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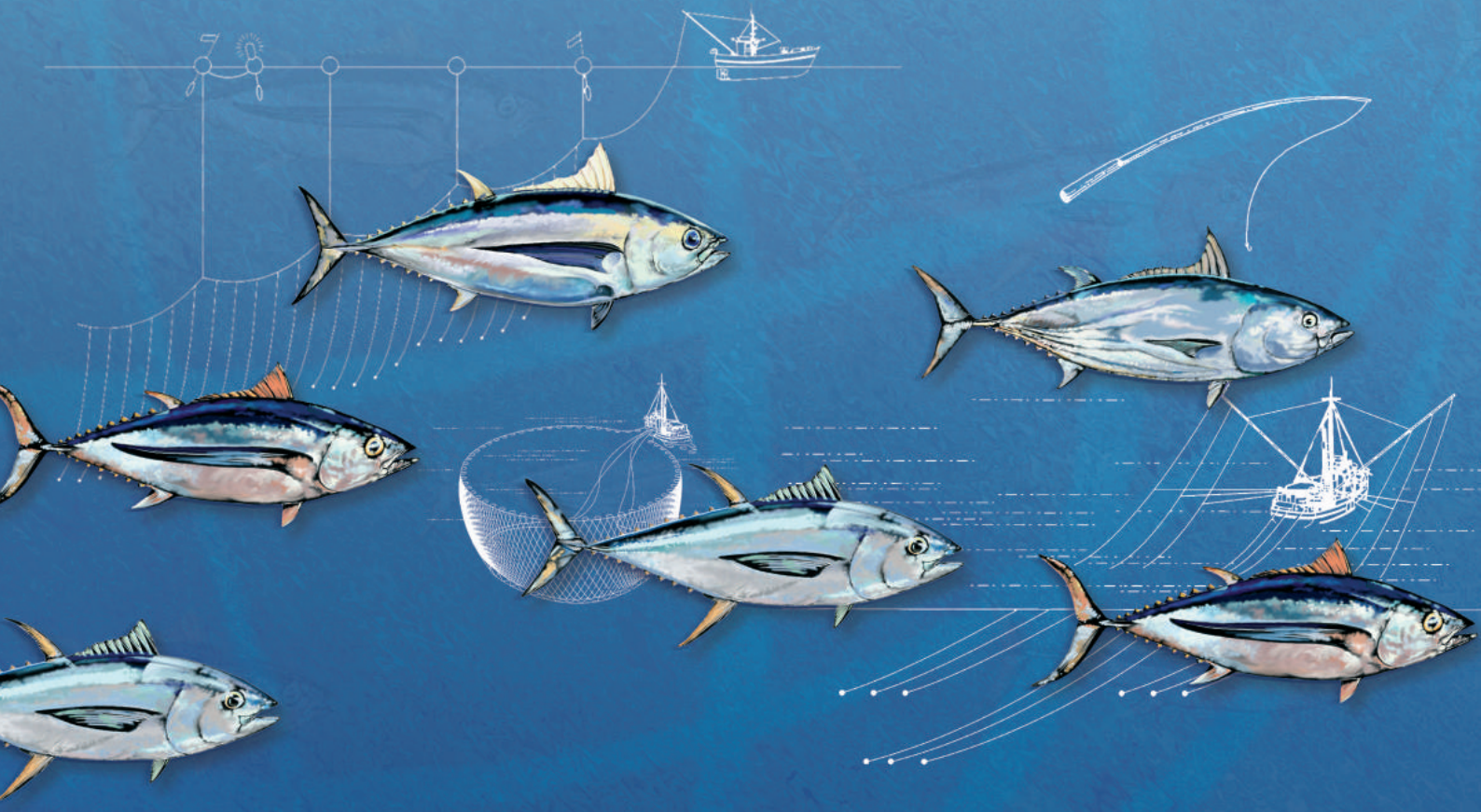
THE WESTERN AND CENTRAL PACIFIC TUNA FISHERY:

2014 OVERVIEW AND STATUS OF STOCKS

Shelton Harley, Peter Williams, Simon Nicol, John Hampton and Stephen Brouwer



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Tuna Fisheries Assessment Report No. 15

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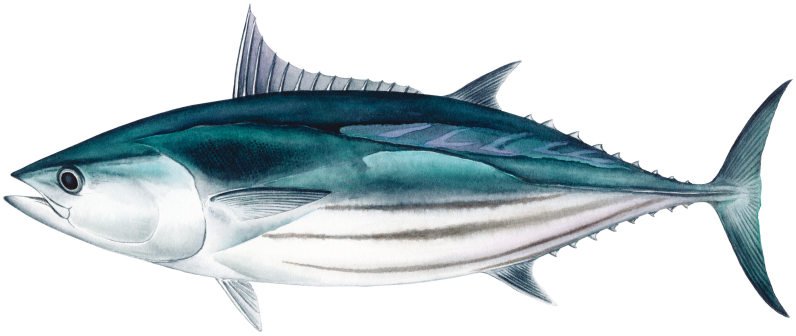

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Preface

Tuna fisheries assessment reports provide current information on the tuna fisheries of the western and central Pacific Ocean and the fish stocks (mainly tuna) that are impacted by them. The information provided in this report is summary in nature, but a list of references (mostly accessible via the Internet) is included for those seeking further details.

This report focuses on the main tuna stocks targeted by the fishery - skipjack tuna (*Katsuwonus pelamis*), yellowfin tuna (*Thunnus albacares*), bigeye tuna (*T. obesus*) and South Pacific albacore tuna (*T. alalunga*).

The report is in three main parts: the first section provides an overview of the fishery, with emphasis on developments over the past few years; the second summarises the most recent information on the status of the stocks; and the third summarises information concerning the interaction between the tuna fisheries and other associated and dependent species. The data used in compiling the report are those which were available to the Oceanic Fisheries Programme (OFP) at the time of publication, and are subject to change as improvements continue to be made to recent and historical catch statistics from the region. The fisheries statistics presented will usually be complete to the end of the year prior to publication. However, some minor revisions to statistics may be made for recent years from time to time. The stock assessment information presented is the most recent available at the time of publication.

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Contents

1 The western and central Pacific tuna fishery

The tuna fishery in the western and central Pacific Ocean (WCPO), encompassed by the Convention Area of the Western and Central Pacific Fisheries Commission (WCP-CA) (Figure 1), is a diverse fishery, 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 the exclusive economic zones (EEZs) of Pacific states and in international waters (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*).

The current fishery characterisation includes updates to historical data, which show that the highest catch year was 2014. We expect revisions to the 2014 catch estimates in next year's report, as catch estimates in the most recent year are preliminary.

Annual total catch 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, and remained relatively stable during most of the 1990s until the sharp increase in catch in 1998. Since then there has been an upward trend in total tuna catch, primarily due to increases in purse-seine catch (Figure 2 and Table 1). The provisional total WCP-CA tuna catch for 2014 was estimated at 2,883,259 tonnes (t) - a record catch. In 2014 the purse-seine fishery accounted for an estimated 2,036,968t (71% of the total catch), a record catch for this fishery. The pole-and-line fishery landed an estimated 215,324t (7% of the catch - a drop from the highest value (415,016t), recorded in 1984). The longline fishery in 2014 accounted for an estimated 263,462t (9% of the catch) - a decrease from the highest value (284,782t) recorded in 2004. Troll gear accounted for 4% of the total catch, a record catch for this fishery, but this was mainly due to a separation of the Indonesian troll catch from the combined artisanal gear catch. The remaining 9% was taken by a variety of artisanal gear, mostly in eastern Indonesia, the Philippines and Vietnam, which is a drop from the highest value (298,991t), recorded in 2012. The WCP-CA tuna catch for 2014 represented 82% of the total Pacific Ocean catch (3,508,685t) and 60% of the global tuna catch (the provisional estimate for 2014 is 4,778,821t).

The 2014 WCP-CA catch of skipjack (1,993,446t - 69% of the total catch) was a record catch; an increase of 8% over the 2013 catch (Table 2). The WCP-CA yellowfin catch for 2014 (600,699t - 21%)[1] was lower than the highest value (603,244t), recorded in 2008. The WCP-CA bigeye catch for 2014 (161,064t - 6%) was a drop from the highest value (190,145t), recorded in 2004, but is an 8% increase from the 2013 catch, driven by an increase in longline catch in 2014. The 2014 WCP-CA albacore catch (128,050 - 4%) was a drop from the highest value (147,793t), recorded in 2002, with a small longline catch from the South Pacific stock offset by increases in catch in the North Pacific.

The 2014 purse-seine catch of 2,036,968t was the third-successive record catch for this fishery (Figure 3 and Table 1). The 2014 purse-seine skipjack catch (1,610,638t - 81% of the total skipjack catch) was 8% higher than the 2013 catch. The 2014 purse-seine catch of yellowfin tuna (354,536t) was a 4% increase from 2013. The purse-seine catch estimate for bigeye tuna for 2014 (67,601t) was lower than 2013, and represented 42% of the total 2014 bigeye catch. However, it is important to note that the purse-seine species composition for 2014 will be revised once all observer data for 2014 have been received and processed, and the current estimate should therefore considered preliminary.

[1]Note: The 2014 species catch estimates differ slightly from the 2014 WCPFC Tuna Fishery Yearbook (but total tuna catch is the same) due to a catch update after the yearbook was published. The numbers presented here will match those presented in WCPFC Tuna Fishery Yearbook 2014 rev.1

The 2014 longline catch of 263,462t represents a decrease from the highest value (284,782t) recorded in 2004 (Figure 4 and Table 1). The recent longline catch estimates are often uncertain and subject to revision due to delays in reporting. Nevertheless, the bigeye (73,314t) catch was higher than 2014 but still low relative to the previous 15 years, while the yellowfin (101,638t) catch for 2014 was the highest since 2004.

The 2014 pole-and-line catch of 215,324t was the lowest catch in over 40 years, and represented a 3% decrease from the 2013 catch (Figure 5 and Table 1). Skipjack tends to account for the majority of the catch (85%). Yellowfin tuna (13%) make up the bulk of the remaining pole-and-line catch. The Japanese distant-water and offshore fleet and the Indonesian fleet account for most of the WCP-CA pole-and-line catch.

The 2014 troll catch in the WCPO of 103,177t was 14% higher than the 2013 catch, and is a record catch for this fishery - most of the catch being skipjack tuna. South Pacific albacore are also taken by troll catch. Since 2007 New Zealand (averaging about 2,375t catch per year) has had the most consistent effort in the south Pacific albacore troll fishery, with the Unites States landing a small catch (average 273t per year) in that area.

2 Status of tuna stocks

The sections below provide a summary of the recent developments in fisheries for each species, and the results from the most recent stock assessments. A summary of the important biological reference points for the four stocks is provided in Table 3. The three tropical tunas were assessed in 2014, while South Pacific albacore was assessed in 2015. Due to uncertainty in the data for the most recent year in each assessment, for the three tropical tuna assessments only fisheries data through to 2012 were used. Information on the status of other oceanic fisheries resources (e.g., billfishes and sharks) is provided in the section on *Ecosystem Considerations*.

2.1 Skipjack tuna

The 2014 WCP-CA skipjack catch of 1,993,446t was a record catch (Figure 6 and Table 4). As has been the case in recent years, the main contributor to the overall catch of skipjack was catch taken in the purse-seine fishery (1,610,638t in 2014 - 81% of total skipjack catch). The next-highest proportion of the catch was pole-and-line gear (153,635t - 8%). 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 domestic fishery of Japan (Figure 6).

The dominant mode of the WCP-CA skipjack catch (by weight) typically falls in the size range between 40 cm and 60 cm, corresponding to 1-2+ year-old fish (Figure 6). For pole-and-line the fish typically range between 40 cm and 55 cm, while for the domestic fisheries of Indonesia and the Philippines they are much smaller (20-40 cm). It is typically found that skipjack taken in unassociated (free-swimming) schools are larger than those taken in associated schools.

Stock assessment

The most recent assessment of skipjack in the WCPO was conducted in 2014, and included data from 1972 to 2012. While estimates of fishing mortality for skipjack have increased over time, current fishing mortality rates for skipjack tuna are estimated to be about 0.62 times the level

of fishing mortality associated with maximum sustainable yield (F_{MSY}). Therefore, overfishing is not occurring (i.e. $F_{CURRENT} < F_{MSY}$) (Figure 7). Estimated recruitment shows an upward trend over time, but estimated biomass is declining over time, to about 52% of the level predicted in the absence of fishing. Nevertheless, recent spawning biomass levels are estimated to be well above the SB_{MSY} level and the recently adopted limit reference point of 20% of the level predicted in the absence of fishing.

The conclusions of the Western and Central Pacific Fisheries Commission (WCPFC) Scientific Committee at its 10th Regular Session SC10, which were presented as recommendations to the Commission, are reproduced below (emphasis added):

- Recent catch is slightly above the estimated MSY of 1,532,000 mt. The assessment continues to show that the stock is currently only moderately exploited ($F_{current}/F_{MSY}$ = 0.62) and fishing mortality levels are sustainable. However, the continuing increase in fishing mortality and decline in stock size are recognised.
- SC11 advised the WCPFC that there is concern that high catch in the equatorial region could result in range contractions of the stocks, thus reducing skipjack availability to high latitude fisheries.
- Fishing is having a significant impact on stock size, especially in the western equatorial region and can be expected to affect catch rates. The stock distribution is also influenced by changes in oceanographic conditions associated with El Niño and La Niña events, which impact on catch rates and stock size. Additional purse-seine effort will yield only modest gains in long-term skipjack catch and may result in a corresponding increase in fishing mortality for bigeye and yellowfin tunas. The management of total effort in the WCPO should recognise this.
- The spawning biomass is now around the mid-point of the range of candidate TRPs of 40%, 50%, and 60% of unfished spawning stock biomass that WCPFC10 has asked the SC11 to consider for skipjack. SC10 recommended the commission take action to avoid further increases in fishing mortality and keep the skipjack stock around the current levels, with tighter purse-seine control rules and advocates for the adoption of TRP and harvest control rules.

2.2 Yellowfin tuna

The WCPC-CA yellowfin catch in 2014, of 600,699t, was lower than the highest value (603,244t), recorded in 2008 (Figure 8 and Table 5). The purse-seine catch (354,536t) has increased by 4%, and the longline catch (101,638t) has increased by 25%, from 2013 levels, and the longline catch was the highest since 2004. The remainder of the yellowfin tuna catch comes from pole-and-line and troll, and the domestic fisheries in Indonesia, Vietnam and the Philippines. The purse-seine catch of yellowfin tuna is typically around four times the size of the longline catch.

As with skipjack, the great majority of the yellowfin catch is taken in equatorial areas by large purse-seine vessels, and a variety of gear in the Indonesian and Philippine fisheries. The domestic surface fisheries of the Philippines and Indonesia take large numbers of small yellowfin in the range 20-50 cm. In the purse-seine fishery, greater numbers of smaller yellowfin are caught in log and fish aggregating device (FAD) sets than in unassociated sets. A major proportion (by weight) of the purse-seine catch is adult (> 100 cm) yellowfin tuna; the purse-seine catch (by weight) of adult yellowfin tuna is usually higher than the longline catch, which was the case in 2008, where an exceptional catch of large yellowfin in the size range 120-130 cm was experienced

in the purse-seine fishery.

Stock assessment

The most recent assessment of yellowfin tuna in the WCPO was conducted in 2014 and included data from 1952 to 2012. Fishing mortality has increased in recent years. Current fishing mortality rates for yellowfin tuna are estimated to be about 0.72 times the level of fishing mortality associated with maximum sustainable yield (F_{MSY}), which indicates that overfishing is not occurring (Figure 9). However, recent catch is close to or exceeds the MSY by up to 13%. Both biomass and recruitment have declined gradually over the duration of the fishery, with current spawning biomass estimated to be about 38% of the level predicted in the absence of fishing. Nevertheless, recent spawning biomass levels are estimated to be well above the SB_{MSY} level and the recently adopted limit reference point of 20% of the level predicted in the absence of fishing.

The conclusions of the WCPFC Scientific Committee at its 10th Regular Session (SC10), which were presented as recommendations to the Commission, are reproduced below (emphasis added):

- The WCPO yellowfin spawning biomass is above the biomass-based LRP WCPFC adopted, $0.2SB_{F=0}$, and overall fishing mortality appears to be below F_{MSY}. It is highly likely that stock is not experiencing overfishing and is not in an overfished state.
- Latest (2012) catch (612,797mt (SC10-GW-WP-01)) of WCPO yellowfin tuna marginally exceed the MSY (586,400mt).
- The SC also noted that levels of fishing mortality and depletion differ between regions, and that fishery impact was highest in the tropical region (regions 3, 4, 7, 8 in the stock assessment model). The WCPFC could consider measures to reduce fishing mortality from fisheries that take juveniles, with the goal to increase to maximum fishery yields and reduce any further impacts on the spawning potential for this stock in the tropical regions.
- WCPFC could consider a spatial management approach in reducing fishing mortality for yellowfin.
- The SC recommend that the catch of WCPO yellowfin should not be increased from 2012 levels which exceeded MSY and measures should be implemented to maintain current spawning biomass levels until the Commission can agree an appropriate TRP.

2.3 Bigeye tuna

The 2014 WCP-CA bigeye tuna catch was 161,064t, which was a drop from the highest value (190,145t), recorded in 2004. A 4,973t decrease in purse seine catch was partially offset by a 8,894t increase in the longline fishery (Figure 10 and Table 6). The purse-seine catch comprised 7% of the total bigeye catch, and longline, 12% of the bigeye catch, and the remainder was distributed across troll, pole and line, and other gears.

The majority of the WCP-CA catch is taken in equatorial areas, by both 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) (Figure 4). In the equatorial areas much of the longline catch is taken in the central Pacific, contiguous with the important traditional bigeye longline area in the eastern Pacific.

As with skipjack and yellowfin tuna, the domestic surface fisheries of the Philippines and Indonesia take large numbers of small bigeye in the range 20-50 cm. The longline fishery clearly

accounts for most of the catch (by weight) of large bigeye in the WCP-CA. This contrasts with large yellowfin tuna, which (in addition to the longline gear) are also taken in significant amounts from unassociated 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 comes from the handline fishery in the Philippines. Bigeye sampled in the longline fishery are predominantly adult fish, with a mean size of approximately 130 cm (range 80-160 cm).

Stock assessment

The most recent assessment of bigeye tuna in the WCPO was conducted in 2014, and this included data from 1952 to 2014. Fishing mortality is estimated to have increased over time, particularly in recent years, and current levels are 1.57 times the F_{MSY} level ($F_{CURRENT} > F_{MSY}$). Therefore, overfishing is occurring (Figure 11). The biomass of spawners is estimated to have declined over the duration of the fishery, with current spawning biomass estimated to be about 16% of the level predicted in the absence of fishing. Recent spawning biomass levels are estimated to be below both the SB_{MSY} level and the recently adopted limit reference point of 20% of the level predicted in the absence of fishing.

The conclusions of the WCPFC Scientific Committee at its 10th Regular Session (SC10), which were presented as recommendations to the Commission, are reproduced below (emphasis added):

- SC10 noted that the spawning biomass of WCPO bigeye tuna breached the biomass LRP in 2012 and that the stock was overfished. Rebuilding spawning biomass to be above the biomass LRP will require a reduction in fishing mortality.
- SC10 recommended that fishing mortality on WCPO bigeye tuna be reduced. A 36% reduction in fishing mortality from the average levels for 2008-2011 would be expected to return the fishing mortality rate to FMSY. This reduction of at least 36% should also allow the stock to rebuild above the LRP over a period of time. This recommended level of reduction in fishing mortality could also be stated as a minimum 33% reduction from the 2004 level of fishing mortality, or a minimum 26% reduction from the average 2001-2004 level of fishing mortality.
- Overfishing and the increase in juvenile bigeye catch has resulted in a considerable reduction in the potential yield of the WCPO bigeye stock. The loss in yield per recruit due to excess harvest of juvenile fish is substantial. SC10 concluded that MSY levels would increase if the mortality of juvenile bigeye was reduced.
- Fishing mortality varies spatially within the Convention Area with high mortality in the tropical Pacific Ocean. WCPFC could consider a spatial management approach in reducing fishing mortality for bigeye tuna.

2.4 South Pacific albacore tuna

The South Pacific albacore catch in 2014 (128,050t) represented a drop from the highest value (147,793t), recorded in 2002, despite the increasing numbers of vessels in the fishery (Figure 12 and Table 7). Longline fishing has accounted for most of the catch of this stock (81% in the 1990s, but 95% in the most recent 10 years). The troll catch, covering a season spanning November to April, has generally been in the range of 3,000-8,000t, however it has averaged 2,628t over the past five years.

The longline catch is widely distributed in the South Pacific, but with catch concentrated in the western part of the Pacific. Much of the increase in catch is attributed to catch taken by Chinese-Taipei and Chinese vessels fishing north of latitude 20°S. The Pacific Island domestic longline fleet catch is restricted to latitudes 10°-25°S. Troll catch is distributed in New Zealand's coastal waters, mainly off the South Island, and along the sub-tropical convergence zone (STCZ). Usually, less than 20% of the overall South Pacific albacore catch is taken east of 150°W.

The longline fishery takes adult albacore, mostly in the narrow size range of 90-105 cm, and the troll fishery takes juvenile fish in the range 45-80 cm. Juvenile albacore also occasionally appear in the longline catch.

Stock assessment

The most recent stock assessment for South Pacific albacore tuna was undertaken in 2015, and was based on data from 1960 to 2013. For this assessment a single model run (a reference case) was chosen to to represent the stock status of south Pacific albacore tuna. To characterise uncertainty SC11 chose all the grid model runs except for those relating to the alternative regional weight hypothesis. This gave a total of 18 model runs, and we report the 5%, median and 95% values on the base case estimate in this stock status summary.

The assessment indicates that fishing mortality has generally been increasing over time, with $F_{CURRENT}$ (2009-12 average) estimated to be 0.39 times the fishing mortality that will support the MSY. Across the grid $F_{CURRENT}/F_{MSY}$ ranged from 0.13-0.62. This indicates that overfishing is not occurring, but fishing mortality on adults is approaching the assumed level of natural mortality (Figure 13). Spawning biomass levels are above both the level that will support the MSY ($SB_{LATEST}/SB_{MSY} = 2.86$ for the base case and range 1.74-7.03 across the grid) and the adopted LRP of $0.2SB_{F=0}$ ($SB_{LATEST}/SB_{F=0} = 0.40$ for the base case and range 0.30-0.60 across the grid). It is important to note that SB_{MSY} is lower than the limit reference point (0.14 $SB_{F=0}$) due to the combination of the selectivity of the fisheries and maturity of the species.

For the first time, SC considered an index of economic conditions in the South Pacific albacore fishery (MI-WP-03). This index, which integrates fish prices, catch rates and fishing prices, estimates a strong declining trend in economic conditions, reaching an historical low in 2013. While there was a slight recovery in 2014, conditions are still well below the average, primarily due to high fishing costs and continued low catch rates. Domestic vessels from some longline fleets have reduced their fishing effort (i.e., tied up for periods of time) in response to these conditions.

The conclusions of the WCPFC Scientific Committee at its 11th Regular Session (SC11), which were presented as recommendations to the Commission, are reproduced below (emphasis added):

- SC11 noted that South Pacific albacore spawning stock is currently above both the level that will support the MSY and the adopted spawning biomass limit reference point, and overfishing is not occurring (F less than F_{MSY}).
- SC11 further noted that while overfishing is not occurring, further increases in effort will yield little or no increase in long-term catch and will result in further reduced catch rates.
- Decline in abundance of albacore is a key driver in the reduced economic conditions experienced by many PICT domestic longline fleets. Further, reductions in prices are also impacting some distant water fleets.
- For several years, SC has noted that any increases in catch or effort in sub-tropical longline fisheries are likely to lead to declines in catch rates in some regions (10°S-30°S), especially

for longline catch of adult albacore, with associated impacts on vessel profitability.

- Despite the fact that the stock is not overfished and overfishing is not occurring, SC11 reiterated the advice of SC10, recommending that longline fishing mortality and longline catch be reduced to avoid further decline in the vulnerable biomass so that economically viable catch rates can be maintained.

3 Ecosystem considerations

The Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean identified ecosystem issues as an important element in the principles for conservation and management of the tuna resource in the WCP-CA. This section of the report provides a brief summary of the information available from the WCP-CA tuna fishery concerning associated and dependent species, including information about the species composition of the catch from the tuna fisheries and an assessment of the impact of the fishery on these species. It is important to note that most of these species have received limited attention to date and, consequently, it is only possible to provide an assessment of the impact of the fishery for a limited range of species. This section also includes a summary review of recent research and research that is currently being undertaken to learn more about the relationship between the main tuna species and the pelagic ecosystem.

3.1 Catch composition

The tuna fisheries of the WCPO principally target four main tuna species: skipjack, yellowfin, bigeye and albacore tuna. However, the fisheries also catch a range of other species in association with these. Some of the associated species (bycatch) are of commercial value (by-products), while many others are discarded. There are also incidents of the capture of species of ecological and/or social significance ('protected species'), including marine mammals, sea birds, sea turtles and some species of shark (e.g. whale sharks).

The information concerning the catch composition of the main tuna fisheries in the WCPO comes largely from the various observer programmes operating in the region. Overall, catch (in weight) from unassociated and associated purse-seine sets are dominated by tuna species (99.6% and 98.5%, respectively), with anchored FAD sets having a lower bycatch rate (99.2% tuna) than drifting Fads. There is limited interaction with protected species, such as whale sharks and manta rays (Figure 14). Historically, some vessels deliberately set around whale sharks associated with tuna schools, but this practice has been banned. In a very small percentage of cases of free schools sets a whale shark is encountered despite not being observed before the set was made.

Species composition of the catch has also been estimated for three main longline fisheries operating in the WCPO: the western tropical Pacific (WTP) shallow-setting longline fishery; the WTP deep-setting longline fishery; and the western South Pacific (WSP) albacore fishery. While estimates are uncertain due to the low level of observer coverage, some general conclusions are possible. The main tuna species account for 46.4%, 74.3%, 70.5% and 41.2% of the total catch (by weight) of the shallow-set, deepset, albacore and shark target longline fisheries respectively (Figure 14). The WTP shallow fishery has a higher proportion of non-tuna species in the catch, principally shark and billfish species, while mahi mahi and opah (moonfish) represent a significant component of the WSP albacore longline catch. There are also considerable differences in the

species composition of the billfish catch in the three fisheries. Overall, the WTP shallow and WSP albacore fisheries catch a higher proportion of surface-orientated species than does the WTP deep-setting fishery. Silky sharks are the most common shark species in the shallow set and shark target longline fisheries, while blue sharks are the most common in the deep set and albacore target shark fisheries (Figure 14).

Interactions with seabirds and marine mammals were very low in all three longline fisheries. Catch of five species of marine turtles were observed in the equatorial longline fishery, although the observed encounter rate was very low, and most of the turtles caught were alive at the time of release. The status of silky and oceanic whitetip sharks is of current concern as assessments have shown that both species are severely depleted. The recent WCPFC ban on the use of 'shark lines' should reduce the catch of silky and oceanic whitetip sharks.

3.2 Impact of catch

In addition to the main tuna species, annual catch estimates for the WCPO in 2014 are available for the main species of billfish (swordfish [21,567t], blue marlin [19,919t], striped marlin [3,911t] and black marlin [2,454t]). For all of these species current catch is around the average for the past decade. Catch of other associated species cannot be accurately quantified using logsheet data, but estimates should be possible in future when longline observer coverage increases. Purse-seine observer coverage is already sufficiently high to estimate catch of associated species.

Over the past several years stock assessments have been undertaken for several billfish and shark species, in addition to the main tuna species. The SC recommendations to the Commission are broadly summarised as follows:

- Stabilise stock size or catch/no increase in fishing pressure
  - Skipjack tuna
  - Yellowfin tuna
  - Southwest Pacific swordfish
  - Pacific-wide blue marlin
- Reduce catch and/or rebuild the stock and/or reduce effort
  - Bigeye tuna
  - Pacific bluefin tuna
  - South Pacific albacore tuna
  - Southwest Pacific striped marlin
  - Western and central north Pacific striped marlin
  - Silky shark
  - Oceanic whitetip shark

3.3 Tuna tagging

Large-scale tagging experiments are required to provide the level of information (fishery exploitation rates and population size) that is necessary to enable tuna stock assessments of tropical tunas in the western and central Pacific Ocean. Tagging data have the potential to provide

significant information of relevance to stock assessment, either by way of stand-alone analyses or, preferably, through their integration with other data directly in the stock assessment model. Tuna tagging has been a core activity of the Oceanic Fisheries Programme over the last 30 years, with tagging campaigns occurring in the 1970s, 1990s and, most recently, since 2006. This most recent campaign has now tagged and released 401,448 tuna in the equatorial western and central Pacific Ocean, with 61,636 reported recaptures (Figure 15). A summary of tag releases and recoveries is provided in Table 8.

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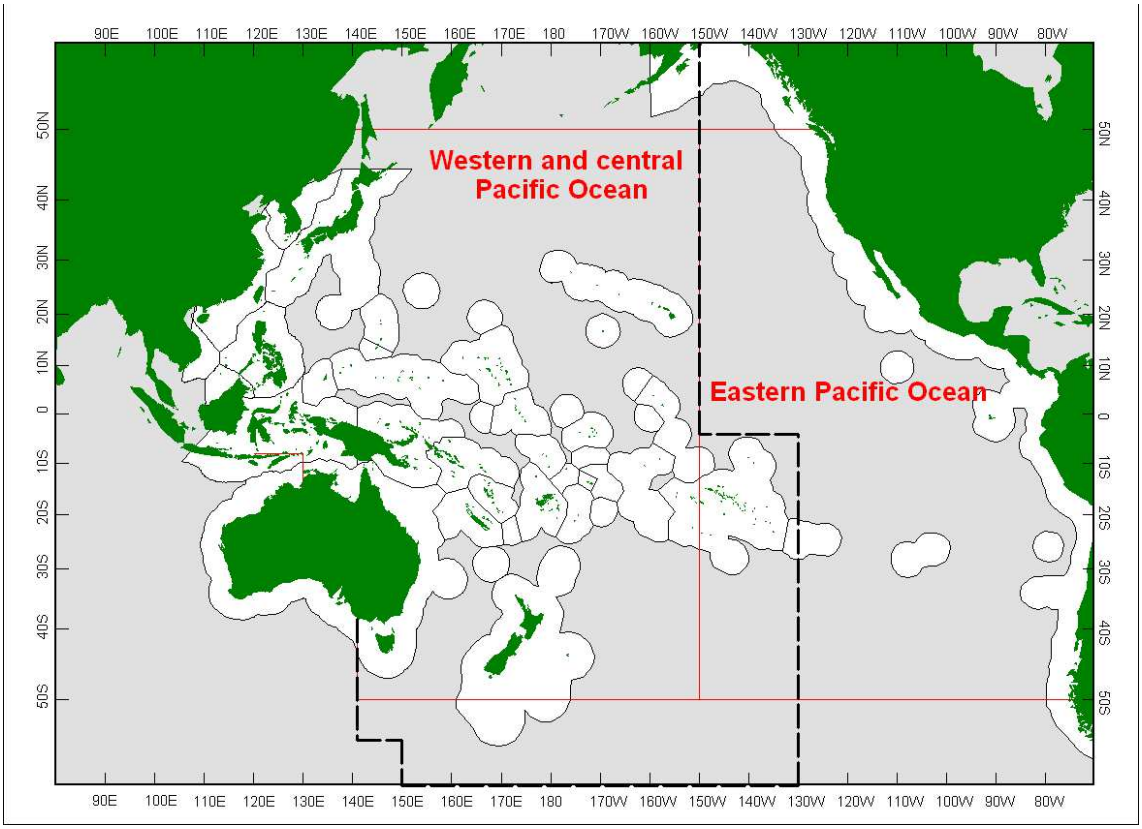

Figure 1: The western and central Pacific Ocean (WCPO), the eastern Pacific Ocean (EPO) and the WCPFC Convention Area boundary. Note: WCP-CA in dashed lines.

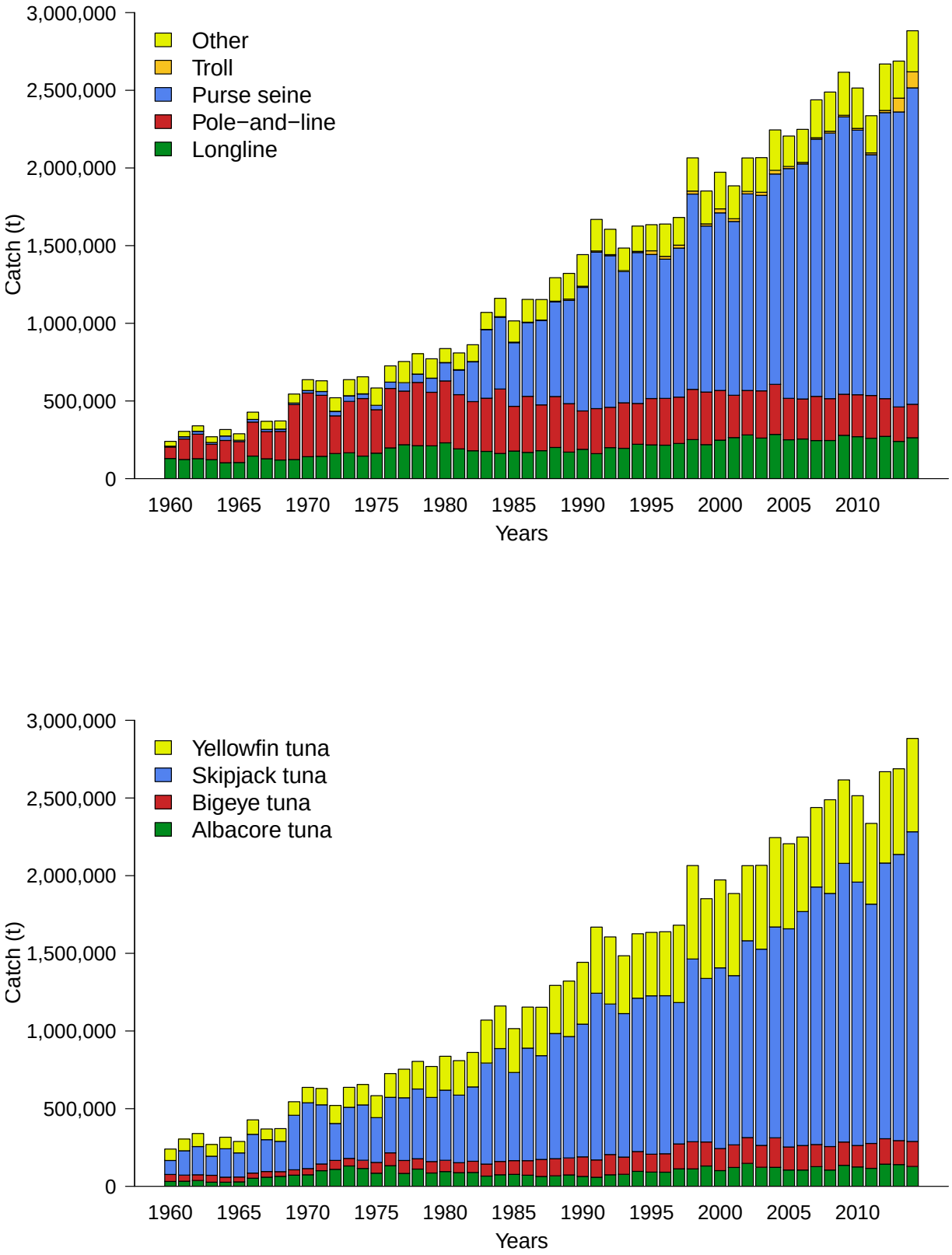

Figure 2: Catch (metric tonnes) by gear (top) and species (bottom) for the western and central Pacific region, 1960-2014. Note: data for 2014 are preliminary.

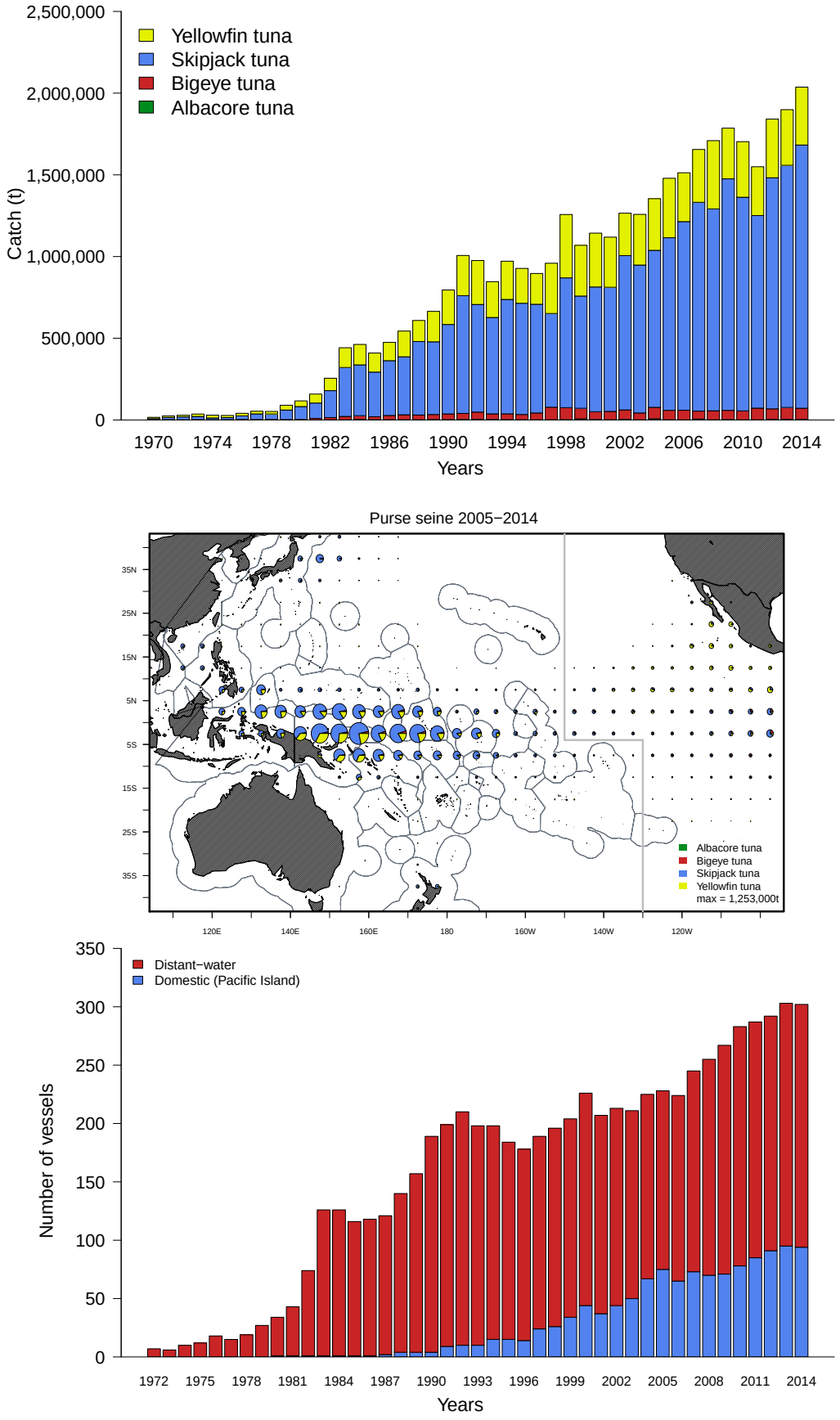

Figure 3: Time series of catch (t) (top), recent spatial distribution of catch (middle), and fleet sizes (bottom) for the purse-seine fishery in the western and central Pacific Ocean (WCPO).

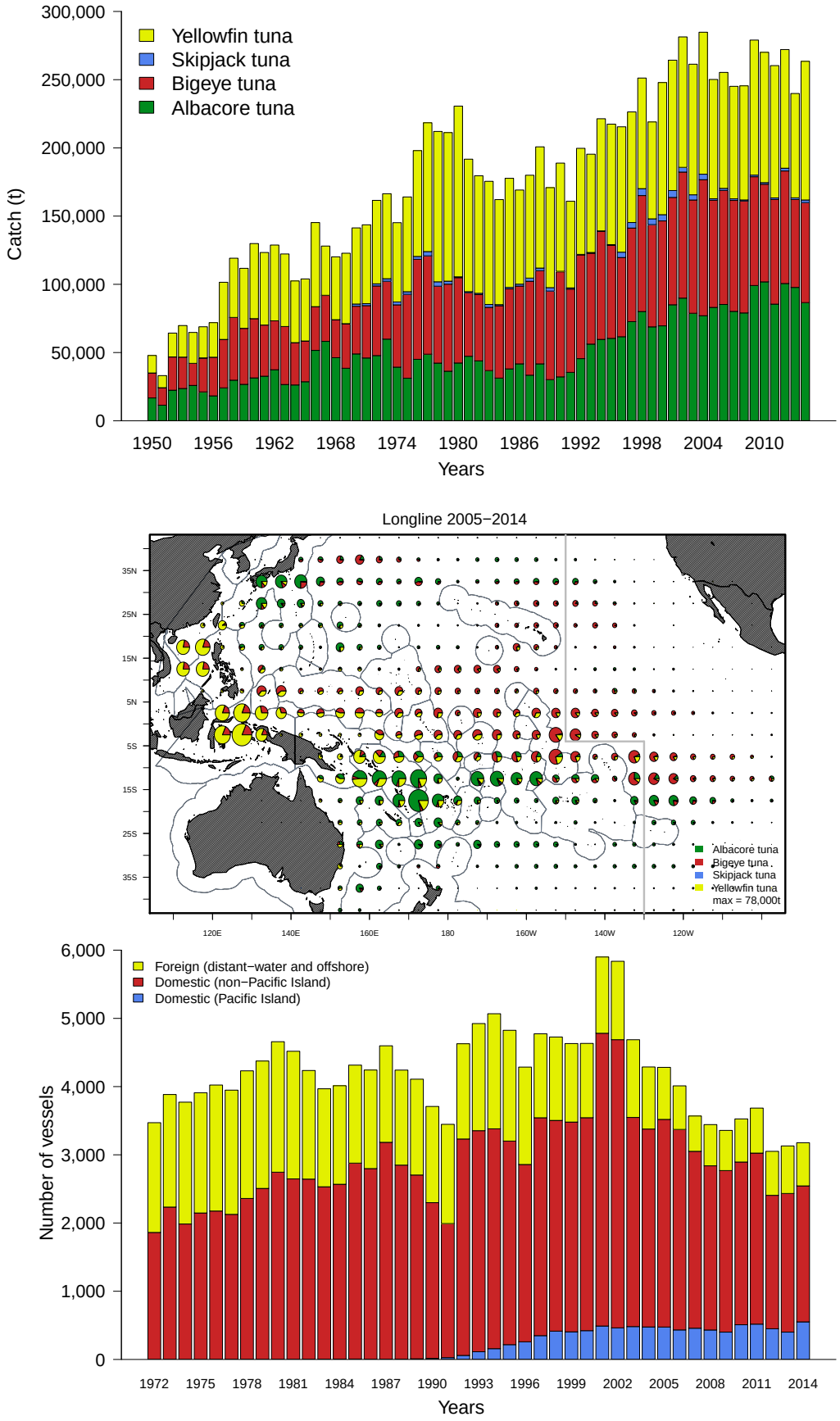

Figure 4: Time series of catch (t) (top), recent spatial distribution of catch (middle), and fleet sizes (bottom), for the longline fishery in the western and central Pacific Ocean (WCPO).

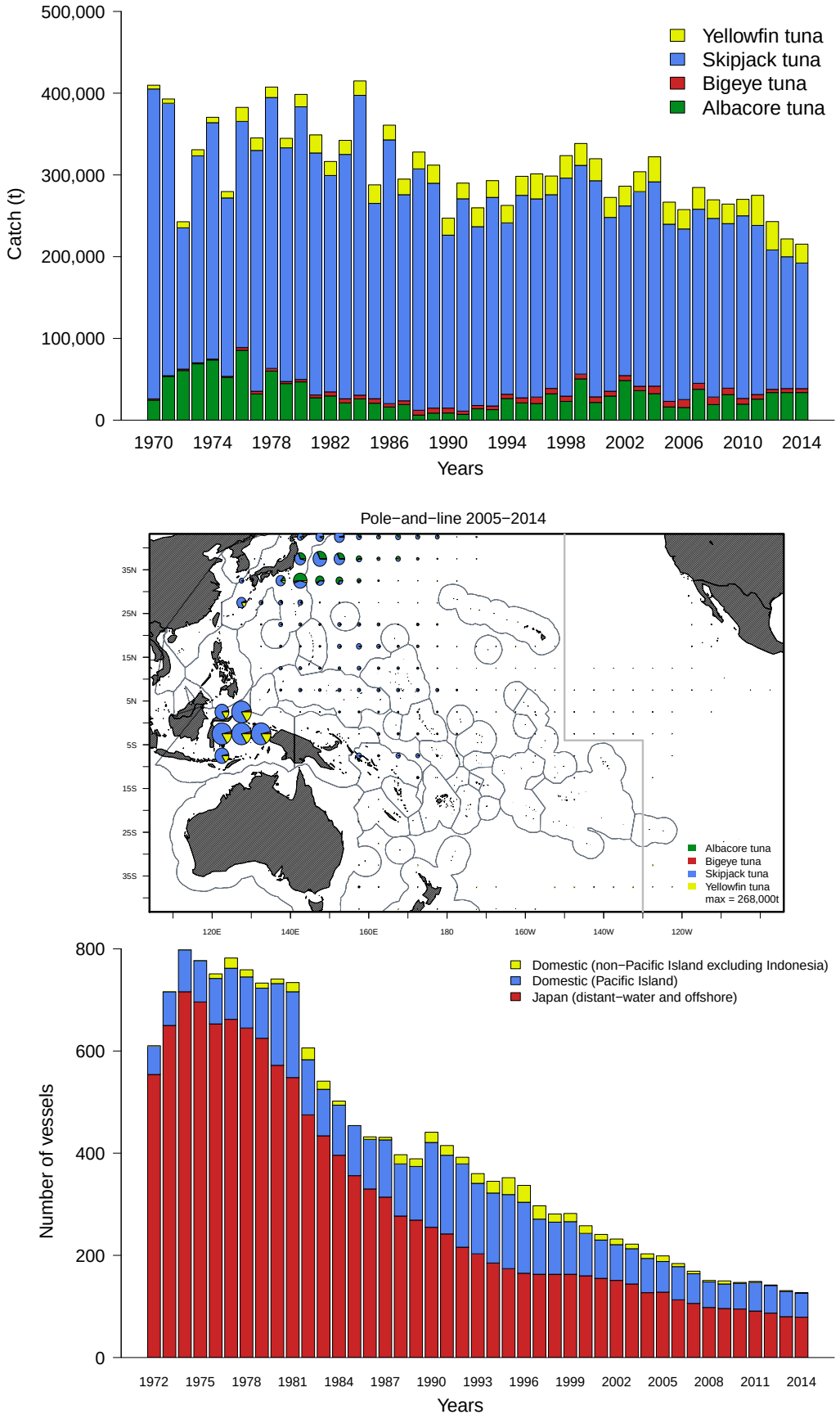

Figure 5: Time series of catch (t) (top), recent spatial distribution of catch (middle), and fleet sizes (bottom), for the pole-and-line fishery in the western and central Pacific Ocean (WCPO).

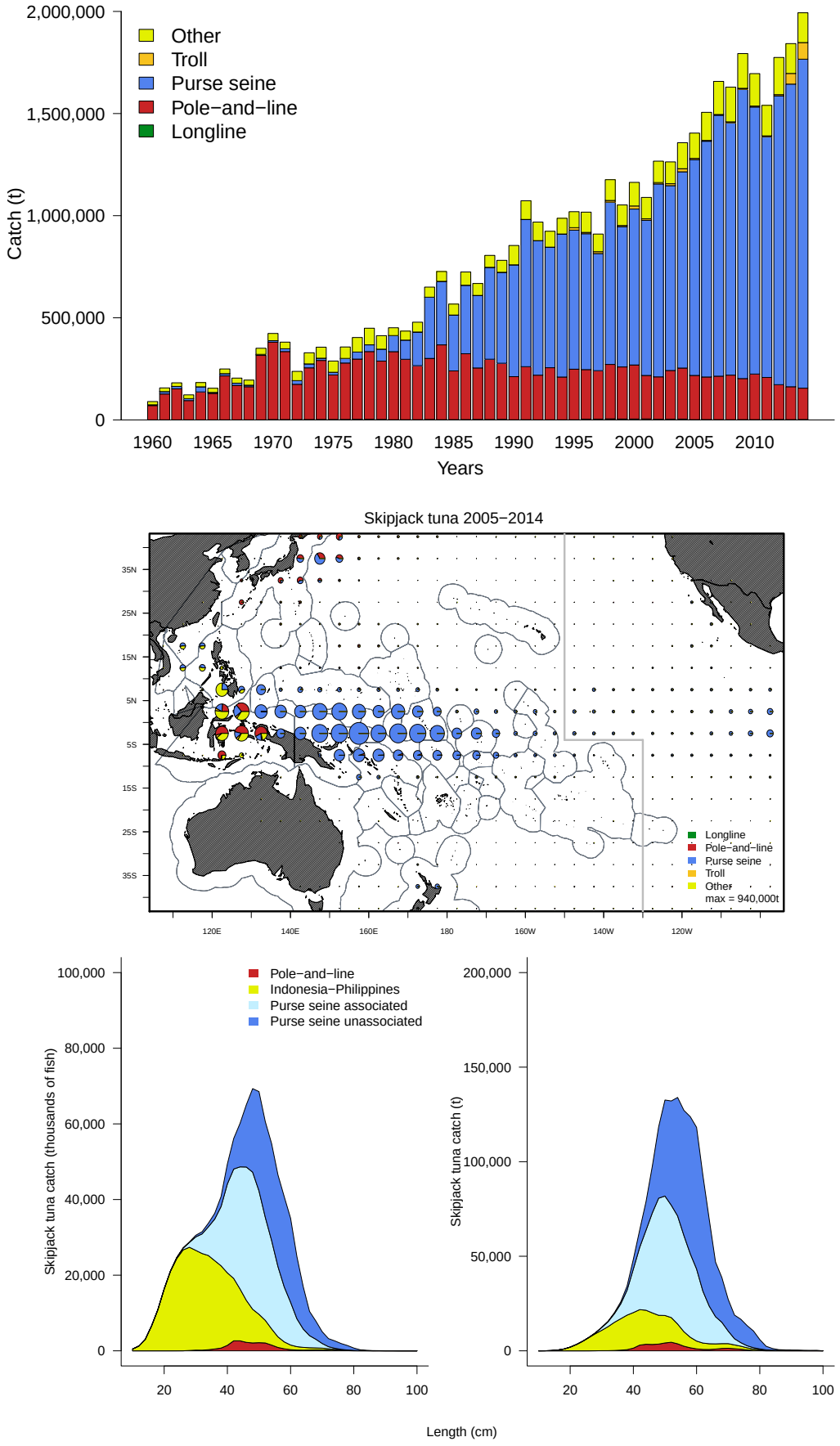

Figure 6: Time series (top), recent spatial distribution (middle), and size composition (average for last five years; bottom) of skipjack tuna catch (t) by gear for the western and central Pacific Ocean (WCPO).

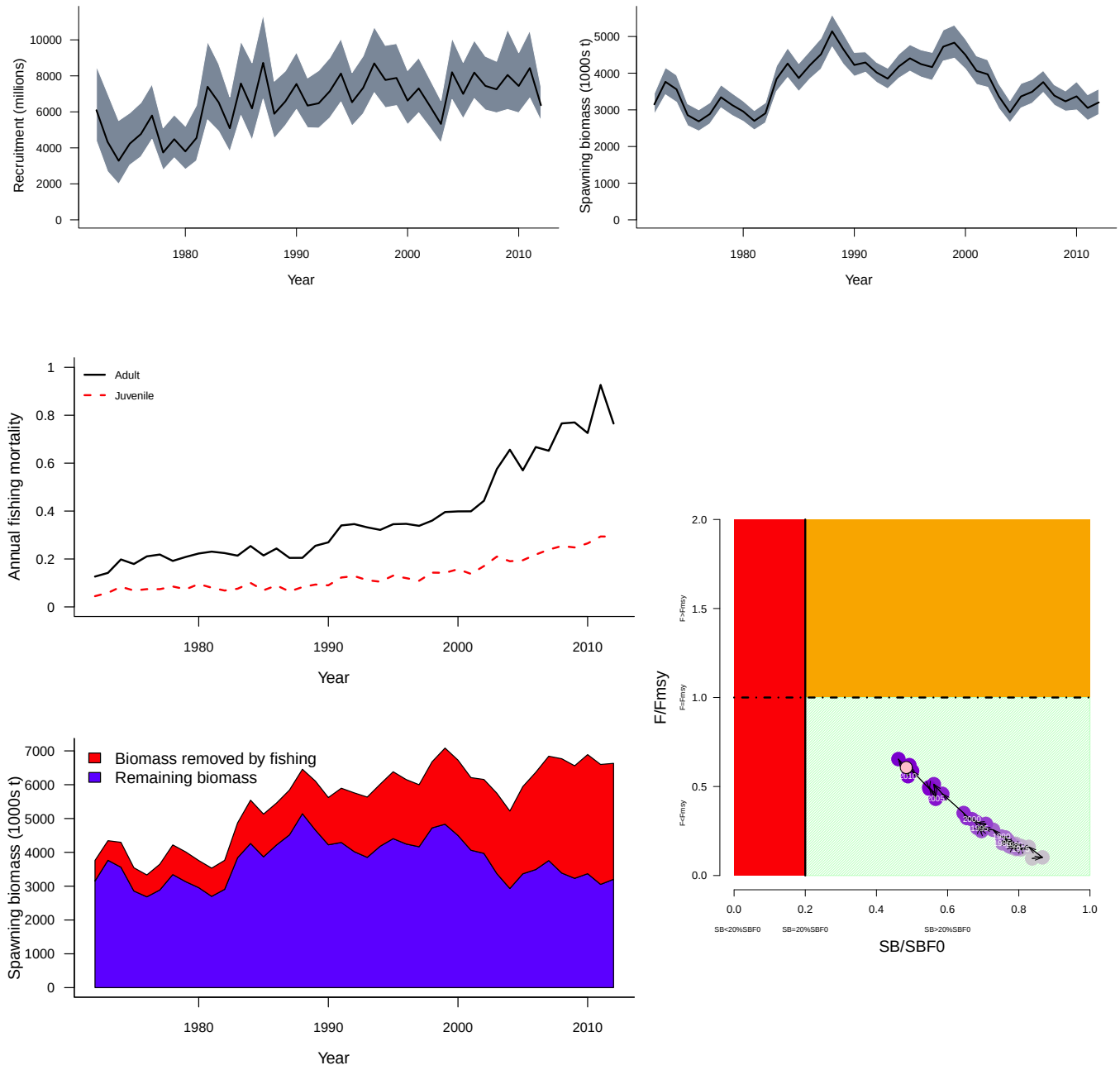

Figure 7: Estimated recruitment (top left), spawning biomass (top right), fishing mortality (middle left), stock status (middle right) and estimated spawning biomass with [blue] and without [red] fishing (bottom left) from the 2014 skipjack tuna stock assessment.

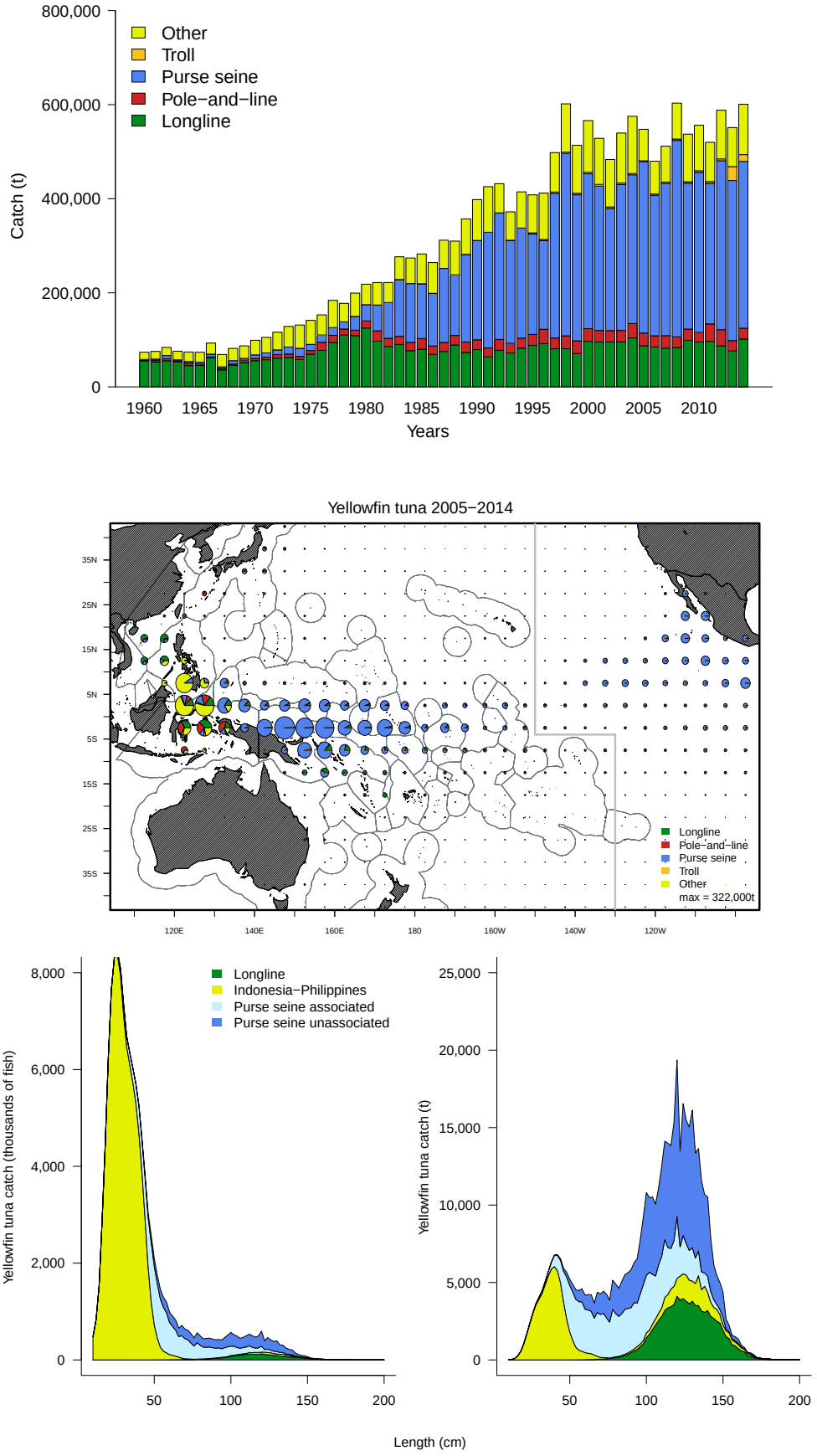

Figure 8: Time series (top), recent spatial distribution (middle), and size composition (average for last five years, bottom) of yellowfin tuna catch (t) by gear for the western and central Pacific Ocean (WCPO).

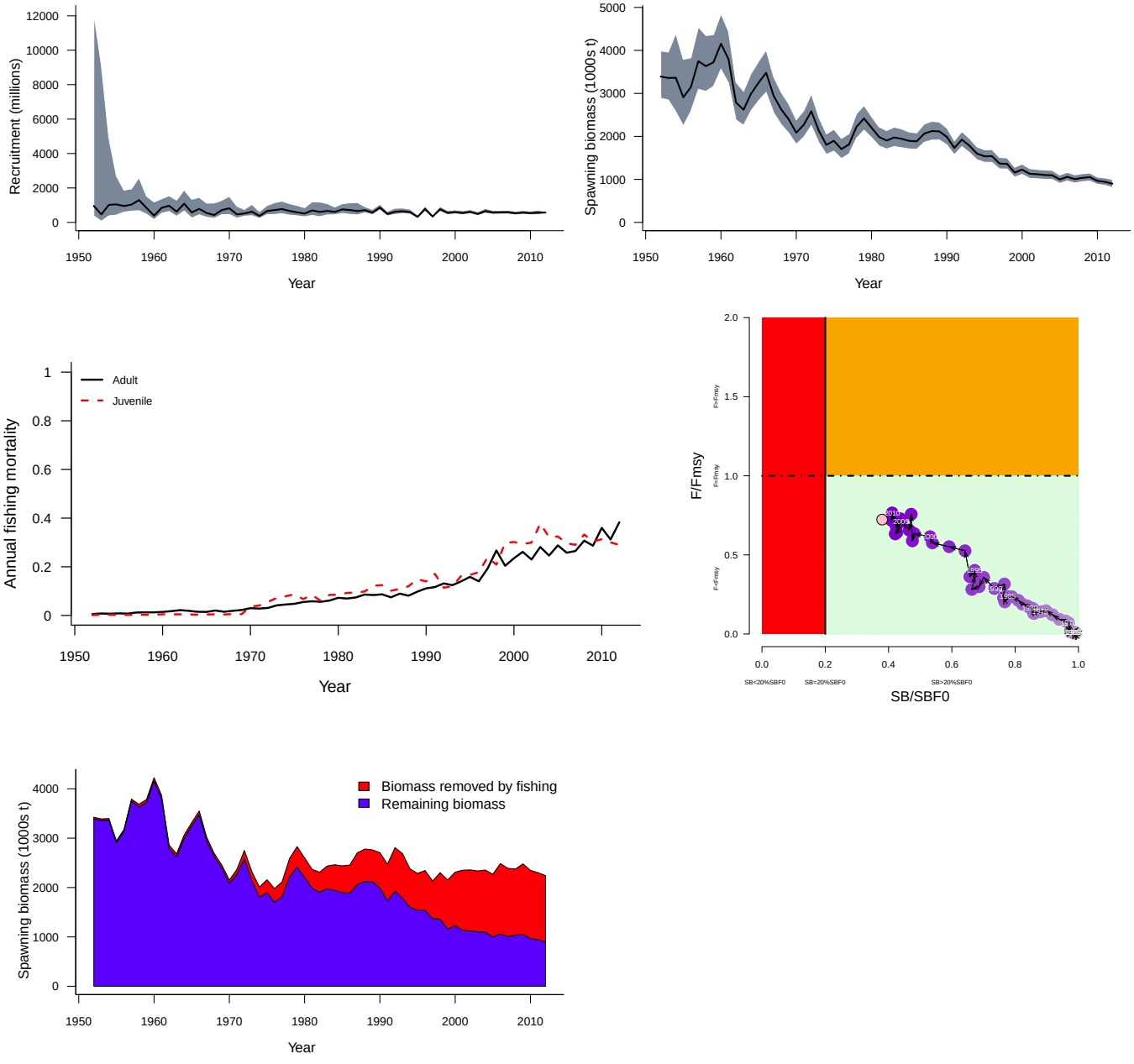

Figure 9: Estimated recruitment (top left), spawning biomass (top right), fishing mortality (middle left), stock status (middle right), estimated spawning biomass with [blue] and without [red] fishing (bottom), from the 2014 yellowfin tuna stock assessment.

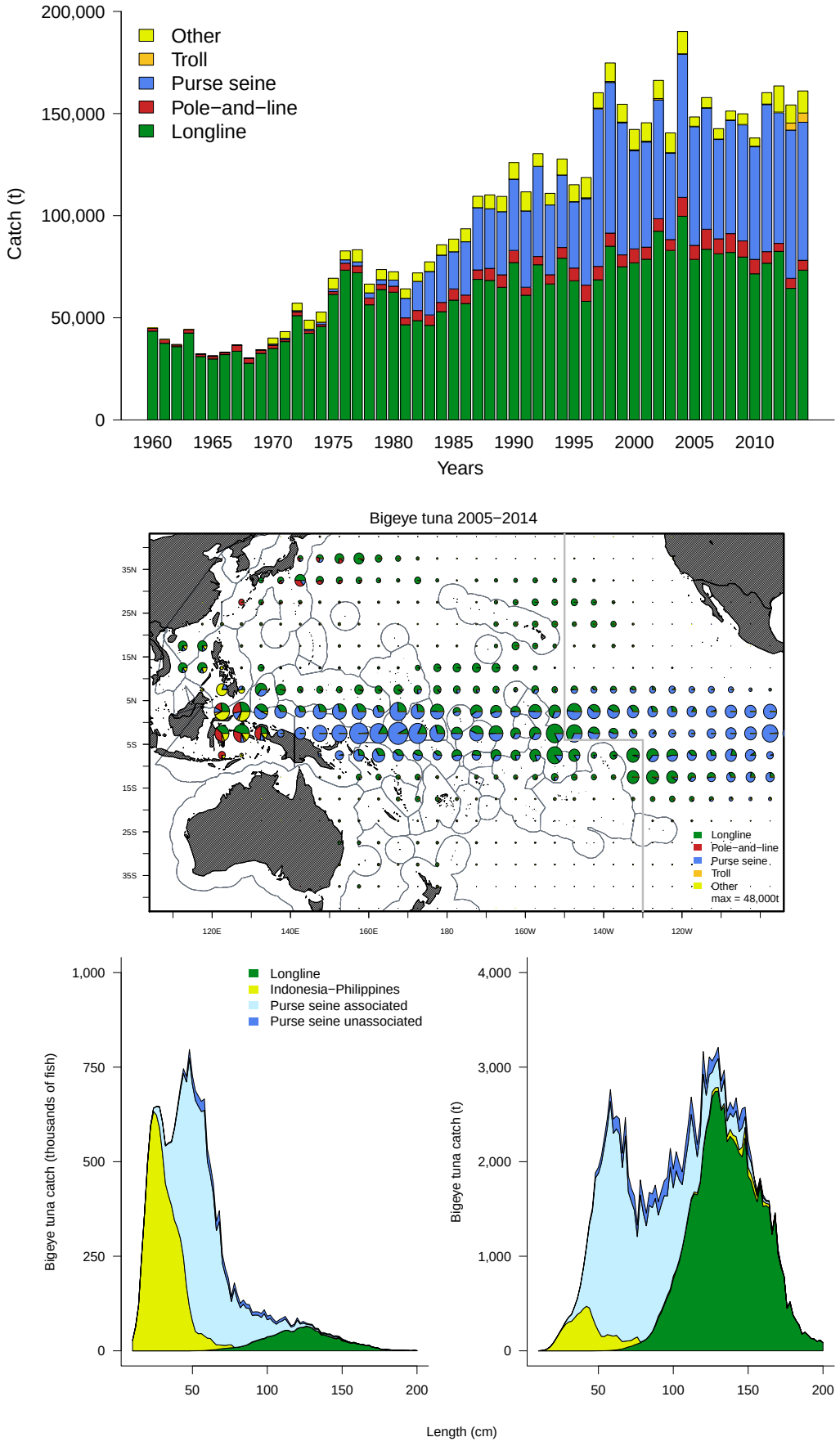

Figure 10: Time series (top), recent spatial distribution (middle), and size composition (average for last five years; bottom) of bigeye tuna catch (t) by gear for the western and central Pacific Ocean (WCPO).

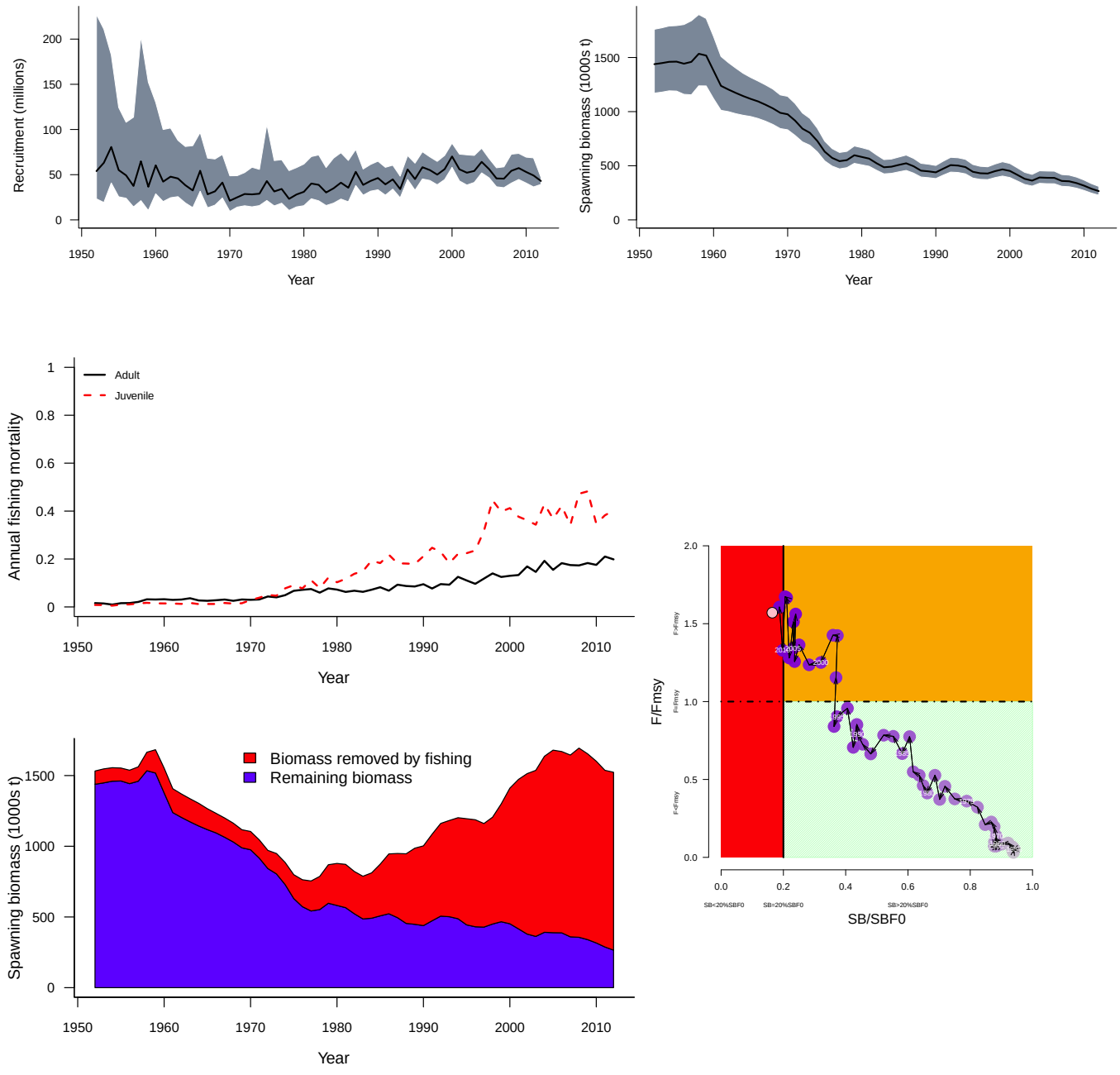

Figure 11: Estimated recruitment (top left), spawning biomass (top right), fishing mortality (middle left), stock status (middle right), and estimated spawning biomass with [blue] and without [red] fishing (bottom left) from the 2014 bigeye tuna stock assessment.

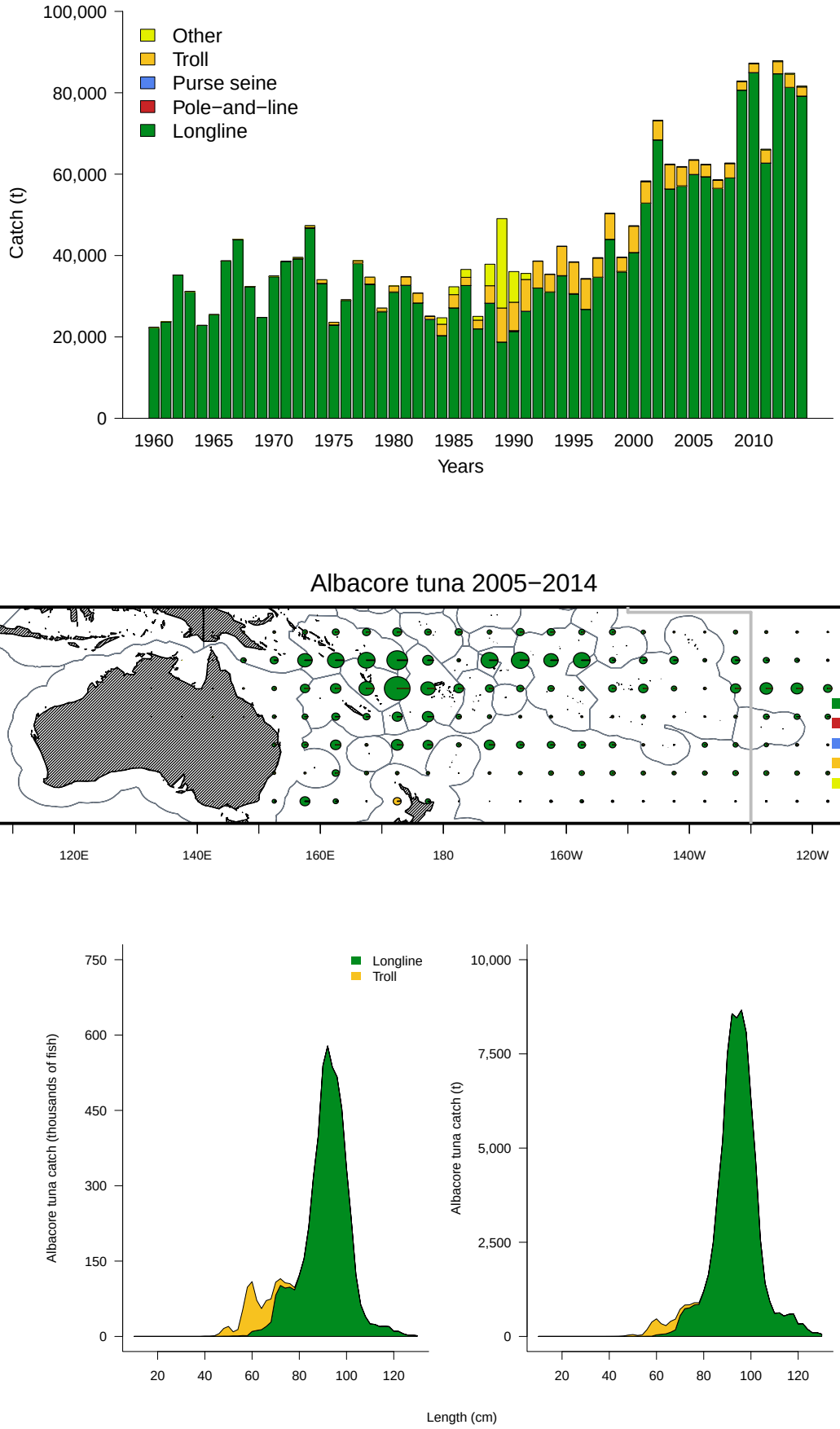

Figure 12: Time series (top), recent spatial distribution (middle), and size composition (average for last five years, bottom) of South Pacific albacore tuna catch (t) by gear for the western and central Pacific Ocean (WCPO).

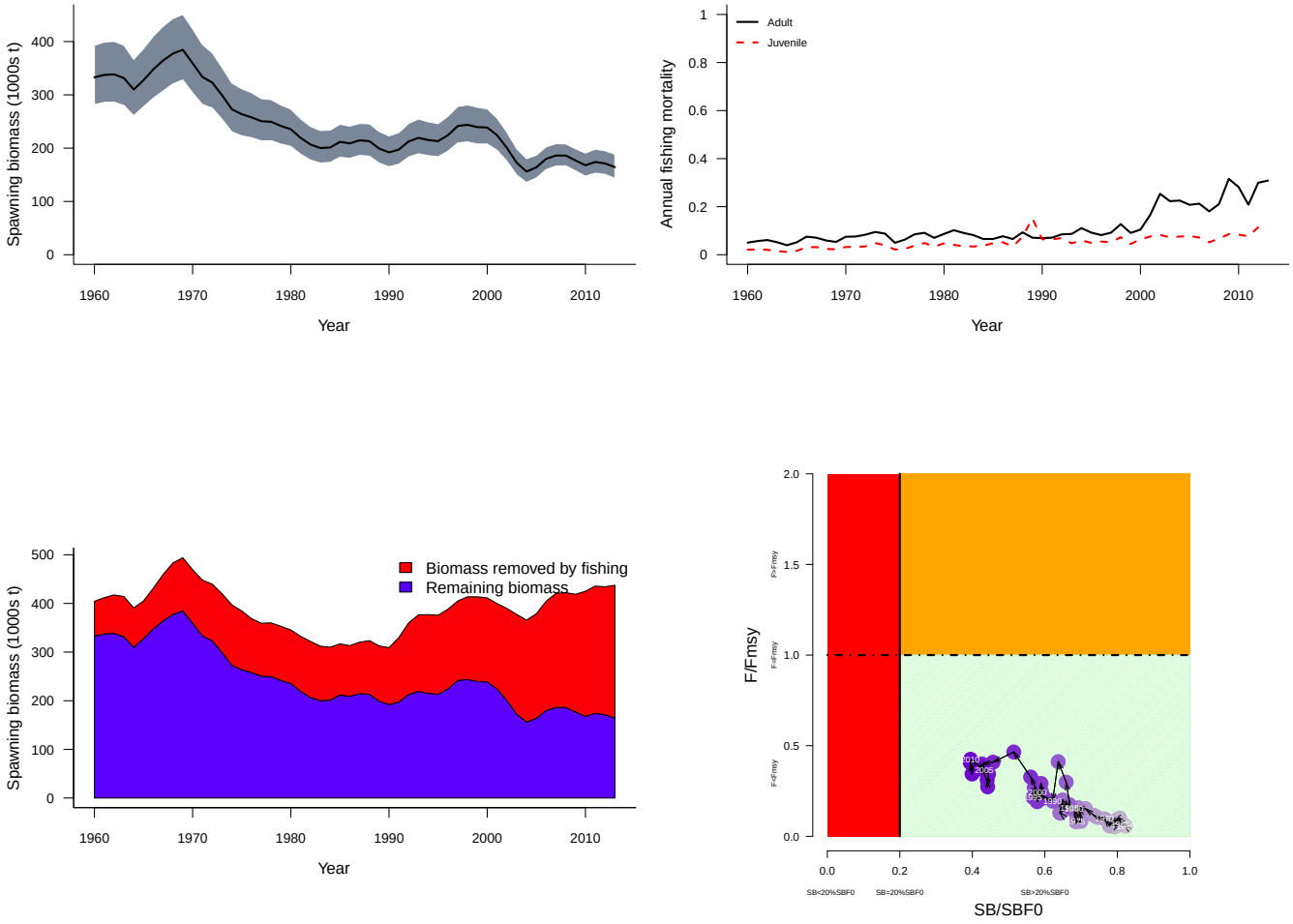

Figure 13: Spawning biomass (top left), fishing mortality (top right), stock status (bottom left), and estimated spawning biomass with [blue] and without [red] fishing (bottom right) from the 2015 South Pacific albacore tuna stock assessment.

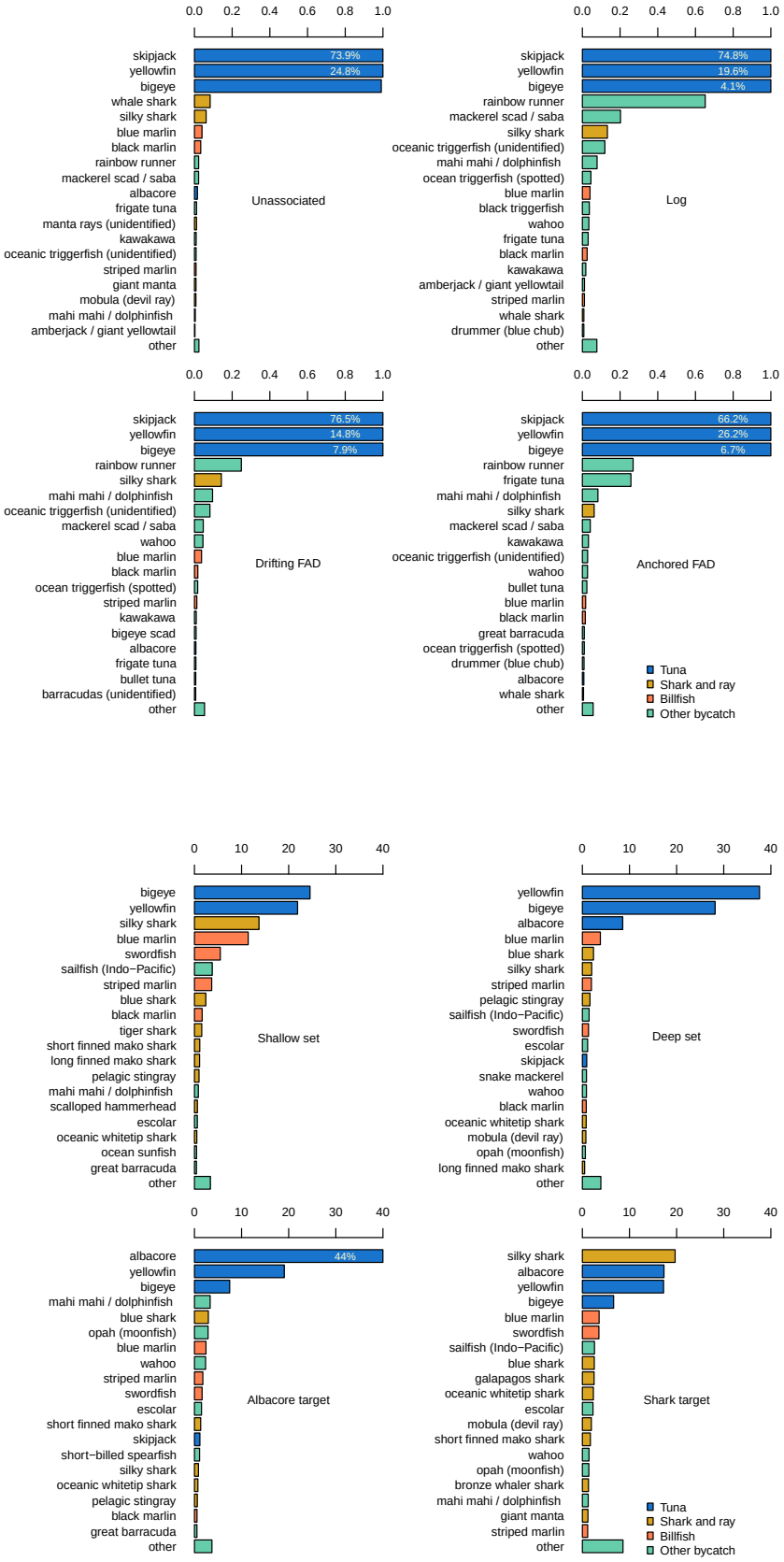

Figure 14: Catch composition of the various categories of purse-seine (top) and longline (bottom) fisheries operating in the WCPO based on observer data based on the last 10 years' data.

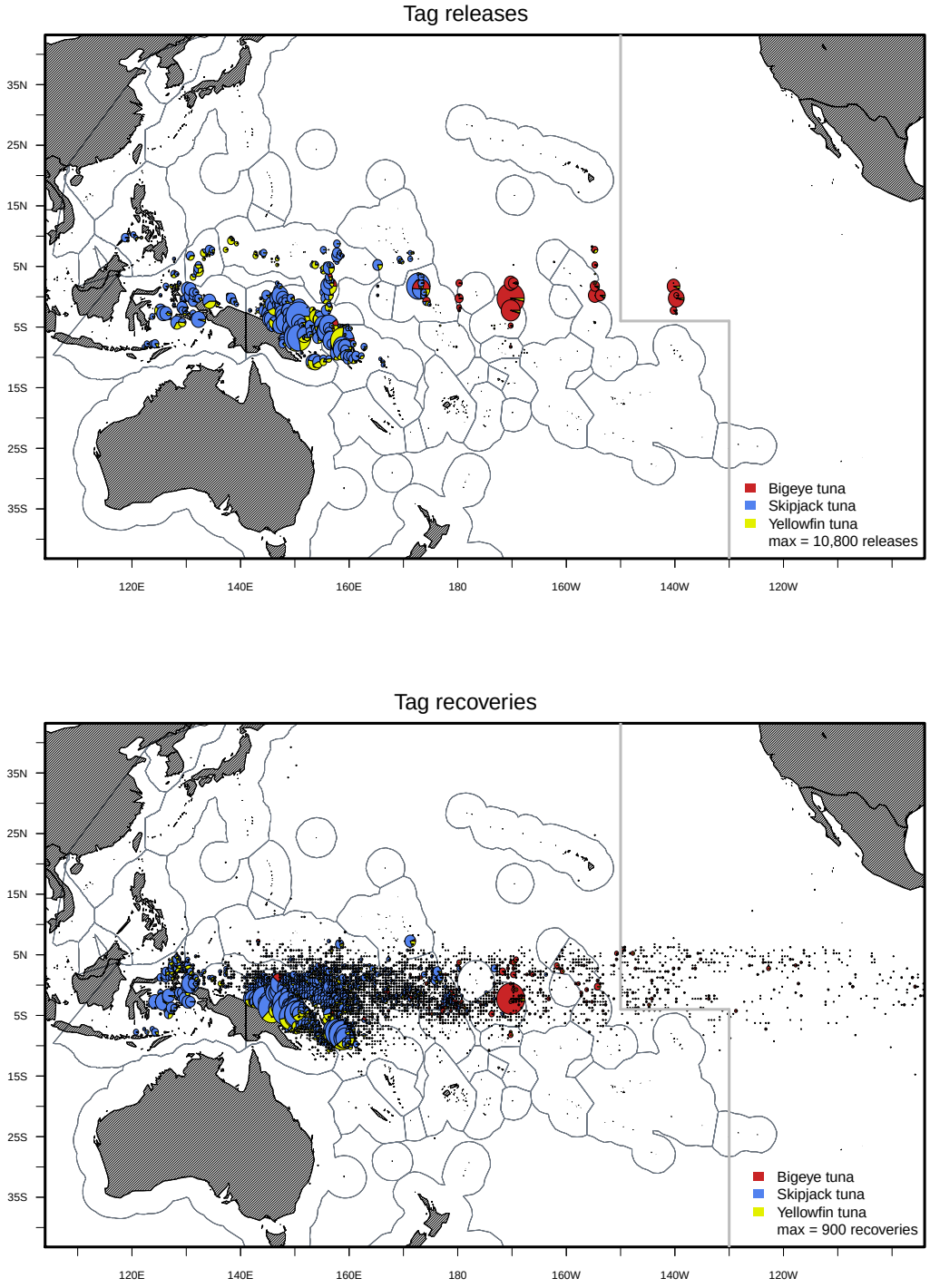

Figure 15: Tag releases (top) and recaptures (bottom) by species from the recent Pacific Tuna Tagging Programme (PTTP).

Table 1: Catch (metric tonnes) by gear for the western and central Pacific region, 1960 to 2014. Note : data for 2014 are preliminary.

Year	Longline	Pole and line	Purse seine	Troll	Other	Total
1960	129,874	73,800	5,224	0	31,195	240,093
1961	123,330	132,070	14,540	0	34,536	304,476
1962	128,804	157,412	18,875	0	34,947	340,038
1963	122,263	98,628	11,934	0	36,795	269,620
1964	102,481	143,323	29,012	0	41,334	316,150
1965	103,955	134,621	8,621	0	41,727	288,924
1966	145,278	218,900	16,913	0	46,993	428,084
1967	128,047	174,774	14,508	5	52,006	369,340
1968	120,136	183,954	15,143	14	52,327	371,574
1969	122,806	354,784	9,483	0	57,703	544,776
1970	141,360	409,754	16,222	50	69,633	637,019
1971	143,625	392,914	24,511	0	68,925	629,975
1972	161,533	242,745	29,030	268	87,209	520,785
1973	166,399	330,841	36,269	484	103,281	637,274
1974	145,192	370,499	29,548	898	109,578	655,715
1975	164,049	279,663	27,685	646	111,669	583,712
1976	198,013	382,627	40,770	25	104,582	726,017
1977	218,413	345,257	53,492	621	136,322	754,105
1978	212,059	407,482	52,040	1,686	131,084	804,351
1979	211,221	344,799	90,102	814	124,684	771,620
1980	230,625	398,498	116,757	1,489	89,969	837,338
1981	191,732	348,917	158,559	2,118	107,884	809,210
1982	179,575	316,457	255,490	2,552	107,990	862,064
1983	175,498	342,287	442,152	949	109,378	1,070,264
1984	162,111	415,016	462,277	3,124	118,478	1,161,006
1985	177,722	287,892	409,534	3,468	136,812	1,015,428
1986	169,129	360,864	474,838	2,284	146,873	1,153,988
1987	179,966	294,879	543,978	2,350	131,849	1,153,022
1988	200,774	327,997	608,996	4,671	151,193	1,293,631
1989	170,876	311,981	664,659	8,687	165,164	1,321,367
1990	188,842	247,104	795,527	7,219	203,508	1,442,200
1991	160,889	290,006	1,006,764	8,004	203,129	1,668,792
1992	199,688	259,762	975,740	6,844	163,536	1,605,570
1993	195,377	293,014	846,116	4,612	145,262	1,484,381
1994	221,367	262,721	971,565	7,493	162,850	1,625,996
1995	217,417	298,301	927,490	23,585	168,062	1,634,855
1996	215,466	301,279	896,443	17,807	208,032	1,639,027
1997	226,375	298,666	959,215	18,732	178,199	1,681,187
1998	251,197	323,645	1,257,389	19,099	213,779	2,065,109
1999	219,024	338,480	1,068,959	13,476	211,900	1,851,839

Table 1: ***(continued)***

Year	Longline	Pole and line	Purse seine	Troll	Other	Total
2000	247,904	319,854	1,143,295	25,845	235,670	1,972,568
2001	264,291	272,483	1,118,919	17,329	211,934	1,884,956
2002	281,369	286,202	1,265,453	16,129	215,317	2,064,470
2003	261,346	303,905	1,258,226	19,875	223,218	2,066,570
2004	284,782	322,179	1,354,242	23,445	260,314	2,244,962
2005	250,167	266,735	1,479,331	13,293	195,972	2,205,498
2006	255,328	257,594	1,512,945	10,098	212,599	2,248,564
2007	245,129	284,661	1,655,499	9,249	244,044	2,438,582
2008	245,495	269,551	1,709,352	11,740	252,565	2,488,703
2009	279,027	264,350	1,785,790	9,898	277,286	2,616,351
2010	270,077	270,123	1,703,131	11,320	260,010	2,514,661
2011	260,309	275,070	1,549,770	11,973	239,331	2,336,453
2012	272,079	242,958	1,841,237	14,018	298,991	2,669,283
2013	239,871	221,715	1,899,013	88,870	238,556	2,688,025
2014	263,462	215,324	2,036,968	103,177	264,328	2,883,259

Table 2: Catch (metric tonnes) by species for the four main tuna species taken in the western and central Pacific region, 1960 to 2014. Note : data for 2014 are preliminary.

Year	Albacore tuna	Bigeye tuna	Skipjack tuna	Yellowfin tuna	Total
1960	31,463	45,025	89,938	73,667	240,093
1961	32,922	39,380	156,736	75,438	304,476
1962	37,602	36,868	181,624	83,944	340,038
1963	26,815	44,346	122,703	75,756	269,620
1964	26,687	32,391	182,918	74,154	316,150
1965	28,735	31,333	155,221	73,635	288,924
1966	52,284	33,187	249,514	93,099	428,084
1967	58,822	36,749	204,840	68,929	369,340
1968	64,213	30,426	195,031	81,904	371,574
1969	72,106	34,361	351,031	87,278	544,776
1970	74,350	40,102	423,398	99,169	637,019
1971	100,737	43,233	380,853	105,152	629,975
1972	109,655	57,156	237,764	116,210	520,785
1973	131,149	48,855	328,748	128,522	637,274
1974	115,162	52,808	356,200	131,545	655,715
1975	84,651	69,360	288,310	141,391	583,712
1976	132,947	82,752	357,207	153,111	726,017
1977	83,171	83,315	403,610	184,009	754,105
1978	111,161	66,513	449,032	177,645	804,351
1979	86,007	73,626	412,551	199,436	771,620
1980	95,156	72,556	451,309	218,317	837,338
1981	88,095	64,173	434,972	221,970	809,210
1982	89,496	71,971	478,548	222,049	862,064
1983	65,988	77,386	650,353	276,537	1,070,264
1984	74,540	85,753	726,663	274,050	1,161,006
1985	77,060	88,525	567,271	282,572	1,015,428
1986	71,757	93,584	724,318	264,329	1,153,988
1987	63,645	109,490	668,034	311,853	1,153,022
1988	67,948	110,177	805,570	309,936	1,293,631
1989	73,533	109,424	781,365	357,045	1,321,367
1990	63,872	126,032	854,152	398,144	1,442,200
1991	58,322	111,669	1,073,172	425,629	1,668,792
1992	74,452	130,394	968,768	431,956	1,605,570
1993	77,496	110,932	923,776	372,177	1,484,381
1994	96,461	127,740	987,249	414,546	1,625,996
1995	91,750	115,158	1,019,683	408,264	1,634,855
1996	91,140	118,667	1,017,341	411,879	1,639,027
1997	112,900	160,195	910,053	498,039	1,681,187
1998	112,465	174,781	1,176,241	601,622	2,065,109
1999	131,066	154,553	1,052,566	513,654	1,851,839

Table 2: ***(continued)***

Year	Albacore tuna	Bigeye tuna	Skipjack tuna	Yellowfin tuna	Total
2000	101,171	142,228	1,163,130	566,039	1,972,568
2001	121,561	145,491	1,089,420	528,484	1,884,956
2002	147,793	166,237	1,267,002	483,438	2,064,470
2003	122,949	140,531	1,263,462	539,628	2,066,570
2004	122,343	190,145	1,357,261	575,213	2,244,962
2005	105,135	148,346	1,404,443	547,574	2,205,498
2006	104,986	157,829	1,505,961	479,788	2,248,564
2007	126,701	142,605	1,657,565	511,711	2,438,582
2008	104,966	151,235	1,629,258	603,244	2,488,703
2009	135,476	149,874	1,793,700	537,301	2,616,351
2010	124,898	138,044	1,695,584	556,135	2,514,661
2011	115,966	160,251	1,540,313	519,923	2,336,453
2012	142,963	163,537	1,774,705	588,078	2,669,283
2013	140,177	154,199	1,842,472	551,177	2,688,025
2014	128,050	161,064	1,993,446	600,699	2,883,259

Table 3: Biological reference points from the latest stock assessments for South Pacific albacore, bigeye, skipjack, and yellowfin tunas. All biomasses are in metric tonnes (t). B_{CURR} is the average biomass over the last 3-4 years; $SB_{F=0}$ is the average spawning potential predicted to occur in the absence of fishing; MSY is the maximum sustainable yield based on recent patterns of fishing; F_{CURR}/F_{MSY} is the ratio of recent fishing mortality to that which will support the MSY; $SB_{latest}/SB_{F=0}$ Spawning potential in the latest time period relative to that which will produce the maximum sustainable yield MSY.

	Albacore tuna	**Bigeye tuna**	**Skipjack tuna**	**Yellowfin tuna**
B_{CURR}	456,984	742,967	3,615,213	1,994,655
$SB_{F=0}$	408,361	1,613,855	6,303,358	2,368,557
MSY	76,800	108,520	1,532,000	586,400
F_{CURR}/F_{MSY}	0.39	1.57	0.62	0.72
$SB_{latest}/SB_{F=0}$	0.4	0.16	0.48	0.39

Table 4: Skipjack tuna catch (metric tonnes) by gear type for the western and central Pacific region, 1960 to 2014. Note : data for 2014 are preliminary.

Year	Longline	Pole and line	Purse seine	Troll	Other	Total
1960	0	70,428	3,728	0	15,782	89,938
1961	0	127,011	11,693	0	18,032	156,736
1962	4	152,387	11,674	0	17,559	181,624
1963	0	94,757	9,592	0	18,354	122,703
1964	5	137,106	25,006	0	20,801	182,918
1965	11	129,933	4,657	0	20,620	155,221
1966	52	215,600	10,949	0	22,913	249,514
1967	124	168,846	10,940	0	24,930	204,840
1968	83	162,379	7,640	0	24,929	195,031
1969	130	315,795	5,036	0	30,070	351,031
1970	1,608	379,074	7,501	0	35,215	423,398
1971	1,475	333,284	13,665	0	32,429	380,853
1972	1,544	172,827	18,025	0	45,368	237,764
1973	1,861	253,217	19,235	0	54,435	328,748
1974	2,124	289,202	10,852	0	54,022	356,200
1975	1,919	218,271	13,101	0	55,019	288,310
1976	2,096	276,582	22,422	0	56,107	357,207
1977	3,127	294,641	34,602	0	71,240	403,610
1978	3,233	331,401	33,169	0	81,229	449,032
1979	2,179	285,859	58,371	0	66,142	412,551
1980	632	333,597	78,784	12	38,284	451,309
1981	756	296,065	93,910	17	44,224	434,972
1982	972	264,726	164,748	64	48,038	478,548
1983	2,144	298,928	299,621	154	49,506	650,353
1984	870	366,811	310,574	284	48,124	726,663
1985	1,108	238,932	273,325	146	53,760	567,271
1986	1,439	322,665	335,249	219	64,746	724,318
1987	2,329	252,142	354,861	168	58,534	668,034
1988	1,937	295,325	449,731	299	58,278	805,570
1989	2,507	275,088	445,089	244	58,437	781,365
1990	363	211,573	547,457	176	94,583	854,152
1991	885	259,778	720,784	148	91,577	1,073,172
1992	432	218,765	658,514	168	90,889	968,768
1993	573	255,152	589,994	175	77,882	923,776
1994	379	209,636	700,042	228	76,964	987,249
1995	598	247,744	680,700	12,298	78,343	1,019,683
1996	3,935	242,486	665,171	6,514	99,235	1,017,341
1997	4,070	236,999	573,506	9,218	86,260	910,053
1998	5,030	266,772	794,437	8,316	101,686	1,176,241
1999	4,208	255,330	686,790	5,660	100,578	1,052,566

Table 4: ***(continued)***

Year	Longline	Pole and line	Purse seine	Troll	Other	Total
2000	4,559	264,407	763,586	15,005	115,573	1,163,130
2001	5,059	212,668	759,742	7,536	104,415	1,089,420
2002	3,450	207,488	944,457	6,796	104,811	1,267,002
2003	3,824	238,179	904,979	9,721	106,759	1,263,462
2004	4,051	249,936	960,792	15,118	127,364	1,357,261
2005	1,084	216,715	1,056,573	6,302	123,769	1,404,443
2006	1,528	208,731	1,154,297	3,987	137,418	1,505,961
2007	1,175	213,010	1,277,592	3,598	162,190	1,657,565
2008	803	218,570	1,235,550	4,572	169,763	1,629,258
2009	1,219	201,323	1,416,844	4,252	170,062	1,793,700
2010	1,191	223,409	1,307,476	4,705	158,803	1,695,584
2011	1,124	206,843	1,178,489	4,214	149,643	1,540,313
2012	2,004	170,538	1,413,974	6,235	181,954	1,774,705
2013	1,254	161,220	1,481,754	52,155	146,089	1,842,472
2014	1,895	153,635	1,610,638	81,298	145,980	1,993,446

Table 5: Yellowfin tuna catch (metric tonnes) by gear type for the western and central Pacific region, 1960 to 2014. Note : data for 2014 are preliminary.

Year	Longline	Pole and line	Purse seine	Troll	Other	Total
1960	55,020	1,872	1,438	0	15,337	73,667
1961	53,166	3,259	2,777	0	16,236	75,438
1962	55,547	4,225	6,975	0	17,197	83,944
1963	53,185	2,071	2,277	0	18,223	75,756
1964	45,247	5,074	3,647	0	20,186	74,154
1965	45,493	3,434	3,752	0	20,956	73,635
1966	61,654	2,192	5,844	0	23,409	93,099
1967	36,083	3,125	3,418	0	26,303	68,929
1968	46,070	2,706	7,043	0	26,085	81,904
1969	51,627	5,166	3,873	0	26,612	87,278
1970	55,806	4,606	7,824	0	30,933	99,169
1971	57,766	5,248	9,244	0	32,894	105,152
1972	61,175	7,465	10,064	0	37,506	116,210
1973	62,291	7,458	14,945	0	43,828	128,522
1974	58,116	6,582	17,406	0	49,441	131,545
1975	69,462	7,801	13,099	0	51,029	141,391
1976	77,570	17,186	15,589	0	42,766	153,111
1977	94,414	15,257	16,268	0	58,070	184,009
1978	110,202	12,767	15,275	0	39,401	177,645
1979	108,910	11,638	29,323	0	49,565	199,436
1980	125,113	15,142	34,627	9	43,426	218,317
1981	97,114	22,044	54,820	16	47,976	221,970
1982	86,149	17,123	75,923	54	42,800	222,049
1983	90,259	17,184	120,887	51	48,156	276,537
1984	76,988	17,633	125,150	67	54,212	274,050
1985	79,973	22,717	116,484	69	63,329	282,572
1986	68,999	17,970	111,931	62	65,367	264,329
1987	75,407	19,044	157,408	48	59,946	311,853
1988	88,855	20,566	128,861	76	71,578	309,936
1989	73,306	22,133	186,119	73	75,414	357,045
1990	79,300	20,769	211,159	68	86,848	398,144
1991	63,512	19,182	245,968	51	96,916	425,629
1992	77,739	23,043	268,950	98	62,126	431,956
1993	72,055	20,486	219,042	141	60,453	372,177
1994	82,184	21,378	234,006	101	76,877	414,546
1995	88,306	23,209	213,218	2,570	80,961	408,264
1996	91,887	30,551	188,374	2,636	98,431	411,879
1997	81,065	22,845	307,536	2,838	83,755	498,039
1998	81,077	27,506	387,620	2,806	102,613	601,622
1999	71,023	26,787	310,622	3,162	102,060	513,654

Table 5: ***(continued)***

Year	Longline	Pole and line	Purse seine	Troll	Other	Total
2000	96,851	26,957	329,223	3,343	109,665	566,039
2001	95,540	24,443	306,727	3,716	98,058	528,484
2002	95,644	24,133	259,534	3,172	100,955	483,438
2003	95,712	24,304	310,241	3,101	106,270	539,628
2004	104,059	30,640	316,162	2,706	121,646	575,213
2005	87,417	27,007	363,775	2,508	66,867	547,574
2006	84,994	23,653	298,926	2,607	69,608	479,788
2007	82,434	26,570	323,554	2,854	76,299	511,711
2008	83,637	22,705	417,574	2,903	76,425	603,244
2009	98,944	23,918	310,038	3,027	101,374	537,301
2010	95,521	20,112	340,181	3,611	96,710	556,135
2011	96,963	36,838	298,791	3,802	83,529	519,923
2012	86,976	34,705	359,073	3,935	103,389	588,078
2013	76,456	21,806	340,492	29,435	82,988	551,177
2014	101,638	23,077	354,536	14,545	106,903	600,699

Table 6: Bigeye tuna catch (metric tonnes) by gear type for the western and central Pacific region, 1960 to 2014. Note : data for 2014 are preliminary.

Year	Longline	Pole and line	Purse seine	Troll	Other	Total
1960	43,467	1,500	58	0	0	45,025
1961	37,517	1,800	63	0	0	39,380
1962	35,895	800	173	0	0	36,868
1963	42,540	1,800	6	0	0	44,346
1964	30,989	1,143	231	0	28	32,391
1965	29,848	1,254	201	0	30	31,333
1966	31,984	1,108	9	0	86	33,187
1967	33,632	2,803	61	0	253	36,749
1968	27,757	2,272	193	0	204	30,426
1969	32,571	1,675	53	0	62	34,361
1970	34,965	1,589	580	0	2,968	40,102
1971	38,359	931	700	0	3,243	43,233
1972	51,040	1,762	664	0	3,690	57,156
1973	42,412	1,258	736	0	4,449	48,855
1974	45,653	1,039	1,129	0	4,987	52,808
1975	61,488	1,334	1,326	0	5,212	69,360
1976	73,325	3,423	1,650	0	4,354	82,752
1977	72,083	3,325	1,953	0	5,954	83,315
1978	56,364	3,337	2,481	0	4,331	66,513
1979	63,837	2,540	2,283	0	4,966	73,626
1980	62,537	2,916	3,017	0	4,086	72,556
1981	46,590	3,382	9,577	0	4,624	64,173
1982	48,578	4,993	14,258	0	4,142	71,971
1983	46,311	5,077	21,294	0	4,704	77,386
1984	52,976	4,557	23,173	0	5,047	85,753
1985	58,629	5,529	18,192	0	6,175	88,525
1986	56,989	4,133	26,116	0	6,346	93,584
1987	68,832	4,602	30,504	0	5,552	109,490
1988	68,288	5,890	29,196	0	6,803	110,177
1989	64,916	6,131	30,930	0	7,447	109,424
1990	77,009	5,985	34,916	0	8,122	126,032
1991	61,033	3,929	37,360	0	9,347	111,669
1992	75,966	4,055	44,172	0	6,201	130,394
1993	66,566	4,505	34,191	0	5,670	110,932
1994	79,175	5,251	35,491	0	7,823	127,740
1995	68,125	6,228	32,395	145	8,265	115,158
1996	58,054	7,940	42,317	432	9,924	118,667
1997	68,597	6,563	77,105	412	7,518	160,195
1998	85,048	6,405	73,778	507	9,043	174,781
1999	74,959	5,856	64,675	316	8,747	154,553

Table 6: ***(continued)***

Year	Longline	Pole and line	Purse seine	Troll	Other	Total
2000	76,912	6,838	48,078	397	10,003	142,228
2001	78,670	5,905	51,476	408	9,032	145,491
2002	92,381	6,109	58,159	713	8,875	166,237
2003	83,016	5,296	42,379	142	9,698	140,531
2004	99,705	9,238	70,088	232	10,882	190,145
2005	78,597	6,851	58,133	220	4,545	148,346
2006	83,560	9,781	59,358	157	4,973	157,829
2007	81,350	7,296	48,671	187	5,101	142,605
2008	82,016	9,204	55,403	212	4,400	151,235
2009	79,736	7,916	56,831	175	5,216	149,874
2010	71,549	7,027	55,144	275	4,049	138,044
2011	76,735	5,655	72,010	251	5,600	160,251
2012	82,516	3,932	63,997	273	12,819	163,537
2013	64,420	4,906	72,574	3,442	8,857	154,199
2014	73,314	4,829	67,601	4,500	10,820	161,064

Table 7: Albacore tuna catch (metric tonnes) by gear type for the western and central Pacific region, 1960 to 2014. Note : data for 2014 are preliminary.

Year	Longline	Pole and line	Purse seine	Troll	Other	Total
1960	22,248	45	0	0	0	22,293
1961	23,742	0	0	0	0	23,742
1962	35,219	0	0	0	0	35,219
1963	31,095	16	0	0	0	31,111
1964	22,824	0	0	0	0	22,824
1965	25,455	0	0	0	0	25,455
1966	38,661	0	0	0	0	38,661
1967	43,952	0	0	5	0	43,957
1968	32,368	0	0	14	0	32,382
1969	24,805	0	0	0	0	24,805
1970	34,775	100	0	50	0	34,925
1971	38,530	100	0	0	0	38,630
1972	39,131	122	0	268	0	39,521
1973	46,705	141	0	484	0	47,330
1974	33,039	112	0	898	0	34,049
1975	22,849	105	0	646	0	23,600
1976	28,957	100	0	25	0	29,082
1977	38,019	100	0	621	0	38,740
1978	32,890	100	0	1,686	0	34,676
1979	26,162	100	0	814	0	27,076
1980	30,972	101	0	1,468	0	32,541
1981	32,694	0	0	2,085	5	34,784
1982	28,347	1	0	2,434	6	30,788
1983	24,309	0	0	744	39	25,092
1984	20,340	2	0	2,773	1,589	24,704
1985	27,138	0	0	3,253	1,937	32,328
1986	32,641	0	0	2,003	1,946	36,590
1987	21,979	9	0	2,134	930	25,052
1988	28,288	0	0	4,296	5,283	37,867
1989	18,738	0	0	8,370	21,968	49,076
1990	21,304	245	0	6,975	7,538	36,062
1991	26,292	14	0	7,805	1,489	35,600
1992	32,014	11	0	6,578	65	38,668
1993	30,998	74	0	4,296	70	35,438
1994	34,998	67	0	7,164	89	42,318
1995	30,508	139	0	7,716	104	38,467
1996	26,763	30	0	7,410	156	34,359
1997	34,657	21	0	4,679	133	39,490
1998	43,970	36	0	6,280	85	50,371
1999	35,955	138	0	3,447	74	39,614

Table 7: ***(continued)***

Year	Longline	Pole and line	Purse seine	Troll	Other	Total
2000	40,642	102	0	6,455	139	47,338
2001	52,855	37	0	5,253	199	58,344
2002	68,411	18	0	4,661	150	73,240
2003	56,351	12	0	5,984	130	62,477
2004	57,024	110	0	4,614	123	61,871
2005	59,897	29	0	3,503	137	63,566
2006	59,343	29	0	2,884	188	62,444
2007	56,500	17	0	2,014	60	58,591
2008	59,066	12	0	3,502	160	62,740
2009	80,638	21	0	2,031	211	82,901
2010	84,949	14	0	2,139	190	87,292
2011	62,694	30	0	3,189	233	66,146
2012	84,644	41	0	2,962	248	87,895
2013	81,294	26	0	3,226	248	84,794
2014	79,163	26	0	2,221	248	81,658

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