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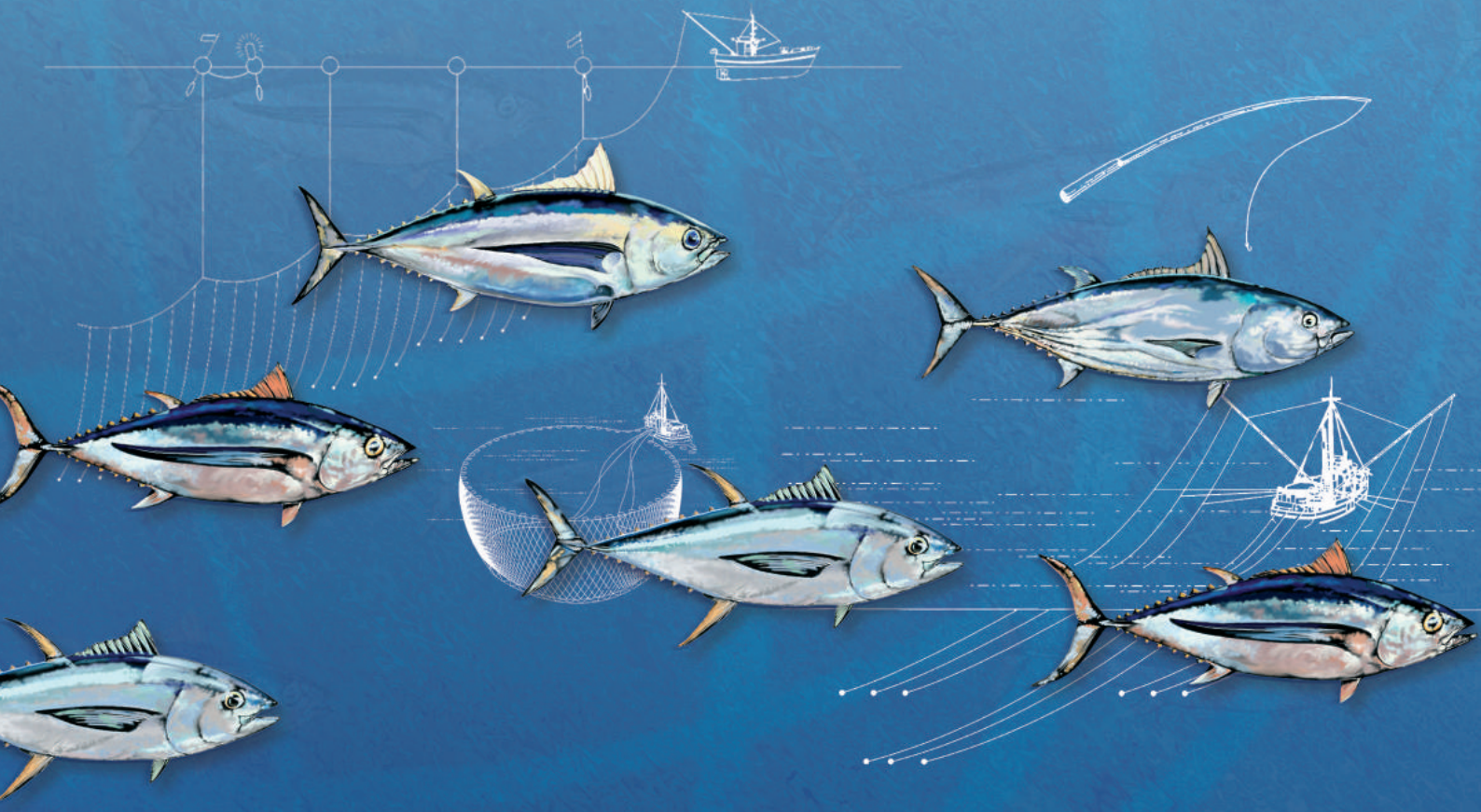
THE WESTERN AND CENTRAL PACIFIC TUNA FISHERY:

2015 OVERVIEW AND STATUS OF STOCKS

Stephen Brouwer, Graham Pilling, John Hampton, Peter Williams, and Sam McKechnie



Oceanic Fisheries Programme

Tuna Fisheries Assessment Report No. 16

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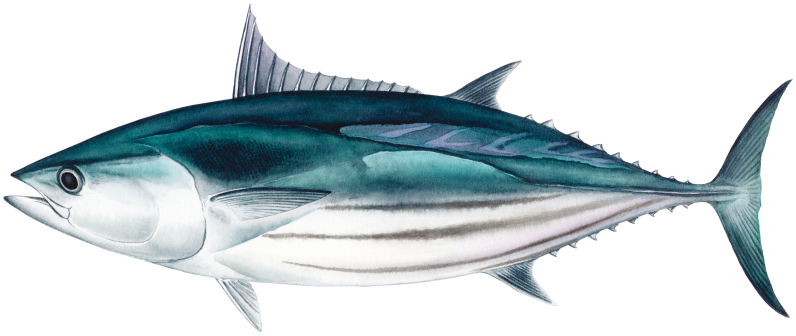

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Preface

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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For further information, including a complete online French version of this report, see the OFP webpage: http://www.spc.int/oceanfish/

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 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 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 2015 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 2015 was estimated at 2,655,594 tonnes (t) - a small drop from the record high of, 2,851,088t experienced in 2014. In 2015 the purse-seine fishery accounted for an estimated 1,774,008t (67% of the total catch), a drop from the record high of, 2,028,631t experienced in 2014 for this fishery. The pole-and-line fishery landed an estimated 215,769t (8% of the catch - a drop from the highest value (415,016t), recorded in 1984). The longline fishery in 2015 accounted for an estimated 254,642t (10% of the catch) - a decrease from the highest value (284,782t) recorded in 2004. Troll gear accounted for 3% of the total catch, a decrease from the highest value (96,233t), recorded in 2014, this was mainly due to a separation of the Indonesian troll catch from the combined artisanal gear catch. The remaining 12% was taken by a variety of artisanal gear, mostly in eastern Indonesia, the Philippines and Vietnam, which is a record catch. The WCP-CA tuna catch for 2015 represented 79% of the total Pacific Ocean catch (3,350,393t) and 56% of the global tuna catch (the provisional estimate for 2015 is 4,739,991t).

The 2015 WCP-CA catch of skipjack (1,831,440t - 69% of the total catch) was a drop from the highest value (1,983,302t), recorded in 2014; a decrease of 8% from 2014 (Table 2). The WCP-CA yellowfin catch for 2015 (575,901t - 22%). The WCP-CA bigeye catch for 2015 (134,682t - 5%) was a drop from the highest value (190,231t), recorded in 2004, and a 2% decrease from the 2014 catch. The 2015 WCP-CA albacore catch (65,456 - 4%) was a drop from the highest value (84,949t), recorded in 2010.

The 2015 purse-seine catch of 1,774,008t was lower than the previous year (Figure 3 and Table 1). The 2015 purse-seine skipjack catch (1,421,949t - 78% of the total skipjack catch) was 12% lower than the 2014 catch. The 2015 purse-seine catch of yellowfin tuna (300,717t) was a 13% decrease from 2014. The purse-seine catch estimate for bigeye tuna for 2015 (49,333t) was 14% lower than in 2014, and represented 37% of the total 2015 bigeye catch. Catches of all three species have declined largely due to a 10% decline in purse seine effort in 2015. However, it is important to note that the purse-seine species composition for 2015 will be revised once all observer data for 2015 have been received and processed, and the current estimate should therefore be considered preliminary.

The 2015 longline catch of 254,642t 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 (64,682t) catch was higher than 2014 but still low relative to the previous 15 years, while the yellowfin (101,326t)

catch for 2015 was the highest since 2004.

The 2015 pole-and-line catch of 215,769t was low, but represented a 4% increase from the 2014 catch (Figure 5 and Table 1). Skipjack accounts for the majority of the catch (78%). Yellowfin tuna (19%) 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 2015 troll catch in the WCPO of 92,201t was 4% lower than the 2014 catch - most of the catch being skipjack tuna. South Pacific albacore are also taken by troll gear. 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 United 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. Bigeye and yellowfin tuna were assessed in 2014, South Pacific albacore in 2015, and skipjack tuna was assessed in 2016. Due to uncertainty in the data for the most recent year in each assessment, bigeye and yellowfin tuna assessments only fisheries data through to 2012 were used, while albacore and skipjack assessments used data through to 2013 and 2015 respectively. 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 2015 WCP-CA skipjack catch of 1,831,440t was a drop from the highest value (1,983,302t), recorded in 2014 (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 (1,421,949t in 2015 - 78% of total skipjack catch). The next-highest proportion of the catch was pole-and-line gear (152,600t - 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 off 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 2016, and included data from 1972 to 2015. While estimates of fishing mortality for skipjack have increased over time, current fishing mortality rates for skipjack tuna are estimated to be about 0.45 times the level of fishing mortality associated with maximum sustainable yield (F_{MSY}). Therefore, overfishing is not occurring (i.e. $F_{recent} < F_{MSY}$) (Figure 7). Estimated recruitment shows an upward trend over time, and estimated biomass is estimated to be at 58% of the level predicted in the

absence of fishing. Nevertheless, recent spawning biomass levels are estimated to be well above the recently adopted limit reference point of 20% of the level predicted in the absence of fishing ($SB/SB_{F=0} = 0.2$) and close to the target reference point of $SB/SB_{F=0} = 0.5$.

The conclusions of the Western and Central Pacific Fisheries Commission (WCPFC) Scientific Committee at its 12th Regular Session (SC12), which were presented as recommendations to the Commission, are reproduced below (emphasis added):

- Dynamics of most model quantities are relatively consistent with the results of the 2014 stock assessment, although there has been a period of several subsequent years with high recruitments and increased spawning biomass.
- Fishing mortality of all age-classes is estimated to have increased significantly since the beginning of industrial tuna fishing, but fishing mortality still remains below the level that would result in the MSY ($F_{recent}/F_{MSY} = 0.45$ for the reference case), and is estimated to have decreased moderately in the last several years. Across the reference case and the structural uncertainty grid F_{recent}/F_{MSY} varied between 0.38 (5% quantile) to 0.64 (95% quantile). This indicates that overfishing is not occurring for the WCPO skipjack tuna stock.
- The estimated MSY of 1,891,600 mt is moderately higher than the 2014 estimate due to the adoption of an annual, rather than quarterly, stock-recruitment relationship. Recent catches are lower than, but approaching, this MSY value.
- The latest (2015) estimate of spawning biomass is well above both the level that will support MSY ($SB_{latest}/SB_{MSY} = 2.56$, for the reference case model) and the adopted LRP of 0.2 $SB_{F=0}$ ($SB_{latest}/SB_{F=0} = 0.58$, for the reference case model), and $SB_{latest}/SB_{F=0}$ was relatively close to the adopted interim target reference point (0.5 $SB_{F=0}$) for all models explored in the assessment (structural uncertainty grid: median = 0.51, 95% quantiles = 0.39 and 0.67).

Note: China, Japan and Chinese Taipei considered it is not possible to select a base-case model from various sensitivity models in the 2016 assessment, given the advice from the Scientific Service Provider that a suite of the sensitivity models were plausible. Therefore, these members considered that it would be more appropriate to provide advice on skipjack stock status based on the range of uncertainty expressed by the alternative model runs in the sensitivity analysis rather than based on the single base case model.

In this case the estimated MSY of WCPO skipjack stock ranges from 1,641,200 to 2,076,800 mt across the alternative skipjack stock assessment models represented in the sensitivity grid. China, Japan and Chinese Taipei also noted that some alternative models indicate that the 2015 biomass is below the adopted TRP of 0.5 $SB_{F=0}$.

2.2 Yellowfin tuna

The WCPC-CA yellowfin catch in 2015, of 575,901t, was lower than the highest value (605,726t), recorded in 2012 (Figure 8 and Table 5). The purse-seine catch (300,717t) has decreased by 13%, and the longline catch (101,326t) has increased by 2%, from 2014 levels, and 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, most of the yellowfin catch is taken in equatorial areas by large purse-seine vessels, and a variety of gear in the Indonesian and Philippines fisheries. The domestic surface fisheries of the Philippines and Indonesia take large numbers of small yellowfin in the range 20-50 cm (Figure 8). 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.

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 and are still the current advice, 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 the 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 exceeds 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 2015 WCP-CA bigeye tuna catch was 134,682t, which was a drop from the highest value (190,231t), recorded in 2004. A 15,914t decrease in purse seine catch and a 8,505t decrease in the longline fishery (Figure 10 and Table 6) have contributed to a total reduction in bigeye catch. The purse-seine catch comprised 37% of the total bigeye catch, and longline 48% of the bigeye catch, 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. In addition, large numbers of 25-75 cm bigey are taken in purse seine fishing in Fish Aggregating Devices (FADs) (Figure 10), which along with the fisheries of the Philippines and Indonesia account for the bulk of the catch by number. The longline fishery, which lands bigeye mostly above 100 cm, accounts for most of the catch by weight 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 2012. 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, and are still the current advice, 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 F_{MSY}. 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 2015 (65,456t) represented a drop from the highest value (84,949t), recorded in 2010, 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 2,658t over the past five years.

The longline catch is widely distributed in the South Pacific, but concentrated in the western part of the Pacific. Much of the increase in catch is attributed to that taken by 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 many older 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 in more southern latitudes.

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 represent the stock status. 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, and are still the current advice, 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 school 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; and WSP shark 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 are very low in all four 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. A WCPFC ban on the use of either 'shark lines' or wire traces in longline sets should reduce the catch of silky and oceanic whitetip sharks a small amount but a ban on both would be more effective.

3.2 Impact of catch

In addition to the main tuna species, annual catch estimates for the WCPO in 2015 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 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.

4 For further information [1]

4.1 Fishery

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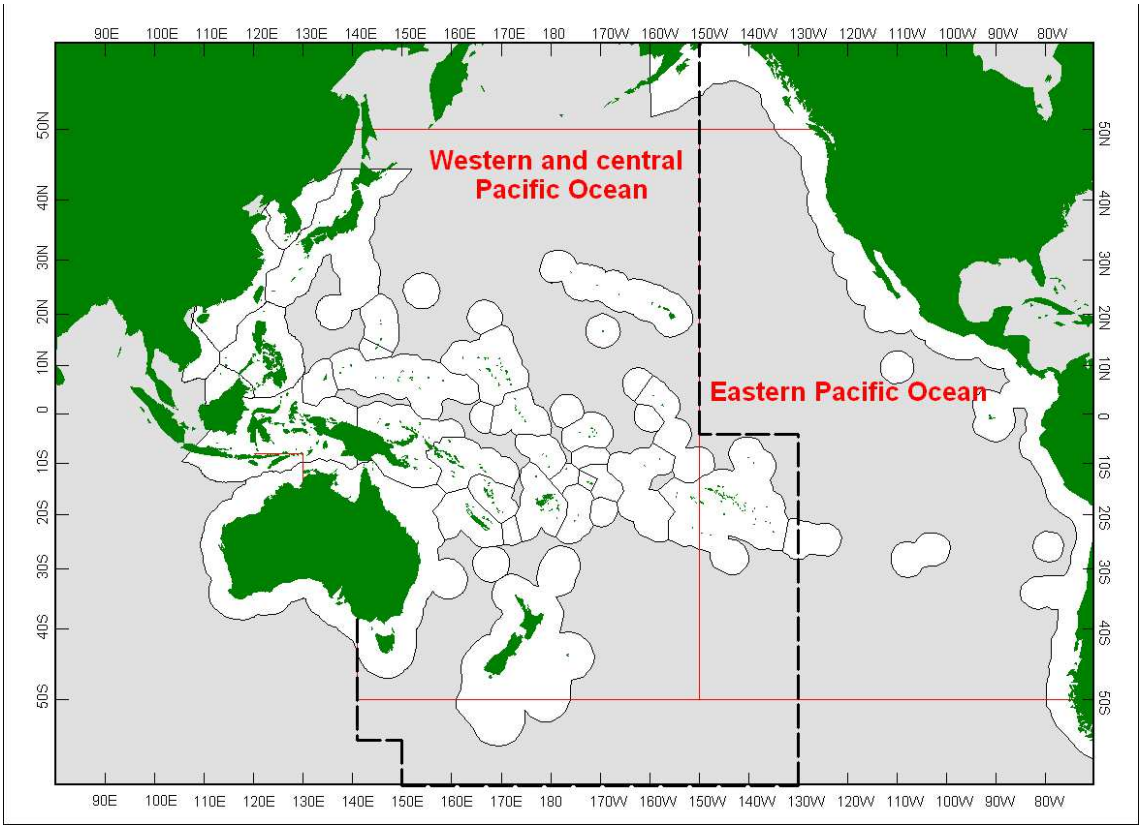

Figure 1: The western and central Pacific Ocean (WCPO), the eastern Pacific Ocean (EPO) and the WCPFC Convention Area boundary. Note: WCP-CA in dashed lines.

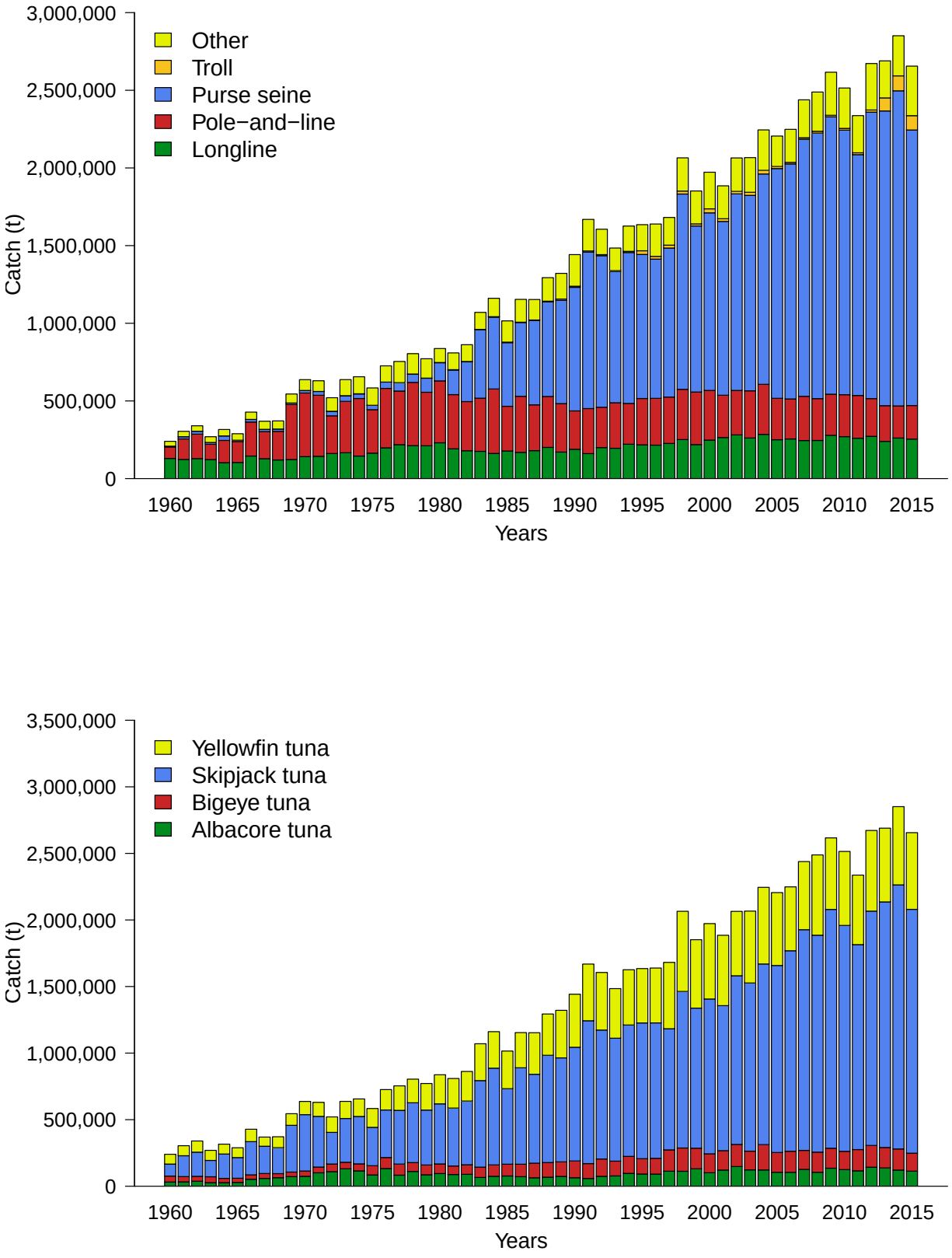

Figure 2: Catch (metric tonnes) by gear (top) and species (bottom) for the western and central Pacific region, 1960-2015. Note: data for 2015 are preliminary.

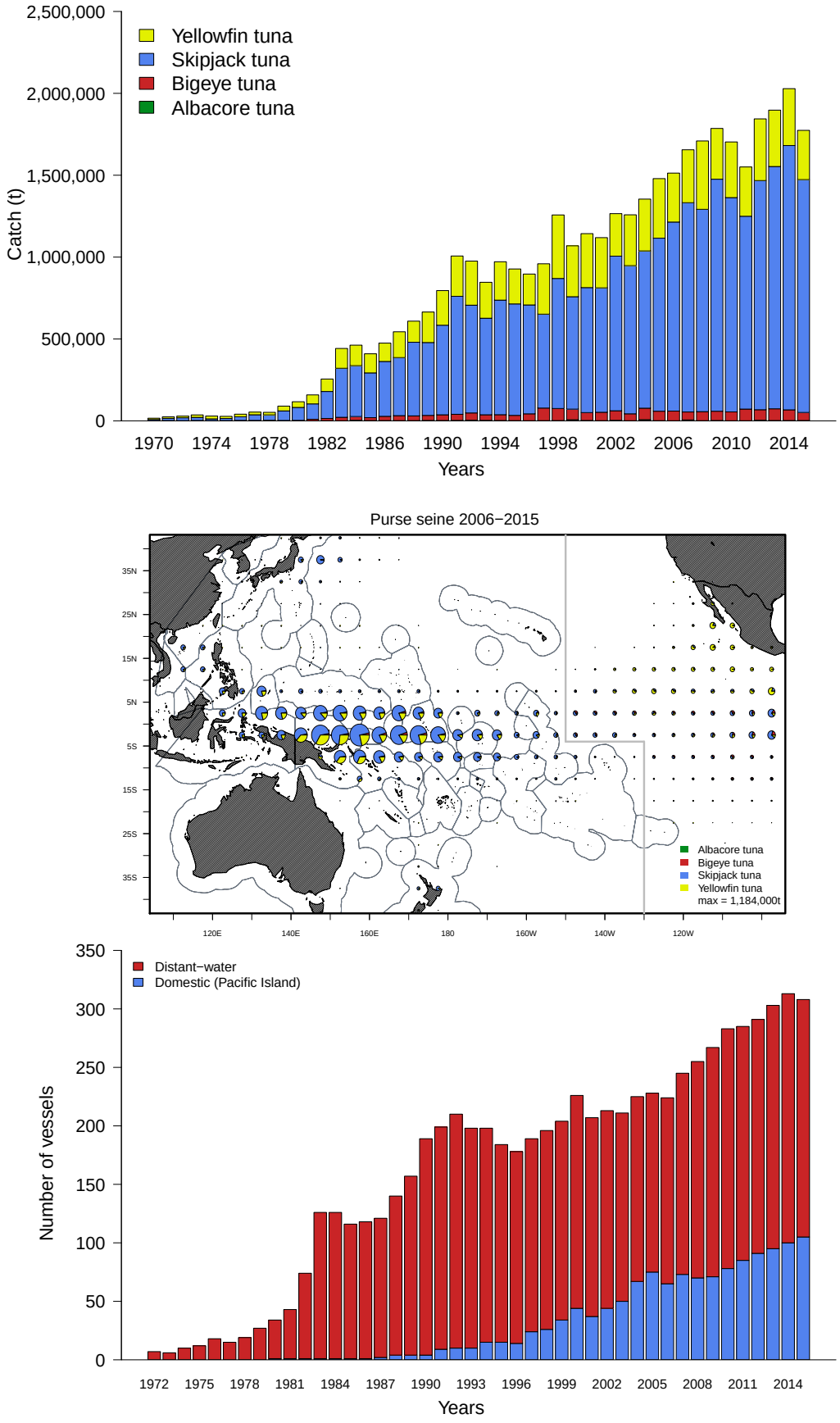

Figure 3: Time series of catch (t) (top), recent spatial distribution of catch (middle), and fleet sizes (bottom) for the purse-seine fishery in the western and central Pacific Ocean (WCPO).

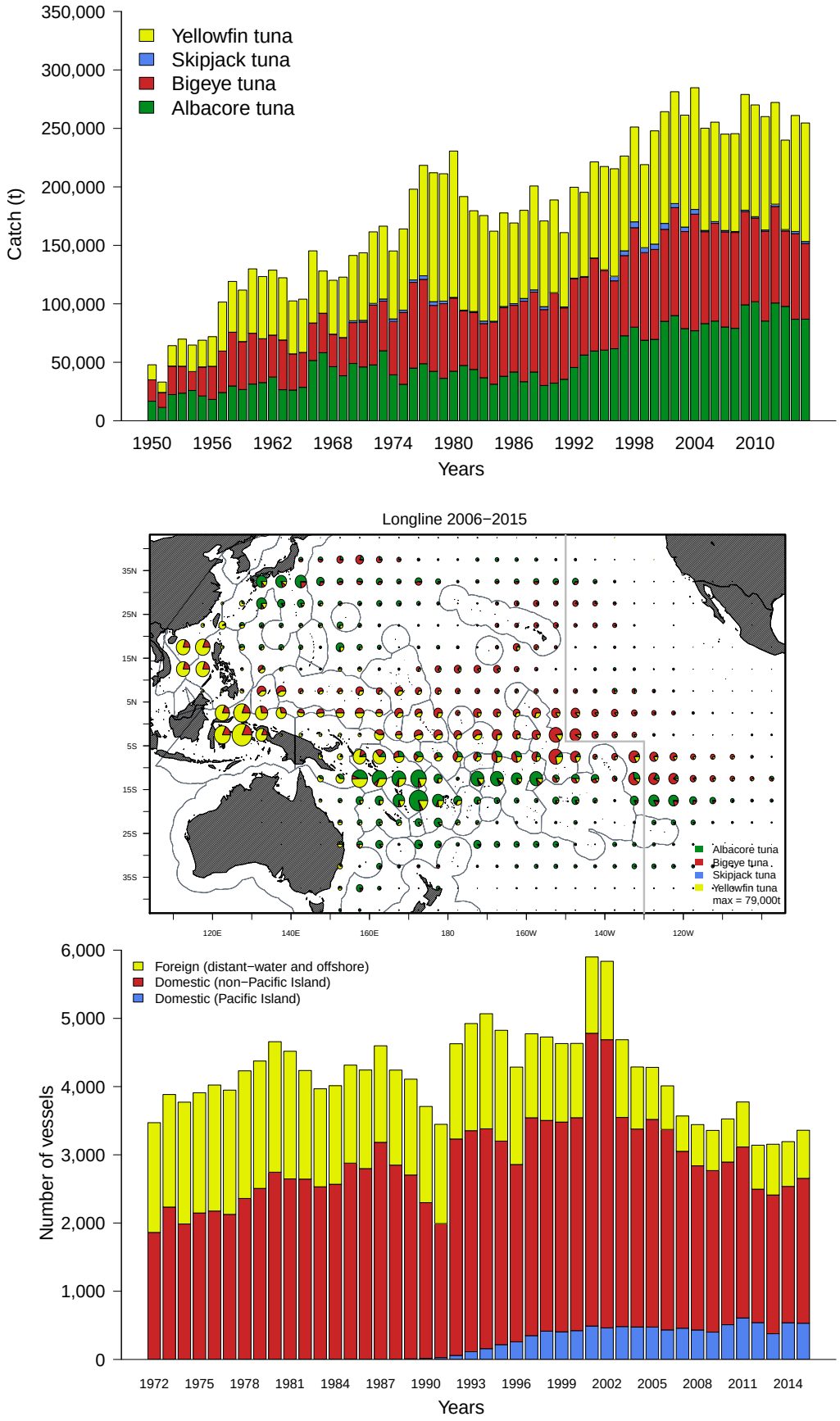

Figure 4: Time series of catch (t) (top), recent spatial distribution of catch (middle), and fleet sizes (bottom), for the longline fishery in the western and central Pacific Ocean (WCPO).

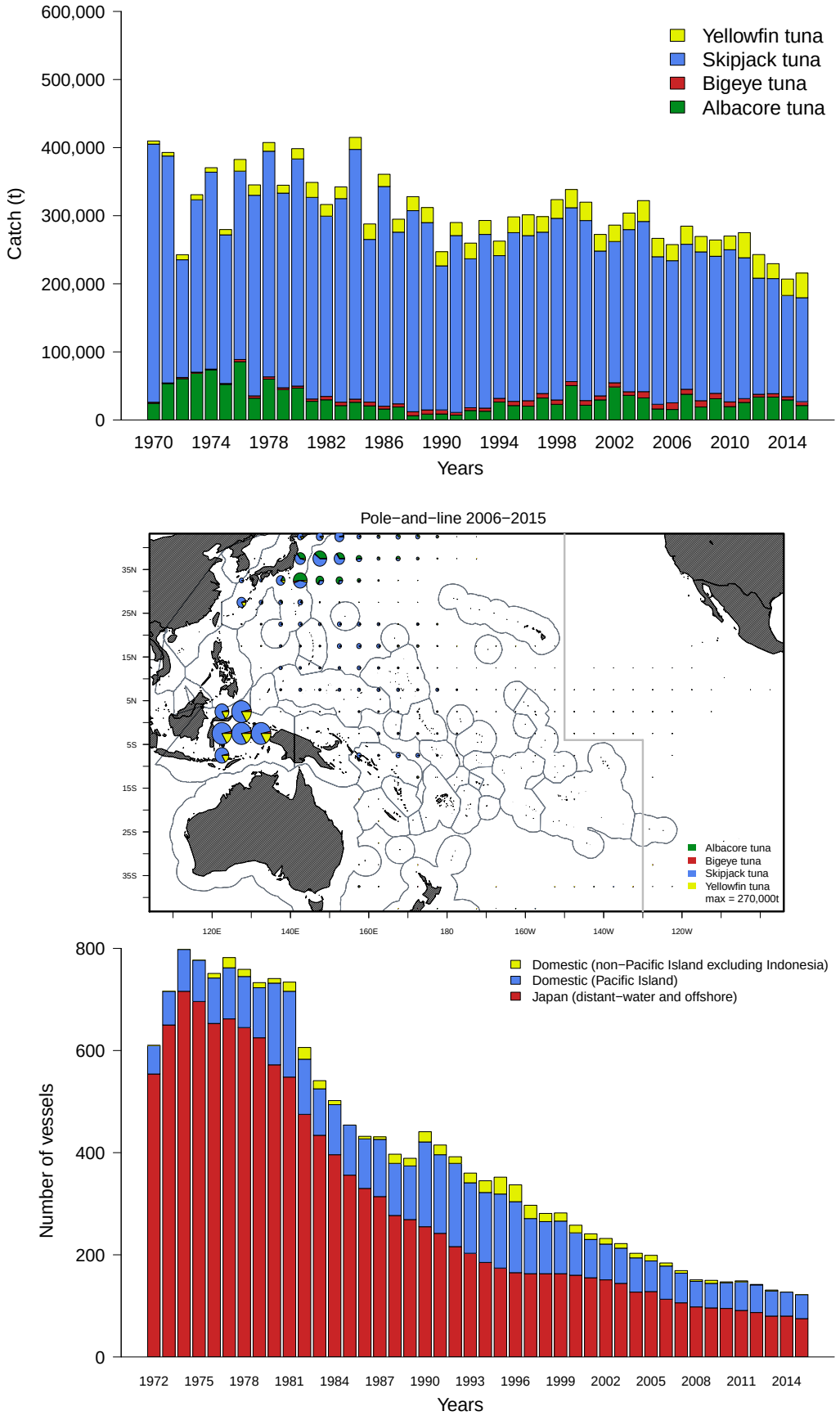

Figure 5: Time series of catch (t) (top), recent spatial distribution of catch (middle), and fleet sizes (bottom), for the pole-and-line fishery in the western and central Pacific Ocean (WCPO).

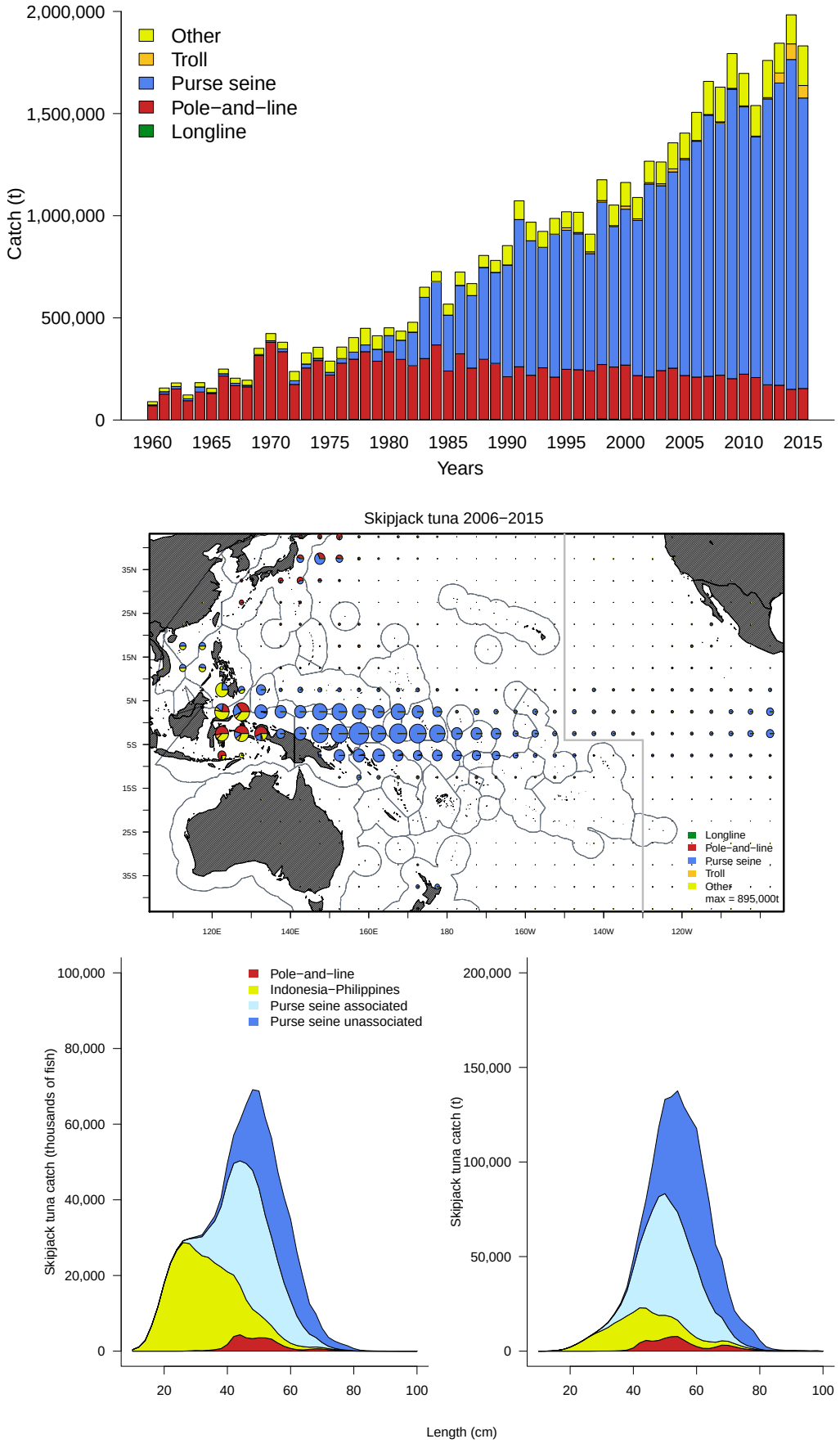

Figure 6: Time series (top), recent spatial distribution (middle), and size composition (average for last five years; bottom) of skipjack tuna catch (t) by gear for the western and central Pacific Ocean (WCPO).

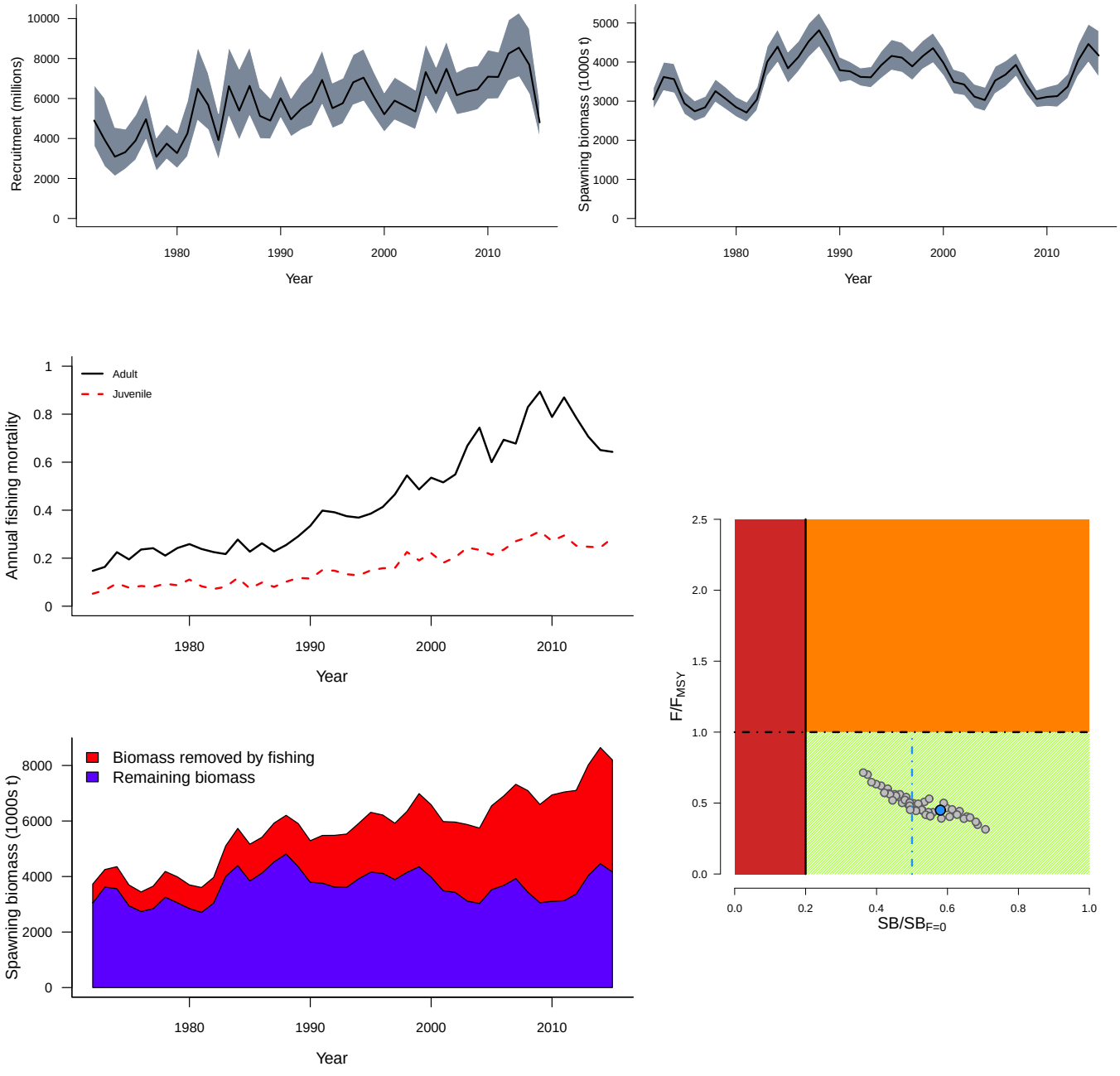

Figure 7: Estimated recruitment (top left), spawning biomass (top right), fishing mortality (middle left), stock status where the vertical dashed line represents the Target Reference Point, the blue point is the reference case run and the grey points indicate the runs in the sensitivity grid (middle right) and estimated spawning biomass with [blue] and without [red] fishing (bottom left) from the 2016 skipjack tuna stock assessment.

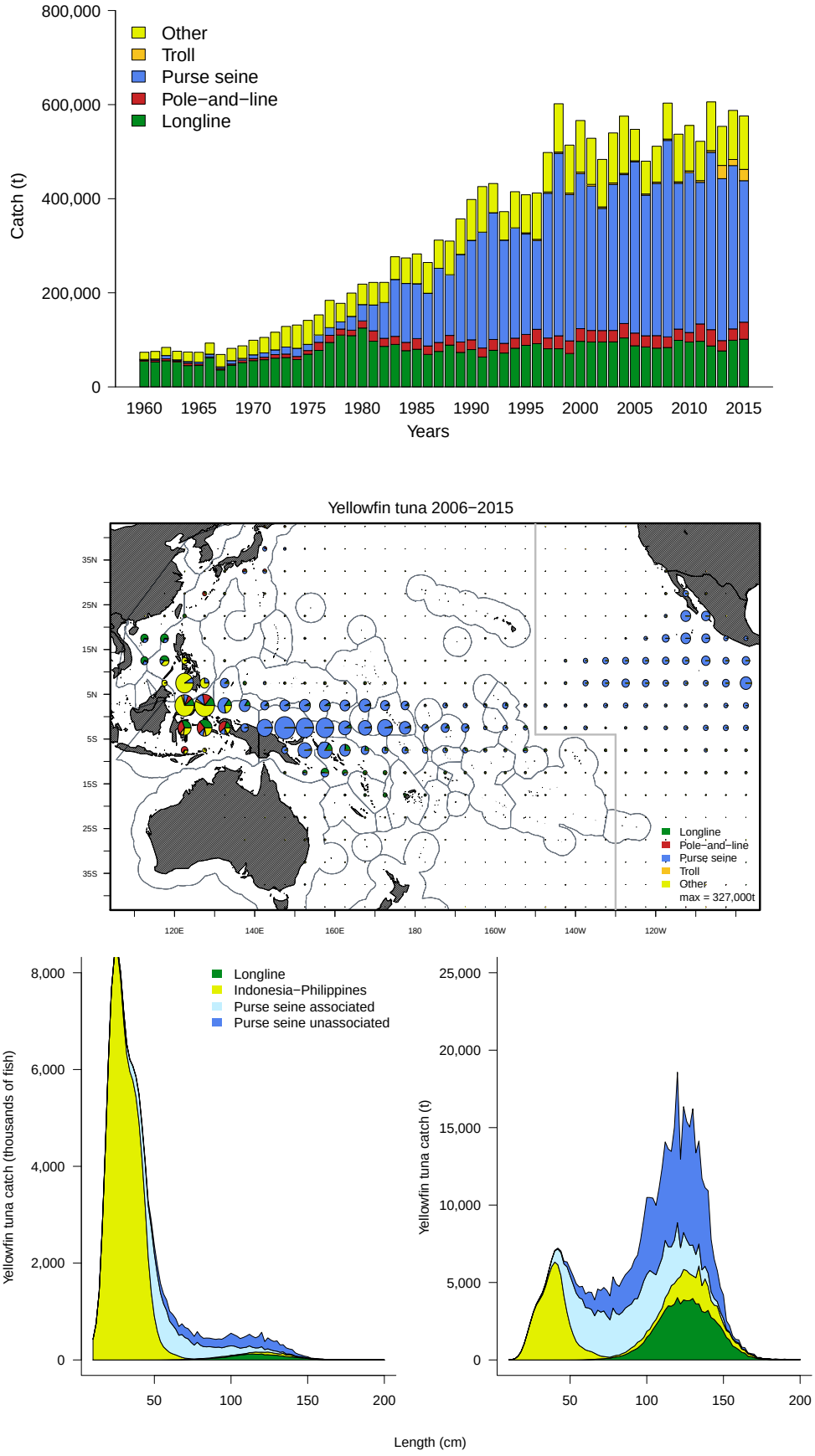

Figure 8: Time series (top), recent spatial distribution (middle), and size composition (average for last five years, bottom) of yellowfin tuna catch (t) by gear for the western and central Pacific Ocean (WCPO).

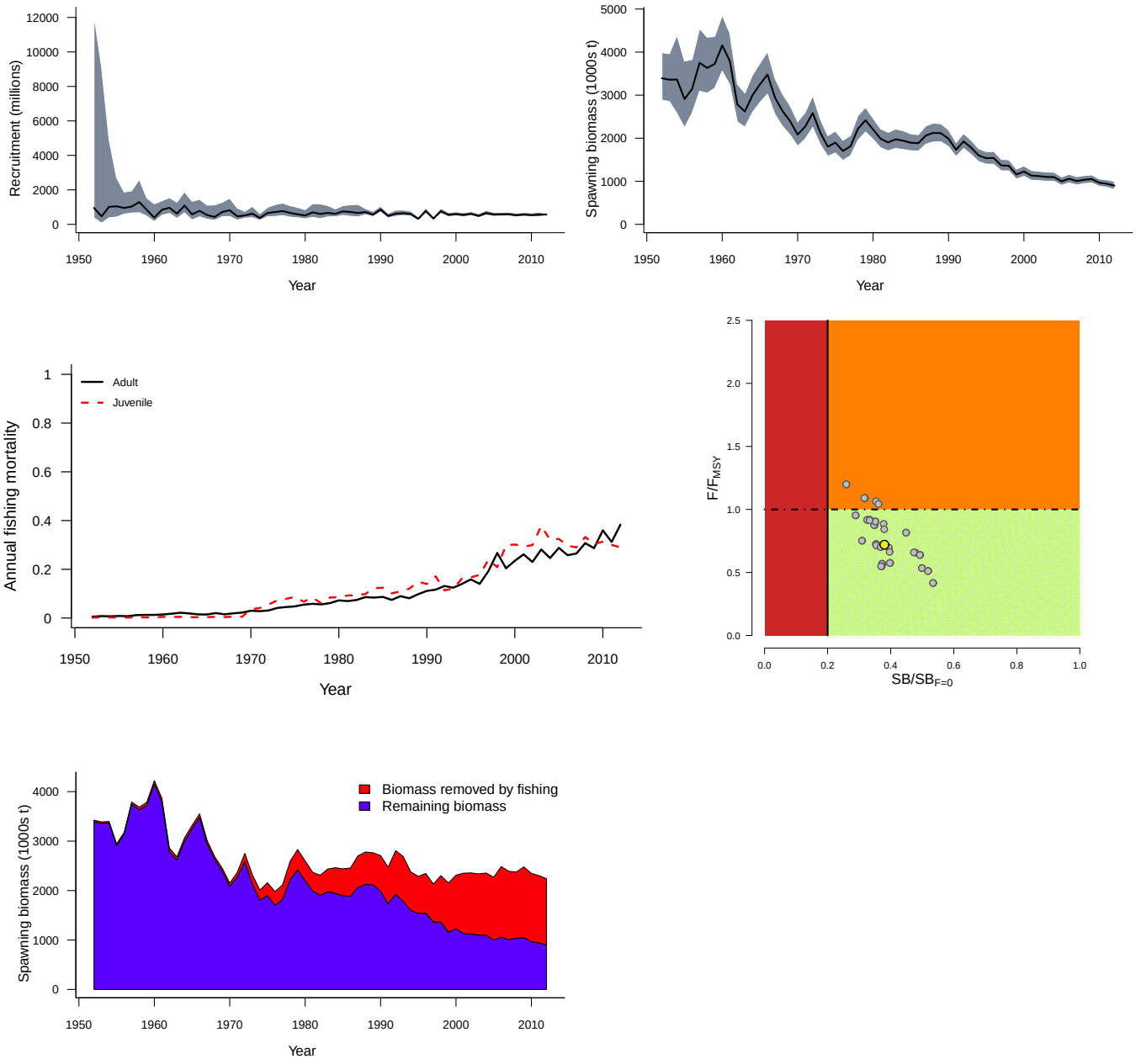

Figure 9: Estimated recruitment (top left), spawning biomass (top right), fishing mortality (middle left), stock status where the yellow point is the reference case run and the grey points indicate the runs in the sensitivity grid (middle right), estimated spawning biomass with [blue] and without [red] fishing (bottom), from the 2014 yellowfin tuna stock assessment.

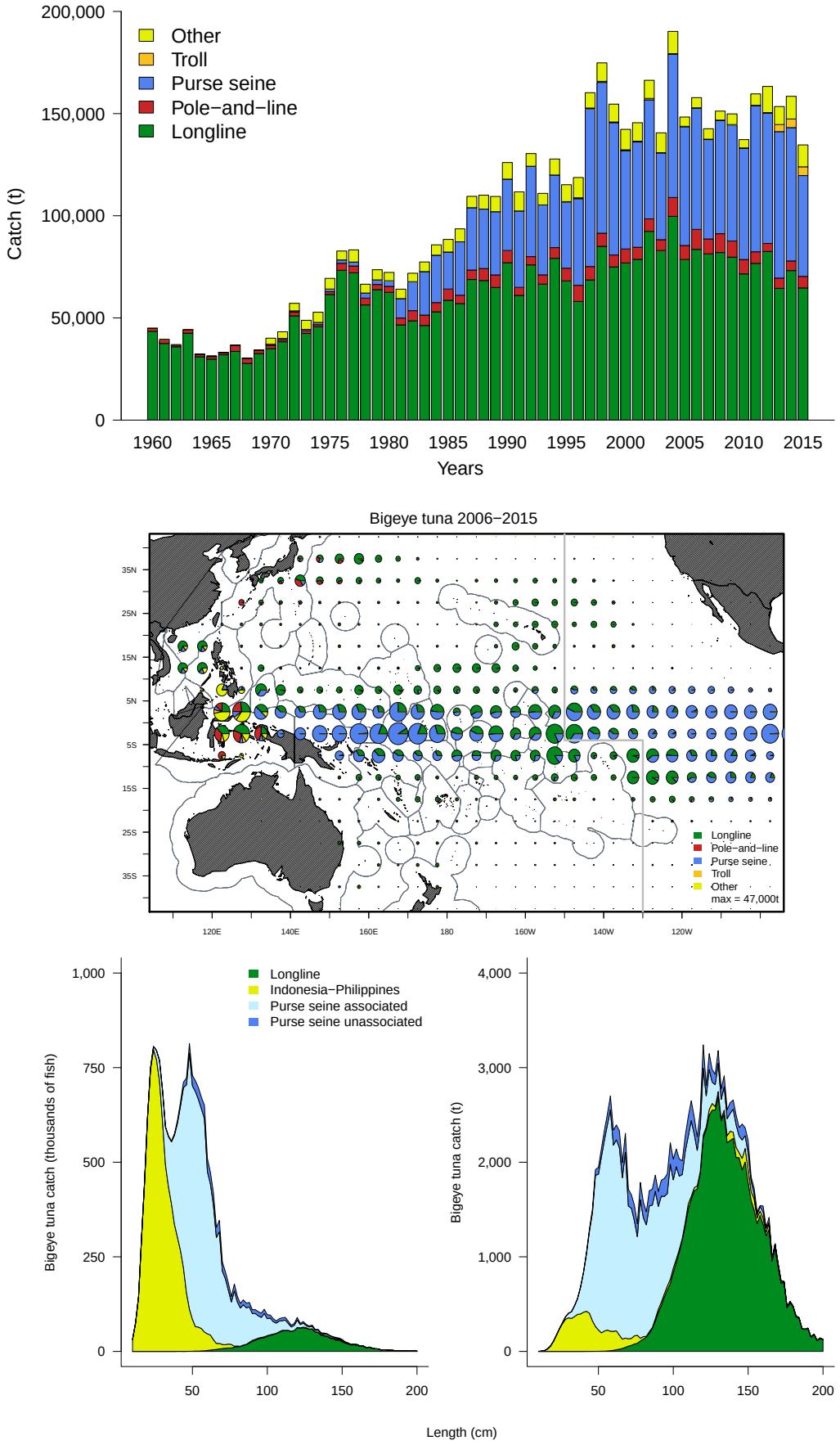

Figure 10: Time series (top), recent spatial distribution (middle), and size composition (average for last five years; bottom) of bigeye tuna catch (t) by gear for the western and central Pacific Ocean (WCPO).

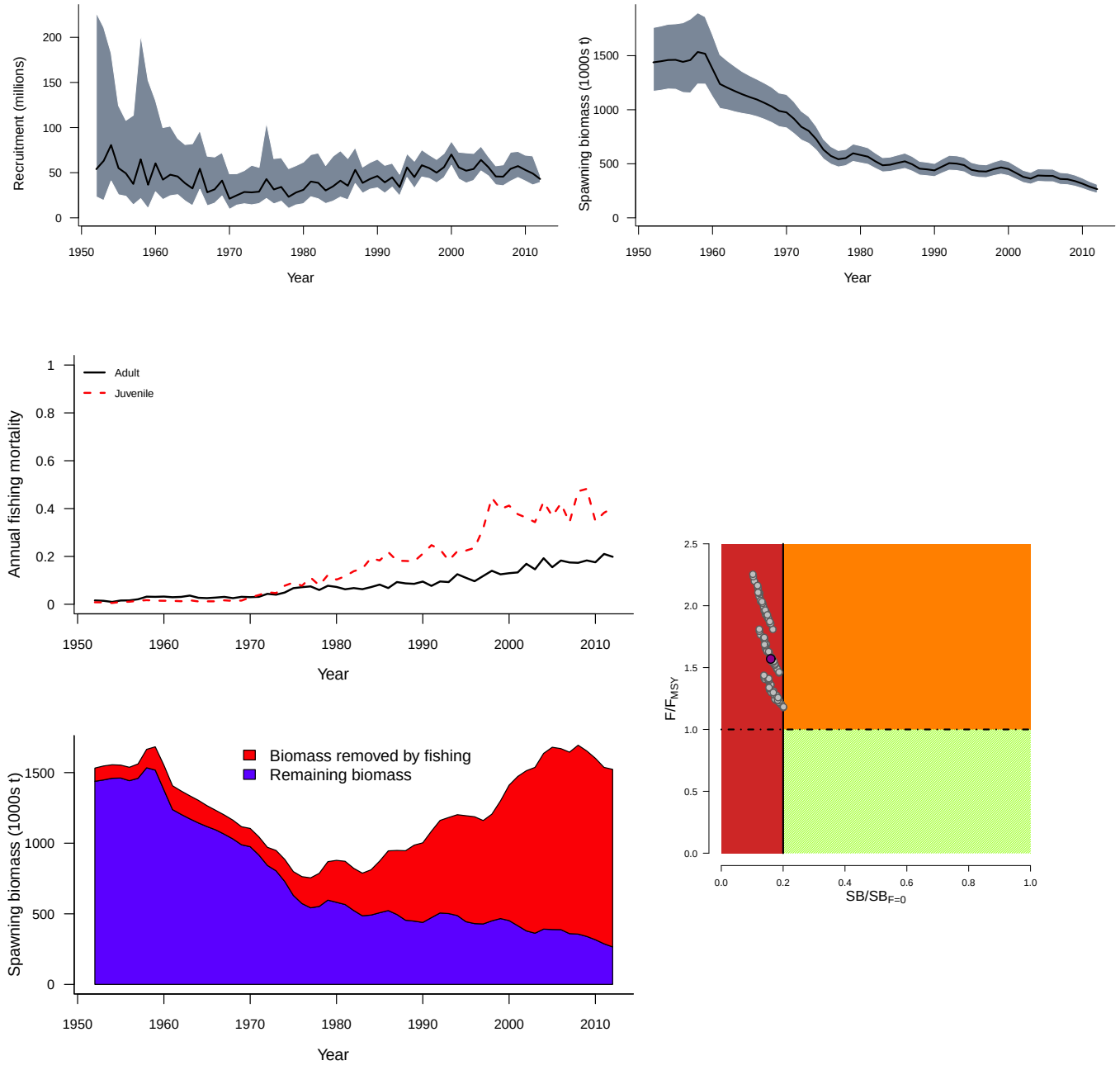

Figure 11: Estimated recruitment (top left), spawning biomass (top right), fishing mortality (middle left), stock status where the red point is the reference case run and the grey points indicate the runs in the sensitivity grid (middle right), and estimated spawning biomass with [blue] and without [red] fishing (bottom left) from the 2014 bigeye tuna stock assessment.

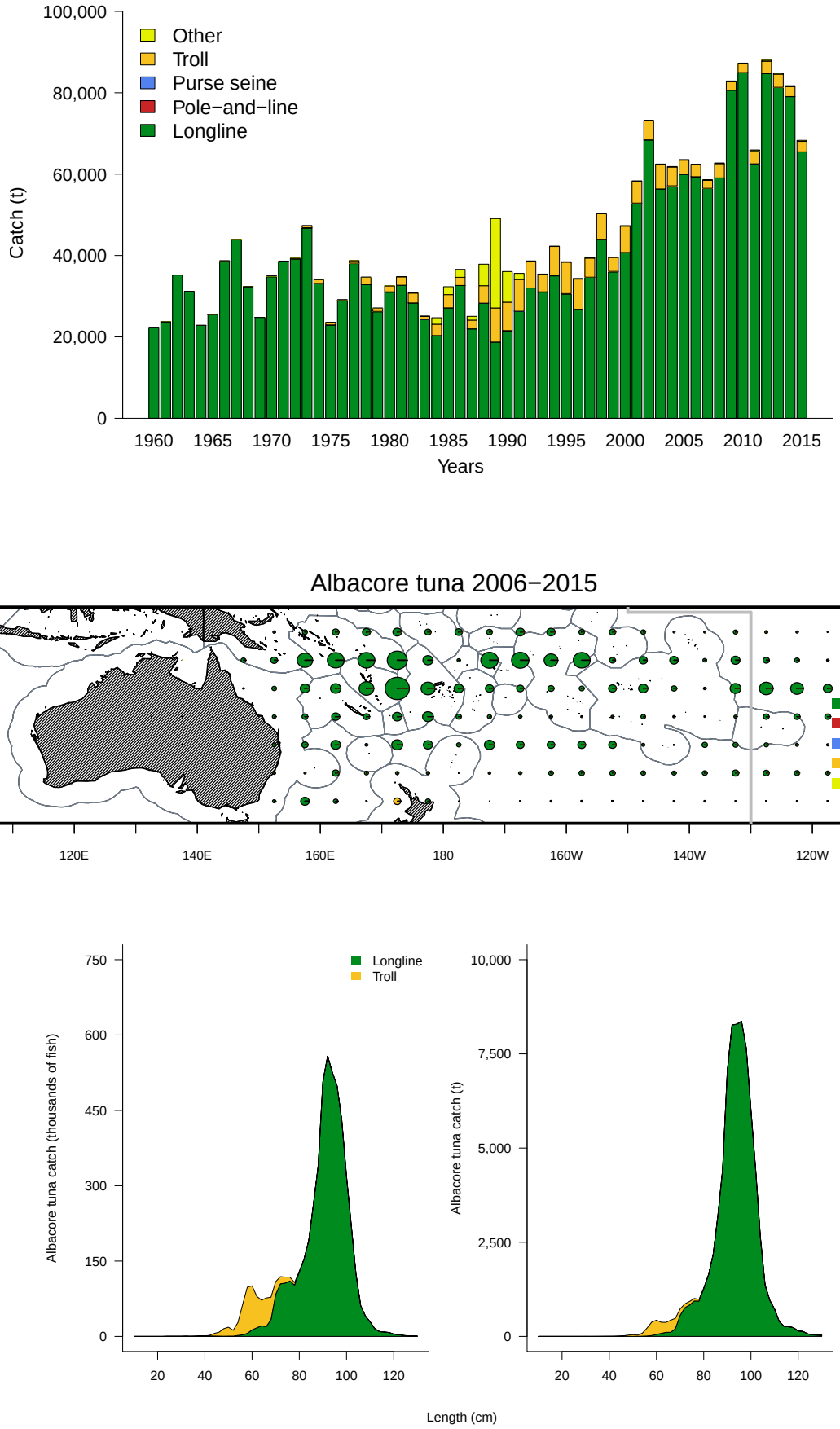

Figure 12: Time series (top), recent spatial distribution (middle), and size composition (average for last five years, bottom) of South Pacific albacore tuna catch (t) by gear for the western and central Pacific Ocean (WCPO).

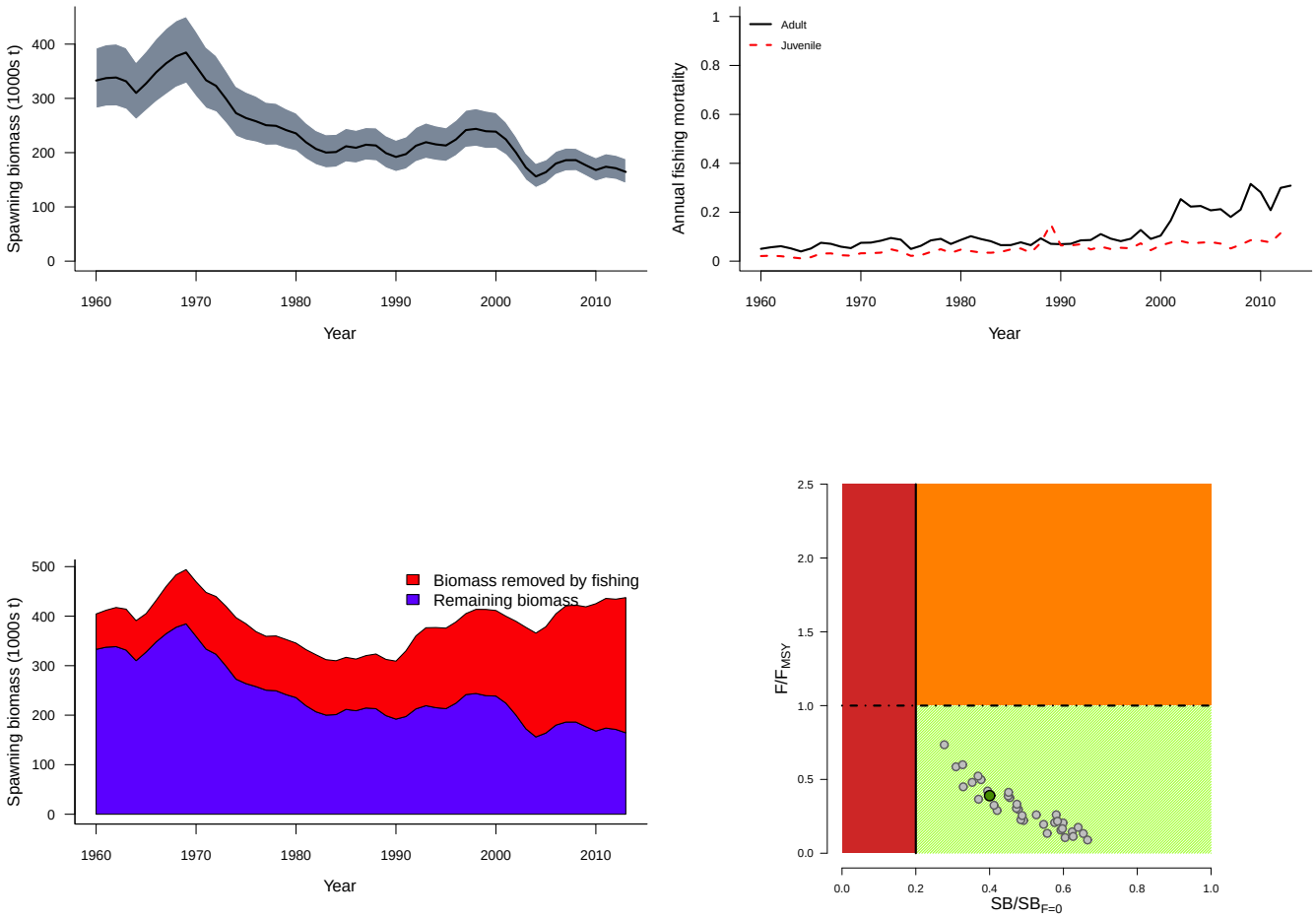

Figure 13: Spawning biomass (top left), fishing mortality (top right), stock status where the green point is the reference case run and the grey points indicate the runs in the sensitivity grid (bottom left), and estimated spawning biomass with [blue] and without [red] fishing (bottom right) from the 2015 South Pacific albacore tuna stock assessment.

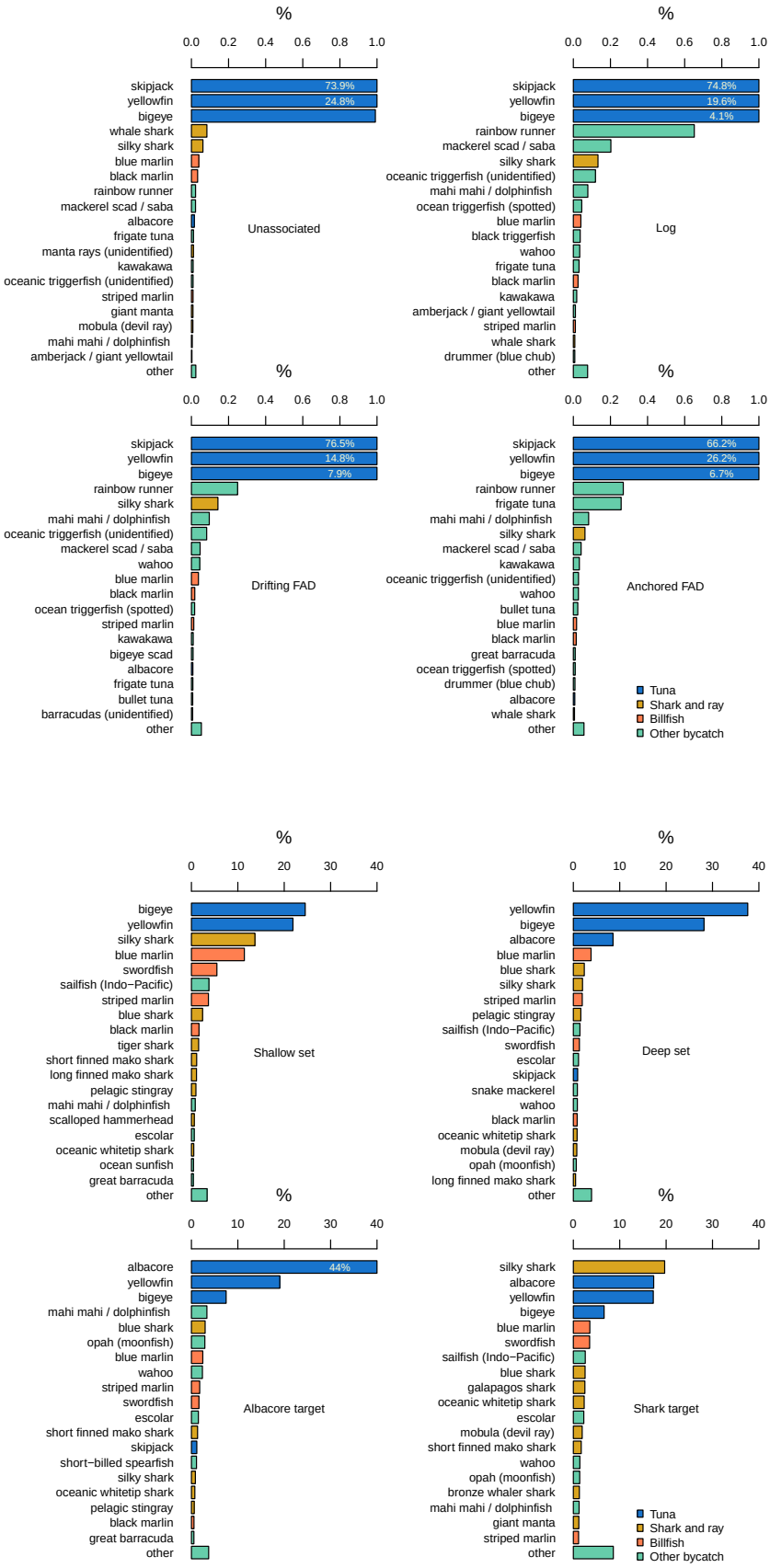

Figure 14: Catch composition of the various categories of purse-seine (top) and longline (bottom) fisheries operating in the WCPO based on observer data from the last 10 years' data.

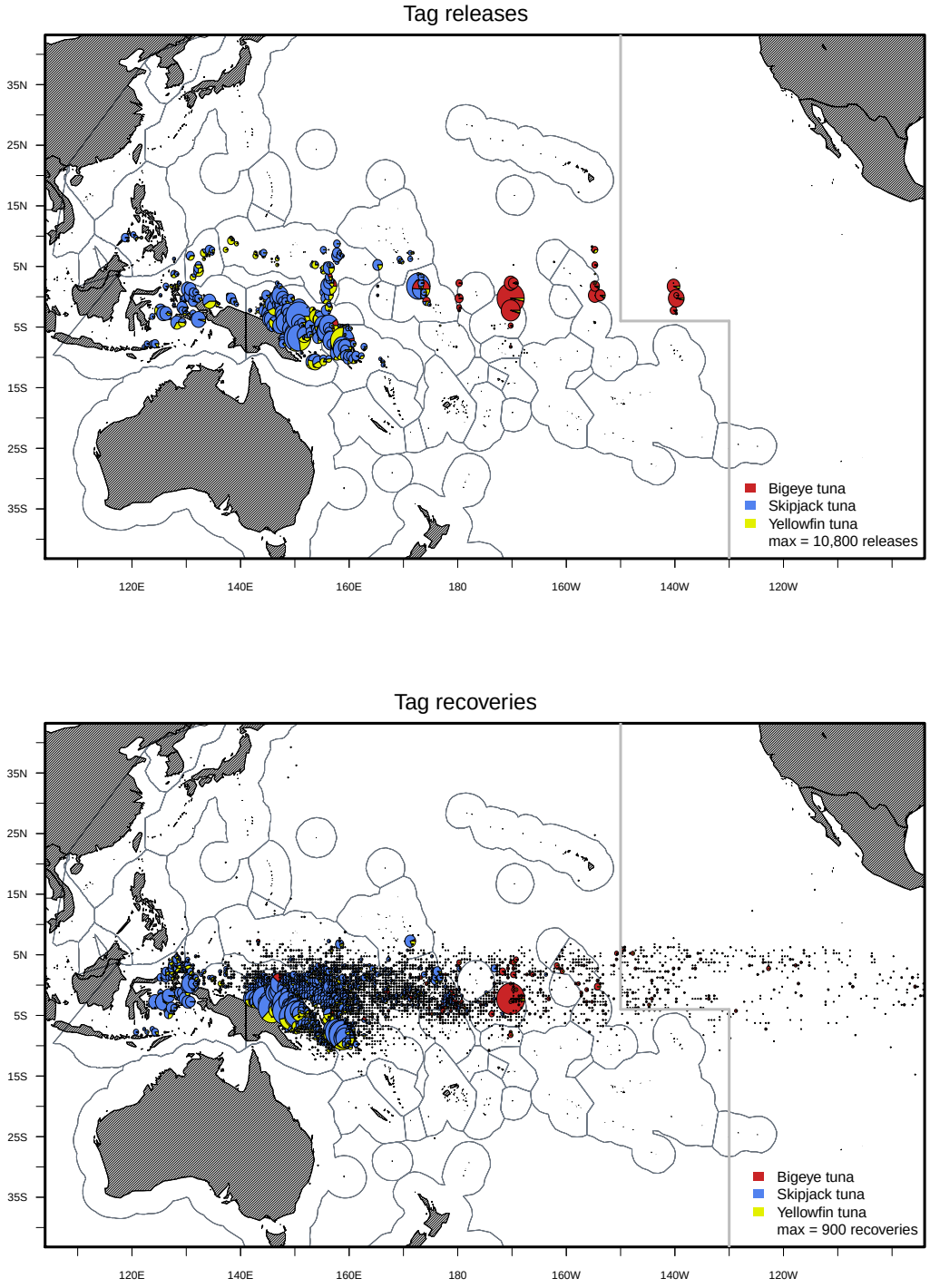

Figure 15: Tag releases (top) and recaptures (bottom) by species from the recent Pacific Tuna Tagging Programme (PTTP).

Table 1: Catch (metric tonnes) by gear for the western and central Pacific region, 1960 to 2015. Note : data for 2015 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	255,489	2,552	107,990	862,063
1983	175,498	342,287	442,152	949	109,378	1,070,264
1984	162,111	415,016	462,278	3,124	118,478	1,161,007
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	543,979	2,350	131,849	1,153,023
1988	200,774	327,997	608,995	4,671	151,193	1,293,630
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	975,741	6,844	163,536	1,605,571
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	1,257,392	19,099	213,779	2,065,112
1999	219,024	338,480	1,068,961	13,476	211,900	1,851,841

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

Year	Longline	Pole and line	Purse seine	Troll	Other	Total
2000	247,904	319,854	1,143,294	25,845	235,670	1,972,567
2001	264,291	272,483	1,118,920	17,329	211,934	1,884,957
2002	281,369	286,202	1,265,453	16,129	215,317	2,064,470
2003	261,346	303,905	1,258,225	19,875	223,218	2,066,569
2004	284,782	322,179	1,354,240	23,445	260,314	2,244,960
2005	250,167	266,735	1,479,330	13,293	195,972	2,205,497
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	1,785,791	9,898	277,286	2,616,352
2010	270,077	270,123	1,703,134	11,320	260,010	2,514,664
2011	260,101	275,070	1,550,491	11,973	239,331	2,336,966
2012	272,194	242,960	1,844,074	14,018	298,991	2,672,237
2013	239,985	229,560	1,897,359	84,089	238,445	2,689,438
2014	261,064	206,939	2,028,631	96,233	258,221	2,851,088
2015	254,642	215,769	1,774,008	92,201	318,974	2,655,594

Table 2: Catch (metric tonnes) by species for the four main tuna species taken in the western and central Pacific region, 1960 to 2015. Note : data for 2015 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	73,603	412,568	199,442	771,620
1980	95,156	72,281	451,467	218,434	837,338
1981	88,095	64,091	434,967	222,057	809,210
1982	89,496	71,877	478,548	222,142	862,063
1983	65,988	77,405	650,214	276,657	1,070,264
1984	74,540	85,772	726,571	274,124	1,161,007
1985	77,060	88,440	567,250	282,678	1,015,428
1986	71,757	93,605	724,206	264,420	1,153,988
1987	63,645	109,515	667,822	312,041	1,153,023
1988	67,948	110,076	805,606	310,000	1,293,630
1989	73,533	109,450	781,224	357,160	1,321,367
1990	63,872	126,061	853,881	398,386	1,442,200
1991	58,322	111,704	1,072,946	425,820	1,668,792
1992	74,452	130,444	968,361	432,314	1,605,571
1993	77,496	110,971	923,347	372,567	1,484,381
1994	96,461	127,778	986,845	414,912	1,625,996
1995	91,750	115,193	1,019,512	408,400	1,634,855
1996	91,140	118,732	1,017,012	412,143	1,639,027
1997	112,900	160,241	909,814	498,232	1,681,187
1998	112,465	174,841	1,175,978	601,828	2,065,112
1999	131,066	154,643	1,052,179	513,953	1,851,841

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

Year	Albacore tuna	Bigeye tuna	Skipjack tuna	Yellowfin tuna	Total
2000	101,171	142,284	1,162,895	566,217	1,972,567
2001	121,561	145,545	1,089,349	528,502	1,884,957
2002	147,793	166,307	1,266,825	483,545	2,064,470
2003	122,949	140,592	1,263,196	539,832	2,066,569
2004	122,343	190,231	1,356,838	575,548	2,244,960
2005	105,135	148,333	1,404,576	547,453	2,205,497
2006	104,986	157,818	1,505,993	479,767	2,248,564
2007	126,701	142,594	1,657,707	511,580	2,438,582
2008	104,966	151,231	1,629,291	603,215	2,488,703
2009	135,476	149,868	1,793,798	537,210	2,616,352
2010	124,898	137,281	1,696,669	555,816	2,514,664
2011	115,766	159,654	1,539,485	522,061	2,336,966
2012	143,078	163,312	1,760,121	605,726	2,672,237
2013	137,567	153,459	1,844,569	553,843	2,689,438
2014	121,547	158,471	1,983,302	587,768	2,851,088
2015	113,571	134,682	1,831,440	575,901	2,655,594

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). $B_{current}$ 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; $F_{current}/F_{MSY}$ 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 predicted to occur in the absence of fishing.

	Albacore tuna	**Bigeye tuna**	**Skipjack tuna**	**Yellowfin tuna**
$B_{current}$	456,984	742,967	4,123,144	1,994,655
$SB_{F=0}$	408,361	1,613,855	7,221,135	2,368,557
MSY	76,800	108,520	1,891,600	586,400
$F_{current}/F_{MSY}$	0.39	1.57	0.45	0.72
$SB_{latest}/SB_{F=0}$	0.4	0.16	0.58	0.38

Table 4: Skipjack tuna catch (metric tonnes) by gear type for the western and central Pacific region, 1960 to 2015. Note : data for 2015 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	58,388	0	66,142	412,568
1980	632	333,597	78,942	12	38,284	451,467
1981	756	296,065	93,905	17	44,224	434,967
1982	972	264,726	164,748	64	48,038	478,548
1983	2,144	298,928	299,482	154	49,506	650,214
1984	870	366,811	310,482	284	48,124	726,571
1985	1,108	238,932	273,304	146	53,760	567,250
1986	1,439	322,665	335,137	219	64,746	724,206
1987	2,329	252,142	354,649	168	58,534	667,822
1988	1,937	295,325	449,767	299	58,278	805,606
1989	2,507	275,088	444,948	244	58,437	781,224
1990	363	211,573	547,186	176	94,583	853,881
1991	885	259,778	720,558	148	91,577	1,072,946
1992	432	218,765	658,107	168	90,889	968,361
1993	573	255,152	589,565	175	77,882	923,347
1994	379	209,636	699,638	228	76,964	986,845
1995	598	247,744	680,529	12,298	78,343	1,019,512
1996	3,935	242,486	664,842	6,514	99,235	1,017,012
1997	4,070	236,999	573,267	9,218	86,260	909,814
1998	5,030	266,772	794,174	8,316	101,686	1,175,978
1999	4,208	255,330	686,403	5,660	100,578	1,052,179

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

Year	Longline	Pole and line	Purse seine	Troll	Other	Total
2000	4,559	264,407	763,351	15,005	115,573	1,162,895
2001	5,059	212,668	759,671	7,536	104,415	1,089,349
2002	3,450	207,488	944,280	6,796	104,811	1,266,825
2003	3,824	238,179	904,713	9,721	106,759	1,263,196
2004	4,051	249,936	960,369	15,118	127,364	1,356,838
2005	1,084	216,715	1,056,706	6,302	123,769	1,404,576
2006	1,528	208,731	1,154,329	3,987	137,418	1,505,993
2007	1,175	213,010	1,277,734	3,598	162,190	1,657,707
2008	803	218,570	1,235,583	4,572	169,763	1,629,291
2009	1,219	201,323	1,416,942	4,252	170,062	1,793,798
2010	1,191	223,409	1,308,561	4,705	158,803	1,696,669
2011	1,124	206,843	1,177,661	4,214	149,643	1,539,485
2012	2,004	170,538	1,399,390	6,235	181,954	1,760,121
2013	1,254	169,025	1,479,430	49,026	145,834	1,844,569
2014	1,874	148,684	1,614,169	76,504	142,071	1,983,302
2015	1,777	152,600	1,421,949	61,109	194,005	1,831,440

Table 5: Yellowfin tuna catch (metric tonnes) by gear type for the western and central Pacific region, 1960 to 2015. Note : data for 2015 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	29,329	0	49,565	199,442
1980	125,113	15,142	34,744	9	43,426	218,434
1981	97,114	22,044	54,907	16	47,976	222,057
1982	86,149	17,123	76,016	54	42,800	222,142
1983	90,259	17,184	121,007	51	48,156	276,657
1984	76,988	17,633	125,224	67	54,212	274,124
1985	79,973	22,717	116,590	69	63,329	282,678
1986	68,999	17,970	112,022	62	65,367	264,420
1987	75,407	19,044	157,596	48	59,946	312,041
1988	88,855	20,566	128,925	76	71,578	310,000
1989	73,306	22,133	186,234	73	75,414	357,160
1990	79,300	20,769	211,401	68	86,848	398,386
1991	63,512	19,182	246,159	51	96,916	425,820
1992	77,739	23,043	269,308	98	62,126	432,314
1993	72,055	20,486	219,432	141	60,453	372,567
1994	82,184	21,378	234,372	101	76,877	414,912
1995	88,306	23,209	213,354	2,570	80,961	408,400
1996	91,887	30,551	188,638	2,636	98,431	412,143
1997	81,065	22,845	307,729	2,838	83,755	498,232
1998	81,077	27,506	387,826	2,806	102,613	601,828
1999	71,023	26,787	310,921	3,162	102,060	513,953

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

Year	Longline	Pole and line	Purse seine	Troll	Other	Total
2000	96,851	26,957	329,401	3,343	109,665	566,217
2001	95,540	24,443	306,745	3,716	98,058	528,502
2002	95,644	24,133	259,641	3,172	100,955	483,545
2003	95,712	24,304	310,445	3,101	106,270	539,832
2004	104,059	30,640	316,497	2,706	121,646	575,548
2005	87,417	27,007	363,654	2,508	66,867	547,453
2006	84,994	23,653	298,905	2,607	69,608	479,767
2007	82,434	26,570	323,423	2,854	76,299	511,580
2008	83,637	22,705	417,545	2,903	76,425	603,215
2009	98,944	23,918	309,947	3,027	101,374	537,210
2010	95,521	20,112	339,862	3,611	96,710	555,816
2011	96,961	36,838	300,931	3,802	83,529	522,061
2012	86,976	34,705	376,721	3,935	103,389	605,726
2013	76,478	21,924	344,250	28,087	83,104	553,843
2014	99,181	24,082	347,206	12,904	104,395	587,768
2015	101,326	36,260	300,717	24,011	113,587	575,901

Table 6: Bigeye tuna catch (metric tonnes) by gear type for the western and central Pacific region, 1960 to 2015. Note : data for 2015 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	2,260	0	4,966	73,603
1980	62,537	2,916	2,742	0	4,086	72,281
1981	46,590	3,382	9,495	0	4,624	64,091
1982	48,578	4,993	14,164	0	4,142	71,877
1983	46,311	5,077	21,313	0	4,704	77,405
1984	52,976	4,557	23,192	0	5,047	85,772
1985	58,629	5,529	18,107	0	6,175	88,440
1986	56,989	4,133	26,137	0	6,346	93,605
1987	68,832	4,602	30,529	0	5,552	109,515
1988	68,288	5,890	29,095	0	6,803	110,076
1989	64,916	6,131	30,956	0	7,447	109,450
1990	77,009	5,985	34,945	0	8,122	126,061
1991	61,033	3,929	37,395	0	9,347	111,704
1992	75,966	4,055	44,222	0	6,201	130,444
1993	66,566	4,505	34,230	0	5,670	110,971
1994	79,175	5,251	35,529	0	7,823	127,778
1995	68,125	6,228	32,430	145	8,265	115,193
1996	58,054	7,940	42,382	432	9,924	118,732
1997	68,597	6,563	77,151	412	7,518	160,241
1998	85,048	6,405	73,838	507	9,043	174,841
1999	74,959	5,856	64,765	316	8,747	154,643

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

Year	Longline	Pole and line	Purse seine	Troll	Other	Total
2000	76,912	6,838	48,134	397	10,003	142,284
2001	78,670	5,905	51,530	408	9,032	145,545
2002	92,381	6,109	58,229	713	8,875	166,307
2003	83,016	5,296	42,440	142	9,698	140,592
2004	99,705	9,238	70,174	232	10,882	190,231
2005	78,597	6,851	58,120	220	4,545	148,333
2006	83,560	9,781	59,347	157	4,973	157,818
2007	81,350	7,296	48,660	187	5,101	142,594
2008	82,016	9,204	55,399	212	4,400	151,231
2009	79,736	7,916	56,825	175	5,216	149,868
2010	71,549	7,027	54,381	275	4,049	137,281
2011	76,729	5,655	71,419	251	5,600	159,654
2012	82,516	3,934	63,770	273	12,819	163,312
2013	64,486	5,009	71,691	3,446	8,827	153,459
2014	73,187	4,714	65,247	4,222	11,101	158,471
2015	64,682	5,667	49,333	4,285	10,715	134,682

Table 7: Albacore tuna catch (metric tonnes) by gear type for the western and central Pacific region, 1960 to 2015. Note : data for 2015 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	62,494	30	0	3,189	233	65,946
2012	84,759	41	0	2,962	248	88,010
2013	81,320	26	0	3,226	248	84,820
2014	79,057	26	0	2,403	248	81,734
2015	65,456	26	0	2,576	248	68,306

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