http://www.customs.go.jp/)

[4] Imports of tuna into Japan are defined to be tunas that are carried into Japan as imports. "That is, tuna which is caught by vessels of foreign nationality in the seas outside of territorial waters (including Japan's and other countries' exclusive economic zones) and carried into Japan, or tuna which is caught by vessels of Japanese nationality and first landed in other countries, and then brought into Japan. Those other than the above (i.e., tuna caught by vessels of Japanese nationality on high seas, etc.) are regard as Japanese products)". www.mof.gov.jp

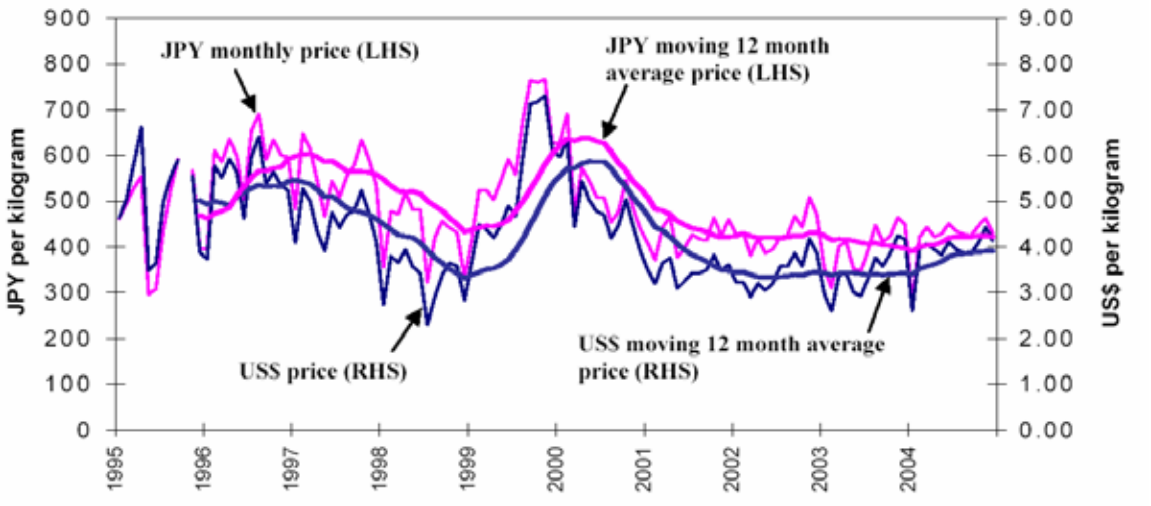


Figure 37. Yaizu market prices (ex-vessel) for longline caught yellowfin in JPY and US$
Source: FFA Tuna Industry Advisor

5.5.2 Japanese market prices – Bigeye

Prices at 10 major Japanese wholesale markets in 2004 averaged 1,191JPY/kg for fresh bigeye, down marginally on 2003, and 911/kg for frozen bigeye, up 6 per cent. Fresh and frozen bigeye sales volumes both continued to declined in 2004, falling by 3 per cent to 11,166Mt and 12 per cent to 45,576 mt respectively.

Frozen bigeye prices (ex-vessel) at selected major Japanese ports rose by 5 per cent in 2004 to 652JPY/kg while fresh bigeye prices (ex-vessel) declined by 12 per cent to 880JPY/kg. Fresh bigeye import prices (c.i.f.) were steady at 784JPY while frozen bigeye import prices (c.i.f.) rose 10 per cent to 654JPY/kg. In US$ terms frozen bigeye import prices rose nearly 18 per cent to US$6.05 while fresh bigeye import prices rose 7 per cent to US$7.26/kg. Following a 16 per cent decline in 2003, import volumes of fresh bigeye rose 3 per cent in 2004 to 18,901 mt.

As with fresh yellowfin in 2003 there was a substantial increase in the price (c.i.f.) of fresh bigeye imports from the Oceania region with prices increasing by 15 per cent. In 2004 prices rose a further 2 per cent to 973JPY/kg. In US$ terms prices rose by 25 per cent in 2003 and 10 per cent in 2004 averaging US$9.00/kg in 2004.

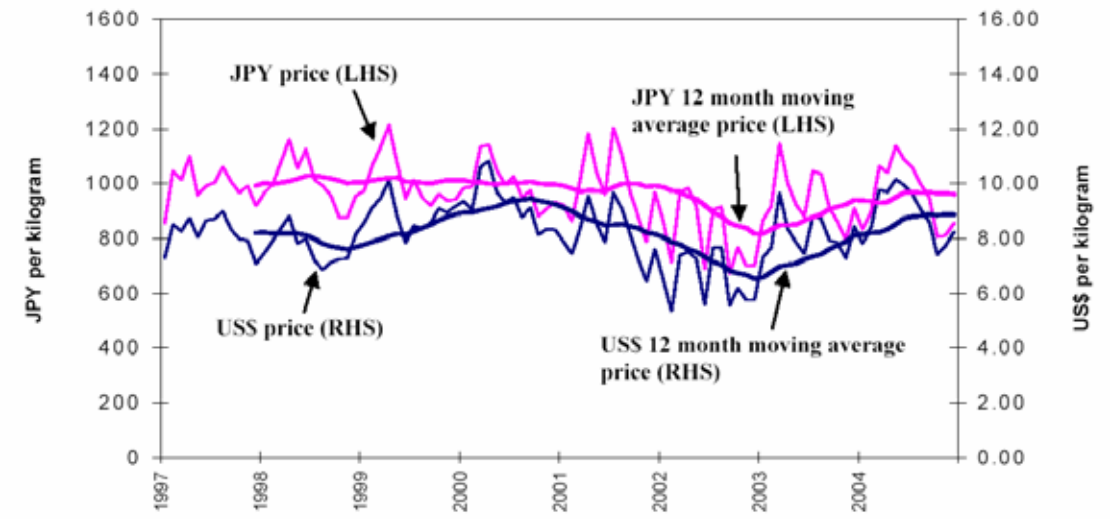


Figure 38. Japanese import prices (c.i.f.) for fresh bigeye from Oceania in JPY and US$
Source: Ministry of Finance (http://www.customs.go.jp/)

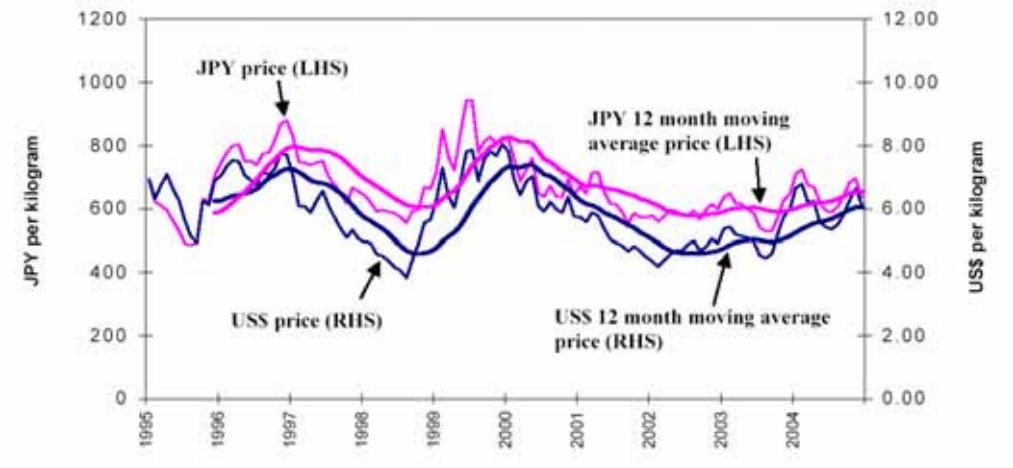


Figure 39. Japanese import prices (c.i.f.) for frozen bigeye in JPY and US$

Source: Ministry of Finance (http://www.customs.go.jp/)

5.5.3 US market prices for longline-caught Albacore, Bigeye and Yellowfin tuna

The value (f.a.s.) of US imports of fresh albacore declined by 24 per cent in 2004 driven by a 20 per cent decline in the average price to US$3.11/kg and a 5 per cent decline in volumes (to 1,004Mt).

The value (f.a.s) of US imports of fresh bigeye declined by 3 per cent in 2004 to US$49.3 million following an increase of 28 per cent in 2003. This decline was driven by a 7 per cent decline in volumes (to 6,872Mt) which was partially offset by a 3 per cent increase in the average price to US$7.18/kg.

Following a pause in the decade long growth in the value of US imports of fresh yellowfin in 2003 growth resumed in 2004 with the value of US imports rising 6 per cent to US$99.4 million driven by a 2 per cent increase in volumes to 15,624Mt and a 4 per cent rise in the average price to US$6.36/kg. [5]

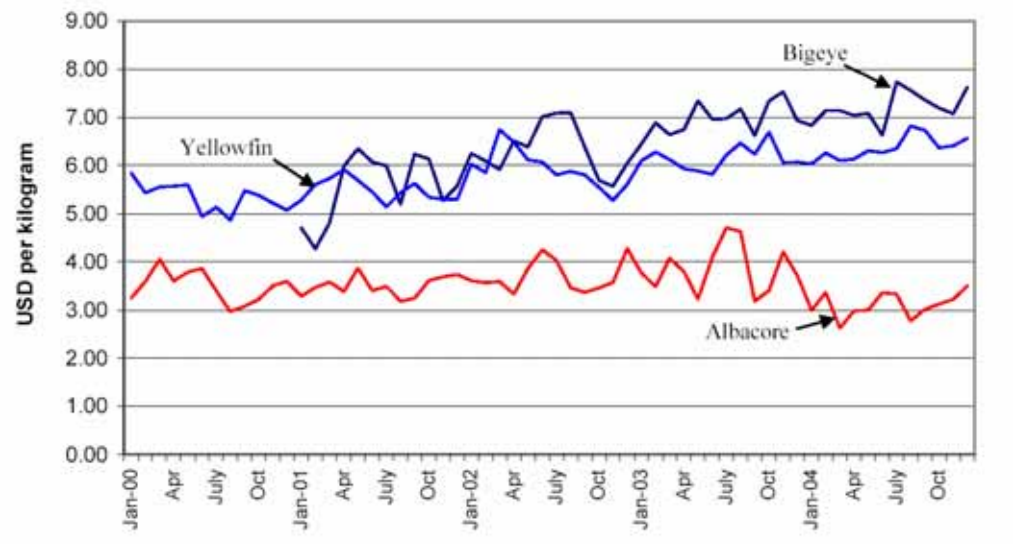


Figure 40. US import prices (f.a.s.) for fresh albacore, bigeye and yellowfin

Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics and Economics Division, Silver Spring, MD (**www.st.nmfs.gov**)

Notes: Prices are calculated from the customs value of the volume imported. Customs value is defined as the price actually paid or payable for merchandise when sold for exportation to the United States, excluding U.S. import duties, freight, insurance and other charges incurred in delivering the merchandise to the United States. This value approximates the free alongside ship value (f.a.s.)

[5] www.st.nmfs.gov/trade/index.html

5.5.4 Market prices – Frozen Albacore

Bangkok frozen albacore market prices (10kg and up, c&f) rose steadily through much of 2004 continuing the upward trend in prices seen since March 2002 when the price of 10kg and up sized fished stood at around US$1700/Mt. Having commenced 2004 at US$2200-2250/Mt the price of 10kg and up sized fished increased through to the end of the 3rd Quarter reaching US$2400-2450/Mt in late September where it remained through to the end of the year.

Following the first decline since 1999 of Thai import volumes of frozen albacore in 2003 volumes rose 11 per cent in 2004 to 32,522Mt. Import prices also rose in 2004 continuing the steady increase seen since the beginning of 2002. Import prices over 2004 average 87THB/kg (US$2173/Mt) up 11 per cent (15 per cent in US$ terms) and finished the year averaging 98THB/kg (US$2503/Mt) over December.[6] This is the highest average monthly Thai import price in US$ terms since August 2001.

US import volumes of frozen albacore declined significantly between 1999 and 2004 presumably as a results of a shift from processing whole round fish to using loins in canneries in the US and US Territories. US imports of whole frozen albacore declined by over 90 per cent between 1999 and 2004 with import volumes of only 4.9Mt being recorded in 2004 compared with 63Mt in 1999. US import prices (f.a.s.) for whole frozen albacore averaged US$2709/Mt over 2004.

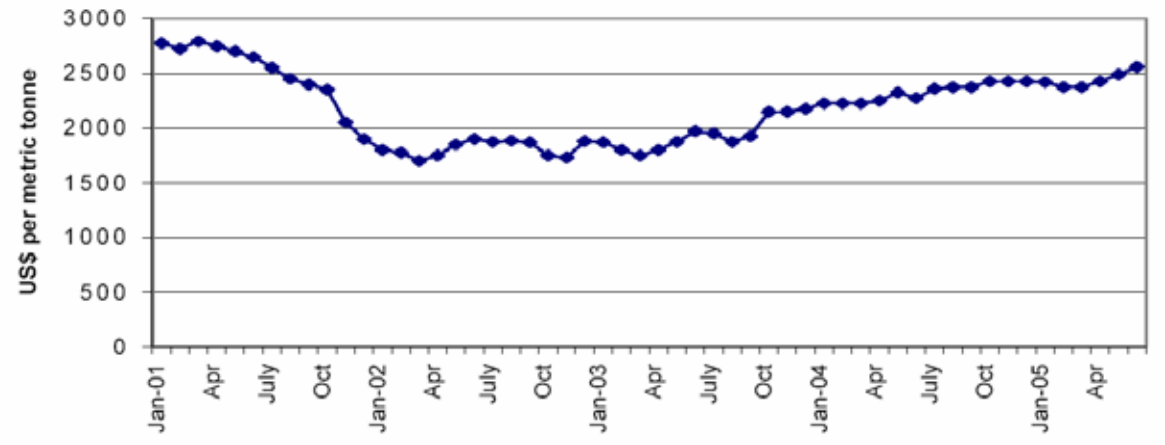


Figure 41. Bangkok monthly albacore price (10kgs and up, c&f)

Note: The prices shown in the above figure are indicative figures only and reflect estimates of prices paid during the respective month based on information received from a range of sources.

[6] www.customs.go.th

5.5.5 Value of the longline catch

As a means of examining the effect of the changes to prices and catch levels over the period 1995-2004 a rough estimate of the annual delivered value of the tuna catch in the longline fishery in the WPFC Area are provided in Figure 42–45. 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.[7]

The estimated delivered value of the longline tuna catch in the WCPFC area for 2004 is US$1,059 million. This represents an increase of US$85 million or 9 per cent on the estimated value of the catch in 2003. This increase was driven a US$84 million (18 per cent) increase in value of the bigeye catch, which was estimated to be worth US$541 million in 2004, resulting from of a 9 per cent increase in the composite delivered price and an 8 per cent increase in catch. The delivered value of the yellowfin catch was marginally higher in 2004 at US$367 while the delivered value of the albacore catch declined marginally to US$147 million. For both albacore and yellowfin catch levels fell, by 14 and 5 per cent respectively, but this decline was offset by an increase of similar magnitude in the delivered composite price for each species.

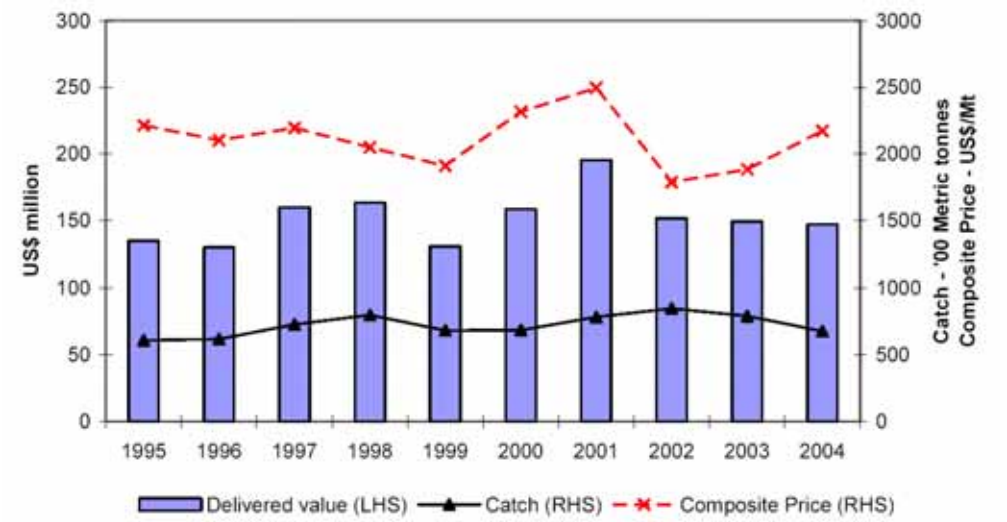


Figure 42. Albacore in the WCPFC longline fishery – Catch, delivered value of catch and composite price

[7] For the yellowfin and bigeye caught by fresh longline vessels it is assumed that 80 per cent of the catch is of export quality and 20 per cent 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 US$1.50/kg throughout the period 1995-2004. 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 is 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.

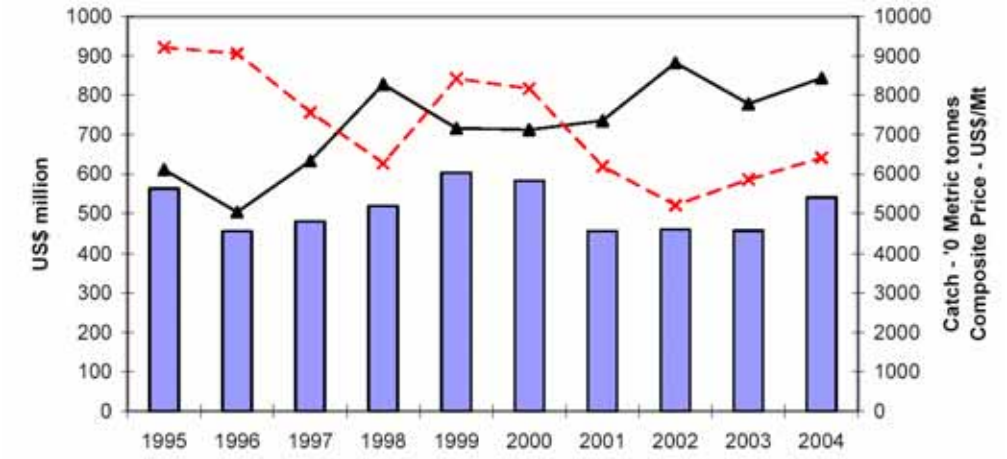


Figure 43. Bigeye in the WCPFC longline fishery – Catch, delivered value of catch and composite price

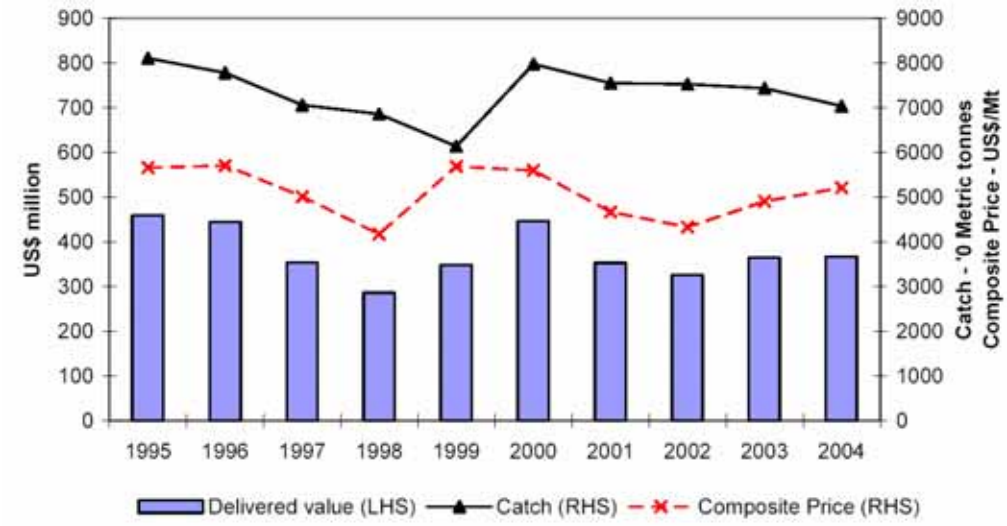


Figure 44. Yellowfin in the WCPFC longline fishery – Catch, delivered value of catch and composite price

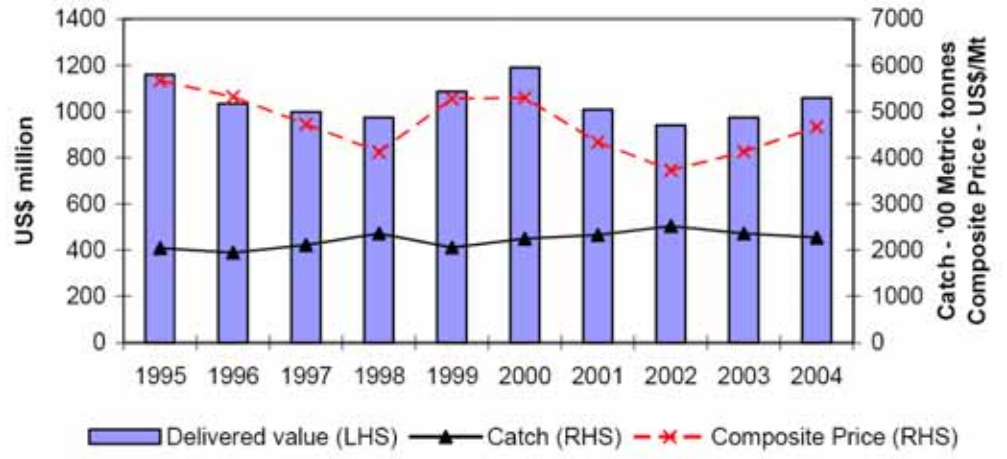


Figure 45. All tunas in the WCPFC longline fishery – Catch, delivered value of catch and composite price

6 SOUTH-PACIFIC TROLL FISHERY

6.1 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 NZ waters located near 40°S). The fleets of New Zealand and 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); since then, annual catches have gradually declined and have hovered in the range 4,500–6,000 mt for the past five years. The level of effort expended by the troll fleets each year tends to reflect the price commanded for the product (albacore for canning) to some extent, and by expectations concerning likely fishing success.

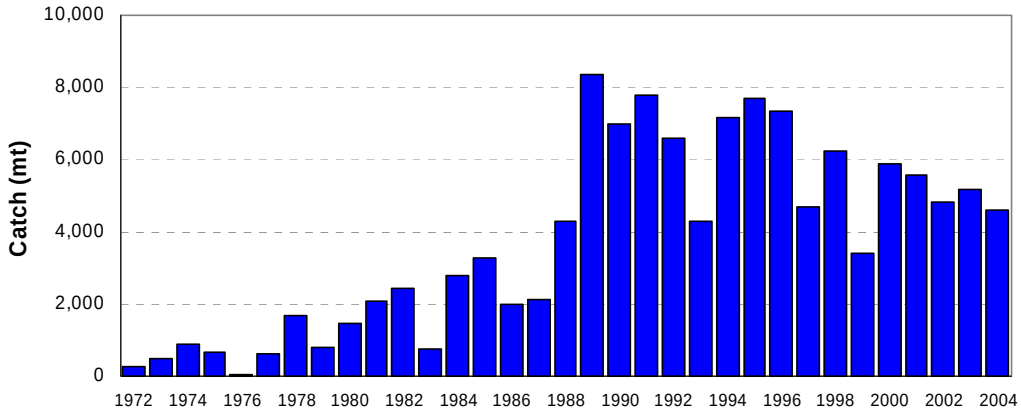


Figure 46. Troll catch (mt) of albacore in the south Pacific Ocean

6.2 The Year 2004 Fishery (provisional)

As has been the case in the past, the fleets of New Zealand (3,373 mt in 2004) and USA (1,205 mt in 2003) account for most of the albacore troll catch, with minor contributions coming from the Canadian and Australian fleets. The provisional 2004 troll albacore catch (4,623 mt) was around 500 mt less than in 2003, although this will not be finalised until the US troll fleet catch for 2004 is made available. Figure 47 shows the distribution of effort for troll fleets for 2003 (2004 data are incomplete), with effort primarily off the coast of New Zealand and in the Sub-tropical convergent zone (STCZ).

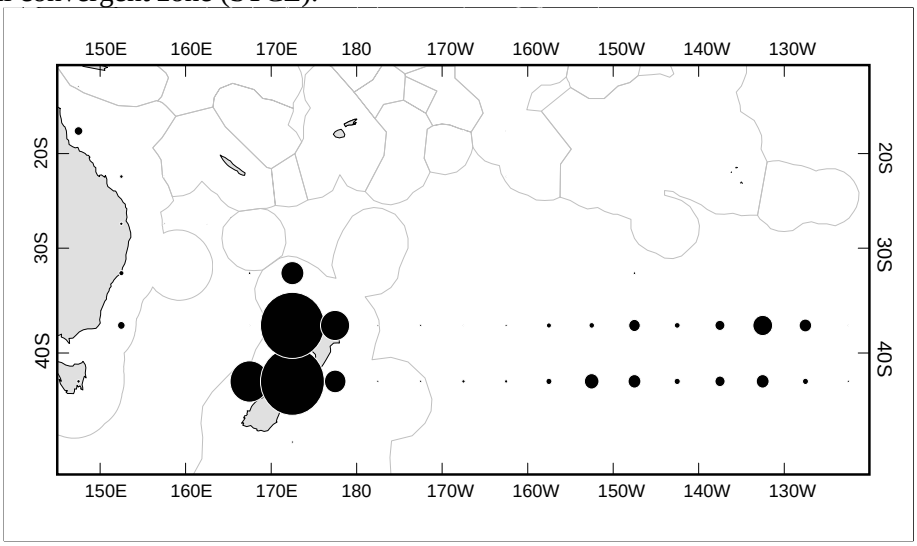


Figure 47. Distribution of South Pacific troll effort during 2003

7. SUMMARY OF CATCH BY SPECIES

7.1 SKIPJACK

Total skipjack catches in the WCP–CA have increased steadily since 1970, more than doubling during the 1980s, and continuing to increase in subsequent years. Annual catches exceeded 1.2 million mt in five of the last seven years (Figure 48). Pole-and-line fleets, primarily Japanese, initially dominated the fishery, with the catch peaking at 380,000 mt in 1984. The relative importance of this 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 now make up 20–25% of the total skipjack catch in WCP–CA in recent years).

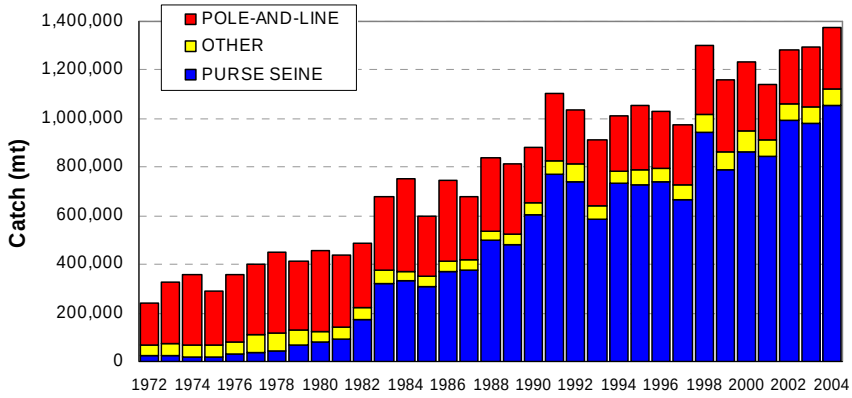


Figure 48. WCP–CA skipjack catch (mt) by gear

The 2004 WCP–CA skipjack catch of 1,376,670 mt was clearly the highest on record, and primarily due to the record catch from the **purse seine** fishery (1,059,061 mt – 78%). The balance of the catch was taken by the **pole-and-line** gear (248,868 mt – 18%) and **unclassified** gears in Indonesia, Philippines and Japan (~57,000 mt – 4%), while the **longline** fishery accounted for less than 1% of the total catch.

The vast majority of the skipjack catch is taken in equatorial areas, and most of the remainder is taken in the seasonal home-water fishery of Japan (Figure 49). The domestic fisheries in Indonesia (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 equatorial areas to the east of the Philippines is influenced by the prevailing ENSO conditions.

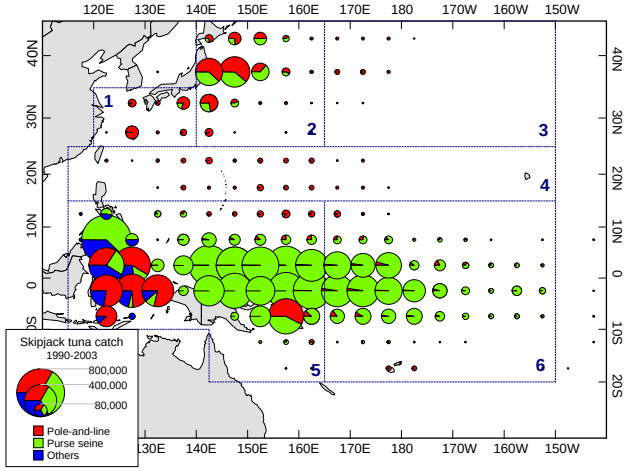


Figure 49. Distribution of skipjack tuna catch, 1990–2003.
The six-region spatial stratification used in stock assessment is shown.

The dominant mode of the WCP–CA skipjack catch (by weight) falls in the size range 50–60 cm, corresponding to 1–2 year-old fish (Figure 50). Unassociated (free swimming school) sets by purse seine vessels usually account for most of the large skipjack (i.e. fish over 70cm), while the Philippines and Indonesian domestic fisheries account for most of catch in 20–40 cm size range. There was a greater proportion of medium-large (60–70 cm) skipjack caught in the purse seine fishery during 2002 compared to the other years presented in this figure.

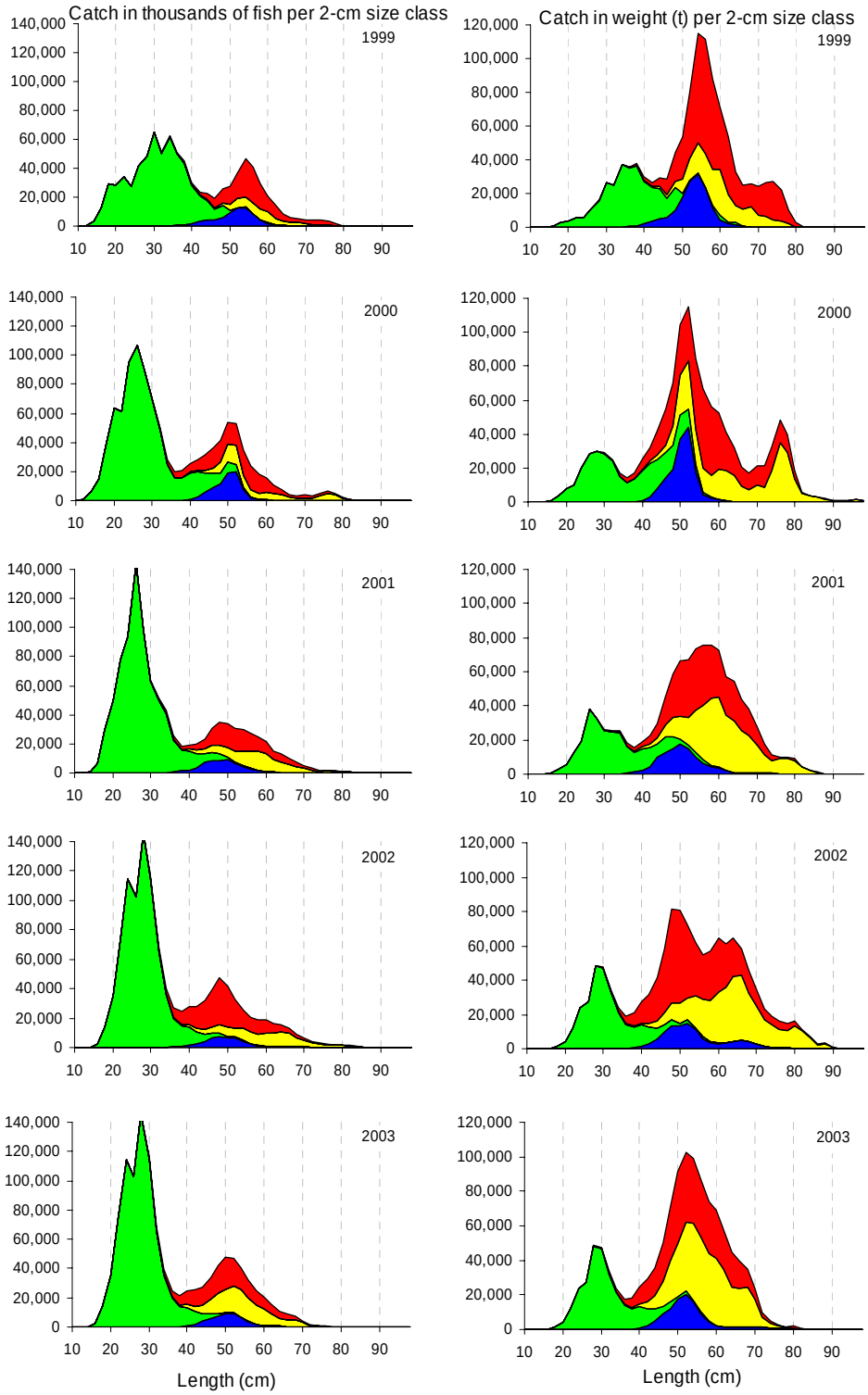


Figure 50. Annual catches of skipjack tuna in the WCPO by size and gear type, 1999–2003. **(blue–Pole-and-line; green–Phil-Indo fisheries; red–purse seine associated; yellow–purse seine unassociated, Phil–Indo data carried over from 2002 to 2003)**

7.2 YELLOWFIN

Since 1997, the total yellowfin catch in the WCP–CA has been relatively stable at between 410,000–470,000 mt (Figure 51). The 1998 catch was the largest on record (470,843 mt) and followed two years after an unusually low catch in 1996, primarily due to poor catches in the purse seine fishery. The 2004 catch (413,201 mt) was the lowest for several years, again due to a relatively low purse seine catch. The high catches of yellowfin experienced recently in the EPO (annual catches of over 400,000 mt for 2001–2003) were not sustained in 2004, as catches returned to their pre-2001 level (the 2004 yellowfin catch in the EPO was 273,744 mt).

In the WCP–CA, **purse seine** typically harvests the majority of the yellowfin catch, which for 2004 was 179,310 mt (or 43% of the total WCP–CA yellowfin catch). The WCP–CA **longline** catch for 2004 was 70,757 mt (17% of the total WCP–CA yellowfin catch). In recent years, the yellowfin longline catch has ranged 61,000–80,000 mt, which is well below catches taken in the late 1970s to early 1980s (90,000–120,000 mt), presumably related to changes in targetting practices by some of the large fleets and the gradual reduction in the number of distant-water vessels.

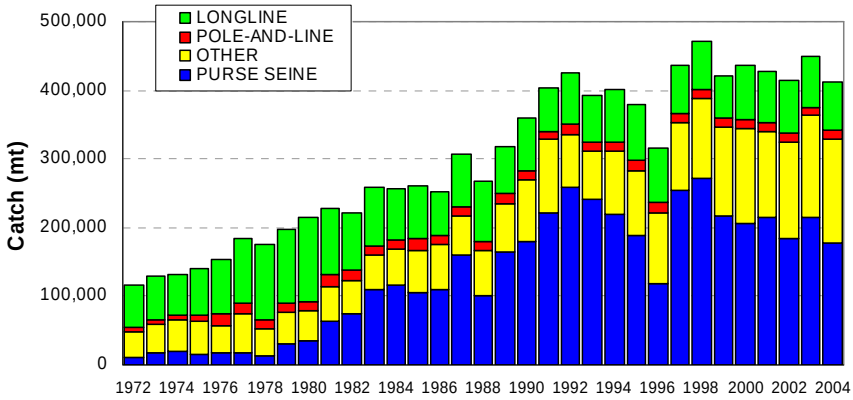


Figure 51. WCP–CA yellowfin catch (mt) by gear

The **pole-and-line** fisheries took 12,253 mt (3% of the total yellowfin catch) during 2003, and **'other'** category accounted for ~150,000 mt (which was 37% of the total catch for all gears). Catches in the '**other**' category are largely composed of yellowfin taken by various assorted gears (e.g. ring net, bagnet, gillnet, handline and seine net) in the domestic fisheries of the Philippines and eastern Indonesia. Figure 52 shows the distribution of yellowfin catch by gear type for the period 1990–2003 (longline data for Chinese-Taipei distant-water fleet is only available to 2003). As with skipjack, the great majority of the catch is taken in equatorial areas by large purse seine vessels, and a variety of gears in the Indonesian and Philippine fisheries.

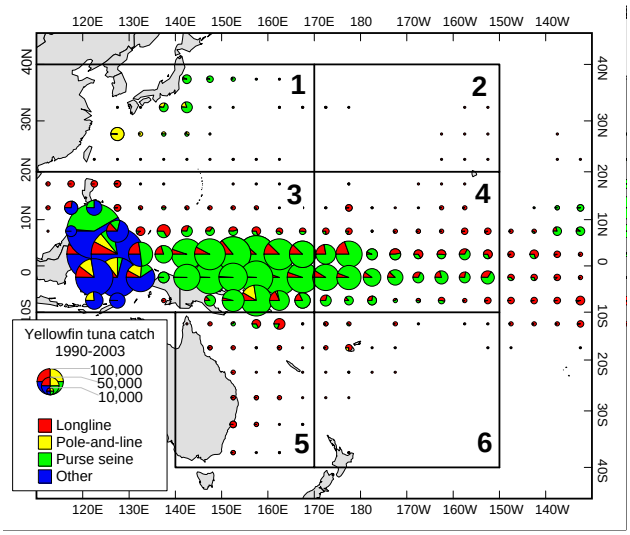


Figure 52. Distribution of yellowfin tuna catch, 1990–2003.
The six-region spatial stratification used in stock assessment is shown.

The domestic surface fisheries of the Philippines and Indonesia take large quantities of small yellowfin in the range 20–50 cm (Figure 53). 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 in weight is adult (> 100 cm) yellowfin tuna, to the extent that the purse-seine catch of adult yellowfin tuna is usually higher than the longline catch. Inter-annual variability in the size of yellowfin taken exists in all fisheries. The relatively high proportion of yellowfin taken from associated purse-seine sets during 1999 corresponds to strong recruitment, with the age class of fish taken in these years present as larger fish taken in the purse seine and longline fisheries in the following years. Note the strong mode of large (130–150cm) yellowfin from (purse-seine) unassociated-sets in 2002, which corresponds to the good catches experienced in the extreme east of the tropical WCPO (Figure 15–right).

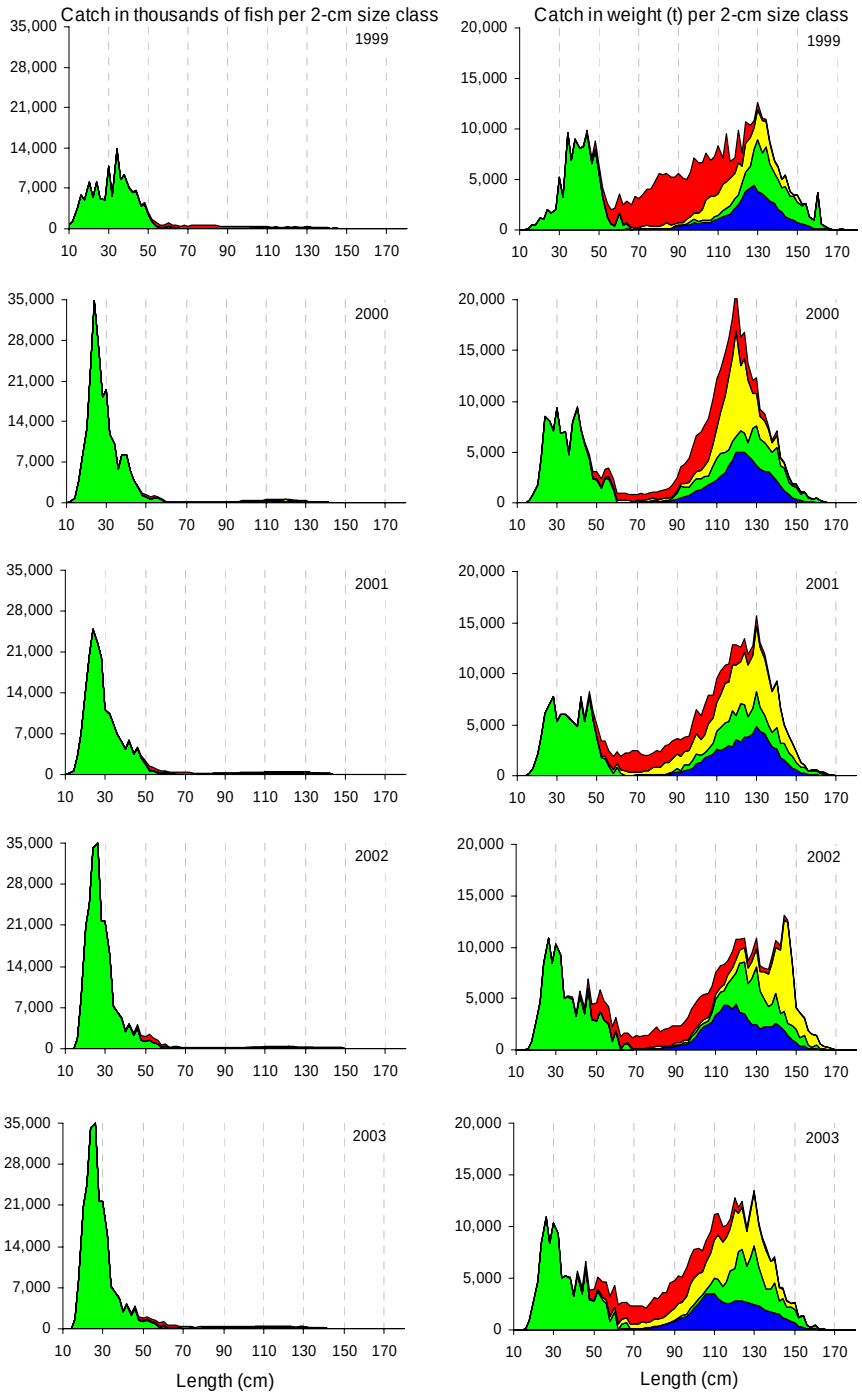


Figure 53. Annual catches of yellowfin tuna in the WCPO by size and gear type, 1999–2003. (blue–Longline; green–Phil-Indo fisheries; red–purse seine associated; yellow–purse seine unassociated, Phil–Indo data carried over from 2002 to 2003)

7.3 BIGEYE

Since 1980, the Pacific-wide total catch of bigeye (all gears) has varied between 118,000 and 253,000 mt (Figure 54), with Japanese longline vessels generally contributing over 80% of the catch until the early 1990s. The 2004 bigeye catch for the Pacific Ocean was the lowest for five years, due to relatively low catches in the EPO longline fishery compared with catches in recent years.

The **longline** catch in the **EPO**, the area east of 150°W, and historically the primary bigeye longline fishing area in the Pacific Ocean, has varied in the range 36,000–105,000 mt since 1980, surpassing 100,000 mt three times (1986, 1987 and 1991), but with an historical low in 1999 (36,405 mt). In recent years the EPO bigeye longline catch has generally been under 70,000 mt. The **WCP–CA longline** catch has ranged between 40,000–80,000 mt for the past thirty years (Figure 55), and has been relatively stable over recent years.

Purse-seine catch in the **EPO** (66,944 mt in 2004) continues to account for a significant proportion (63% in 2004) of the total EPO bigeye catch. The **WCP–CA purse seine** bigeye catch for 2004 was estimated to be 24,790 mt, the fifth consecutive drop in catch since the record in 1999 (38,327 mt), and directly related to reduced drifting FAD use. The **WCP–CA pole-and-line** fishery has accounted for between 2,000–4,000 mt of bigeye catch annually over the past decade, and the "**other**" category, representing various gears in the Philippine, Indonesian and Japanese domestic fisheries, has accounted for about 11,000–15,000 mt in recent years.

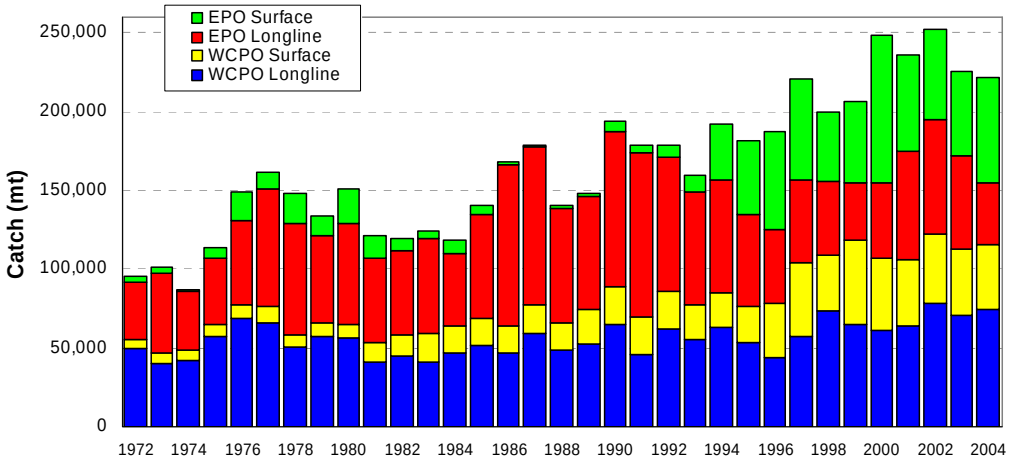


Figure 54. Pacific bigeye catch (mt) by gear
(excludes catches by "other" gears)

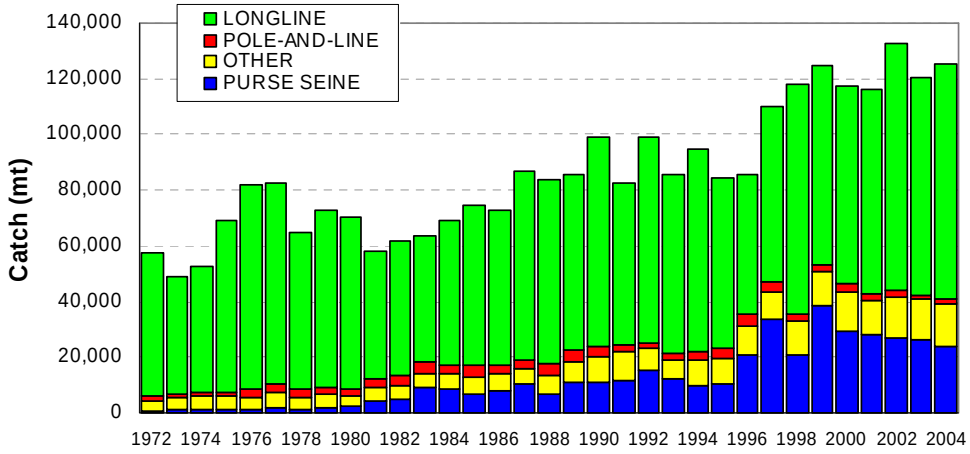


Figure 55. WCP–CA bigeye catch (mt) by gear

Figure 56 shows the spatial distribution of bigeye catch in the Pacific for the period 1990–2003 (2004 longline data for the Chinese-Taipei fleet is not yet available). The majority of the WCP–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.

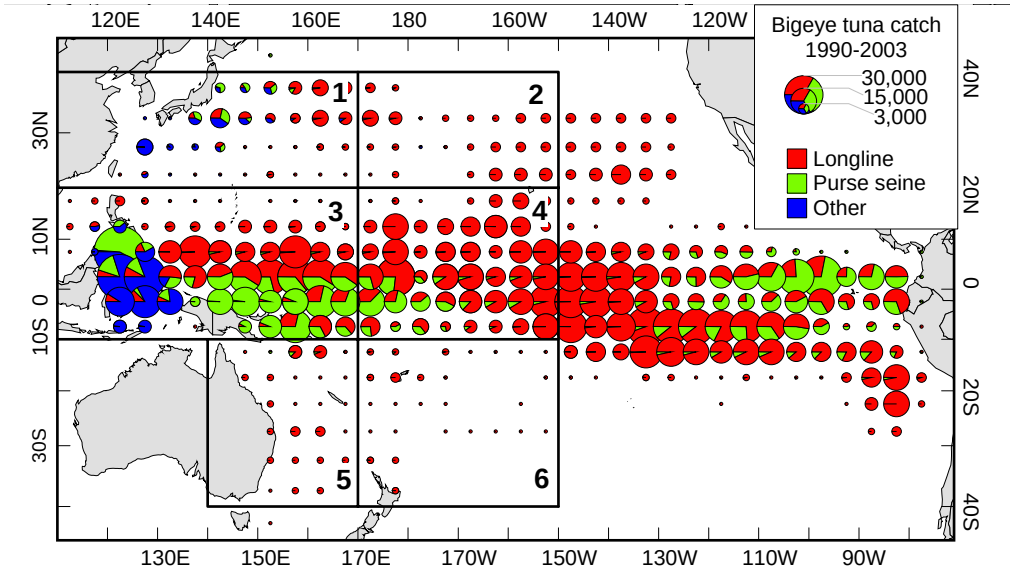


Figure 56. Distribution of bigeye tuna catch, 1990–2003.
The six-region spatial stratification used in stock assessment for the WCP–CA is shown.

The longline fishery clearly accounts for most of the catch of large bigeye in the WCP–CA (Figure 57). This is in contrast to large yellowfin tuna, which (in addition to the 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 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 sampled in the longline fishery are predominantly adult fish with a mean size of ~130 cm FL (range 80–160 cm FL), while the domestic surface fisheries of the Philippines and Indonesia take small bigeye in the range 20–60 cm. Associated sets account for nearly all the bigeye catch in the WCP–CA purse seine fishery with considerable variation in the sizes from year to year. The relatively higher proportion of bigeye taken by associated purse seine sets in 1999 corresponds to stronger recruitment in that year.

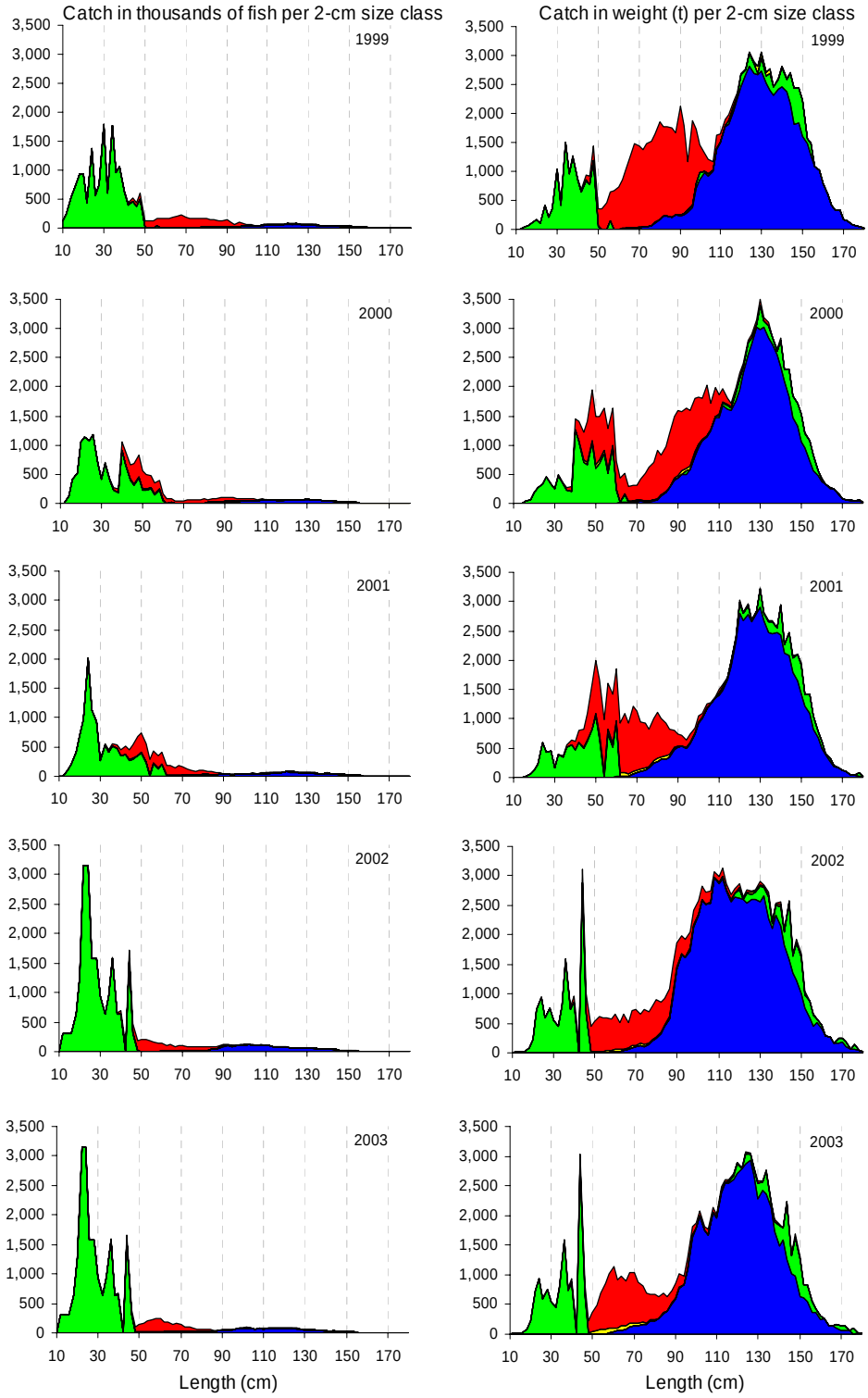


Figure 57. Annual catches of bigeye tuna in the WCPO by size and gear type, 1999–2003. (blue–longline; green–Phil-Indo fisheries; red–purse seine associated; yellow–purse seine unassociated, Phil–Indo data carried over from 2002 to 2003)

7.4 ALBACORE

Prior to 2001, south Pacific albacore catches have been in the range 25,000–40,000 mt, although a significant peak was attained in 1989 (48,562 mt), when driftnet fishing was in existence. Since 2001, catches have exceeded this range, primarily as a result of the growth in several Pacific Islands domestic longline fisheries. The 2002 south Pacific albacore catch of 63,082 mt was the highest on record, with the 2003 catch of 61,594 mt not far behind. The albacore catch in 2004 was reduced to 56,740 mt, directly related to a drop in catches in the longline fishery.

In the post-driftent era, **longline** has accounted for most (> 75%) of the South Pacific Albacore catch, while the **troll** catch, for a season spanning November – April has been in the range 3,000–8,000 mt (Figure 58). The WCP–CA albacore catch (102,749 mt in 2004) includes north Pacific catches (from the longline, pole-and-line and troll fisheries) and typically contributes around 80–90% of the Pacific catch of albacore.

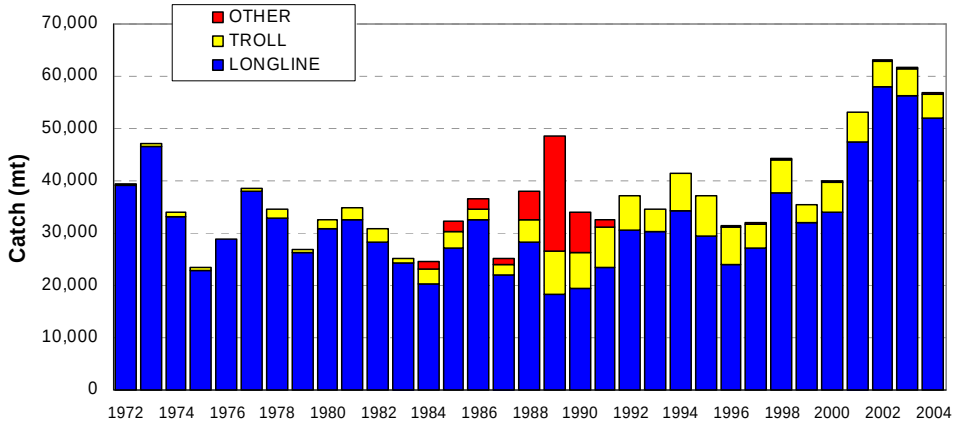


Figure 58. South Pacific albacore catch (mt) by gear ("Other" is primarily catch by the driftnet fishery.)

The longline catch is widely distributed in the south Pacific (Figure 59), but with catches concentrated in the western part of the region. The Chinese-Taipei distant-water longline fleet catch is taken in all three regions, while the Pacific Island domestic longline fleet catch is 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 SCTZ**.** Less than 20% of the overall south Pacific albacore catch is usually taken east of 150°W.

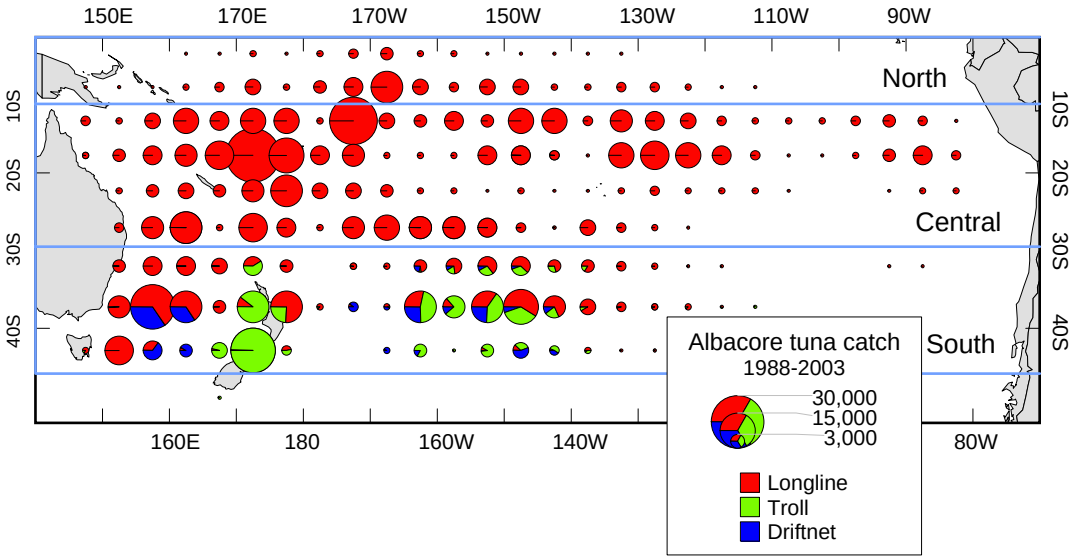


Figure 59. Distribution of South Pacific albacore tuna catch, 1988–2003.
The three-region spatial stratification used in stock assessment is shown.

REFERENCES

Langley, A., K. Bigelow & M. Maunder. (2005) Longline CPUE indices for yellowfin and bigeye in the Pacific Ocean using GLM and statistical habitat standardisation methods. Working Paper **SA WP–8**. First Meeting of the Scientific Committee of the WCPFC. Noumea, New Caledonia. 8th–19th August 2005.

Langley, A, J. Hampton, P. Willliams & P. Lehodey (2005) The Western and Central Pacific tuna fishery: 2003: overview and status of stocks. Tuna Fisheries Assessment Report 6. Noumea, New Caledonia: Secretariat of the Pacific Community.

Lawson, T. A. & P. Williams (2005) Estimates of annual catches in the WCPFC Convention Area. Working Paper **ST IP–1**. First Meeting of the Scientific Committee of the WCPFC. Noumea, New Caledonia. 8th–19th August 2005.

OFP (2005) Preliminary review of the WCPO purse seine fishery – 2004. Paper presented to the Annual Meeting of the Parties, USMLT, Nulu'alofa, Tonga. March 2005.

Unwin, M., Richardson, K., Davies, N., and Griggs, L. (2005) Standardized CPUE for the New Zealand albacore troll and longline fisheries. Working Paper **SA WP–5**. First Meeting of the Scientific Committee of the WCPFC. Noumea, New Caledonia. 8th–19th August 2005.