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ANNUAL REPORT TO THE COMMISION
PART1: INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

National Tuna Fisheries Report of Japan

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Scientific data was provided to the Commission in accordance with the decision relating to the provision of scientific data to the Commission by 30 April, 2018	YES Annual catch data, April 30. Catch by EEZ data, April 30. Catch and effort data, April 30. Size data, April 30.
If no, please indicate the reason(s) and intended actions:	

SUMMARY

This paper describes recent trends in the Japanese tuna and billfish fisheries, e.g., longline, pole-and-line, purse seine and other miscellaneous coastal fisheries in the WCPFC Convention Area (WCP-CA), including fleet size, catch and fishing effort statistics. During the 2012-2017, the number of Japanese commercial longline vessels shows a declining trend, the total number of pole-and-line vessels (larger than 20 GRT) has decreased, and the total number of purse seine vessels which are engaged in tuna fishery shows a decreasing. The preliminary total 2017 WCP-CA catch of tunas (Pacific bluefin, albacore, bigeye, yellowfin and skipjack) by the Japanese fishery was still provisional and estimated to be 297,282mt, and this is corresponding to 94% of 2016 total tunas catch (316,264 mt). In 2017, the total tuna catch by the purse seine fishery was 173,945 mt (59% of the total), with 70,619 mt (24%) by the pole-and-line fishery, 43,417 mt (15%) by the longline fishery, and the remaining (3%) by the other gears. Japan has conducted several research activities in relation to biological and stock assessment studies on tunas, and other bycatch species in the WCP-CA in 2016 and early 2017 such as several research cruises on larvae/juvenile sampling for Pacific bluefin and tropical tunas, and mitigation studies for bycatch species.

1. Introduction

This paper describes recent trends in the Japanese tuna and billfish fisheries, e.g., longline, pole-and-line, purse seine and the other fisheries in the WCPFC Convention Area (WCP-CA), including fleet size, catch and fishing effort statistics. With respect to the recent research activities, a brief explanation was given at section 6 of this report.

The catch statistics is given not only in WCP-CA but in the other areas, depending on species, according to the section on "Annual Catch Estimates" contained in the document "Scientific Data to be provided to the Commission". The catch estimates for bigeye, yellowfin, blue marlin, black marlin and skipjack in the portion of the WCP-CA east of the 150˚ meridian of west longitude, which is the duplicating area with IATTC, is shown in Appendix Table 1. This is requested by Attachment N of the report of the SC4. Note that there are some catches in the portion of the WCP-CA east of the 150˚ meridian of west longitude only by the distant-water and offshore longline fisheries. The catch estimates for Pacific bluefin, albacore, swordfish and striped marlin in other broad ocean areas are shown in Appendix Table 2. In addition to this, several tables which are requested by CMMs were given in the Appendix Tables.

2. Data source

The National Research Institute of Far Seas Fisheries (NRIFSF) is responsible for compiling catch and effort statistics for major fisheries (pole-and-line vessels larger than 20 GRT, longliners larger than 10 GRT, and tuna purse seiners). The other minor fisheries are referred to in the publication of the Statistics Department, Minister's Secretariat, Ministry of Agriculture, Forestry and Fisheries for 2012-2016 data (MAFFJ 2013-2017a, MAFFJ 2018b), and presented in this paper.

3. Trends in fleet size

Table 1 shows the number of Japanese tuna fishing vessels by fishery and vessel size class, which actually fished in the WCP-CA during the 2012-2017 period (coastal longline vessels were not included). As this number of active vessels is estimated basing on logbook submitted, some vessels which actually operated but did not submit logbook were not included. The research and training vessels of longline and pole-and-line are not included.

The number of Japanese commercial longline vessels shows a declining trend, from 402 vessels in 2012 to 368 in 2017 in total. The number of vessels for each category generally decreased, except that for category over 200GRT.

The total number of pole-and-line vessels (larger than 20 GRT) has decreased during the 2012-2017. The number of vessels for category 50-200 GRT decreased from 60 in 2012 to 48 in 2017, corresponding to 20% decrease. The number of vessels for category over 200 GRT ranged from 24 to 29 without apparent trend during the period.

The total number of purse seine vessels which are engaged in tuna fishery shows a decreasing trend during the 2012-2017 period. The number of vessels of 50-200 GRT ranged from 30 to 37 without apparent trend during the period. Note that the number of distant water purse seiners which are allowed to operate in the tropical waters in the Pacific Ocean by government regulation was 35 and has been stabilized since 1995.

4. Trends in catch and effort

The preliminary total 2017 WCP-CA catch of tunas (Pacific bluefin, albacore, bigeye, yellowfin and skipjack) by the Japanese fishery was still provisional and estimated to be 297,282mt, and this is corresponding to 94% of 2016 total tunas catch (316,264 mt). In 2017, the total tuna catch by the purse seine fishery was 173,945 mt (59% of the total), with 70,619mt (24%) by the pole-and-line fishery, 43,417 mt (15%) by the longline fishery, and the remaining (3%) by the other gears, whereas, in 2016, the total tuna catch by the purse seine fishery was 175,770 mt (56% of the total), with 89,157 mt (28%) by the pole-and-line fishery, 43,045mt (14%) by the longline, and the remaining (3%) by the other gears. The following is the description of each fishery in more details including tables of their catch and effort in the WCP-CA.

4.1. Longline fishery

Japanese longline vessels are classified into three categories (coastal, offshore and distant water longline fisheries) according to the operation area and vessel size. Coastal longliners, whose size is 1-20 GRT, are allowed to fish only in Japan's EEZ. Offshore longline vessels are further divided into two categories, small offshore ones, 10-20 GRT, and offshore ones, 10-120 GRT, both of which are able to go beyond Japan's EEZ in the Pacific Ocean with some restricted areas in the eastern Pacific Ocean. Although the vessel size of two offshore categories is duplicated in the range of 10-20 GRT, most vessels of the latter category are larger than 50 GRT. Distant water longliners are over 120 GRT and basically can fish in all oceans but need to follow the various domestic regulations that will ensure the management measures imposed by each tuna RFMO.

Most recent statistics available are 2017 data, though the 2016 and 2017 data are still preliminary. Catches in weight of tuna species (Pacific bluefin, albacore, yellowfin, bigeye and skipjack), swordfish and billfishes (striped

marlin, blue marlin, black marlin, sailfish and shortbill spearfish) caught by the Japanese distant water and offshore (not including small offshore) longliners in the WCP-CA from 2012 to 2017 are shown in Table 2A. Historical changes in fishing effort and catch by species are shown in Figs. 1 and 2, respectively, for the years 1971-2016. The total effort (in number of hooks) of distant water and offshore longline fisheries in all oceans decreased from 556 million hooks in 1981 to 495 million in 1983 and increased again to 557 million in 1988 after which it decreased steadily to less than 400 million since 1999. The ratio of the fishing effort exerted in the Pacific Ocean to that of the total fishing effort was about 40-50% in the latest decade. In the WCP-CA, around 60% of the total Pacific effort has been deployed since the middle of the 1980s. The fishing effort of distant water and offshore longlines in the WCP-CA was more than 200 million hooks during the 1971-1990 period, and then decreased to less than 100 million hooks in 2005, furthermore decreased to less than 50 million hooks in 2015. (Table 2). Primary species for the longline catch are yellowfin and bigeye historically. Among the species caught, yellowfin catch was around 60,000 mt at a peak during the late 1970s and the early 1980s and has since declined continuously to about 10,000 mt or less in the recent years (Fig. 2). Bigeye catch which had been relatively stable during the 1970s and 1980s ranging between 30,000 and 50,000 mt, and then decreased to between 20,000 and 30,000 mt during the mid-1990s to early 2000s. Further, bigeye catch continued to decrease: less than 20,000 mt after 2005, was less than 10,000 mt after 2009. The yellowfin catch continued to decrease since the end of 1970s. Table 2 shows fishing effort and catch by species for the distant water and offshore longline fisheries during the 2012-2017 period. The bigeye catch shows a declining trend in the recent years: 4,054 mt in 2017 which is 62% of that in the average of the previous 5 years (2012-2016). The yellowfin catch decreased to 3,654 mt in 2014 and then increased to 5,813 mt in 2017. The yellowfin catch in 2007 is 116% of that in the average of previous 5 years. (Table 2).

The average quarterly effort distribution of distant water and offshore longline vessels during the 2015-2017 is shown in Fig. 3. The fishing grounds are located in east-west direction off Japan to Hawaii, equatorial area between 10˚S and 15˚N and off Australia. Distribution patterns of the effort do not show remarkable seasonal changes, but in the overall area, the fishing effort appeared to decrease in the second quarter than in the other quarters. Distribution of the catch by species by this fleet is shown in Fig. 4. They are classified into several clear patterns, swordfish is dominant species near Japan, albacore in the middle latitudes between 15-30˚N and 25-40˚S, and tropical tuna (mostly bigeye and yellowfin) in the equatorial waters.

As for the small offshore longline fishery, catch by species in the WCP-CA during the 2012-2017 period is shown in Table 2. The total number of hooks deployed by small offshore longline fishery shows a declining trend ng from 86,127 thousand in 2012 to 66,065 thousand in 2017. Bigeye catches for the small offshore longline show no apparent trend in this period: 7,615 mt in 2017, which is 99% of that in the average of previous 5 years. Yellowfin catches for the small offshore longline shows an increasing trend in this period and was 4,260 mt in 2017 which is 110% of that in the average of previous 5 years. Geographical distributions of fishing efforts and catches by species by the small offshore longline fishery are shown in Figs. 5 and 6, respectively. At the area between 130˚E and 150˚E and north of 15˚N, albacore is dominant in the catch while bigeye catch is dominant from 140˚E to 160˚E and from 30˚N to 40˚N. In the south of 15˚N, bigeye and yellowfin are primary target species.

4.2. Pole-and-line fishery

The catch and effort statistics in the WCP-CA by the Japanese pole-and-line fishery (larger than 20 GRT in vessel size) are shown in Table 3 during the 2012-2017. In addition to this, historical changes in catch by species and effort are shown in Fig. 7 for the period of 1972-2017. The data for 2017 are preliminary. Both the catch and effort which were at a peak around the late 1970s gradually decreased throughout 1980s. After 1991, the total catch and effort had been relatively stable until the mid-2000s, though the catch showed some fluctuations. After that the catch decreased though the effort was relatively stable. Total annual catches which ranged from 250,000 to 300,000 mt in the 1970s and early 1980s, decreased to around 150,000 mt in the 1990s and around 100,000 mt in 2009 and 2010. Skipjack occupied the major part of catches followed by albacore and yellowfin. The number of fishing days exceeded 60,000 in the 1970s but it is about 15,000-17,000 days from 2006 onward.

During the 2012-2017 period, the number of fishing days (including no catch days) for this fishery shows a declining trend: 11,009 days in 2017 which is 81% of that in the average of the previous 5 years. (Table 3). The total catch of tunas (skipjack, bigeye, yellowfin, albacore and bluefin) in 2017 was 60,531 mt, which is 66% of that in the average of the previous 5 years. The skipjack catch was 43,428 mt in 2017, which is 71% of that in the average of the previous 5 years.

Seasonal distributions of fishing effort (fishing days in 1x1 degree area) of the pole-and-line fishery are shown in Fig 8 as the average of 2015-2017. The fishing ground in the temperate waters (north of around 25˚N) moved from southwest of Japan toward northeast as time progresses. In addition to these fishing grounds, in subtropical waters, north of the North Equatorial Current area was also the important fishing ground for this fishery in first, second, and fourth quarters of the year. In the third quarter fishing grounds off northern Japan expanded to further east of 170˚E. There were few operations in the tropical waters south of 15˚N in the third quarter.

Typical seasonal fishing grounds by vessel type are as follows. The distant water vessels (larger than 300 GRT) fish skipjack in the tropical waters and the North Equatorial Current area from the late 4th quarter to the early 2nd

quarter, and turn to north of around 35˚N, east of 150˚E where they target on albacore from June to October. The offshore vessels (smaller than 300 GRT) primarily catch skipjack, and its fishing starts at sub-tropical area east of Northern Mariana Islands in February. This fishing ground gradually moves northward, and then reaches areas just close to Japan, south and/or east of Tokyo in May and June. The fishing ground of this fleet moves further northeastward to off northern Japan 35˚N-42˚N, west of 155˚E, so-called the Tohoku area. Other than these offshore vessels, some of small sized offshore vessels operate around the Nansei Islands, southwest of Japan, with anchored FADs almost all year around. The other smaller size vessels in the offshore vessel category operate around the Izu Islands, south of Tokyo, almost all year round.

In most of the fishing grounds of the pole-and-line fishery, skipjack dominated among species, except for in some regions off north-east Japan, in which albacore dominated (Fig. 9). Most of yellowfin catch was made in the waters around the Nansei Islands located in the southern part of Japan.

4.3. Purse seine fishery

The catch and effort statistics in the WCP-CA by the Japanese tuna purse seine fishery (larger than 50 GRT in vessel size) are shown in Table 4 from 2012 to 2017. In addition to this, historical changes in catch by species and effort are shown in Fig. 10 for the period of 1970-2017. The data for 2017 are preliminary. The fishing effort was less than 5,000 days in the 1970s, rapidly increased in the early 1980s, then the effort fluctuated between 7,500 to 9,500 days (Fig. 10). The total catch of this fishery showed rapid increase in the early 1980s, then, gradually increased until the late 2000s. Skipjack occupied the major part of catches followed by yellowfin.

During the 2012-2017 period, the number of fishing days (including only searching) for this fishery shows a declining trend: 6,091 days in 2017 which is 92% of the that in the average of previous 5 years (Table 4). The total catch of the purse seine fishery shows a decreasing trend during the period, and the catch in 2017 was 169,000 mt which is the lowest during this period. Skipjack catch was 128,266 mt in 2017, which is 79% of that in the average of the previous 5 years. Yellowfin catch was 34,410 mt in 2017, which is 110% of that in the average of the previous 5 years.

The fishing effort (fishing and searching days) for the purse seine fishery distributed in two regions: tropical waters and northern waters. They are clearly separated by the border of 20˚N (Fig. 11). The fishing grounds in the tropical waters were developed widely between 10˚N, 130˚E and 10˚S, 180˚ with some seasonal fishing ground shifts. In the northern waters, the skipjack fishing season starts in April and continues until the third quarter in the vicinities of Japan in the Pacific Ocean. Geographical distributions of catches for skipjack, yellowfin and bigeye are shown in Fig. 12. In most regions, skipjack was the largest part of the catch among these three species in each 1˚ x 1˚ block as shown in Fig. 11.

This fishery utilizes tuna schools in association with natural log and FADs mainly in equatorial fishing grounds (Fig. 13). However, the operations for free swimming schools were dominant both in the equatorial waters and northern waters.

Number of purse seine sets associated with whale sharks and cetaceans is currently being added up. According to the reports of the master of a vessel/observer, Japanese tuna purse seine set a net on schools of tuna associated with a cetacean and whale shark unintentionally was 12 times and 122 times. All whale sharks were release alive, but one cetaceans were dead before releasing.

4.4. Other coastal fisheries

Besides the major tuna fisheries described above, there are miscellaneous coastal fisheries, which also catch tunas and tuna like species such as troll, setnet and gillnet fisheries. The catch by species and fishery during the 2012-2017 is shown in Table 5. The figures in 2017 are preliminary.

There used to be two kinds of large-scale gillnet (driftnet) fisheries. One is a large-mesh driftnet fishery, which fished billfishes and tunas, and the other is a squid driftnet fishery, which fished flying squid. Those fisheries used to operate in the wide area of high seas in the Pacific Ocean, however, stopped the operations on the high seas of the North Pacific in January 1993 due to a UN moratorium on the use of large-scale driftnets on the high seas. After 1993, the former gillnet fishery started operating within the Japanese EEZ targeting tunas and billfishes. Swordfish, striped marlin and skipjack are primary target species in the fishing ground. The annual catch by the fishery has been less than 1,500 mt since 1993.

The troll fishery takes various pelagic species including tunas. The size of troll vessels is generally small, mostly less than 10 GRT, and they make one-day trip. All catches by the troll gear are made within territorial seas. Skipjack is very important resources for the troll fishermen in the local communities and a very low level of skipjack catch by troll along the Pacific coast in the western Japan is getting a big political issue in recent years.

The setnet (also called as “trap net”) fishery also catches pelagic species including tunas.

4.5. Total catch for tropical tunas for all gears combined

The total catch of tropical tunas by all gears combined, including coastal fisheries (longline, pole-and-line, troll and other miscellaneous gears), are shown in Table 6 for 2012-2017. The data in 2016 and 2017 are preliminary.

The total catch of skipjack shows a declining trend during the 2012-2017 period from 265,014 mt in 2012 to 182,337 mt in 2017. The total catch of bigeye shows a declining trend during this period from 23,231 mt in 2012 to 15,969 mt in 2017. The total catch of yellowfin shows an increasing trend during this period from 47,089 mt in 2012 to 53,080 mt in 2017.

5. Status of tuna fishery data collection systems

5.1. Logbook data collection and verification

Longline

The owners of fishing vessels larger than or equal to 10 GRT are required to submit the log sheet on their operations and catch information to the Japanese government. Coastal, small offshore and offshore vessel must submit it by each cruise within 30 days after the end of cruise while distant water longliners are required to submit it every ten days. The log sheet of longline contains set by set data on catch number and weight in each species, and other information data such as fishing date and location, fishing effort (the number of basket and hooks used), water temperature. Catch weight information was not included in the logbook till 1993. The number of hooks per basket is essential information as it suggests the depth of the gear and target species. As tuna and tuna-like fishes, six tunas (Pacific bluefin, southern bluefin, albacore, bigeye, yellowfin and skipjack), and six billfishes (swordfish, striped marlin, blue marlin, black marlin, sailfish and shortbill spearfish) are separately recorded in the log sheets. Additionally, information on the cruise (date and port of departure and arrival of the cruise), vessel (name, size, license number and call sign), the number of crew and the configurations of the fishing gear (material of main line and branch line) are asked to fill in on the top part of the sheet by each cruise.

Submitted log sheets are processed into electronic data files. Error checks for several types of information, such as date, location, range of weight, CPUE, are conducted before these data are finalized. Vessel characteristics (call sign, name, license number, etc.) are verified with the corresponding register.

Because the coverage rate of log sheets is not necessarily 100% for longline fisheries, it is necessary to raise the sample values to represent 100 %. For both of distant water and offshore longline fisheries (20-120 GRT, excluding 10-20 GRT vessels that operate outside of the Japanese EEZ), the coverage rate has been about 90 - 95% of total operation (Table 7). In the case of the distant water longline fishery, information on the total number of operations aggregated by sub-areas and month provided by the fishermen's association (Federation of Japan Tuna Fisheries Co-operative Association) was used to raise the log sheet data to the total catch. For the offshore longline vessels larger than 20 GRT, the total number of operation by prefecture (which the vessel belongs to) by year given by MAFFJ has been used for the raising. Since 2008, Vessel Monitoring System (VMS) information is utilized to raise the log sheet data for both fisheries. As for the small offshore longline, although reliable information of coverage rate had been available until 2007, it became possible to raise for the data of 2008 onward due to the utilize of VMS. But reliable information of coverage rate is not available for the coastal longline yet.

Since the catch in weight in log sheet is in processed weight, so that conversion factors by species are used to convert processed weight to whole weight.

An electric logbook system had been available since November 2016 for only distant water longline fishery. It allows for fishermen to fill out logbook in electric file and submit the electric file of logbook through web site to the server running by the Fishery Agency of Japan. Fishermen is moving to change from the ordinary log sheet by paper to the electric logbook system.

Pole-and-line

The license holders of the distant water pole-and-line or the offshore pole-and-line (mostly vessel larger than 20 GRT) are required to submit a log sheet on their operations and catch information to the Japanese government within 30 days after the end of cruise. The log sheets submitted to the government are forwarded to the NRIFSF and are then compiled. Although the log sheet submission is mandate, the submission rate for the pole-and-line is not necessarily 100%. The coverage is likely to be around 80% in the beginning of the history of the pole-and-line log sheet system (1970s), but the submission rate was improved after that, to nearly 100% in 1990s. The coverage rate in Table 7 for the pole-and-line was calculated by

(Number of the vessels which submitted log sheet at least once) / (Number of vessels which actually operated).

Similar error check processes to the longline are also conducted. In case there is significant omission or errors, the NRISFS staff will contact the owner or other relevant person to obtain information to revise.

Purse seine

The logbooks of 50 – 200 GRT class and greater than 200 GRT vessels were reported when fishermen caught tuna species. The coverage of the latter class was 100 % and the reported catch by species could be verified by comparing with the landing data, which were obtained from market receipts of three major unloading ports (Yaizu, Makurazaki, and Yamagawa).

In 2011, the reporting system from fishermen to the government was changed for the cruises for which purse

seine vessels operates in the Sea of Japan or the East China Sea. Such fishermen used to submit the log sheets designed for tunas when they operated targeting tunas or submit the log sheets designed for small pelagics, such as mackerel sardines and anchovies, when they operated targeting small pelagics. The NRIFSF used to compile the logbook data only for the tuna caught operation. After implementation of the new system, fishermen submit a single kind of log sheets regardless of target species. As a result, the logbook data used for fishing operations in the Sea of Japan or the East China Sea now have a large quantity of zero catch records of tuna, so care should be given when interpreting the fishing effort for tunas using the data coming from the new log sheets.

5.2. Size data collection and compilation

The NRIFSF has collected size data for tuna and tuna like species to use for biological study and to provide to stock assessments. There are several kinds of data source for the size data such as at-sea sampling and port sampling for the fish caught by commercial fisheries and onboard sampling by training and research vessels.

5.2.1. At-sea sampling on commercial fishing vessels

Length data is voluntarily collected for all tunas and billfishes by fishermen who are on board distant water longline vessels. Fishermen recorded the data in the field note which is provided by the NRIFSF, and send the field note back to the NRIFSF after the completion of the cruise. The length data reported by the at-sea sampling is compiled on a daily basis as temporal resolution and 1˚x1˚block basis as geographical resolution and is stored in a specific database for size data for tunas and billfishes. In some cases, fishermen take measurement at an interval of 2cm or 5cm though the NRIFSF encourages measurement at an interval of 1cm. There is the length data provide from fishermen in this way until 2014.

5.2.2. At-sea sampling on training and research vessels

Size data is collected for not only tunas and billfishes but also all animals caught by training and research vessels using longline gears. The crew and/or students measured the length and weight of the animals retrieved on board and reported the data to the NRIFSF. Size data is collected for skipjack (and the other species sometimes) by training and research vessels using pole-and-line gears. The crew and/or students measured the length and weight of skipjack retrieved on board and reported the data to the NRIFSF. Size data received from training/research vessels is compiled and stored in the same manner as the at-sea sampling on commercial fishing vessels.

5.2.3. Port sampling

Port sampling is an important way to collect size data and occupies the largest percentage of size sampling which the NRIFSF has been conducting. Measurement is done at a timing between unloading from fishing vessels and starting of auction. Samplers randomly conduct measurement in general but conduct measurement for all individuals in some cases. In general, size data collected by port sampling is compiled on a monthly basis as temporal resolution and by specific blocks of 1˚x1˚, 5˚x5˚, 5˚x10˚ or 10˚x20˚ as geographical resolutions, depending on the width of the range of fishing position at the cruise. The temporal and geographical resolution is determined by the range of each cruise in which size sampling is done based on the information in the interview with the captain or fishing master of the fishing vessel at unloading sites and/or logbook data reported by fishermen.

As a special case, skipjack unloaded as unfrozen fish is recorded in a unique way from the above even in measurements by port sampling. In most cases of measurement of such skipjack, information of the fishing dates on a daily basis and fishing positions on a minute basis (finer than 1˚x1˚ block) are recorded on the size database for skipjack, since fishing dates and fine positions can be specified by the interview.

Port sampling for distant water purse seiners has been carried out in a unique way, which is conducted at three ports (Yaizu, Makurazaki and Yamagawa). The number of annual samplings is about 25 in average, which is more than 10% coverage (25/220) on a cruise number basis. Size data is collected for skipjack, yellowfin and bigeye. Fish form a commercial vessel was selected from a single well, which is filled up with fish caught by a single operation. Thus, the fishing date, fishing location and school type (associated school, free school) for these fish are identified by the hatch plan (a fish unloading plan describing the amount of catch by species for each well with the fishing date and location) sent from vessel captains before unloading. In general, only one vessel per one port sampling is selected, and fish from one to three wells of the vessel are measured for the individual length and partially weight. About 1,000 kg fish per well were measured in average.

The followings are species, types of gear/fishery and locations of sampling site for port sampling conducted in 2017;

- Size data was collected for albacore and skipjack caught by distant water pole-and-line vessels by the NRIFSF staff at Yaizu.
- Size data was collected for skipjack, yellowfin, and bigeye caught by distant-water purse seine vessels by the staff of an organization contracted with the government at Yaizu, Makurazaki and Yamagawa.
- Size data was collected for skipjack caught by the middle-sized pole-and-line vessels which unload unfrozen fishes at Kesennuma by the NRIFSF staff.

- Size data was collected for albacore, swordfish and striped marlin and sharks caught by the offshore longline vessel at Kesennuma by the NRIFSF staff.
- Size data was collected for Pacific bluefin caught by the vessels of most of fishing gears at most of prefectures where bluefin is unloaded under the nationwide port sampling project. Also, size data was collected for albacore, yellowfin, bigeye and swordfish and billfishes caught by offshore and small offshore and coastal longline vessels, for skipjack caught by mid-sized pole-and-line at major landing ports under the same project.

6. Research activities related to tuna and tuna-like species in the WCPFC Convention Area

6.1. Observer program

Two kinds of national observer programs have been conducted in the WCP-CA, one for purse seiners and the other for longliners.

The observer program for purse seine boats has been implemented in the tropical Pacific Ocean since 1995. The details of time and position at each operation, type of association, and the length frequencies of samples were taken by scientific observers in each operation. After 2012, the observer program for tuna purse seiners in the vicinity of Japan's waters has been started. Five purse seine cruises were observed from June to July 2017 in the vicinity of Japan. Days spent for these cruises ranged from 3 to 22 days. They returned to their port frequently without filling up their fish wells in one cruise.

The observer program for longliners in the WCP-CA started in 2008. The information on fishing vessels, fishing operations and almost all the catches in each operation were identified and measured as much as observer can. Twenty cruises of distant water and offshore longline vessels and 59 cruises of small offshore longline vessels were observed in the 2017 calendar year. The data from 17 distant water cruises and 59 small offshore cruises were inputted to the database and the number of operations and species observed in each fishery was shown in Table 8.

6.2. Tagging

Skipjack tagging

The NRIFSF has been conducting skipjack tagging mainly to investigate migration pattern to the fishing ground off Japan. One distant water pole-and-line vessel (> 199 GRT) was substantially chartered and tagging was conducted in the tropical area between 8 and 10˚N in December 2017. A total of 202 skipjack including 22 fishes with archival tag (Lotek LAT2910) were released in 2017. In addition, skipjack tagging has been being conducted in cooperation with Ajinomoto Co., Inc. in the coastal area of southwestern Japan since 2009. In 2017, 100 skipjack including 22 fishes with archival tag were released at the east of Taiwan in December 2017 and March 2018.

Besides above studies, three research/training pole-and-line vessels conducted skipjack tagging in 2017 around Japanese water. A total of 797 skipjack including 98 archival tags were deployed in the south off Japan and around Izu Islands, around Hachijo Island (33˚N, 139˚E) and Wakayama (33.15˚N, 135.75˚E).

6.3. Research cruise conducted

PBF larval/juvenile sampling

Since 2011, larval surveys have been conducted to estimate current main spawning area and period of PBF. In 2017, research cruises were designed to focus on ecological studies of larval/juvenile PBF by R/Vs Shunyo-Maru, Yoko-Maru, Hokko-Maru, fisheries training vessel Mizunagi and five prefectural R/Vs. Larval surveys were conducted in the south of Japan around Nansei Islands area, where is a major spawning ground of PBF, from May to August and also in the Sea of Japan, which is another spawning ground of PBF, from July to August. In 2017, approximately 1,800 of PBF larvae in total were captured in both spawning grounds, which should help to understand biological and environmental factors on larval survival of PBF.

Juvenile surveys were also conducted nursery areas both in the Pacific Ocean in July and in the Sea of Japan in September, respectively. Over 300 of PBF juveniles were captured in the Sea of Japan in 2017. Samples collected are being examined by a variety of approaches such as genetic identification, aging, stable isotope, microchemistry and stomach contents analyses to understand recruitment process to PBF fisheries around Japan.

Skipjack larval/juvenile sampling

In order to better understand the relationship between recruitment variability and growth during the early life stage of tropical tunas, a cruise was conducted with the aims to (1) describe the variations of the early life stage growth among areas and (2) describe the horizontal distribution of skipjack and the other tropical tunas. The research cruise was conducted from 6 Nov. 2017 to 21 Dec. 2017 around the subtropical area including the North Equatorial Current area and in the EEZ of the Republic of Palau, and in the archipelagic waters in Indonesia in collaboration with the Ministry of Marine Affairs and Fisheries, Indonesia. This research cruise conducted CTD (XCTD) observations, mid-water trawl, 2-m ring plankton net and tucker trawl net tows and NORPAC. These sampling gears collected larvae and juveniles of skipjack and other tuna species as well as water to measure chlorophyll-a concentration.

6.4. Bycatch species related research

Mitigation studies for seabirds

A research cruise was conducted from April to June 2018 using a longline fishing vessel of Den-Maru No. 37 (167 GRT), covering an area of 20º-35ºN and 137º-170ºE of the North Pacific Ocean. The objective of this research cruise was to investigate influences of large circle hook (approximately 16/0) on catch rates of target species under deep set targeting tunas. The following three types of hooks were used with bait of sardine: large circle hook with 10-degrees offset, large circle hook without offset and tuna hook. Deep set gear configuration was applied with number of hooks between floats of 10 to 16.

The WCPFC CMM of 2015-03 became effective since January 1st, 2017, including application of tori line for small longline vessels operated north of 23ºN. A research cruise using Hanei-Maru No. 188 was carried out in March 2018 to address extension of aerial extent of tori line for small longline vessels. Because towing devices to create drag to extend the aerial extent of tori line could cause entanglement with longline gear, a number of combinations of material and total length of tori line were tested through the research cruise.

References

MAFFJ 2014-2017a. Annual report of catch statistics on fishery and aquaculture, 2012-2015. Statistics Department, Minister's Secretariat, the Ministry of Agriculture, Forestry and Fisheries of Japan.

MAFFJ 2018b. Annual report of catch statistics on fishery and aquaculture 2016, on the portal site for governmental statistics "e-Stat" (published in February 21, 2018). https://www.e-stat.go.jp/stat-search/files?page=1&layout=datalist&tstat=000001015174&cycle=7&tclass1=000001015175&tclass2=000001110615&second2=1

Table 1. Number of fishing vessels engaged in tuna fisheries in the WCPFC Convention Area by gear and size of vessel. Figures in parentheses indicate provisional data. NA indicates not available. In the number of longline vessel, coastal longliner and training/research vessels are not included. In the number of pole-and-line vessel, research and training vessels are not included.

Longline

	10-50 GRT	50-100 GRT	100-200 GRT	200- GRT	Total
2012	262	21	21	98	402
2013	260	20	23	109	412
2014	248	18	21	84	371
2015	239	18	24	69	350
2016	234	16	16	84	350
2017	(229)	(15)	(16)	(108)	(368)

Pole-and-line

	20-50 GRT	50-200 GRT	200- GRT	Total
2012	0	60	27	87
2013	0	55	25	80
2014	1	54	25	80
2015	1	51	24	76
2016	1	50	25	76
2017	(1)	(48)	(29)	(78)

Purse Seine

	50-200 GRT	200-500 GRT	500- GRT	Total
2012	34	37	4	75
2013	34	37	4	75
2014	33	37	3	73
2015	30	35	5	70
2016	32	33	4	69
2017	(37)	(34)	(4)	(75)

Table 2. Fishing effort (in 1000 hooks) and catch (mt) in the WCPFC Convention Area by species for the Japanese distant and offshore (top table) and small offshore (bottom table) longline fisheries. Figures in the parentheses indicate provisional data.

Distant water (120- GRT) and offshore (10-120 GRT) longlines

	#hooks	PBF	ALB	BET	YFT	SWO	MLS	BUM	BLM	SFA	SSP	SKJ
2012	68,164	14	7,587	8,375	7,061	3,243	425	1,137	20	45	111	199
2013	61,394	12	6,771	6,269	4,760	3,417	405	989	31	66	169	207
2014	51,353	15	5,755	7,210	3,654	3,215	310	938	26	48	138	156
2015	45,297	15	5,024	5,945	4,196	3,594	280	715	25	41	54	87
2016	(46,960)	19	(5,279)	(4,686)	(5,489)	(3,725)	(270)	(848)	(44)	(134)	(66)	(45)
2017	(46,949)	(28)	(6,091)	(4,054)	(5,813)	(2,844)	(191)	(819)	(54)	(73)	(56)	(65)

	BSH	LMD	POR	SMA	OCS	THR	FAL	SPN	RHN	O-shk	Total
2012	10,857	467	1	751	0	69	-	-	-	13	40,374
2013	9,548	205	1	603	0	96	0	1	-	125	33,672
2014	9,890	741	8	707	0	84	0	0	0	4	32,898
2015	10,270	642	1	642	0	44	0	1	0	0	31,576
2016	(10,921)	(54)	(0)	(827)	(0)	(64)	(0)	(0)	(0)	(1)	(32,469)
2017	(9,931)	(77)	(0)	(586)	(0)	(63)	(0)	(0)	(0)	(1)	(30,739)

Small offshore longline (10-20 GRT)

	#hooks	PBF	ALB	BET	YFT	SWO	MLS	BUM	BLM	SFA	SSP	SKJ
2012	86,127	-	-	8,542	3,556	1,187	927	1,177	11	39	0	4
2013	79,358	-	-	6,703	3,530	960	964	1,351	19	18	0	2
2014	73,617	-	-	8,259	2,900	1,121	704	975	14	46	0	4
2015	70,546	-	-	8,046	4,643	1,243	883	827	16	51	0	7
2016	(69,172)	-	-	(6,775)	(4,694)	(1,992)	(576)	(965)	(19)	(28)	(1)	(4)
2017	(66,065)	-	-	(7,615)	(4,260)	(1,869)	(529)	(791)	(13)	(33)	(0)	(4)

	BSH	LMD	POR	SMA	OCS	THR	FAL	SPN	RHN	O-shk	Total
2012	632	91	0	3	0	1	-	-	-	4	16,176
2013	881	193	0	24	0	21	0	0	0	86	15,227
2014	836	325	0	4	0	2	0	0	0	1	16,884
2015	581	448	0	2	0	1	0	0	0	0	16,749
2016	(1,041)	(1,284)	(0)	(55)	(0)	(6)	(0)	(0)	(0)	(0)	(17,439)
2017	(1,781)	(3,567)	(0)	(77)	(0)	(78)	(0)	(0)	(0)	(1)	(20,617)

* The catches for PBF and ALB are not appropriate to show hear as the category "small offshore". See also Appendix Tables 2 for PBF and ALB catches by longline.

Table 3. Fishing effort (Days fished and number of poles) and catch by species (mt) for the Japanese offshore and distant water pole-and-line fishery in the WCPFC Convention Area. Figures in parentheses indicate provisional data.

year	#days	#pole	SKJ	YFT	BET	PBF	ALB	Total
2012	14,804	280,356	57,266	1,679	2,036	113	33,665	94,758
2013	13,288	252,667	71,309	1,150	2,340	8	33,515	108,323
2014	12,642	241,878	54,234	1,172	2,612	5	29,352	87,375
2015	12,806	243,353	63,152	1,261	615	8	21,208	86,244
2016	(14,126)	(258,159)	(61,947)	(1,715)	(947)	44	(14,416)	(79,069)
2017	(11,009)	(199,846)	(43,428)	(1,491)	(1,115)	(86)	(14,411)	(60,531)

* PBF catches for offshore and distant water pole-and-line were not estimated separately. See also Appendix Table 2 to see statistics for PBF catch.

Table 4. Fishing days including searching days and catch (mt) by species for the Japanese tuna purse seine fishery in the WCPFC Convention Area based on logbook data.

	#days	SKJ	YFT	BET	PBF*	ALB	Total
2012	7,370	193,372	28,742	3,493	-	4,193	229,800
2013	7,208	181,605	22,513	2,820	-	1,988	208,927
2014	6,487	167,378	31,987	4,000	-	2,009	205,375
2015	5,749	146,375	35,499	3,970	-	1,072	186,916
2016	6,361	126,400	38,073	2,116	-	3,679	170,268
2017	(6,091)	(128,266)	(34,410)	(2,644)	-	(3,679)	(169,000)

* PBF catches for tuna purse seine were not estimated separately. See also Appendix Table 2 to see statistics for PBF catch.

Table 5. Japanese catches (mt) for miscellaneous coastal fisheries by species and gear in the WCPFC Convention Area. Figures in parentheses indicate provisional data. SKJ: skipjack tuna, YFT: yellowfin tuna, BET: bigeye tuna, PBF: Pacific bluefin tuna, ALB: albacore. SWO: swordfish, MLS: striped marlin, BLZ: blue marlin, BLM: black marlin. Figures in parentheses indicate provisional data.

Coastal longline

	SKJ	YFT	BET	PBF*	ALB*	SWO	MLS	BUM+BLM	Total
2012	11	1,289	446	-	-	99	200	148	2,193
2013	5	1,338	390	-	-	102	242	166	2,243
2014	9	1,218	374	-	-	96	230	131	2,058
2015	11	1,765	343	-	-	100	248	130	2,597
2016	4	2,018	280	-	-	89	201	113	2,705
2017	(4)	(2,018)	(280)	-	-	(89)	(201)	(113)	(2,705)

Coastal pole-and-line

	SKJ	YFT	BET	PBF*	ALB	Total
2012	9,930	1,994	71	-	92	12,087
2013	13,003	2,182	146	-	61	15,392
2014	8,670	1,662	234	-	81	10,647
2015	8,251	1,710	165	-	86	10,212
2016	8,438	1,554	63	-	33	10,088
2017	(8,438)	(1,554)	(63)	-	(33)	(10,088)

Coastal purse seine

	SKJ	YFT	BET	PBF*	ALB	Total
2012	58	2	0	-	13	73
2013	21	44	0	-	2	67
2014	87	7	0	-	0	94
2015	18	439	0	-	4	461
2016	62	342	2	-	3	409
2017	(62)	(342)	(2)	-	(3)	(409)

Gillnet

	SKJ	YFT	BET	PBF*	ALB	Total
2012	95	6	2	-	26	129
2013	112	8	1	-	14	135
2014	119	8	0	-	11	138
2015	119	12	4	-	138	273
2016	111	16	0	-	19	146
2017	(111)	(16)	(0)	-	(19)	(146)

Troll

	SKJ	YFT	BET	PBF	ALB	Total
2012	3,487	2,279	118	570	610	7,064
2013	2,514	1,817	116	904	302	5,653
2014	954	1,523	160	1,023	197	3,857
2015	1,238	2,014	140	413	239	4,044
2016	1,642	2,250	87	778	148	4,905
2017	(1,642)	(2,250)	(87)	(603)	(148)	(4,730)

Setnet

	SKJ	YFT	BET	PBF	ALB	Total
2012	404	113	0	1,932	48	2,497
2013	209	103	5	1,415	36	1,768
2014	131	67	0	1,907	24	2,129
2015	153	56	3	1,242	17	1,471
2016	264	120	1	1,227	28	1,640
2017	(264)	(120)	(1)	2,255	(28)	(2,668)

* PBF catches for coastal longline, coastal pole-and-line, coastal purse seine and gillnet were not estimated separately. See also Appendix Table 2 to see statistics for PBF catch. ALB catches for coastal longline was not estimated separately. See also Appendix Table 2 to see statistics for ALB catch.

Table 6. Japanese catches (mt) for tropical tuna species by gear in the WCPFC Convention Area. Figures in parentheses indicate provisional data. LL: longline, PL: pole-and-line, PS: purse seine.

	2012	2013	2014	2015	2016	2017
Skipjack						
Total	265,014	269,099	231,835	219,457	(198,969)	(182,337)
Distant water and Offshore LL	199	207	156	87	(45)	(65)
Distant water and Offshore PL	57,266	71,309	54,234	63,152	(61,947)	(43,428)
Tuna PS	193,372	181,605	167,378	146,375	126,400	(128,266)
Small offshore LL	4	2	4	7	(4)	(4)
Coastal LL	11	5	9	11	4	(4)
Coastal PL	9,930	13,003	8,670	8,251	8,438	(8,438)
Coastal PS	58	21	87	18	62	(62)
Gill net	95	112	119	119	111	(111)
Troll	3,487	2,514	954	1,238	1,642	(1,642)
Set net	404	209	131	153	264	(264)
Unclassified	188	111	93	46	53	(53)
Yellowfin						
Total	47,089	37,936	44,626	52,193	(57,078)	(53,080)
Distant water and Offshore LL	7,061	4,760	3,654	4,196	(5,489)	(5,813)
Distant water and Offshore PL	1,679	1,150	1,172	1,261	(1,715)	(1,491)
Tuna PS	28,742	22,513	31,987	35,499	38,073	(34,410)
Small offshore LL	3,556	3,530	2,900	4,643	(4,694)	(4,260)
Coastal LL	1,289	1,338	1,218	1,765	2,018	(2,018)
Coastal PL	1,994	2,182	1,662	1,710	1,554	(1,554)
Coastal PS	2	44	7	439	342	(342)
Gill net	6	8	8	12	16	(16)
Troll	2,279	1,817	1,523	2,014	2,250	(2,250)
Set net	113	103	67	56	120	(120)
Unclassified	369	491	429	599	806	(806)
Bigeye						
Total	23,231	18,901	22,987	19,345	(15,067)	(15,969)
Distant water and Offshore LL	8,375	6,269	7,210	5,945	(4,686)	(4,054)
Distant water and Offshore PL	2,036	2,340	2,612	615	(947)	(1,115)
Tuna PS	3,493	2,820	4,000	3,970	2,116	(2,644)
Small offshore LL	8,542	6,703	8,259	8,046	(6,775)	(7,615)
Coastal LL	448	390	374	343	280	(280)
Coastal PL	71	146	234	165	63	(63)
Coastal PS	0	0	0	0	2	(2)
Gill net	2	1	0	4	0	(0)
Troll	118	116	160	140	87	(87)
Set net	0	5	0	3	1	(1)
Unclassified	146	111	138	114	109	(109)

Table 7. Coverage rate of logbook for longline, pole-and-line and Purse seine fisheries. The calculation methods among fishery are not the same. N/A indicates not available.

Type of fishery	2012	2013	2014	2015	2016	2017
Distant water longline	100%	100%	100%	100%	100%	99%
Offshore longline	94%	96%	98%	96%	96%	89%
Small offshore longline	84%	86%	88%	90%	93%	79%
Coastal longline	N/A	N/A	N/A	N/A	N/A	N/A
Offshore pole-and-line (20-120 GRT)	100%	100%	100%	100%	100%	100%
Distant water pole-and-line (over 120 GRT)	100%	100%	100%	100%	100%	100%
Purse seine (>200GRT)	100%	100%	100%	100%	100%	100%

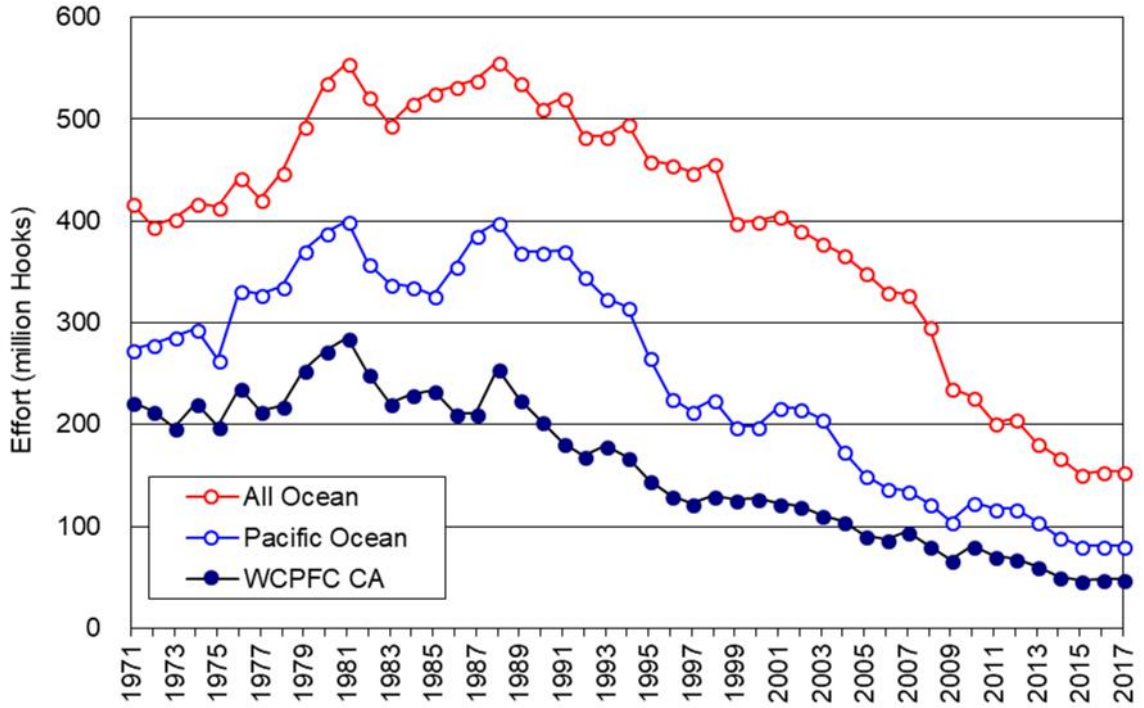

Fig. 1. Historical change in fishing effort of the Japanese distant water and offshore longline fishery (not including small offshore) in the WCPFC Convention Area. Values in 2016 and 2017 are provisional.

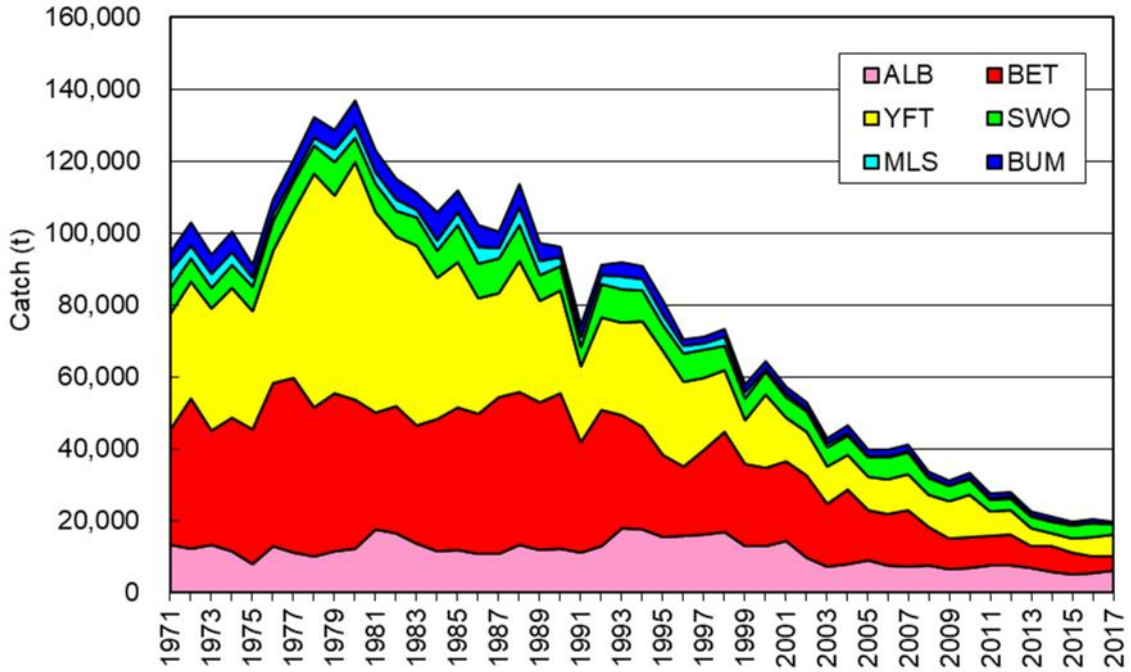

Fig. 2. Historical change of catches for major species for the Japanese distant water and offshore longline fishery (not including small offshore) in the WCPFC Convention Area. ALB: albacore, BET: bigeye, YFT: yellowfin, SWO: sword fish, MLS: striped marlin, BUM: blue marlin. Values in 2016 and 2017 are provisional.

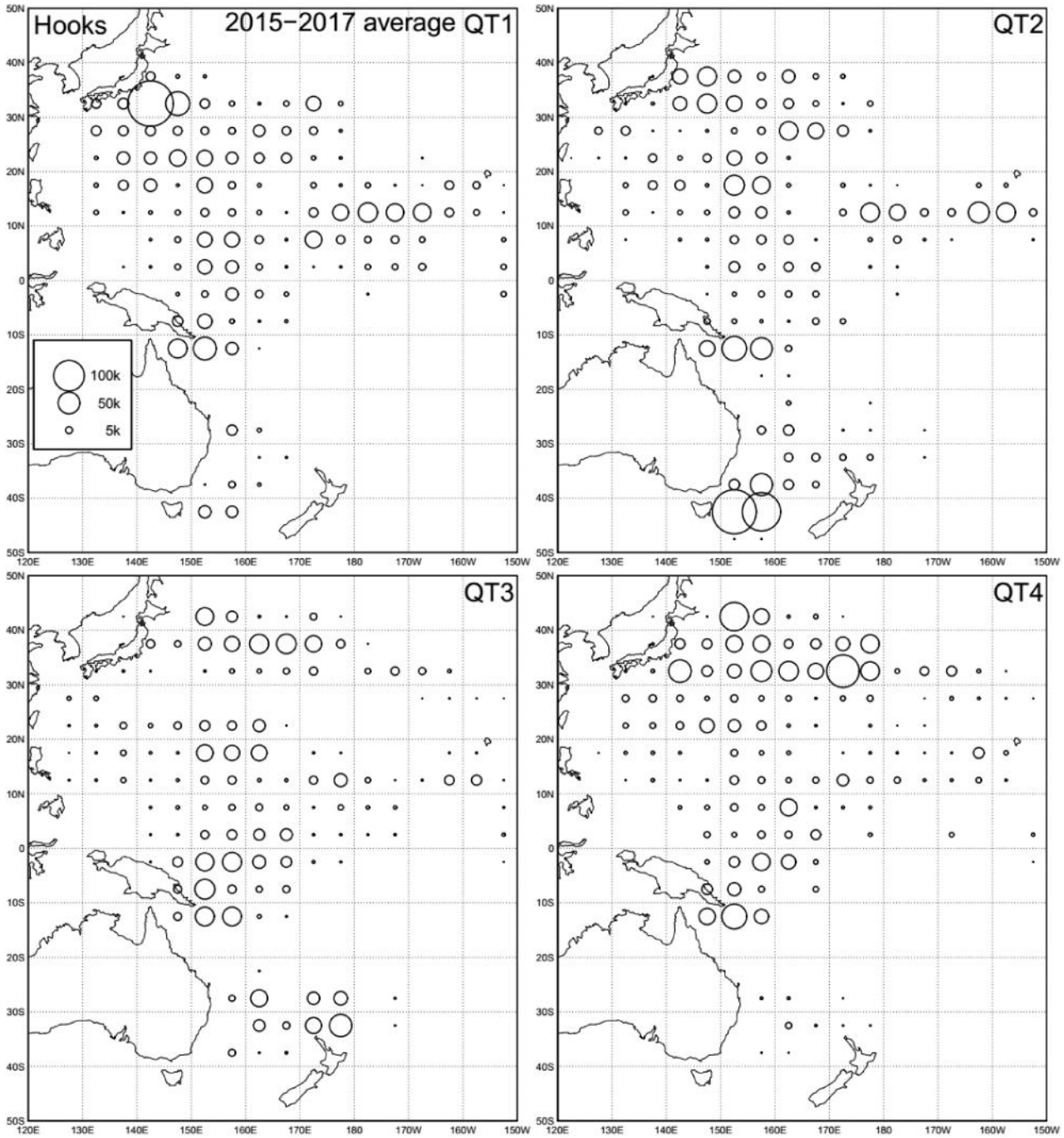

Fig. 3. Quarterly distribution of fishing effort for the Japanese offshore and distant water longline fisheries in the western and central Pacific Ocean in average of 2015-2017.

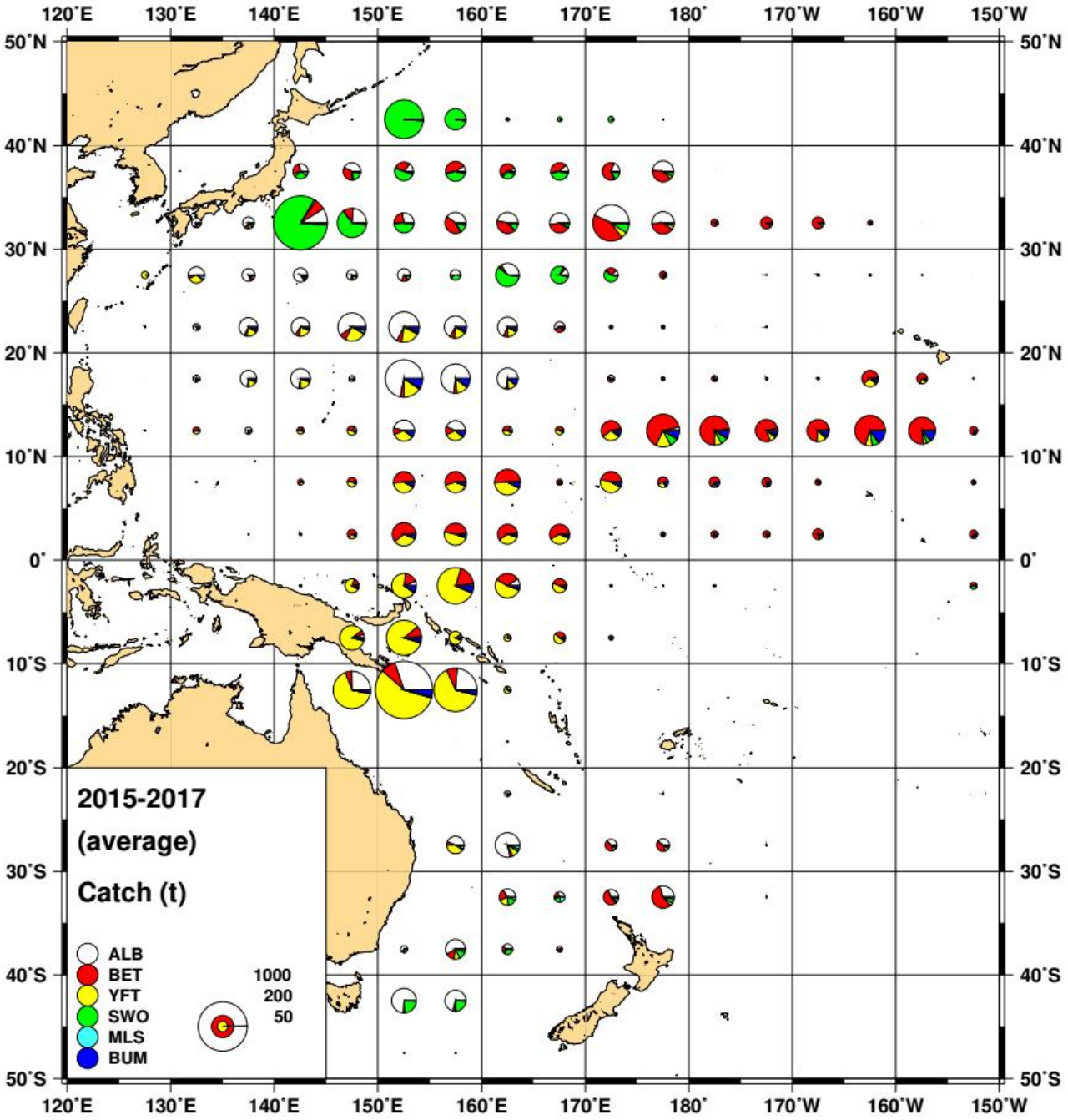

Fig. 4. Distributions of offshore and distant water longline catch (in weight) by species in average of 2015-2017 for six main species (ALB: albacore, BET: bigeye tuna, YFT: yellowfin tuna, SWO: swordfish, MLS: striped marlin and BUM: blue marlin).

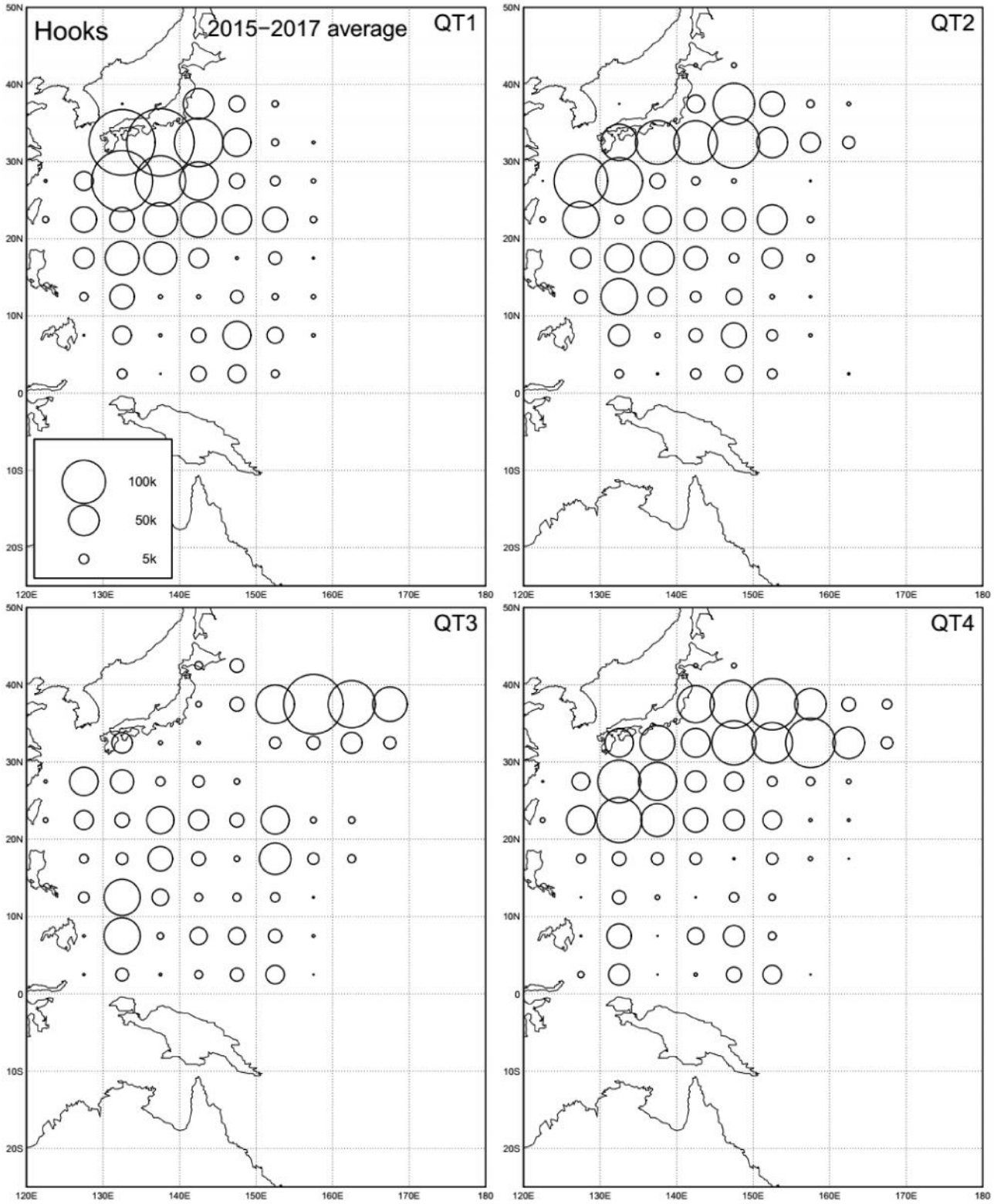

Fig. 5. Quarterly distribution of fishing effort for the Japanese small offshore longline fisheries (10- 20 GRT) in the western and central Pacific Ocean in average of 2015-2017.

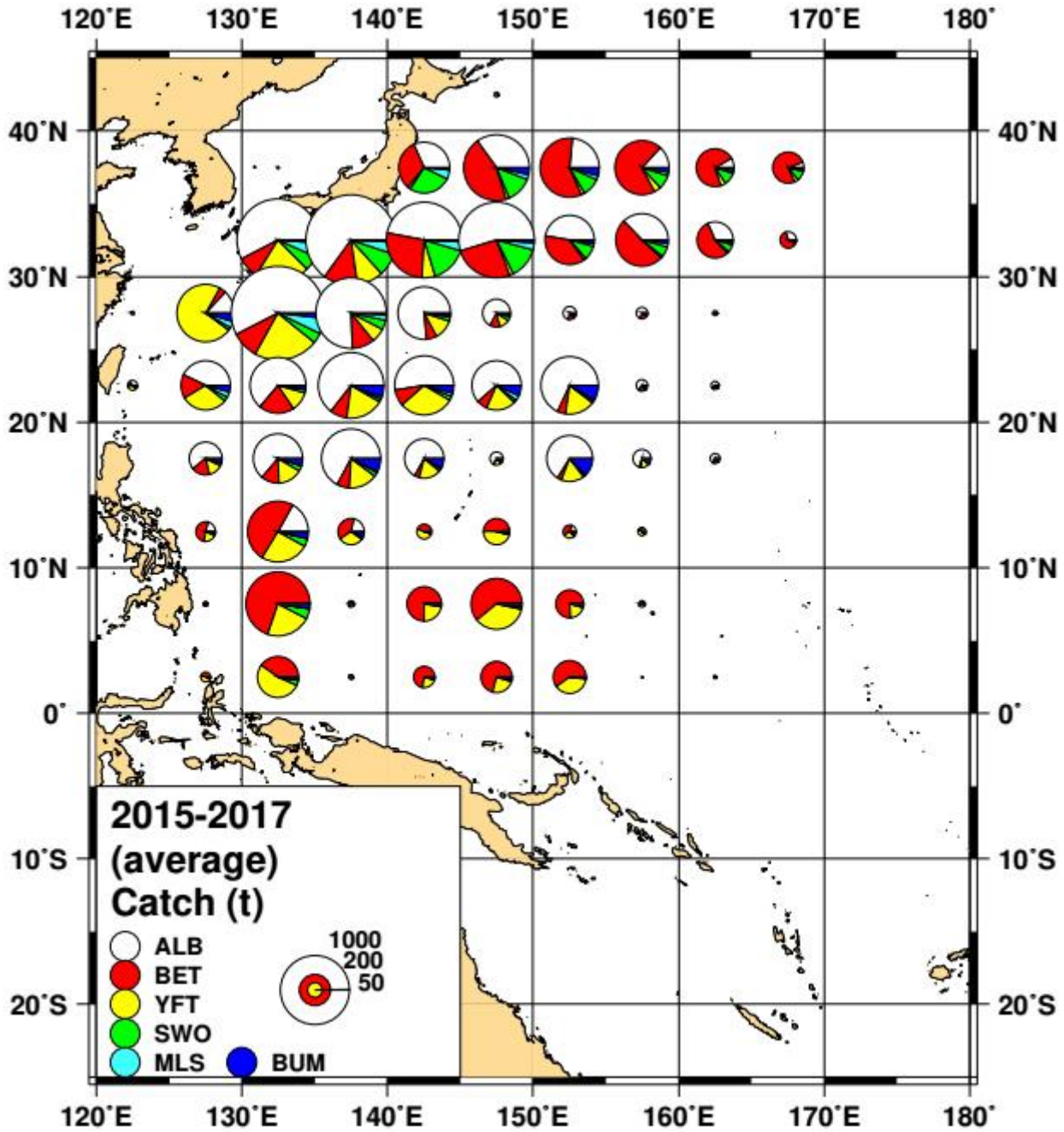

Fig. 6. Distributions of small offshore longline catch (in weight) by species in average of 2015-2017 for six main species (ALB: albacore, BET: bigeye tuna, YFT: yellowfin tuna, SWO: swordfish, MLS: striped marlin and BUM: blue marlin).

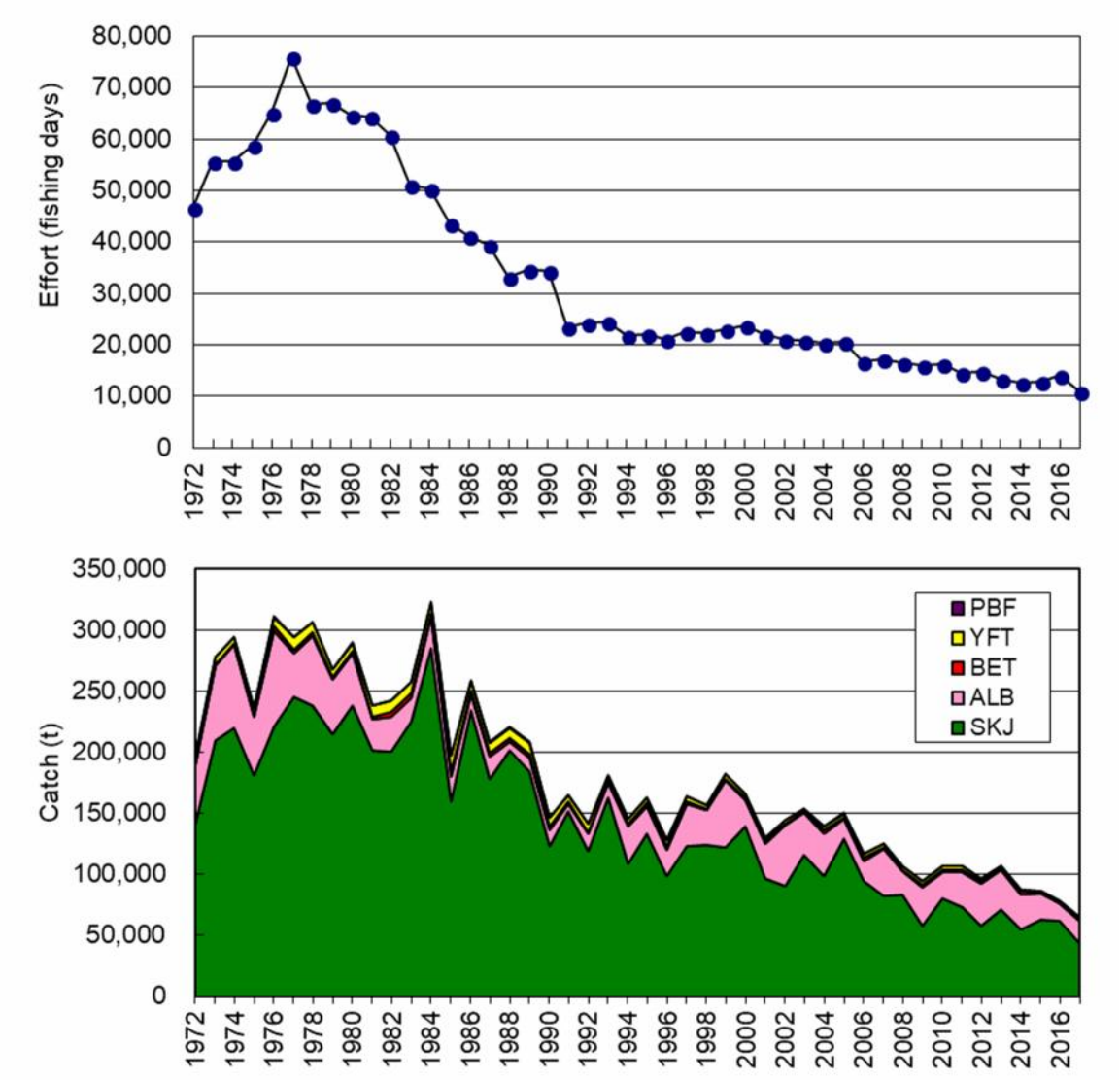

Fig. 7. Historical change of fishing effort and catches by species for the Japanese pole-and-line fishery (>20GRT) in the WCPFC Convention Area. Values in 2016 and 2017 are provisional.

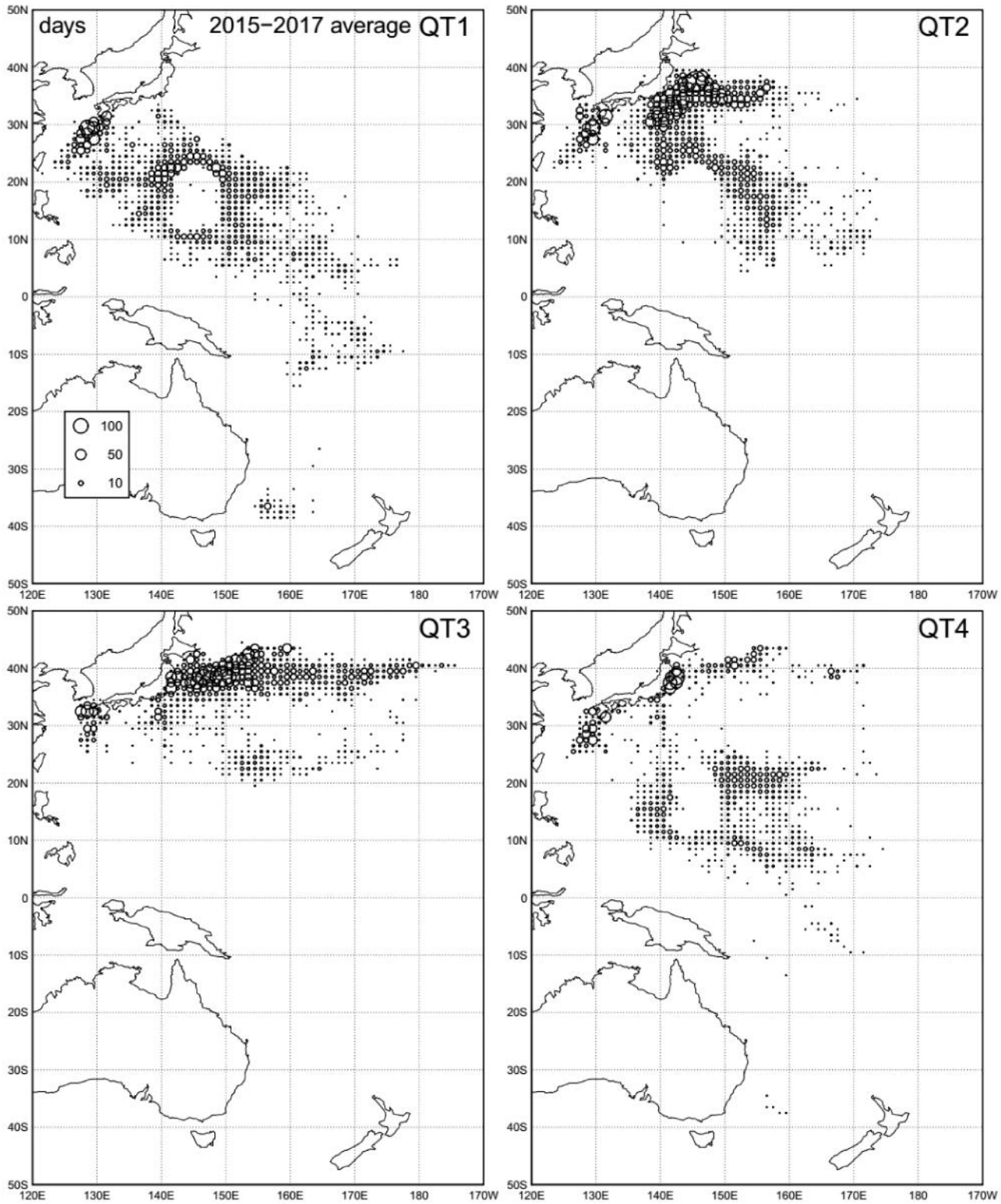

Fig. 8. Quarterly distribution of fishing effort (days) for the Japanese pole-and-line fishery (offshore and distant water licenses) in the Pacific Ocean in average of 2015-2017.

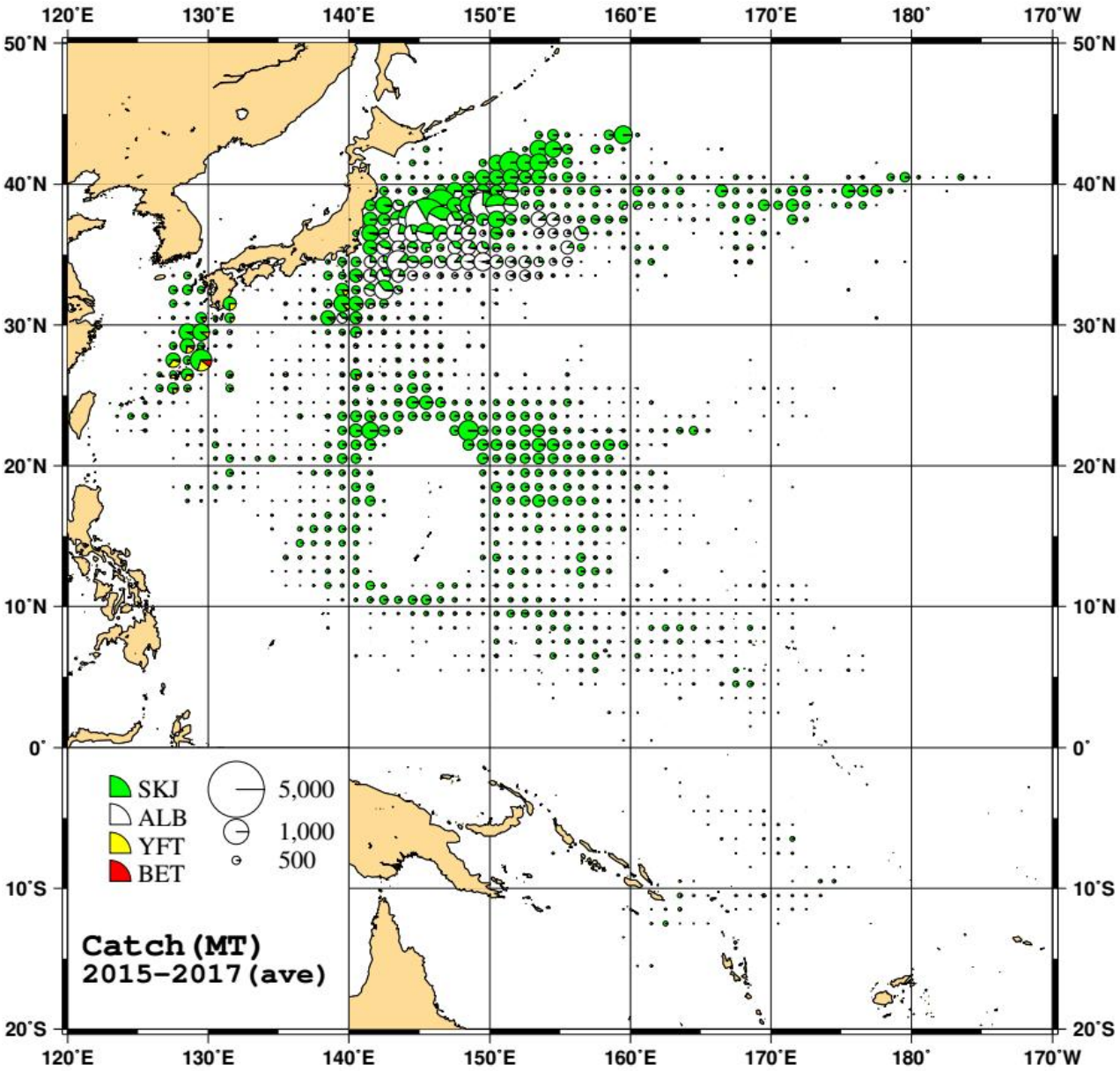

Fig. 9. Distribution of catch and its species composition for the Japanese offshore and distant water pole-and-line fishery in average of 2015-2017.

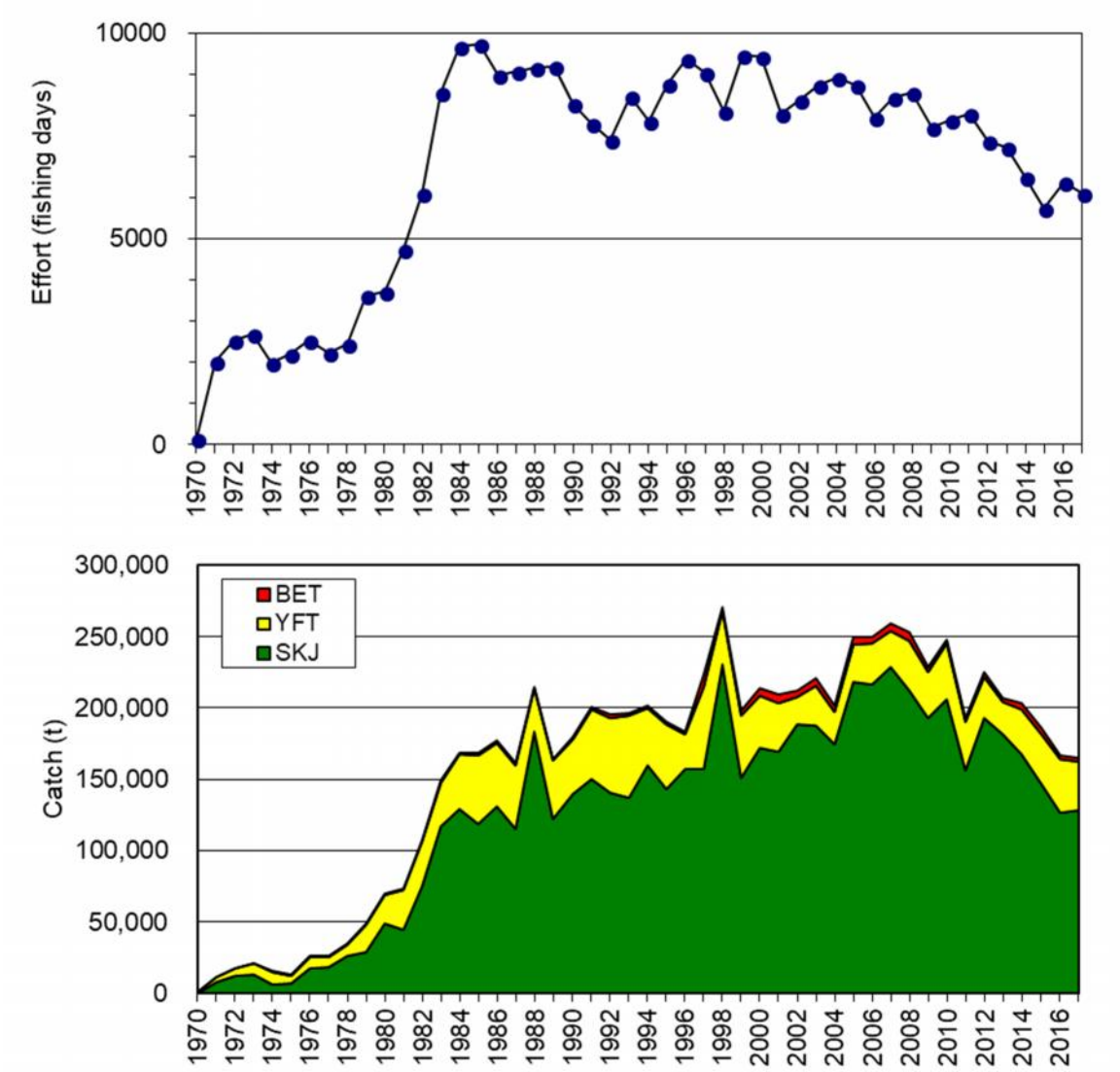

Fig. 10. Trends of fishing effort and catches by species for the Japanese tuna purse seine fishery in the WCPFC Convention Area. Values in and 2016 and 2017 are provisional.

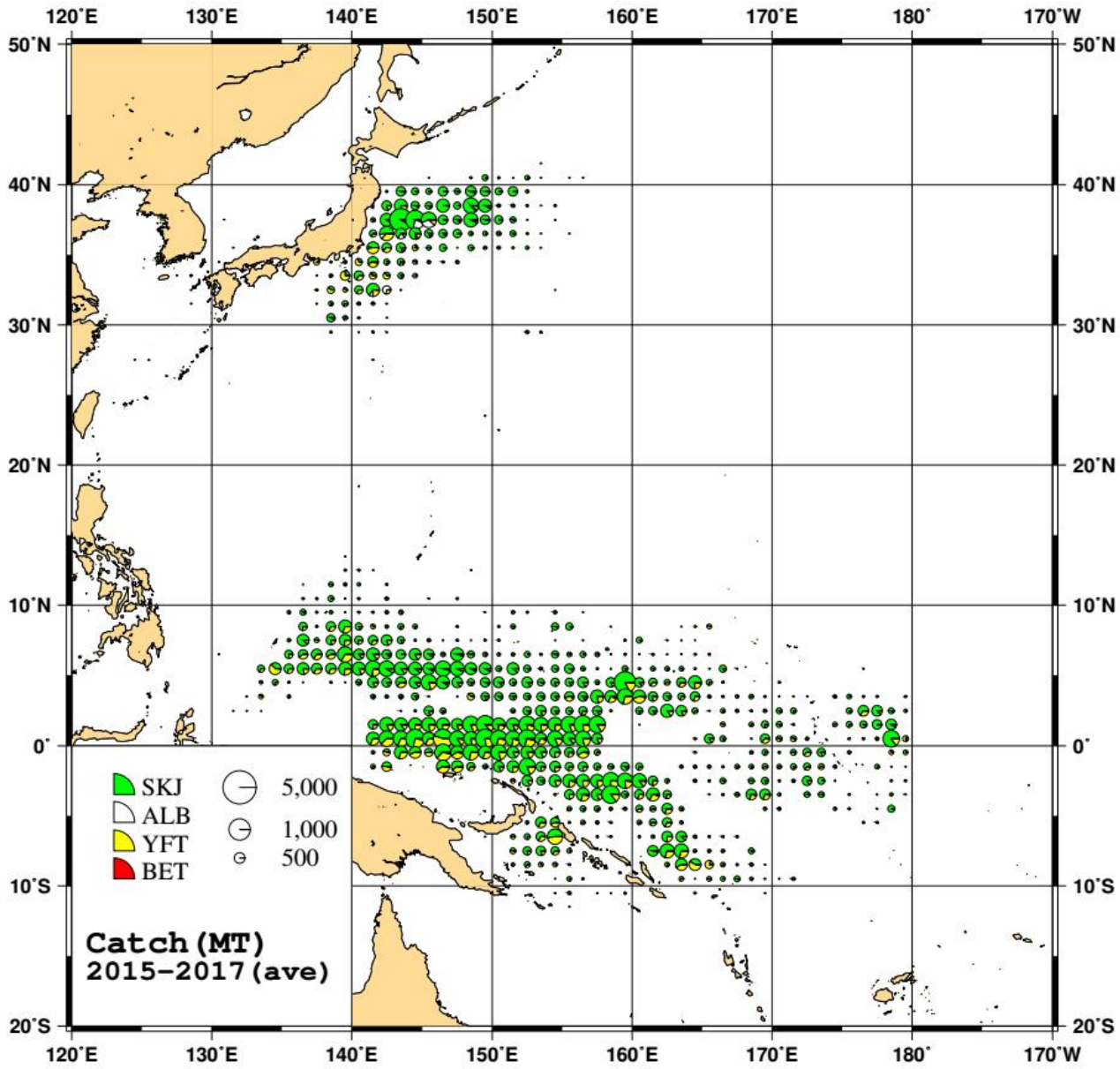

Fig. 11. Distribution of tuna purse seine catch (t) by species (skipjack, yellowfin and bigeye) combined for 2015-2017.

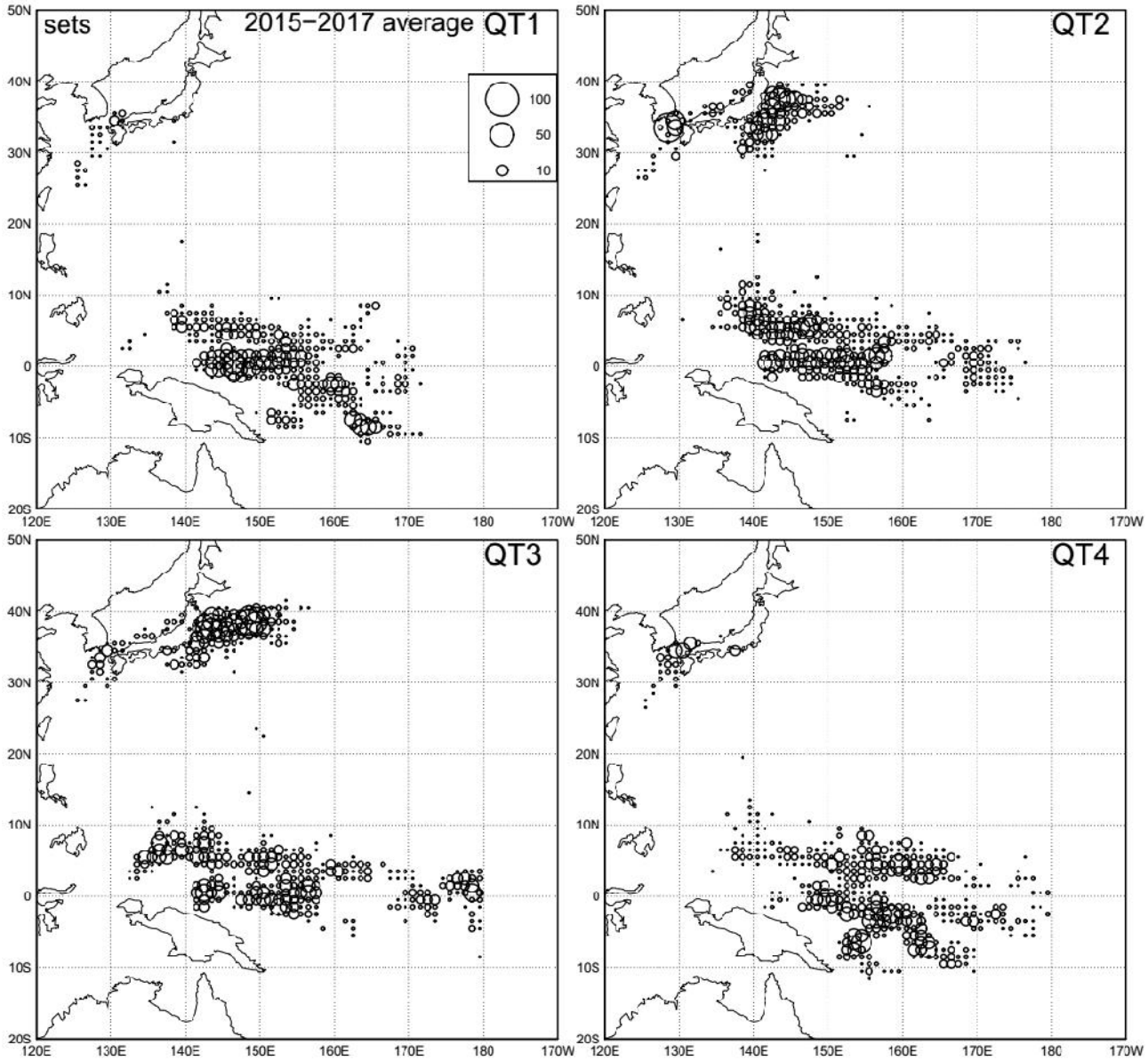

Fig. 12. Quarterly distributions of fishing effort (number of set) for the Japanese tuna purse seine fishery in the Pacific Ocean for 2015-2017.

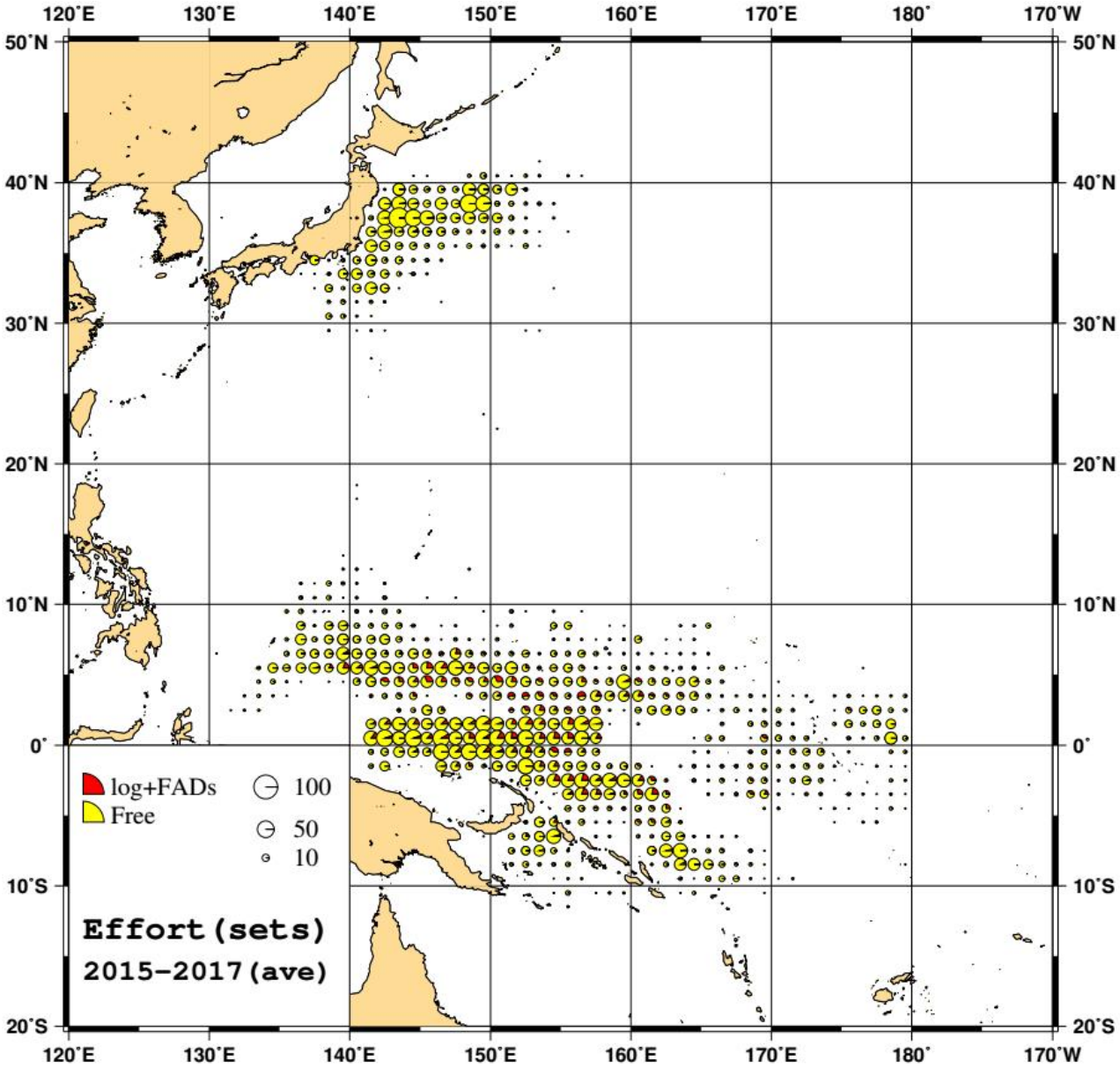

Fig. 13. Distribution of sets by type of school for 2015-2017 deployed by the tuna purse seine fishery by Japan.

Appendix Table 1. Catches (t) for tunas, billfishes and sharks in the portion of the WCPFC Convention Area east of the 150˚ meridian of west longitude caught by distant-water and offshore longline fisheries. O-shk: the other sharks

Year	BET	YFT	SKJ	BUM	BLM	BSH	LMD	POR	SMA	OCS	THR	FAL	SPN	RHN	O-shk
2012	1,836	387	7	86	2	128	0	1	18	0	1	-	-	-	1
2013	1,436	332	8	120	2	50	0	1	5	0	2	0	0	0	0
2014	787	210	2	68	1	29	0	0	1	0	0	0	0	0	0
2015	425	65	1	36	1	21	0	0	0	0	0	0	0	0	0
2016	(272)	(70)	(2)	(51)	(0)	(22)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
2017	(224)	(43)	(0)	(24)	(1)	(10)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)

Appendix Table 2. Catches (mt) for Pacific bluefin, albacore, swordfish and striped marlin in the Pacific Ocean north of the Equator, the Pacific Ocean south of the Equator, the WCPFC Convention Area north of the Equator and the WCPFC Convention Area south of the Equator. Parenthesis represents provisional. In this table, definition of "Coastal longline" is vessel size less than 20 GRT, which is different from that in Table 5. Values in 2017 are provisional.

Pacific bluefin tuna (1) in the Pacific Ocean north of the Equator

Year	LL	LL	PL	PS	Troll	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water	(unspecified)	(unspecified)			
2012	667	6	113	2462	570	1932	343
2013	777	7	8	2771	904	1415	529
2014	672	11	5	5456	1023	1907	499
2015	607	11	8	3645	413	1242	432
2016	674	14	44	5095	778	1227	508
2017	865	21	86	4540	603	2255	665

Pacific bluefin tuna (2) in the Pacific Ocean south of the Equator

Year	LL	LL	PL	PS	Troll	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water	(unspecified)	(unspecified)			
2012	0	8	0	0	0	0	0
2013	0	7	0	0	0	0	0
2014	0	4	0	0	0	0	0
2015	0	4	0	0	0	0	0
2016	0	4	0	0	0	0	0
2017	0	6	0	0	0	0	0

Pacific bluefin tuna (3) in the WCPFC Statistical Area north of the Equator

Year	LL	LL	PL	PS	Troll	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water	(unspecified)	(unspecified)			
2012	667	6	113	2462	570	1932	343
2013	777	5	8	2771	904	1415	529
2014	672	10	5	5456	1023	1907	499
2015	607	11	8	3645	413	1242	432
2016	674	14	44	5095	778	1227	508
2017	865	21	86	4540	603	2255	665

Pacific bluefin tuna (4) in the WCPFC Statistical Area south of the Equator

Year	LL	LL	PL	PS	Troll	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water	(unspecified)	(unspecified)			
2012	0	8	0	0	0	0	0
2013	0	7	0	0	0	0	0
2014	0	4	0	0	0	0	0
2015	0	4	0	0	0	0	0
2016	0	4	0	0	0	0	0
2017	0	6	0	0	0	0	0

Pacific bluefin tuna (5) the portion of the WCPFC Statistical Area east of the 150°meridian of west longitude

Year	LL	LL	PL	PS	Troll	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water	(unspecified)	(unspecified)			
2012	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0

Appendix Table 2. (Continued)

Albacore (1) the Pacific Ocean north of the Equator

Year	LL	LL	PL	PL	PS	Gillnet	Troll	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water	Coastal	Offshore and distant-water	(unspecified)				
2012	17668	5160	92	33650	4193	26	610	48	129
2013	15110	4729	61	33507	1988	14	302	36	211
2014	15701	4269	81	29352	2009	11	197	24	197
2015	16967	4091	86	21208	1072	138	239	17	170
2016	13110	3439	33	14409	3679	19	148	25	128
2017	12362	3950	33	14409	3679	19	148	25	128

Albacore (2) the Pacific Ocean south of the Equator

Year	LL	LL	PL	PL	PS	Gillnet	Troll	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water	Coastal	Offshore and distant-water	(unspecified)				
2012	0	4584	0	15	0	0	0	0	0
2013	0	3664	0	8	0	0	0	0	0
2014	0	2389	0	0	0	0	0	0	0
2015	0	1892	0	0	0	0	0	0	0
2016	0	2753	0	7	0	0	0	0	0
2017	0	3254	0	2	0	0	0	0	0

Albacore (3) the WCPFC Statistical Area north of the Equator

Year	LL	LL	PL	PL	PS	Gillnet	Troll	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water	Coastal	Offshore and distant-water	(unspecified)				
2012	17668	5006	92	33650	4193	26	610	48	129
2013	15110	4615	61	33507	1988	14	302	36	211
2014	15701	4211	81	29352	2009	11	197	24	197
2015	16967	3849	86	21208	1072	138	239	17	170
2016	13110	3405	33	14409	3679	19	148	25	128
2017	12362	3913	33	14409	3679	19	148	25	128

Albacore (4) the WCPFC Statistical Area south of the Equator

Year	LL	LL	PL	PL	PS	Gillnet	Troll	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water	Coastal	Offshore and distant-water	(unspecified)				
2012	0	2580	0	15	0	0	0	0	0
2013	0	2156	0	8	0	0	0	0	0
2014	0	1544	0	0	0	0	0	0	0
2015	0	1175	0	0	0	0	0	0	0
2016	0	1874	0	7	0	0	0	0	0
2017	0	2178	0	2	0	0	0	0	0

Albacore (5) the portion of the WCPFC Statistical Area east of the 150°meridian of west longitude

Year	LL	LL	PL	PL	PS	Gillnet	Troll	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water	Coastal	Offshore and distant-water	(unspecified)				
2012	0	213	0	0	0	0	0	0	0
2013	0	141	0	0	0	0	0	0	0
2014	0	57	0	0	0	0	0	0	0
2015	0	39	0	0	0	0	0	0	0
2016	0	27	0	0	0	0	0	0	0
2017	0	6	0	0	0	0	0	0	0

Appendix Table 2. (Continued)

Swordfish (1) the Pacific Ocean north of the Equator

Year	LL	LL	Gillnet	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water			
2012	1085	2946	371	8	351
2013	924	3319	290	13	459
2014	1081	3279	269	7	293
2015	1234	3867	277	3	486
2016	1961	3535	303	2	427
2017	1573	2648	303	2	427

Swordfish (2) the Pacific Ocean south of the Equator

Year	LL	LL	Gillnet	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water			
2012	0	3916	0	0	0
2013	0	3528	0	0	0
2014	0	3627	0	0	0
2015	0	3770	0	0	0
2016	0	3778	0	0	0
2017	0	3080	0	0	0

Swordfish (3) the WCPFC Statistical Area north of the Equator

Year	LL	LL	Gillnet	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water			
2012	1085	2568	371	8	351
2013	921	2879	290	13	459
2014	1089	2823	269	7	293
2015	1157	3237	277	3	486
2016	1515	3311	277	3	486
2017	1515	2553	277	3	486

Swordfish (4) the WCPFC Statistical Area south of the Equator

Year	LL	LL	Gillnet	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water			
2012	0	675	0	0	0
2013	0	538	0	0	0
2014	0	393	0	0	0
2015	0	357	0	0	0
2016	0	414	0	0	0
2017	0	290	0	0	0

Swordfish (5) the portion of the WCPFC Statistical Area east of the 150°meridian of west longitude

Year	LL	LL	Gillnet	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water			
2012	0	265	0	0	0
2013	0	227	0	0	0
2014	0	125	0	0	0
2015	0	90	0	0	0
2016	0	126	0	0	0
2017	0	57	0	0	0

Appendix Table 2. (Continued)

striped marlin (1) the Pacific Ocean north of the Equator

Year	LL	LL	Gillnet	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water			
2012	981	326	597	52	96
2013	1104	358	336	39	86
2014	842	265	173	35	57
2015	1039	292	287	37	107
2016	737	257	308	25	106
2017	630	180	308	25	106

striped marlin (2) the Pacific Ocean south of the Equator

Year	LL	LL	Gillnet	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water			
2012	0	760	0	0	0
2013	0	600	0	0	0
2014	0	545	0	0	0
2015	0	336	0	0	0
2016	0	327	0	0	0
2017	0	271	0	0	0

striped marlin (3) the WCPFC Statistical Area north of the Equator

Year	LL	LL	Gillnet	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water			
2012	981	261	597	52	96
2013	1104	247	336	39	86
2014	842	191	173	35	57
2015	1039	190	287	37	107
2016	737	187	308	25	106
2017	630	140	308	25	106

striped marlin (4) the WCPFC Statistical Area south of the Equator

Year	LL	LL	Gillnet	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water			
2012	0	164	0	0	0
2013	0	157	0	0	0
2014	0	119	0	0	0
2015	0	90	0	0	0
2016	0	84	0	0	0
2017	0	52	0	0	0

striped marlin (5) the portion of the WCPFC Statistical Area east of the 150°meridian of west longitude

Year	LL	LL	Gillnet	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water			
2012	0	29	0	0	0
2013	0	23	0	0	0
2014	0	18	0	0	0
2015	0	6	0	0	0
2016	0	5	0	0	0
2017	0	2	0	0	0

Appendix Table 3-1. Albacore catch in mt in the WCPCA north of the Equator (except for small coastal fisheries) every six month. Figures in parentheses indicate provisional data. That was request written in **paragraph 3 of CMM-2005-03**. Note that although catches for the January to June 2016 were already reported to the Commission on April 2017, those catches were updated here.

Year		PL Offshore & distant-water	LL Offshore & distant-water	LL Small offshore	PS Offshore & distant-water
2016	Jan.-Jun.	15891	1284	3534	156
2016	Jul.-Dec.	2759	2107	7897	1125

Appendix Table 3-2. Albacore catch in mt and fishing effort in fishing days in the WCPCA north of the Equator. Figures in parentheses indicate provisional data. That was request written in paragraph 4 of CMM-2005-03.

(a) Catch

Year	LL Coastal	LL Offshore & distant-water	PL Coastal	PL Offshore & distant-water	PS Coastal	PS Offshore & distant-water	Gillnet	Troll	Setnet	Others
2012	17668	5004	92	33650	72	4121	26	610	48	129
2013	15110	4622	61	33507	3	1985	14	302	36	211
2014	15701	4211	81	29352	0	2009	11	197	24	197
2015	16967	3849	86	21208	4	1068	138	239	17	166
2016	13315	3405	86	15000	4	3496	138	200	17	100
2017	12290	3913	86	13241	4	1133	138	200	17	100

(b) Effort

Year	LL Coastal	LL Offshore & distant-water	PL Coastal	PL Offshore & distant-water	PS Coastal	PS Offshore & distant-water	Gillnet	Troll	Setnet	Others
2012	38977	13818	NA	14646	NA	8449	NA	NA	NA	NA
2013	37529	13406	NA	12781	NA	7518	NA	NA	NA	NA
2014	35362	13305	NA	12147	NA	6996	NA	NA	NA	NA
2015	37801	11763	NA	12743	NA	7334	NA	NA	NA	NA
2016	37179	10436	NA	13923	NA	6623	NA	NA	NA	NA
2017	35207	10505	NA	13923	NA	6780	NA	NA	NA	NA

Appendix Table 4. Striped marlin catch for the Japanese offshore and distant water longline fishery in the WCPCA south of 15˚S. This table was request written in paragraph 4 of CMM-2006-04

Year	Striped marlin catch (mt)
2012	134
2013	124
2014	98
2015	79
2016	66
2017	30

Appendix Table 5. Catch in weight, of swordfish at south of 20° South of WCPFC statistical area by year with vessel statistics. "Vessel number" means number of vessels who caught at least one fish in this area in each year. Figures in parentheses indicate provisional data. That was request written in paragraph 8 of CMM-2009-03.

Year	Japan-flagged vessels south of 20S		Chartered vessels		Other vessels fishing within the Japan's waters south of 20S		
	Catch (mt)	Vessel numbers	Catch (mt)	Vessel numbers	Flag	Catch (mt)	Vessel numbers
2012	297	29	0	0	--	--	--
2013	235	28	0	0	--	--	--
2014	235	26	0	0	--	--	--
2015	225	26	0	0	--	--	--
2016	239	26	0	0	--	--	--
2017	174	26	0	0	--	--	--

Appendix Table 6-1. The total quantity (mt) of highly migratory fish stocks transshipped by fishing vessels in 2017. That was request written in **paragraph 8 of CMM-2009-06**.

1. Offloaded by Japanese longliners

1.1. By species

1.1.1 Catch inside the CA

	Port inside the CA	HS inside the CA	Port outside the CA	HS outside the CA
Bigeye	0	285	0	102
Yellowfin	0	100	0	12
Swordfish	0	84	0	15
Others	0	72	0	17
Total	0	540	0	145

1.1.2. Catch outside the CA

	Port inside the CA	HS inside the CA
Bigeye	0	39
Yellowfin	0	56
Swordfish	0	76
Others	0	72
Total	0	592

1.2. by product form

1.2.1. Catch inside the CA

	Port inside the CA	HS inside the CA	Port outside the CA	HS outside the CA
Gilled and Gutted	0	394	0	115
Gutted and Headed	0	0	0	21
Dress	0	44	0	0
Whole	0	40	0	0
Fillets	0	43	0	3
Others	0	19	0	6
Total	0	540	0	145

1.2.2. Catch outside the CA

	Port inside the CA	HS inside the CA
Gilled and Gutted	0	451
Gutted and Headed	0	3
Dress	0	32
Whole	0	24
Fillets	0	63
Others	0	19
Total	0	592

2. Received by Japanese carriers from longliners.
2.1. By species
2.1.1 Catch inside the CA

	HS inside the CA	HS outside the CA
Bigeye	0	0
Yellowfin	0	0
Swordfish	0	0
Others	0	0
Total	0	0

2.1.2. Catch outside the CA

	HS inside the CA	Port inside the CA
Bigeye	0	0
Yellowfin	0	0
Swordfish	0	0
Others	0	0
Total	0	0

Appendix Table 6-2. The number of transshipments involving highly migratory fish stocks in 2017. That was request written in **paragraph 8 of CMM-2009-06**.

1. Offloaded by Japanese longliners
1.2. The number of transhipment

	Port inside the CA	HS inside the CA	Port outside the CA	HS outside the CA
Caught inside the CA	0	4	0	1
Caught both inside and outside the CA	0	8	0	7
Caught outside the CA	0	1	0	0
Total	0	13	0	8

2. Received by Japanese carriers from longliners.
2.2 The number of transhipment

	HS inside the CA	HS outside the CA
Caught inside the CA	0	0
Caught both inside and outside the CA	0	0
Caught outside the CA	0	0
Total	0	0

Appendix Table 7. Catch (mt) for shark species in the WCPFC Convention Area by species for the Japanese distant and offshore (top table) and small offshore (bottom table) longline fisheries. Figures in the parentheses indicate provisional data. The catch for salmon shark and porbeagle was counted only in south of 20° south. By 2012, catches of silky shark, hammerhead sharks and whale shark are included in other sharks. This table was request written in **paragraph 4 of CMM-2010-07**.
BSH: Blue shark, LMD: Salmon shark, POR: Porbeagle shark, SMA: Shortfin mako shark, OCS: Oceanic white-chip shark, THR: Thresher sharks nei, FAL: Silky sharks, SPN: Hammerhead sharks nei, RHN: Whale shark, O-shk: the other sharks

Distant water and offshore longlines

Year	BSH	LMD	POR	SMA	OCS	THR	FAL	SPN	RHN	O-shk
2012	10,857	467	1	751	0	69	0	0	-	13
2013	9,548	205	1	603	0	96	0	1	0	125
2014	9,890	741	8	707	0	84	0	0	0	4
2015	10,270	642	1	642	0	44	0	1	0	0
2016	10,921	54	0	827	0	64	0	0	0	1
2017	9,931	77	0	586	0	63	0	0	0	1

Small offshore longline

Year	BSH	LMD	POR	SMA	OCS	THR	FAL	SPN	RHN	O-shk
2012	632	91	0	3	0	1	0	0	-	4
2013	881	193	0	24	0	21	0	0	0	86
2014	836	325	0	4	0	2	0	0	0	1
2015	581	448	0	2	0	1	0	0	0	0
2016	1,041	1,284	0	55	0	6	0	0	0	0
2017	1,781	3,567	0	77	0	78	0	0	0	1

Appendix Table 8. The estimated and observed number of released oceanic whitetip shark on longline vessels in 2017 (calendar year). The estimated number of release was calculated by raising observed number to total number based on the observer coverage ratio in 2017 (see Appendix Table 10). This table was request written in **paragraph 3 of CMM-2011-04**.

	Observed (number)	Estimated (number)
Alive	13	191
Dead	6	75

Appendix Table 9. The estimated and observed number of released silky shark on longline vessels in 2017 (calendar year). The estimated number of release was calculated by raising observed number to total number based on the observer coverage ratio in 2017 (see Appendix Table 10). This table was request written in **paragraph 3 of CMM-2013-08**.

	Observed (number)	Estimated (number)
Alive	190	3,117
Dead	182	3,017

Appendix Table 10. Observer coverage for the Japanese longline fishery. Values in 2016 and 2017 are provisional. This table was request written in **paragraph 4 of CMM-2007-01**.

Year	Fishery	No. of Hooks			Days Fished			Days at Sea			No. of Trips		
		T.	O.	%	Total	Observer	%	T.	O.	%	T.	O.	%
2015	Ice/Fresh, short-trip	***	***	***	28176	1226	4.35%	***	***	***	***	***	***
	Frozen, long-trip	***	***	***	7996	651	8.14%	***	***	***	***	***	***
2016	Ice/Fresh, short-trip	***	***	***	26256	874	3.33%	***	***	***	***	***	***
	Frozen, long-trip	***	***	***	8392	690	8.22%	***	***	***	***	***	***
2017	Ice/Fresh, short-trip	***	***	***	24298	919	3.78%	***	***	***	***	***	***
	Frozen, long-trip	***	***	***	8371	669	7.99%	***	***	***	***	***	***

Appendix Table 11-1. Fishing effort and albacore catch for the Japanese offshore and distant water longline and pole-and-line fisheries in the south of 20˚S in the WCPCA. This table was request written in **paragraph 4 of CMM-2015-02**.

(a) Offshore and distant water longline

Year	Albacore catch (mt)
2012	1321
2013	1416
2014	1402
2015	851
2016	835
2017	989

(b) Offshore and distant water pole-and-line

Year	Vessels	Albacore catch (mt)
2012	3	15
2013	2	8
2014	1	0
2015	3	0
2016	3	7
2017	2	2

Appendix Table 11-2. Catch (t) by vessel for the Japanese offshore and distant water longline fishery in the south of 20˚S in the WCPCA. BIL: other billfishes, SHK: sharks. This table was request written in **paragraph 4 of CMM-2015-02**.

Year	Vessel	ALB	BET	YFT	SWO	BIL	SHK
2006	A01	1	0	1	0	1	0
2006	A02	14	4	0	1	0	3
2006	A03	30	6	1	4	1	3
2006	A04	19	4	3	2	3	1
2006	A05	25	3	6	2	2	5
2006	A06	33	13	2	5	1	7
2006	A07	14	3	13	2	3	4
2006	A08	1	1	0	1	4	2
2006	A09	24	4	24	3	8	2
2006	A10	19	3	5	2	3	6
2006	A11	19	10	1	3	0	1
2006	A12	3	1	0	1	0	3
2006	A13	12	2	0	1	1	3
2006	A14	81	19	10	5	4	11
2006	A15	26	5	1	2	3	4
2006	A16	29	4	2	1	5	3
2006	A17	6	1	0	1	0	5
2006	A18	11	3	0	1	0	0
2006	A19	34	32	25	4	3	2
2006	A20	107	13	27	8	9	11
2006	A21	5	4	2	0	0	1
2006	A22	23	1	2	1	0	2
2006	A23	13	2	1	3	33	3
2006	A24	39	8	2	2	5	3
2006	A25	128	12	14	5	6	15
2006	A26	11	4	1	2	0	4
2006	A27	31	2	1	1	0	2
2006	A28	38	7	1	4	1	3
2006	A29	79	8	27	6	7	8
2006	A30	32	1	6	1	0	3
2006	A31	14	3	14	1	1	3
2006	A32	30	8	8	3	2	3
2006	A33	25	5	7	2	2	3
2006	A34	83	9	14	6	6	8

Year	Vessel	ALB	BET	YFT	SWO	BIL	SHK
2007	B01	42	1	1	2	1	8
2007	B02	20	1	0	1	0	4
2007	B03	53	2	3	4	2	6
2007	B04	83	3	12	1	4	1
2007	B05	8	34	3	1	1	3
2007	B06	41	36	2	12	5	13
2007	B07	22	0	1	2	0	3
2007	B08	3	0	0	0	0	1
2007	B09	1	1	0	14	0	34
2007	B10	75	62	3	5	2	8
2007	B11	129	87	44	7	12	8
2007	B12	69	2	3	1	2	3
2007	B13	25	36	9	1	1	6
2007	B14	92	40	46	9	18	10
2007	B15	4	0	10	1	3	1
2007	B16	1	0	1	1	20	1
2007	B17	40	2	3	2	1	5
2007	B18	26	1	1	2	0	10
2007	B19	78	2	11	4	4	4
2007	B20	52	3	9	2	4	7
2007	B21	81	1	3	2	4	2
2008	C01	33	22	1	4	1	10
2008	C02	43	50	15	5	4	19
2008	C03	31	26	1	5	6	10
2008	C04	99	35	18	9	16	28
2008	C05	43	56	9	6	2	13
2008	C06	46	51	3	10	11	14
2008	C07	8	1	0	2	0	2
2008	C08	53	54	2	6	1	12
2008	C09	81	32	5	6	5	21
2008	C10	57	91	5	5	6	19
2008	C11	33	46	5	6	14	9
2008	C12	6	1	0	1	0	4
2008	C13	57	41	5	7	7	8

Appendix Table 11-2. (Continue)

Year	Vessel	ALB	BET	YFT	SWO	BIL	SHK
2008	C14	47	41	6	6	4	14
2008	C15	8	0	0	0	1	1
2008	C16	10	1	7	2	3	10
2008	C17	84	27	13	5	9	14
2008	C18	81	21	9	5	8	18
2008	C19	87	27	5	5	5	12
2009	D01	54	16	2	6	6	9
2009	D02	119	48	9	10	8	16
2009	D03	16	7	0	3	1	10
2009	D04	103	18	10	12	17	12
2009	D05	37	39	7	4	4	12
2009	D06	29	8	3	3	7	4
2009	D07	90	14	6	7	15	11
2009	D08	57	3	1	2	2	9
2009	D09	67	43	3	10	7	11
2009	D10	3	0	0	1	0	5
2009	D11	71	40	1	7	2	5
2009	D12	110	46	6	11	5	15
2009	D13	6	2	0	1	0	2
2009	D14	39	48	11	7	20	6
2009	D15	28	10	2	4	1	10
2009	D16	69	70	1	7	5	14
2009	D17	44	28	6	7	8	13
2009	D18	133	12	9	4	17	20
2009	D19	27	6	1	2	2	6
2010	E01	1	0	0	0	0	0
2010	E02	51	15	4	9	10	22
2010	E03	97	18	9	9	17	24
2010	E04	5	0	0	0	0	0
2010	E05	6	2	0	1	0	4
2010	E06	3	0	0	1	0	3
2010	E07	1	0	0	1	0	3
2010	E08	39	15	3	7	7	9
2010	E09	53	14	5	8	7	13
2010	E10	10	1	0	1	0	5
2010	E11	61	16	2	12	9	10
2010	E12	15	3	2	2	3	6
2010	E13	86	15	3	8	3	10
2010	E14	102	18	5	7	11	12
2010	E15	1	0	0	1	0	0
2010	E16	8	0	0	1	0	2
2010	E17	66	45	31	11	29	23
2010	E18	3	0	0	1	0	2
2010	E19	27	9	2	8	24	7
2010	E20	2	0	0	1	0	1
2010	E21	73	27	7	6	17	9
2010	E22	35	8	2	3	2	7
2010	E23	20	6	2	3	5	7
2010	E24	72	17	5	16	8	18
2010	E25	57	8	4	4	4	8
2010	E26	4	1	0	1	0	2
2011	F01	12	0	0	2	0	1
2011	F02	9	1	1	0	0	0
2011	F03	41	1	3	1	1	7
2011	F04	54	35	10	5	7	26
2011	F05	114	26	18	11	10	14

Year	Vessel	ALB	BET	YFT	SWO	BIL	SHK
2011	F06	11	1	0	1	0	3
2011	F07	17	1	1	1	1	4
2011	F08	78	25	9	6	5	22
2011	F09	80	2	9	3	4	4
2011	F10	23	1	9	3	6	9
2011	F11	80	44	24	12	25	17
2011	F12	12	0	0	3	0	5
2011	F13	14	1	0	5	0	3
2011	F14	117	10	15	8	19	13
2011	F15	61	28	8	12	5	11
2011	F16	69	32	5	6	8	11
2011	F17	70	42	9	9	6	12
2011	F18	67	3	2	1	1	1
2011	F19	86	17	16	5	6	10
2011	F20	10	4	2	3	2	4
2011	F21	89	46	21	7	11	15
2011	F22	77	49	23	12	25	20
2011	F23	19	2	1	1	0	4
2011	F24	45	1	2	3	0	5
2011	F25	137	8	21	8	16	16
2011	F26	7	3	1	0	2	0
2011	F27	9	0	0	1	0	4
2011	F28	86	23	24	6	20	10
2011	F29	45	4	9	4	3	7
2011	F30	9	2	3	2	1	3
2011	F31	89	43	23	20	21	11
2011	F32	11	1	3	2	2	11
2011	F33	36	6	12	4	5	12
2011	F34	116	8	13	4	9	15
2012	G01	9	4	2	2	1	0
2012	G02	58	10	8	3	4	0
2012	G03	10	3	3	1	3	1
2012	G04	75	11	4	7	6	7
2012	G05	80	40	1	18	6	4
2012	G06	17	3	1	3	0	0
2012	G07	11	0	0	3	0	0
2012	G08	14	1	0	2	0	1
2012	G09	1	0	0	0	0	0
2012	G10	37	34	2	15	3	31
2012	G11	69	50	18	16	36	12
2012	G12	78	39	1	12	3	0
2012	G13	64	9	2	13	7	9
2012	G14	22	2	1	2	1	0
2012	G15	91	13	3	10	4	8
2012	G16	76	49	19	11	20	12
2012	G17	71	33	1	12	4	4
2012	G18	117	33	2	10	5	2
2012	G19	75	5	4	4	4	4
2012	G20	28	44	3	6	3	12
2012	G21	57	63	15	8	8	15
2012	G22	4	0	0	1	0	0
2012	G23	63	4	2	6	1	0
2012	G24	10	1	0	2	0	0
2012	G25	18	5	5	2	7	4
2012	G26	68	9	6	8	6	8
2012	G27	11	2	1	3	1	0

Appendix Table 11-2. (Continue)

Year	Vessel	ALB	BET	YFT	SWO	BIL	SHK
2012	G28	69	9	4	5	4	11
2012	G29	20	5	0	4	0	0
2013	H01	27	1	3	1	1	0
2013	H02	12	3	1	1	0	0
2013	H03	27	4	7	3	7	0
2013	H04	91	23	3	9	6	12
2013	H05	94	37	8	10	5	21
2013	H06	22	10	1	3	2	0
2013	H07	27	12	1	3	1	0
2013	H08	14	0	0	2	0	0
2013	H09	38	24	1	5	1	19
2013	H10	60	28	7	9	6	0
2013	H11	73	35	16	10	32	19
2013	H12	10	2	3	2	3	0
2013	H13	53	20	1	8	1	0
2013	H14	55	3	2	6	3	6
2013	H15	40	5	4	4	4	0
2013	H16	92	10	3	8	3	8
2013	H17	84	33	20	10	20	10
2013	H18	80	29	1	8	2	7
2013	H19	88	28	5	7	2	7
2013	H20	55	28	9	8	6	0
2013	H21	14	1	1	2	1	2
2013	H22	38	31	9	8	15	15
2013	H23	9	0	0	1	0	0
2013	H24	67	2	4	3	3	0
2013	H25	41	6	1	4	1	7
2013	H26	22	2	2	3	1	0
2013	H27	69	8	3	6	2	16
2013	H28	115	3	3	4	3	0
2014	I01	115	6	48	15	10	24
2014	I02	95	23	30	18	32	14
2014	I03	50	2	11	5	4	10
2014	I04	53	6	26	2	4	1
2014	I05	59	3	2	5	1	6
2014	I06	131	15	18	6	6	33
2014	I07	30	0	0	4	1	1
2014	I08	10	1	0	1	0	0
2014	I09	56	16	2	5	2	17
2014	I10	82	11	23	9	8	0
2014	I11	82	14	2	11	3	0
2014	I12	23	1	1	4	2	2
2014	I13	50	7	1	7	2	0
2014	I14	55	2	1	6	1	5
2014	I15	71	20	16	8	10	12
2014	I16	74	22	2	8	2	11
2014	I17	117	12	15	5	6	21
2014	I18	18	0	0	2	2	0
2014	I19	68	17	11	11	9	0
2014	I20	25	1	2	3	2	3
2014	I21	20	0	0	1	0	0
2014	I22	17	0	0	2	0	0
2014	I23	16	0	0	2	0	0
2014	I24	27	1	0	3	0	4
2014	I25	42	3	5	3	6	0
2014	I26	17	0	2	2	1	0

Year	Vessel	ALB	BET	YFT	SWO	BIL	SHK
2015	J01	38	2	15	11	20	2
2015	J02	67	54	33	11	9	15
2015	J03	43	10	3	8	2	0
2015	J04	23	4	31	3	6	1
2015	J05	5	0	0	3	0	0
2015	J06	130	8	21	9	13	17
2015	J07	9	0	1	4	0	0
2015	J08	12	0	0	4	0	0
2015	J09	6	0	0	3	0	0
2015	J10	37	40	2	6	2	0
2015	J11	38	26	6	6	3	0
2015	J12	65	34	4	10	3	0
2015	J13	28	2	4	3	6	3
2015	J14	6	0	1	2	0	0
2015	J15	11	0	0	5	0	3
2015	J16	26	31	2	4	1	0
2015	J17	50	8	5	13	3	4
2015	J18	121	6	12	6	7	14
2015	J19	71	3	7	6	8	4
2015	J20	15	0	0	4	0	0
2015	J21	10	1	1	4	0	0
2015	J22	11	0	1	6	1	0
2015	J23	11	0	0	2	0	2
2015	J24	9	0	0	5	0	0
2015	J25	10	1	1	4	1	0
2016	K01	33	4	15	4	3	0
2016	K02	59	52	35	8	16	3
2016	K03	17	1	2	4	0	0
2016	K04	23	2	10	2	2	2
2016	K05	53	18	6	12	2	0
2016	K06	62	39	10	9	12	21
2016	K07	17	0	1	3	0	0
2016	K08	11	0	0	2	0	0
2016	K09	16	0	0	3	0	0
2016	K10	45	40	6	5	2	0
2016	K11	24	6	2	6	1	0
2016	K12	29	36	9	5	3	3
2016	K13	18	2	7	5	3	0
2016	K14	18	0	0	2	0	0
2016	K15	50	39	7	7	4	8
2016	K16	24	2	1	3	1	0
2016	K17	49	34	6	8	3	11
2016	K18	33	30	5	7	3	21
2016	K19	20	0	0	3	0	0
2016	K20	18	0	2	3	1	0
2016	K21	55	28	16	19	4	0
2016	K22	85	20	5	15	6	12
2016	K23	18	1	2	3	1	5
2016	K24	11	0	0	3	0	0
2016	K25	20	2	2	5	0	0
2016	K26	26	2	3	3	2	0
2017	L01	19	1	3	2	1	0
2017	L02	67	16	1	3	2	0
2017	L03	6	0	0	1	0	0
2017	L04	23	5	1	2	2	3
2017	L05	39	6	0	14	1	0

Appendix Table 11-2. (Continue)

Year	Vessel	ALB	BET	YFT	SWO	BIL	SHK
2017	L06	95	24	3	10	5	28
2017	L07	22	2	0	3	0	0
2017	L08	17	1	0	2	1	0
2017	L09	28	2	0	3	1	0
2017	L10	46	22	1	4	1	19
2017	L11	18	9	0	4	1	0
2017	L12	46	3	1	3	1	0
2017	L13	73	25	2	6	2	0
2017	L14	19	2	7	4	3	0
2017	L15	27	2	0	3	1	0
2017	L16	51	6	1	5	1	8
2017	L17	26	2	0	3	1	0
2017	L18	61	34	1	9	2	11
2017	L19	78	28	3	5	3	19
2017	L20	9	1	0	4	0	0
2017	L21	17	2	0	2	0	0
2017	L22	142	11	11	6	4	0
2017	L23	5	0	0	2	0	0
2017	L24	16	1	0	3	1	0
2017	L25	19	3	1	4	1	0
2017	L26	7	0	0	1	0	0

Appendix Table 12-1. Effort, observed and estimated seabird captures by the longliners larger than 20 GRT (approximately >= 24 m) by fishing year [South of 30˚S, 23˚N - 30˚S, or North of 23˚N]. For each year, the table gives the total number of hooks; the number of observed hooks; observer coverage (the percentage of hooks that were observed); the number of observed captures (both dead and alive); the capture rate (captures per thousand hooks). Figures in parenthesis indicate provisional data. This table was request written in **paragraph 9 of CMM2017-06**.

South of 30˚S

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2015	26	5,221,895	883,807	16.9%	506	0.573
2016	26	6,454,799	989,128	15.3%	936	0.946
2017	26	6,663,041	766,467	11.5%	257	0.335

23˚N - 30˚S

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2015	98	21,754,651	745,253	3.4%	6	0.008
2016	116	21,411,568	1,030,720	4.8%	0	0
2017	148	22,438,313	781,389	3.5%	2	0.003

North of 23˚N

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2015	49	13,624,152	575,449	4.2%	72	0.125
2016	92	13,809,603	265,780	1.9%	35	0.132
2017	138	11,613,848	198,478	1.7%	63	0.317

Appendix Table 12-2. Effort, observed and estimated seabird captures by the longliners less than 20 GRT (approximately < 24 m) by fishing year [South of 30˚S; 25˚S - 30˚S, 23˚N - 25˚S, or North of 23˚N]. For each year, the table gives the total number of hooks; the number of observed hooks; observer coverage (the percentage of hooks that were observed); the number of observed captures (both dead and alive); the capture rate (captures per thousand hooks). Figures in parenthesis indicate provisional data. This table was request written in **paragraph 9 of CMM-2017-06**.

23˚N - 30˚S

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2015	156	23,828,896	819,633	3.4%	1	0.001
2016	152	21,422,312	608,855	2.8%	3	0.005
2017	129	19,614,016	850,736	4.3%	2	0.002

North of 23˚N

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2015	218	51,515,088	1,565,760	3.0%	219	0.140
2016	219	53,070,400	1,191,256	2.2%	371	0.311
2017	205	52,719,440	871,309	1.7%	215	0.247

Appendix Table 13. Proportion of observed effort by seabird bycatch mitigation measures[1] for the longliners by fishing year. This table was request written in **paragraph 9 of CMM-2017-06**.

Combination of mitigation measures	Proportion of observed effort using mitigation measures		
	2015	2016	2017
No mitigation measures	5.8%	2.6%	0.0%
TL + NS	0.2%	0.3%	0.0%
TL + WB	0.0%	3.6%	12.1%
NS + WB	0.0%	0.0%	0.0%
TL + NS + WB	0.0%	0.0%	0.2%
SS/BC/WB/DSLS	0.0%	0.0%	0.0%
SS/BC/WB/(MOD or BDB)	0.0%	0.0%	0.0%
TL	37.4%	44.2%	32.0%
NS	0.2%	0.8%	0.0%
WTL	1.4%	0.0%	0.0%
TL + MOD	1.8%	2.4%	4.7%
NS + MOD	0.4%	0.1%	0.0%
WTL + MOD	5.0%	2.1%	1.4%
WTL + NS + MOD	0.1%	0.1%	0.0%
MOD	47.8%	43.7%	49.7%
Total	100.0%	100.0%	100.0%

[1]TL = tori line, NS=night setting, WB = weighted branch line, SS = side setting, BC = bird curtain, BDB = blue dyed bait, DSLS = deep setting line shooter, MOD = management of offal discharge, WTL = double tori line.

Appendix Table 14-1. Number of observed seabird captures in the longliners larger than 20 GRT (approximately >= 24 m), 2017, by species and area. This table was request written in **paragraph 9 of CMM2017-06**.

Species	South of 30˚S	23˚N - 30˚S	North of 23˚N	Total
Black-browed albatross	1	-	-	1
Black-browed albatross group	4	-	-	4
Black-footed albatross	-	-	16	16
Buller's albatross group	44	-	-	44
Campbell albatross	2	-	-	2
Grey petrel	1	-	-	1
Grey-headed albatross	1	-	-	1
Laysan albatross	-	-	22	22
Masked booby	-	2	-	2
Northern giant petrel	2	-	-	2
Shy-type albatrosses	10	-	-	10
Unidentified albatrosses	1	-	25	26
Unidentified petrels	154	-	-	154
Wandering albatross	3	-	-	3
Wandering albatross group3	4	-	-	4
White-chinned petrel	30	-	-	30
Total	257	2	63	322

Appendix Table 14-2. Number of observed seabird captures in the longliners less than 20 GRT (approximately < 24 m), 2017, by species and area. This table was request written in **paragraph 9 of CMM2017-06**.

Species	South of 30˚S	23˚N - 30˚S	North of 23˚N	Total
Black-footed albatross	-	-	20	20
Laysan albatross	-	-	168	168
Streaked shearwater	-	-	9	9
Unidentified albatrosses	-	-	18	18
Unidentified petrels	-	2	-	2
Total	-	2	215	217