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JAPAN

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

National Tuna Fisheries Report of Japan

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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 2014-2019, 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 no clear trend. The total 2019 WCP-CA catch of tunas (Pacific bluefin, albacore, bigeye, yellowfin and skipjack) by the Japanese fishery was still provisional and estimated to be 319,348mt, and this is corresponding to 97% of 2018 total tunas catch (329,764 mt). In 2019, the total tuna catch by the purse seine fishery was 176,678 mt (56% of the total), with 93,417 mt (29%) by the pole-and-line fishery, 41,581 mt (13%) by the longline fishery, and the remaining (2%) by the other gears. Japan has conducted several research activities in relation to biological and stock assessment studies on tunas, tuna like species and other bycatch species in the WCP-CA in 2018 and early 2019 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 2014-2018 data (MAFFJ 2015-2019a, MAFFJ 2020b), 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 2014-2019 period (coastal longline vessels were not included). As this number of active vessels is estimated based on logbook submitted, some vessels which actually operated but did not submit logbook yet 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 373 vessels in 2014 to 302 in 2019 in total. The number of vessels for each category generally decreased.

The total number of pole-and-line vessels (larger than 20 GRT) has decreased during the 2014-2019. The number of vessels for category 50-200 GRT decreased from 54 in 2014 to 41 in 2019, corresponding to 24% decrease. The number of vessels for category over 200 GRT ranged from 25 to 24 without apparent trend during the period.

The total number of purse seine vessels which are engaged in tuna fishery ranged from 68 to 75 without apparent trend during the 2014-2019 period. The number of vessels of 50-200 GRT shows an increase trend during the period and was 36 in 2019. The number of vessels of 200-500 GRT shows a decreasing trend during the period and was 31 in 2019. 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 total 2019 WCP-CA catch of tunas (Pacific bluefin, albacore, bigeye, yellowfin and skipjack) by the Japanese fishery was still provisional and estimated to be 319,348mt, and this is corresponding to 97% of 2018 total tunas catch (329,764 mt). In 2019, the total tuna catch by the purse seine fishery was 176,678 mt (56% of the total), with 93,417 mt (29%) by the pole-and-line fishery, 41,581 mt (13%) by the longline fishery, and the remaining (2%) by the other gears, whereas, in 2018, the total tuna catch by the purse seine fishery was 184,426 mt (56% of the total), with 101,293 mt (31%) by the pole-and-line fishery, 37,957 mt (12%) by the longline, and the remaining (2%) 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 2019 data, though the 2018 and 2019 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 2014 to 2019 are shown in Table 2A. Historical changes in fishing effort and catch by species for this fishery are shown in Figs. 1 and 2, respectively, for the years 1971-2019. 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 2A). 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 2A shows fishing effort and catch by species for the distant water and offshore longline fisheries during the 2014-2019 period. The bigeye catch shows a declining trend in the recent years. The bigeye catch was 3,913 mt in 2018 which is 74% of that in the average of the previous 5 years (2014-2018). The yellowfin catch increased from 3,645 mt in 2014 to 6,196 mt in 2019. The yellowfin catch in 2019 is 127% 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 2017-2019 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 2014-2019 period is shown in Table 2B. The total number of hooks deployed by the small offshore longline fishery decreased from 73,617 thousand hooks in 2014 to 66,442 thousand hooks in 2019. Bigeye catch for the small offshore longline show no apparent trend in this period. The bigeye catch was 8,384 mt in 2019, which is 110% of that in the average of previous 5 years. Yellowfin catches for the small offshore longline shows an increasing trend in this period. The yellowfin catch was 6,762 mt in 2019 which is 158% 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 2014-2019. In addition to this, historical changes in catch by species and effort are shown in Fig. 7 for the period of 1972-2019. The data for 2018 and 2019 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 a 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 2014-2019 period, the number of fishing days (including no catch days) for this fishery shows no apparent trend. The number of fishing days was 10,756 in 2019 which is 82% of that in the average of the previous 5 years. (Table 3). The total catch of tunas (skipjack, bigeye, yellowfin and albacore) in 2019 was 77,806 mt, which is 94% of that in the average of the previous 5 years. The skipjack catch was 58,529 mt in 2019, which is 90% 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 2017-2019. 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 2014 to 2019. In addition to this, historical changes in catch by species and effort are shown in Fig. 10 for the period of 1970-2018. The data for 2019 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 a major part of catches followed by yellowfin.

During the 2014-2019 period, the number of fishing days (including only searching) for this fishery shows a declining trend. The number of fishing days was 5,222 in 2019 which is 93% 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. The total catch in 2019 was 169,979 mt which is 95% of the average of previous 5 years. Skipjack catch for this fishery was 128,082 mt in 2019, which is 91% of that in the average of the previous 5 years. Yellowfin catch for this fishery was 39,767 mt in 2019, 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 that encircled whale sharks and cetaceans is currently being added up. According to the reports of the master of a vessel/observer, the number of cases that Japanese tuna purse seine encircled a cetacean and whale shark unintentionally was 50 times and 160 times.

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 2014-2019 is shown in Table 5. The figures in 2019 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 2014-2019. The data in 2018 and 2019 are preliminary. The total catch of skipjack shows a declining trend during this period from 231,835 mt in 2014 to 202,007 mt in 2019. The total catch of bigeye shows a declining trend during this period from 22,987 mt in 2014 to 15,416 mt in 2019. The total catch of yellowfin shows an increasing trend during this period from 44,626 mt in 2014 to 59,938 mt in 2019.

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 %. The coverage rate for the combined both of distant water and offshore longline fisheries (20-120 GRT, excluding 10-20 GRT vessels that operate outside of the Japanese EEZ) has been about 90 - 95% of total operation since 1994, The coverage rate by fishery category for recent years is shown in 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 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 operations by prefecture (which the vessel belongs to) by year given by MAFFJ has been used to raise the log sheet data to the total catch. Since 2008, Vessel Monitoring System (VMS) information is utilized to raise the log sheet data. 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 had been voluntarily collected for all tunas and billfishes by fishermen who were on board distant water longline vessels. Fishermen recorded the data in the field note which was provided by the NRIFSF, and sent the field note back to the NRIFSF after the completion of the cruise. The length data reported by the at-sea sampling was 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 took measurement at an interval of 2cm or 5cm though the NRIFSF encouraged measurement at an interval of 1cm. The length data provide from fishermen in this way is available 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 on a cruise number basis. Size data is collected for skipjack, yellowfin and bigeye. Fish to be measured was selected from a single well of commercial vessel, 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 2019.

- 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 and sex data were collected for blue shark, shortfin mako, salmon shark and other species caught by offshore, small-scale offshore and coastal longline vessels and gillnet fishing vessel at Kesennuma by NRIFSF staff. Majority of measurement was for blue shark and shortfin mako (details are described in NRIFSF 2020). For blue shark, subsampling (about 5 individuals) was conducted for each container and shortfin mako was landed by individuals and measurement was conducted as much as possible.
- 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 May to August 2019 in the vicinity of Japan. Days spent for these cruises ranged from 8 to 17 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 could. Nine cruises of distant water and offshore longline vessels and 109 cruises of small offshore longline vessels were observed in the 2019 calendar year. The data from eight distant water cruises and 109 small offshore cruises were inputted to the database and the number of operations and number of catches by species and species group are shown in Table 8.

6.2. Tagging

Skipjack tagging

The NRIFSF has been conducting skipjack tagging research mainly to investigate migration patterns to the fishing ground off Japan. One offshore pole-and-line vessel (20-119 GRT) and one distant water pole-and-line vessel (> 199 GRT) were fully chartered to conduct the research off Japan in October 2019 and in tropical areas (5°-25°N, 140°-180°E) in December 2019, respectively. A total of 6,404 skipjack tuna (1,302 off Japan and 5,102 in tropical areas) were released including 533 individuals (218 off Japan and 315 in tropical areas) with archival tags (Lotek LAT2910) and 50 individuals (20 off Japan and 30 in tropical areas) with Mini Pat (Wildlife Computers Inc, USA). In addition, skipjack tagging has been conducted in cooperation with Ajinomoto Co., Inc. in the coastal area of southwestern Japan since 2009. In 2019, 419 skipjack tuna were released including 78 individuals with archival tags at the east of Taiwan in March and December.

Besides above studies, five research/training cruises on pole-and-line vessels conducted skipjack tagging in 2019 around Japanese water. A total of 614 skipjack tuna including 140 individuals with archival tags were released in the south off Japan, 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 2019, research cruises were designed to focus on ecological studies of larval/juvenile PBF by R/Vs Shunyo-Maru, Yoko-Maru, Hokko-Maru 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 addition to these two spawning grounds, larval survey was conducted in Joban area in the coastal area of northeastern Japan in July and August. In 2019, approximately over 700 of PBF larvae were captured in the spawning grounds. Juvenile surveys were also conducted nursery areas in the Sea of Japan in September. Over 1958 of PBF juveniles were captured in the Sea of Japan in 2019.

Collected samples are being examined by a variety of approaches such as genetic identification, aging, growth analysis, stable isotope, microchemistry and stomach contents analyses to elucidate the survival processes of larval and juvenile PBF in relation to biological and environmental factors, which should help to understand the recruitment mechanism 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 15 Nov. 2019 to 13 Dec. 2019 around the subtropical area including the North Equatorial Current area. 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 May 2019 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 physical characteristics of tori-line during deployment and protocols of video image collection during longline operation. Drag power of several designs of tori-line were recorded during research cruise.

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 May 2020. Effectiveness of two designs of tori-line were examined in respect to aerial extent and bait-attacking behavior during the research cruise.

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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 vessels, 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 ton	50-100 ton	100-200 ton	200- ton	Total
2014	250	18	21	84	373
2015	239	18	24	69	350
2016	234	16	16	64	330
2017	233	15	16	59	323
2018	226	14	16	63	319
2019	(222)	(13)	(17)	(50)	(302)

Pole-and-line

	20-50 ton	50-200 ton	200- ton	Total
2014	1	54	25	80
2015	1	51	24	76
2016	1	50	25	76
2017	1	48	31	80
2018	1	43	25	69
2019	(1)	(41)	(24)	(66)

Purse Seine

	50-200 ton	200-500 ton	500- ton	Total
2014	33	37	3	73
2015	30	35	5	70
2016	32	33	4	69
2017	37	34	4	75
2018	34	30	4	68
2019	(36)	(31)	(5)	(72)

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
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	46,927	17	5,272	4,684	5,487	3,724	270	847	44	134	66	45
2017	45,875	22	5,814	3,867	5,660	3,066	181	804	53	72	55	64
2018	(47,143)	16	(4,441)	(4,565)	(5,408)	(3,429)	(149)	(719)	(57)	(75)	(47)	(36)
2019	(45,978)	(24)	(4,244)	(3,913)	(6,196)	(2,933)	(237)	(705)	(32)	(100)	(40)	(42)

	BSH	LMD	POR	SMA	OCS	THR	FAL	SPN	RHN	O-shk	Total
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	32,455
2017	10,140	128	0	640	0	61	0	0	0	1	30,630
2018	(9,687)	(241)	(0)	(682)	(0)	(18)	(0)	(0)	(0)	(0)	(29,571)
2019	(9,793)	(204)	(0)	(743)	(0)	(35)	(0)	(0)	(0)	(0)	(29,242)

Small offshore longline (10-20 GRT)

	#hooks	PBF	ALB	BET	YFT	SWO	MLS	BUM	BLM	SFA	SSP	SKJ
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	69,360	-	-	6,783	4,679	2,005	577	964	19	28	1	4
2017	66,443	-	-	7,604	4,439	1,883	541	780	13	39	0	4
2018	(64,590)	-	-	(7,440)	(4,701)	(1,728)	(469)	(753)	(14)	(47)	(0)	(3)
2019	(66,442)	-	-	(8,384)	(6,762)	(1,265)	(754)	(840)	(14)	(44)	(0)	(1)

	BSH	LMD	POR	SMA	OCS	THR	FAL	SPN	RHN	O-shk	Total
2014	836	325	0	4	0	2	0	0	0	1	15,191
2015	581	448	0	2	0	1	0	0	0	0	16,091
2016	1,036	1,272	0	55	0	6	0	0	0	0	17,672
2017	1,605	3,097	0	66	0	82	0	0	0	1	20,153
2018	(2,026)	(2,287)	(0)	(88)	(0)	(31)	(0)	(0)	(0)	(0)	(19,586)
2019	(1,729)	(2,263)	(0)	(75)	(0)	(13)	(0)	(0)	(0)	(0)	(22,144)

* 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
2014	12,642	241,878	54,234	1,172	2,612	-	29,352	87,370
2015	12,806	243,353	63,152	1,261	615	-	21,208	86,236
2016	14,126	258,159	61,921	1,667	949	-	14,409	78,945
2017	12,775	234,456	51,802	1,741	1,192	-	20,863	75,597
2018	(13,242)	(245,632)	(65,072)	(1,567)	(1,254)	-	(17,795)	(85,688)
2019	(10,756)	(198,679)	(58,529)	(1,108)	(375)	-	(17,795)	(77,806)

* 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
2014	6,487	167,378	31,987	4,000	-	-	203,366
2015	5,743	146,375	35,499	3,970	-	-	185,844
2016	6,355	126,400	38,073	2,116	-	-	166,589
2017	6,083	128,122	34,475	2,645	-	-	165,242
2018	5,232	132,838	40,673	3,626	-	-	177,137
2019	(5,532)	(128,082)	(39,767)	(2,125)	-	-	(169,974)

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

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
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	6	1,666	291	-	-	91	223	83	2,360
2018	6	1,611	298	-	-	69	240	83	2,307
2019	(6)	(1,611)	(298)	-	-	(69)	(240)	(83)	(2,307)

Coastal pole-and-line

	SKJ	YFT	BET	PBF*	ALB	Total
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	10,441	1,456	203	-	30	12,130
2018	13,418	1,942	156	-	119	15,635
2019	(13,418)	(1,942)	(156)	-	(119)	(15,635)

Coastal purse seine

	SKJ	YFT	BET	PBF*	ALB	Total
2014	87	7	0	-	0	94
2015	18	439	0	-	4	461
2016	62	342	2	-	3	409
2017	467	376	1	-	17	861
2018	57	144	0	-	2	203
2019	(57)	(144)	(0)	-	(2)	(203)

Gillnet

	SKJ	YFT	BET	PBF*	ALB	Total
2014	119	8	0	-	11	138
2015	119	12	4	-	138	273
2016	111	16	0	-	19	146
2017	61	7	1	-	40	109
2018	91	6	1	-	35	133
2019	(91)	(6)	(1)	-	(35)	(133)

Troll

	SKJ	YFT	BET	PBF	ALB	Total
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	1,615	1,877	119	605	107	4,323
2018	1,154	1,738	80	371	78	3,421
2019	(1,154)	(1,738)	(80)	(718)	(78)	(3,768)

Setnet

	SKJ	YFT	BET	PBF	ALB	Total
2014	131	67	0	1,907	24	2,129
2015	153	56	3	1,242	17	1,471
2016	264	120	1	1,228	28	1,641
2017	401	135	0	2,221	48	2,805
2018	494	77	0	645	13	1,229
2019	(494)	(77)	(0)	(941)	(13)	(1,525)

* 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.

	2014	2015	2016	2017	2018	2019
Skipjack						
Total	231,835	219,457	198,943	193,064	(213,301)	(202,007)
Distant water and Offshore LL	156	87	45	64	(36)	(42)
Distant water and Offshore PL	54,234	63,152	61,921	51,802	(65,072)	(58,529)
Tuna PS	167,378	146,375	126,400	128,122	132,838	(128,082)
Small offshore LL	4	7	4	4	(3)	(1)
Coastal LL	9	11	4	6	6	(6)
Coastal PL	8,670	8,251	8,438	10,441	13,418	(13,418)
Coastal PS	87	18	62	467	57	(57)
Gill net	119	119	111	61	91	(91)
Troll	954	1,238	1,642	1,615	1,154	(1,154)
Set net	131	153	264	401	494	(494)
Unclassified	93	46	53	81	133	(133)
Yellowfin						
Total	44,626	52,193	57,012	52,522	(58,454)	(59,938)
Distant water and Offshore LL	3,654	4,196	5,487	5,660	(5,408)	(6,196)
Distant water and Offshore PL	1,172	1,261	1,667	1,741	(1,567)	(1,108)
Tuna PS	31,987	35,499	38,073	34,475	40,673	(39,767)
Small offshore LL	2,900	4,643	4,679	4,439	(4,701)	(6,762)
Coastal LL	1,218	1,765	2,018	1,666	1,611	(1,611)
Coastal PL	1,662	1,710	1,554	1,456	1,942	(1,942)
Coastal PS	7	439	342	376	144	(144)
Gill net	8	12	16	7	6	(6)
Troll	1,523	2,014	2,250	1,877	1,738	(1,738)
Set net	67	56	120	135	77	(77)
Unclassified	429	599	806	690	587	(587)
Bigeye						
Total	22,987	19,345	15,074	16,011	(17,503)	(15,416)
Distant water and Offshore LL	7,210	5,945	4,684	3,867	(4,565)	(3,913)
Distant water and Offshore PL	2,612	615	949	1,192	(1,254)	(375)
Tuna PS	4,000	3,970	2,116	2,645	3,626	(2,125)
Small offshore LL	8,259	8,046	6,783	7,604	(7,440)	(8,384)
Coastal LL	374	343	280	291	298	(298)
Coastal PL	234	165	63	203	156	(156)
Coastal PS	0	0	2	1	0	(0)
Gill net	0	4	0	1	1	(1)
Troll	160	140	87	119	80	(80)
Set net	0	3	1	0	0	(0)
Unclassified	138	114	109	89	84	(84)

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	2014	2015	2016	2017	2018	2019
Distant water longline	100%	100%	100%	100%	100%	96%
Offshore longline	98%	96%	96%	96%	97%	84%
Small offshore longline	88%	90%	93%	88%	87%	74%
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%	97%	97%
Distant water pole-and-line (over 120 GRT)	100%	100%	100%	100%	100%	100%
Purse seine (>200GRT)	100%	100%	100%	100%	100%	100%

Table 8. Number of operations and catch number for longline observer program in the western central Pacific in 2019.

Fishery	Small offshore longline	Distant water and offshore longline
Number of Cruises	109	8
Number of Operation	1,470	653
Number of Catch Observed	92,088	43,483
Catch by species		
Albacore	18,550	11,276
Yellowfin tuna	9,929	5,542
Southern bluefin tuna	0	8,474
Bigeye tuna	14,898	4,340
Pacific bluefin tuna	14	4
Skipjack tuna	3,238	378
Sailfish	51	61
Black marlin	16	8
Blue marlin	884	251
Shortbill spearfish	326	71
Striped marlin	1,142	38
Swordfish	1,696	460
Lancetfishes	5,975	1,640
Opah	932	628
Pomfrets	897	573
Dolphinfishes	710	260
Escolar	1,978	961
Other fish	1,589	1,799
Thresher sharks	328	144
Shortfin mako	779	201
Blue shark	24,228	3,327
Other sharks	491	1,318
Stingray	2,703	556
Other rays	22	4
Seabirds	521	1,144
Sea turtles	175	21
Mammals	16	4

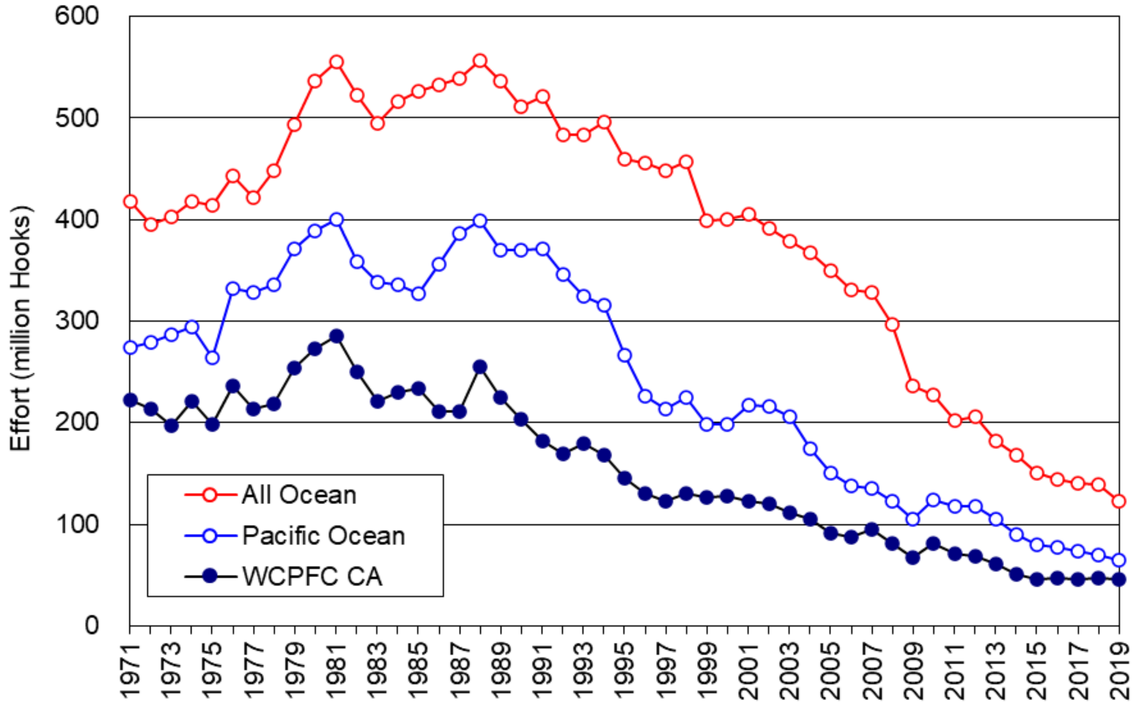

Fig. 1. Historical change in fishing effort of the Japanese distant water and offshore longline fishery (not including small offshore) in the WCPFC Convention Area. Values in 2018 and 2019 are provisional.

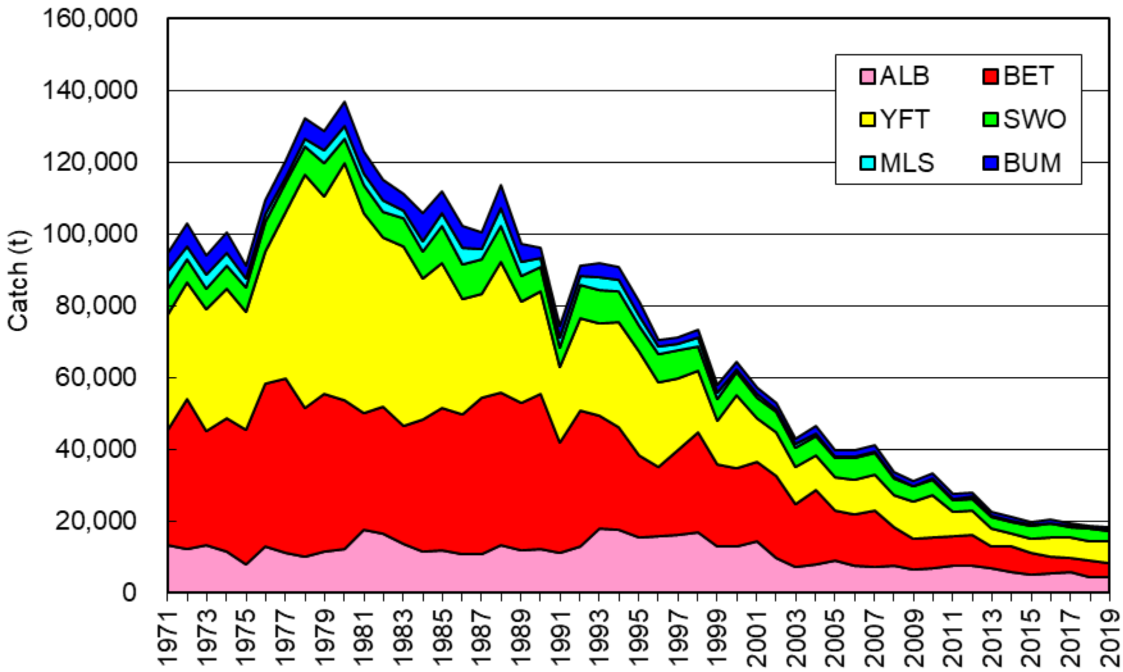

Fig. 2. Historical change of catches for major species for the Japanese distant water and offshore longline fishery (not including small offshore) in the WCPFC Convention Area. ALB: albacore, BET: bigeye, YFT: yellowfin, SWO: sword fish, MLS: striped marlin, BUM: blue marlin. Values in 2018 and 2019 are provisional.

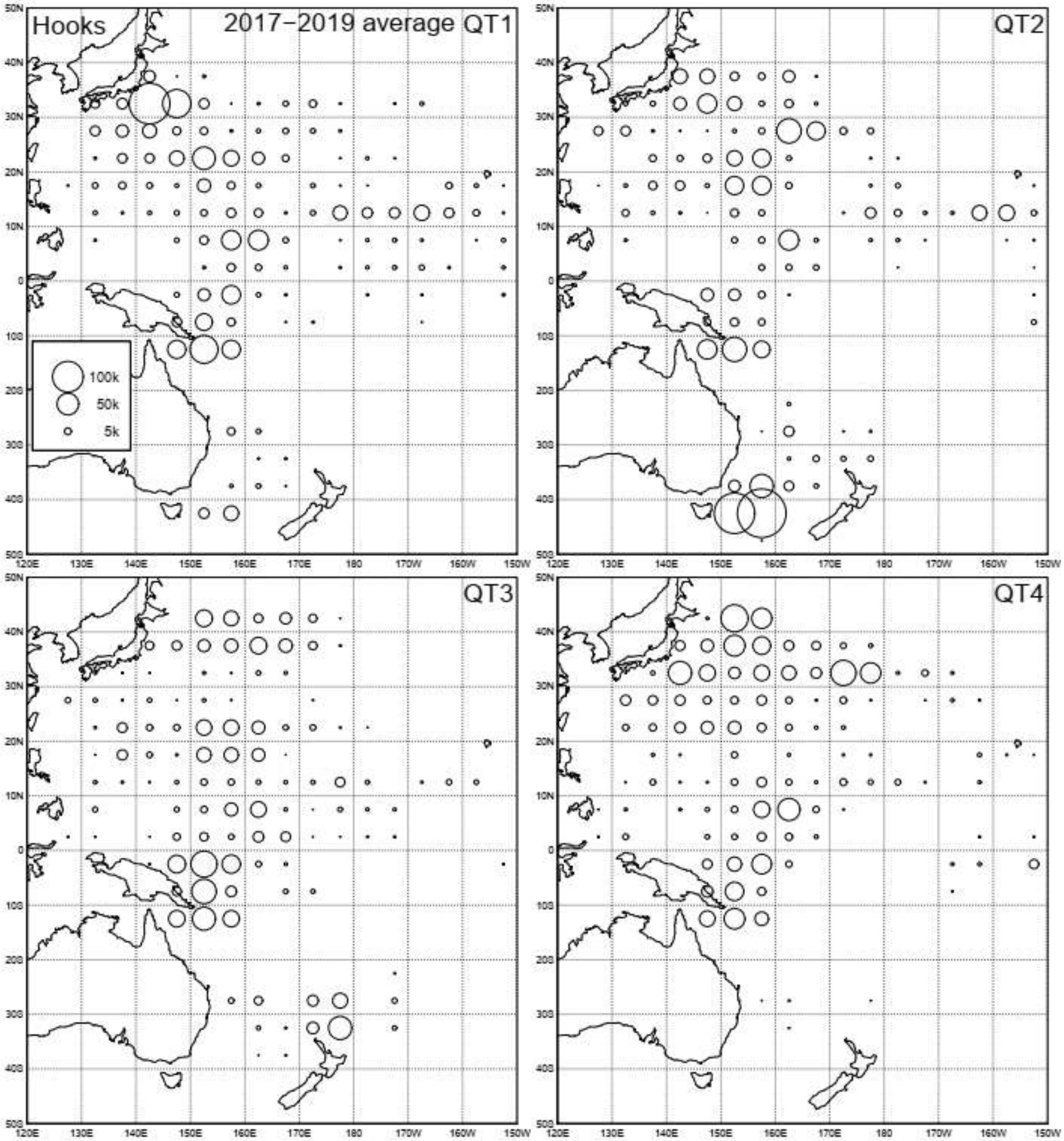

Fig. 3. Quarterly distribution of fishing effort for the Japanese offshore and distant water longline fisheries in the western and central Pacific Ocean in average of 2017-2019.

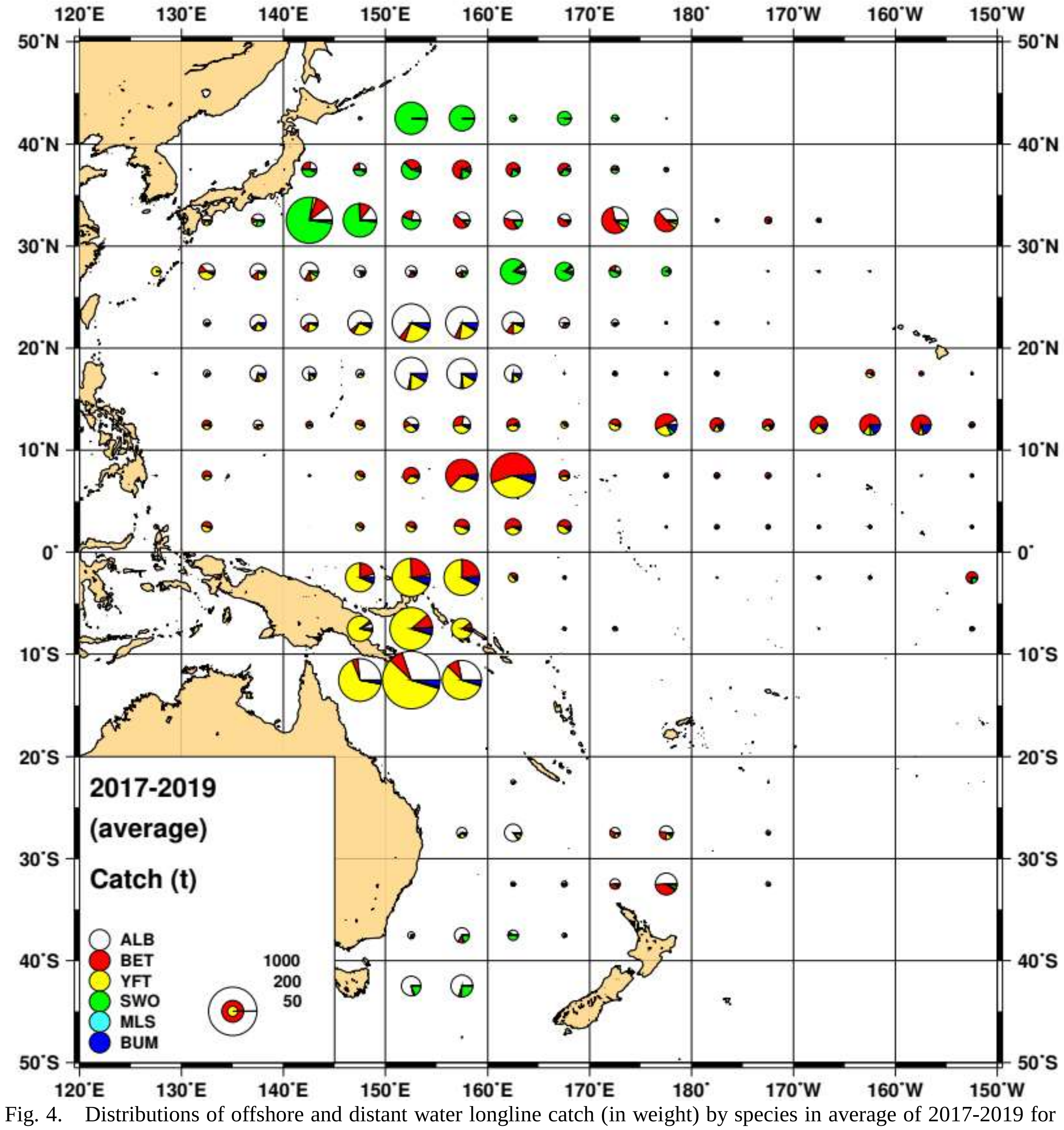

Fig. 4. Distributions of offshore and distant water longline catch (in weight) by species in average of 2017-2019 for six main species (ALB: albacore, BET: bigeye tuna, YFT: yellowfin tuna, SWO: swordfish, MLS: striped marlin and BUM: blue marlin).

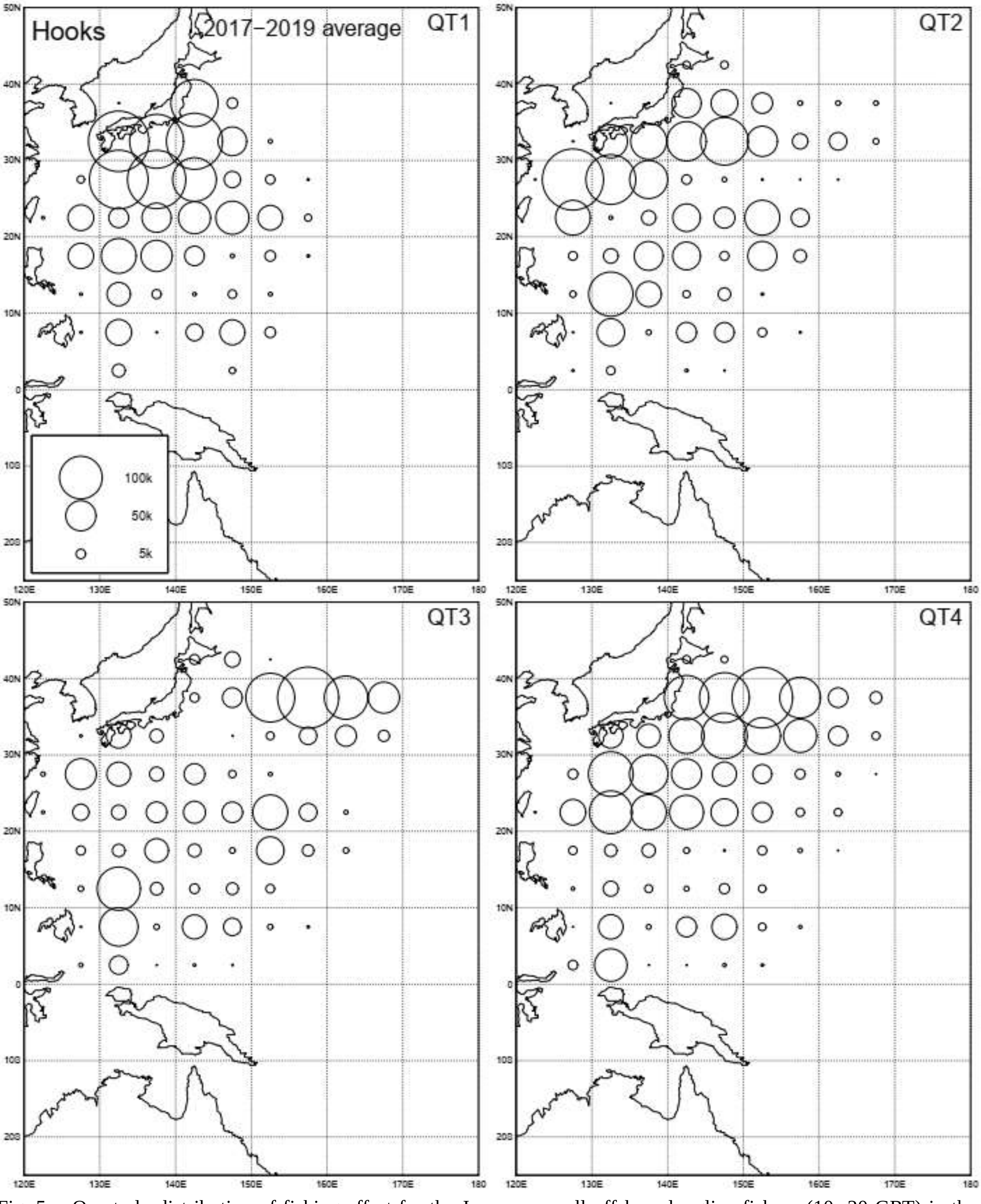

Fig. 5. Quarterly distribution of fishing effort for the Japanese small offshore longline fishery (10- 20 GRT) in the western and central Pacific Ocean in average of 2017-2019.

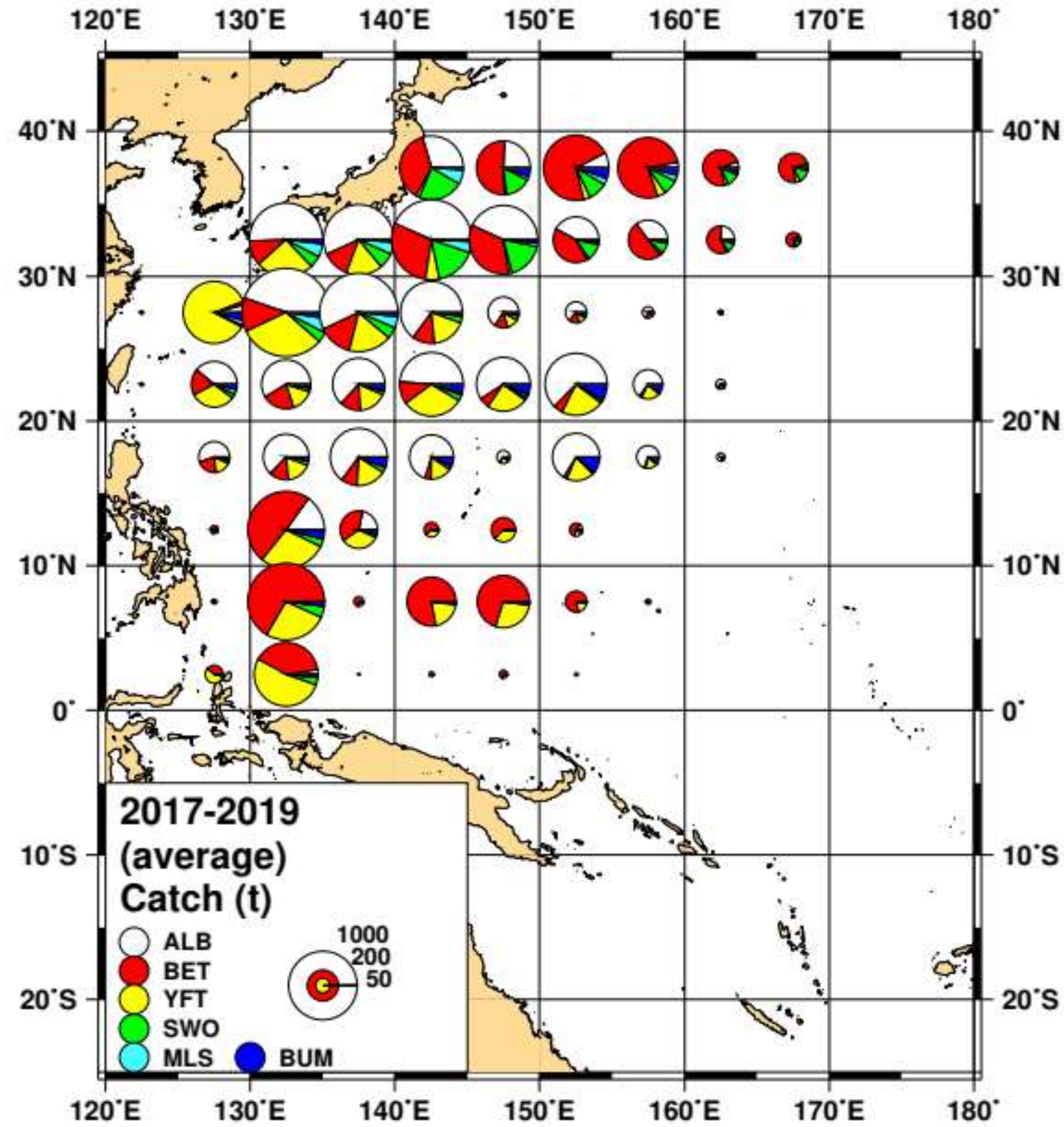

Fig. 6. Distributions of small offshore longline catch (in weight) by species in average of 2017-2019 for six main species (ALB: albacore, BET: bigeye tuna, YFT: yellowfin tuna, SWO: swordfish, MLS: striped marlin and BUM: blue marlin).

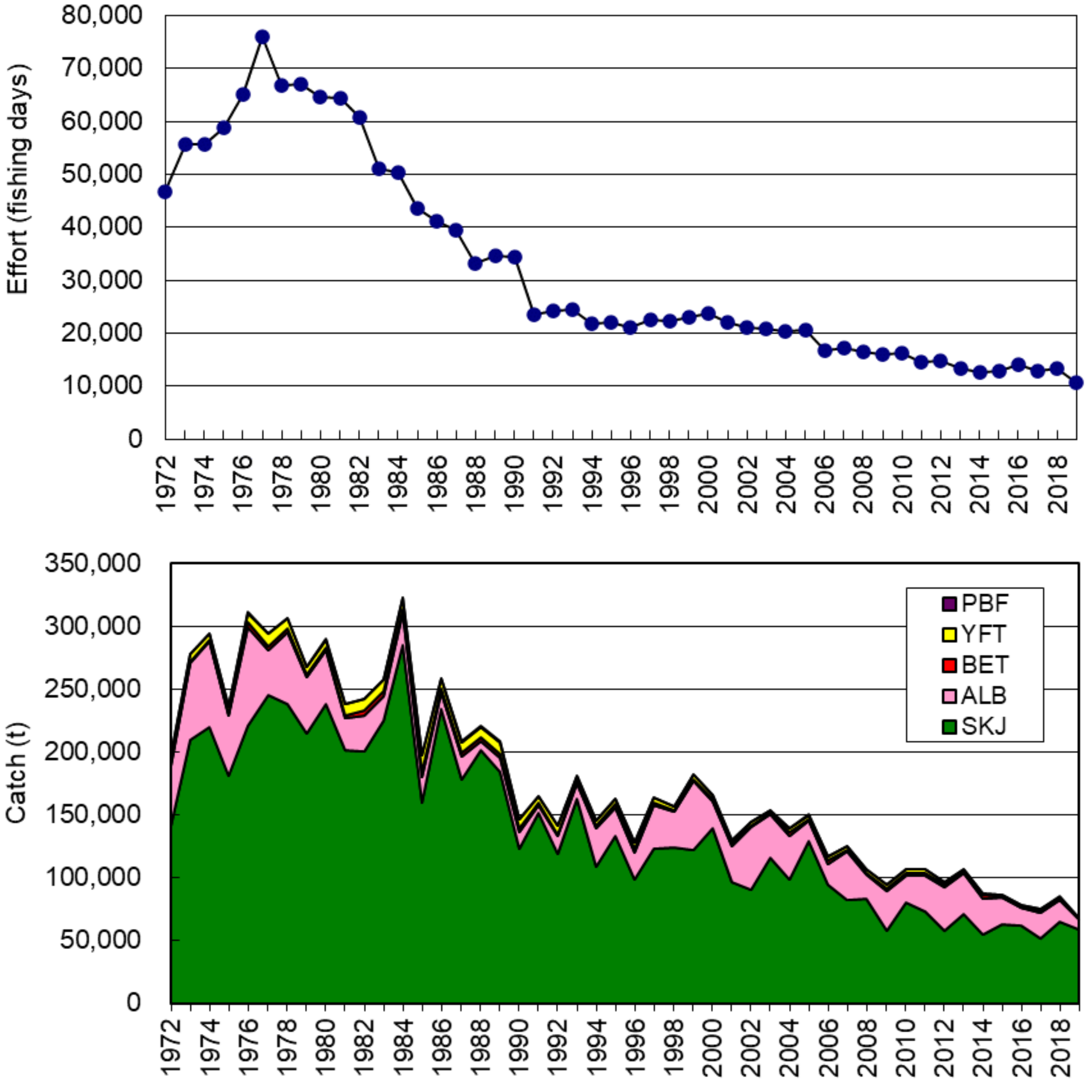

Fig. 7. Historical change of fishing effort and catches by species for the Japanese pole-and-line fishery (>20GRT) in the WCPFC Convention Area. Values in 2018 and 2019 are provisional.

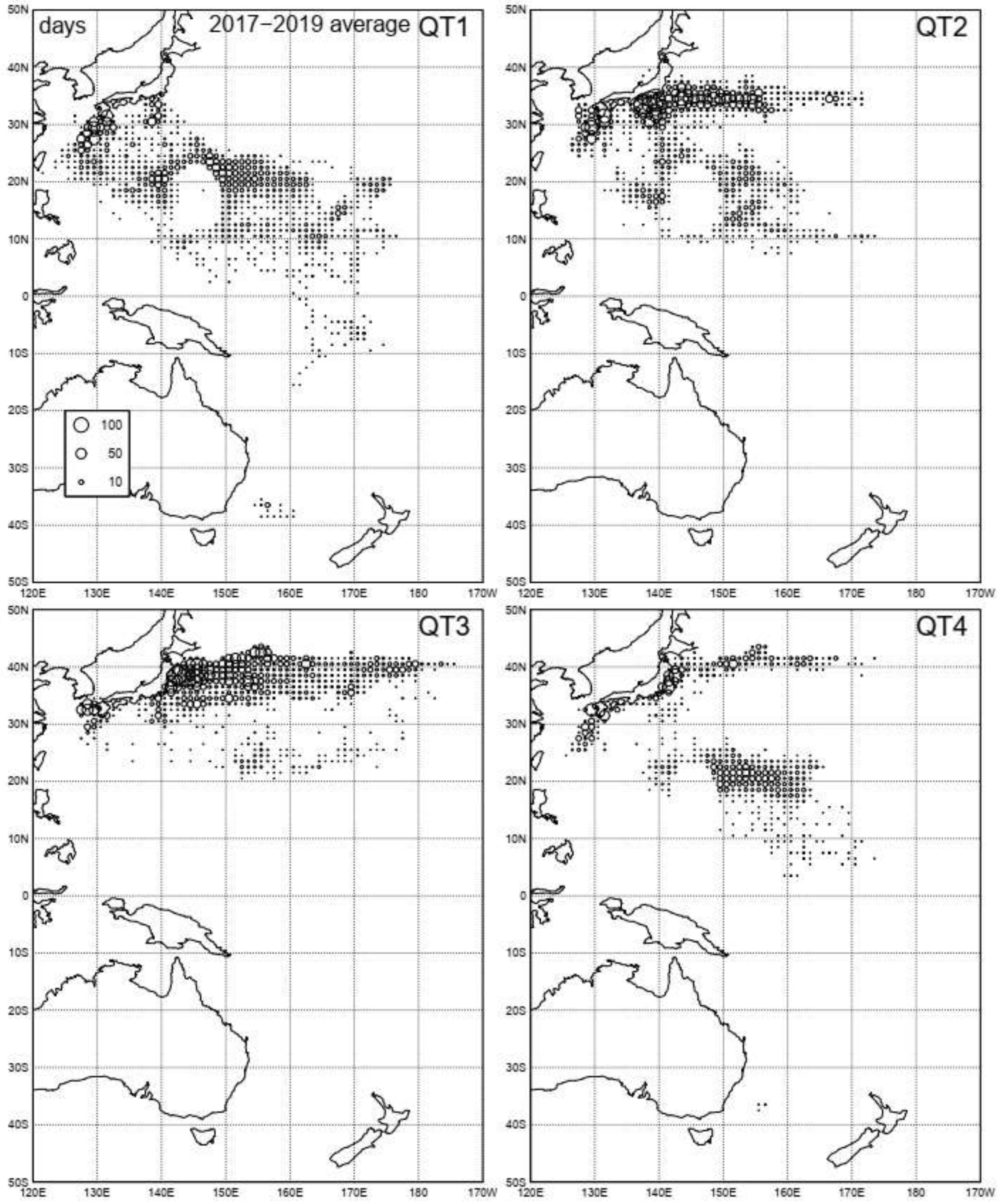

Fig. 8. Quarterly distribution of fishing effort (days) for the Japanese pole-and-line fishery (offshore and distant water licenses) in the Pacific Ocean in average of 2017-2019.

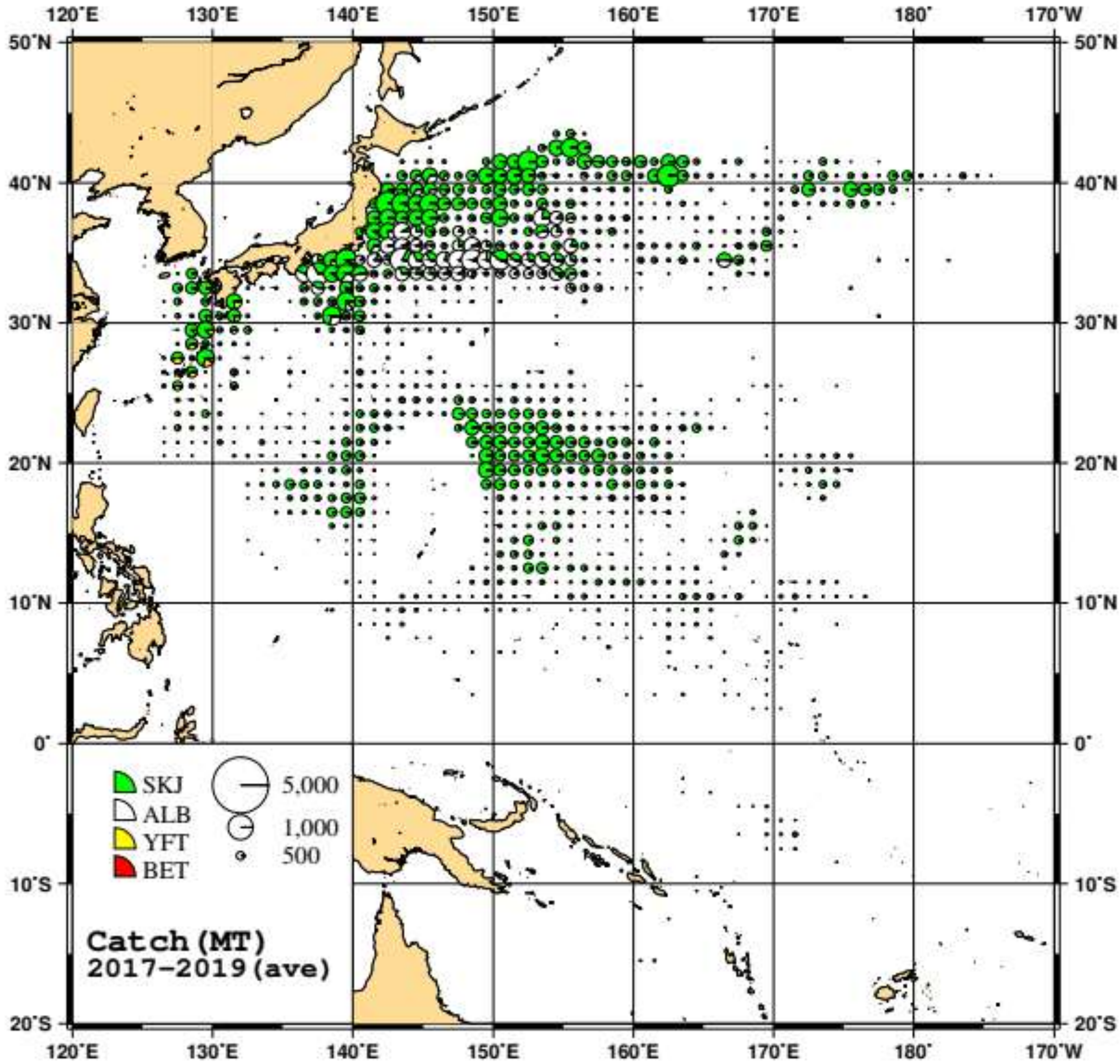

Fig. 9. Distribution of catch and its species composition for the Japanese offshore and distant water pole-and-line fishery in average of 2017-2019.

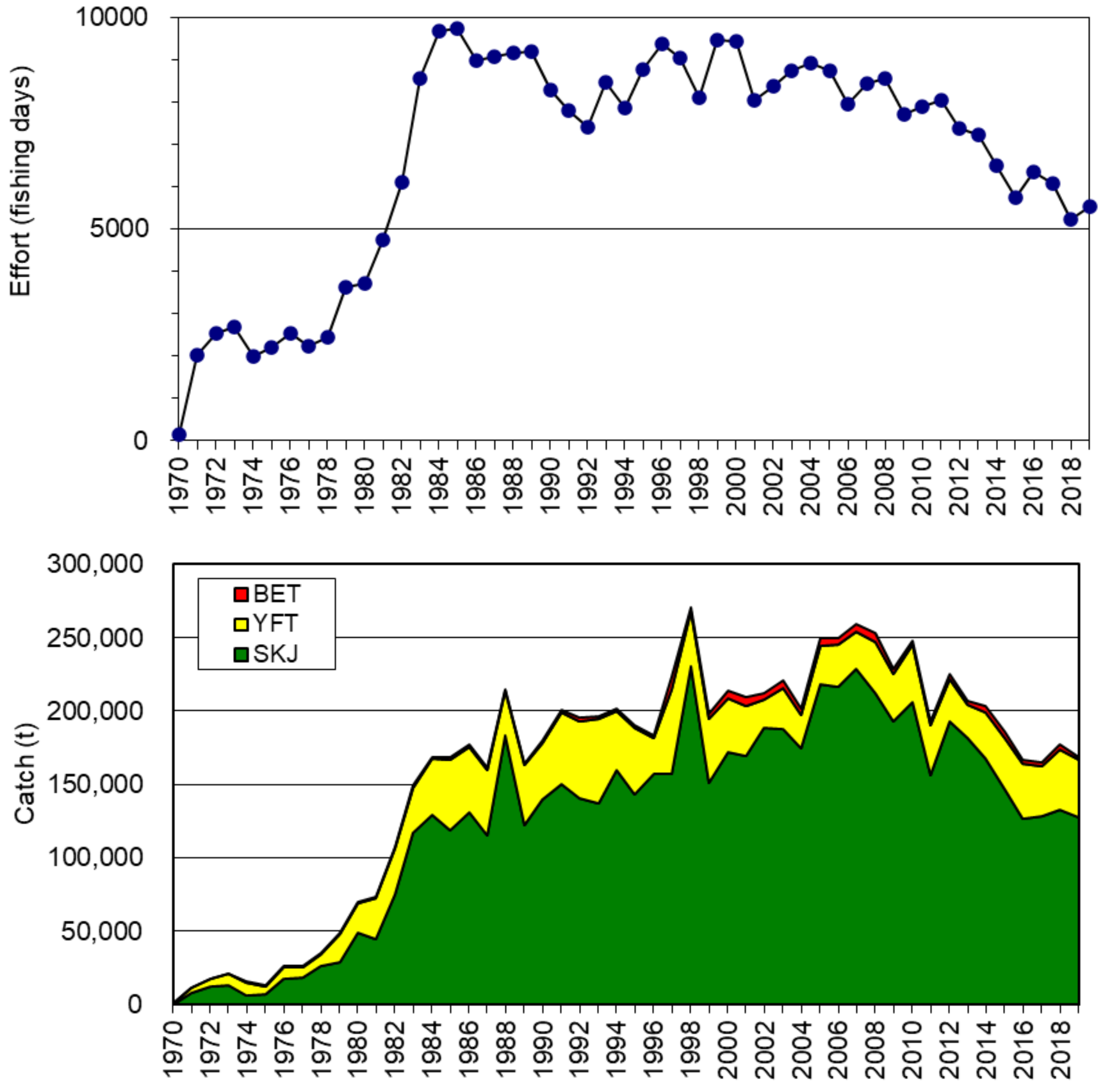

Fig. 10. Trends of fishing effort and catches by species for the Japanese tuna purse seine fishery in the WCPFC Convention Area. Values in and 2018 and 2019 are provisional.

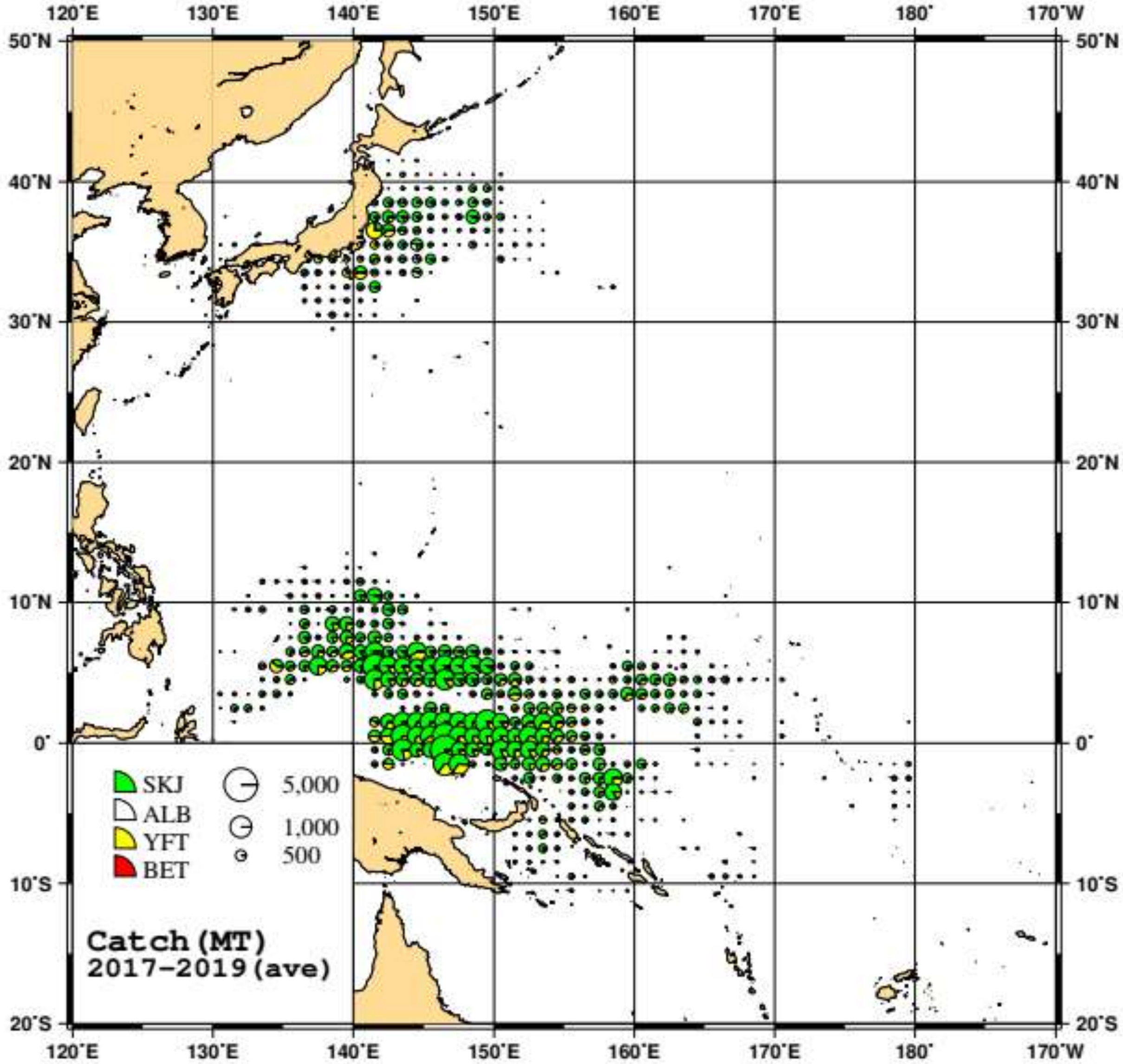

Fig. 11. Distribution of tuna purse seine catch (mt) by species (skipjack, yellowfin and bigeye) combined for 2017-2019.

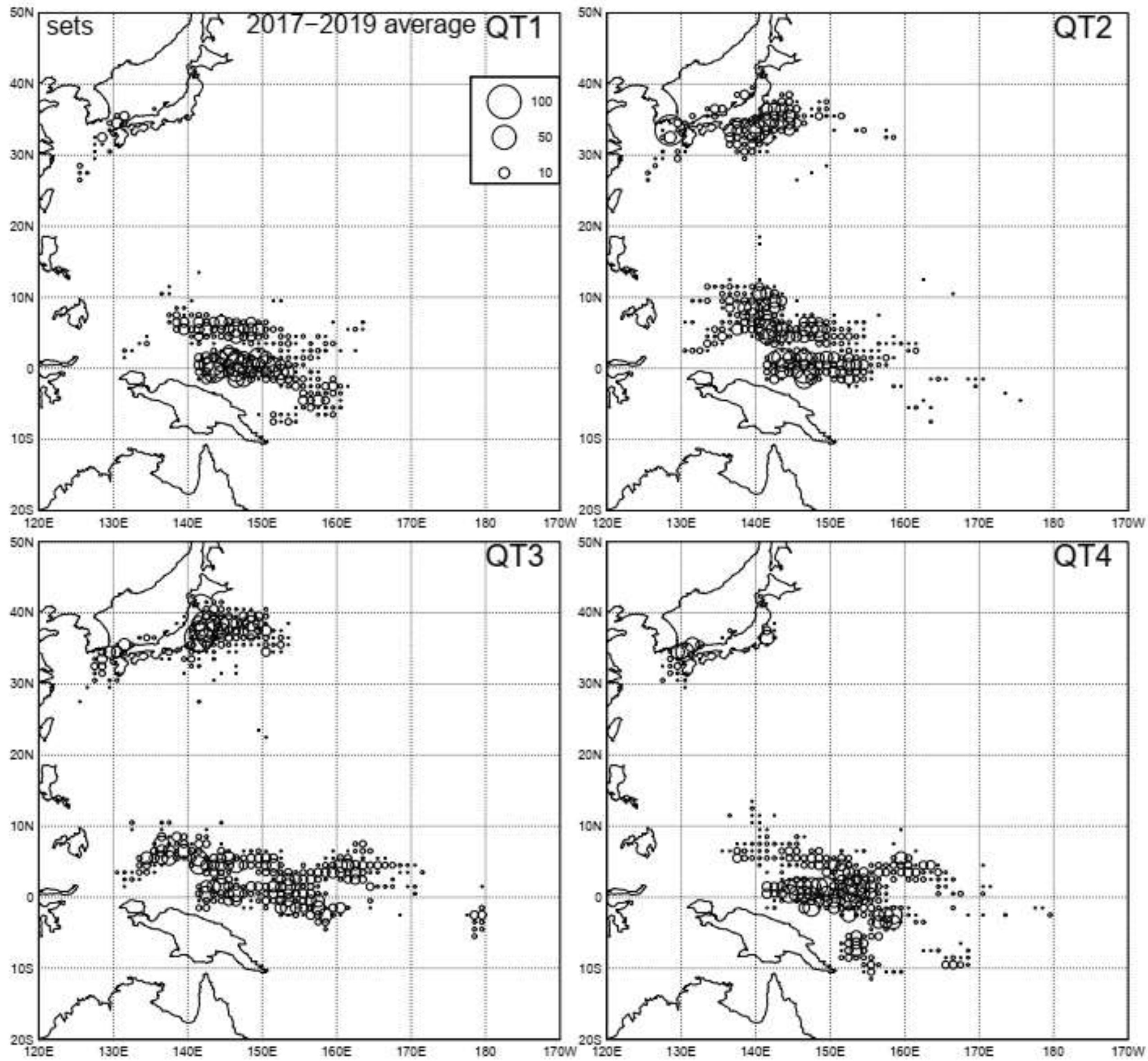

Fig. 12. Quarterly distributions of fishing effort (number of set) for the Japanese tuna purse seine fishery in the Pacific Ocean for 2017-2019.

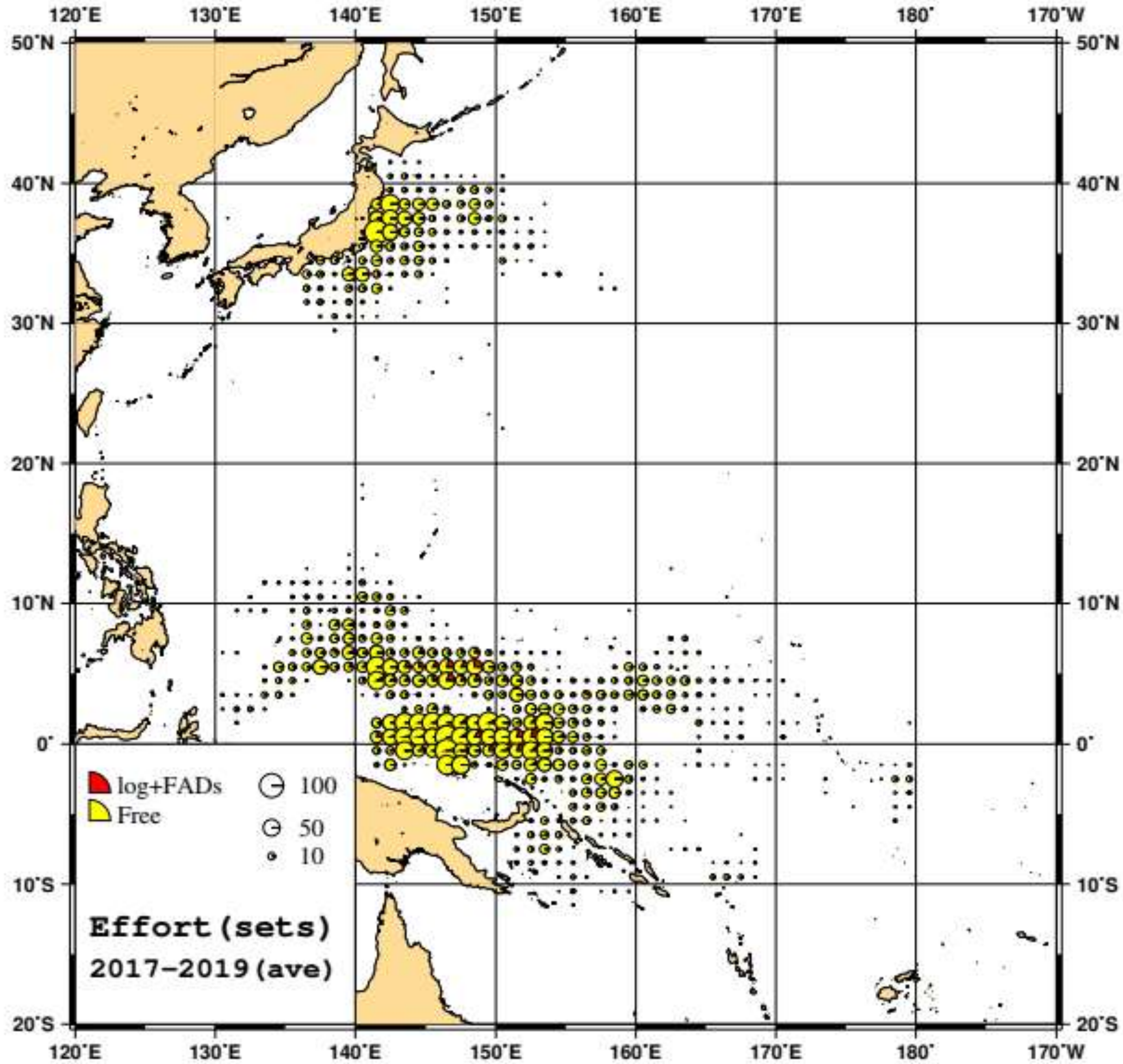

Fig. 13. Distribution of sets by type of school for 2017-2019 deployed by the tuna purse seine fishery by Japan.

Appendix Table 1. Catches (mt) 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.

Year	BET	YFT	SKJ	BUM	BLM	BSH	LMD	POR	SMA	OCS	THR	FAL	SPN	RHN	oSHK
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
2018	(429)	(76)	(0)	(31)	(2)	(33)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
2019	(29)	(15)	(0)	(3)	(0)	(0)	(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 2018 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)			
2014	672	11	5	5456	1023	1907	499
2015	637	11	8	3645	413	1242	431
2016	677	14	54	5095	778	1228	508
2017	892	21	49	4540	605	2221	665
2018	679	21	9	4049	371	645	431
2019	976	26	0	4464	718	941	372

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)			
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
2018	0	2	0	0	0	0	0
2019	0	2	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)			
2014	672	10	5	5456	1023	1907	499
2015	637	11	8	3645	413	1242	431
2016	677	13	54	5095	778	1228	508
2017	892	16	49	4540	605	2221	665
2018	679	14	9	4049	371	645	431
2019	976	21	0	4464	718	941	372

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)			
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
2018	0	2	0	0	0	0	0
2019	0	2	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)			
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
2018	0	0	0	0	0	0	0
2019	0	6	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)				
2014	15703	4270	81	29352	2009	11	197	24	197
2015	17106	3907	86	21208	1072	138	239	17	170
2016	13118	3431	33	14402	3679	19	148	28	128
2017	13598	3710	30	20861	1250	40	107	48	119
2018	10121	3070	119	17756	3039	35	78	13	70
2019	10259	3106	119	17770	3039	35	78	13	70

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)				
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	3217	0	2	0	0	0	0	0
2018	0	2538	0	39	0	0	0	0	0
2019	0	2268	0	25	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)				
2014	15703	4211	81	29352	2009	11	197	24	197
2015	17106	3849	86	21208	1072	138	239	17	170
2016	13118	3397	33	14402	3679	19	148	28	128
2017	13598	3673	30	20861	1250	40	107	48	119
2018	10121	3004	119	17756	3000	35	78	13	70
2019	10259	2975	119	17770	3000	35	78	13	70

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)				
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	2141	0	2	0	0	0	0	0
2018	0	1437	0	39	0	0	0	0	0
2019	0	1269	0	25	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)				
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
2018	0	30	0	0	0	0	0	0	0
2019	0	4	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			
2014	1101	3279	269	7	293
2015	1235	3775	277	3	486
2016	1961	3534	303	2	427
2017	1775	2880	291	3	565
2018	1570	3230	230	5	749
2019	1334	2843	230	5	749

Swordfish (2) the Pacific Ocean south of the Equator

Year	LL	LL	Gillnet	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water			
2014	0	3627	0	0	0
2015	0	3770	0	0	0
2016	0	3778	0	0	0
2017	0	3081	0	0	0
2018	0	2205	0	0	0
2019	0	1337	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			
2014	1101	2823	269	7	293
2015	1235	3237	277	3	486
2016	1961	3310	303	2	427
2017	1775	2779	291	3	565
2018	1570	3073	230	5	749
2019	1334	2782	230	5	749

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			
2014	0	393	0	0	0
2015	0	357	0	0	0
2016	0	414	0	0	0
2017	0	287	0	0	0
2018	0	357	0	0	0
2019	0	152	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			
2014	0	125	0	0	0
2015	0	90	0	0	0
2016	0	126	0	0	0
2017	0	56	0	0	0
2018	0	95	0	0	0
2019	0	2	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			
2014	855	265	173	35	57
2015	1039	284	287	37	107
2016	737	257	308	25	106
2017	706	171	241	28	104
2018	639	157	278	28	116
2019	994	264	278	28	116

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			
2014	0	545	0	0	0
2015	0	336	0	0	0
2016	0	327	0	0	0
2017	0	271	0	0	0
2018	0	229	0	0	0
2019	0	218	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			
2014	855	191	173	35	57
2015	1039	190	287	37	107
2016	737	186	308	25	106
2017	706	130	241	28	104
2018	639	106	278	28	116
2019	994	205	278	28	116

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			
2014	0	119	0	0	0
2015	0	90	0	0	0
2016	0	84	0	0	0
2017	0	51	0	0	0
2018	0	43	0	0	0
2019	0	31	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			
2014	0	18	0	0	0
2015	0	6	0	0	0
2016	0	5	0	0	0
2017	0	2	0	0	0
2018	0	7	0	0	0
2019	0	0	0	0	0

Appendix Table 3. 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)
2014	98
2015	79
2016	66
2017	30
2018	23
2019	20

Appendix Table 4. 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
2014	235	26	0	0	--	--	--
2015	225	26	0	0	--	--	--
2016	239	26	0	0	--	--	--
2017	172	26	0	0	--	--	--
2018	175	27	0	0	--	--	--
2019	103	27	0	0	--	--	--

Appendix Table 5-1. The total quantity (mt) of highly migratory fish stocks transshipped by fishing vessels. That was request written in **paragraph 8 of CMM-2009-06**.

(1) The total quantities in 2019, by weight, of highly migratory fish stocks covered by this measure that were transhipped by fishing vessels the CCM is responsible for reporting against, with those quantities broken down by:

a) offloaded and received;	b) transhipped in port, transhipped at sea in areas of national jurisdiction, and transhipped beyond areas of national jurisdiction	c) transhipped inside the Convention Area and transshipped outside the Convention Area;	d) caught inside the Convention Area and caught outside the Convention Area;	e) Species	f) Product Form	g) Fishing gear	quantity
Offloaded							249
Received							0
	In port						0
	At sea in NJ						0
	At sea beyond NJ						249
		Inside CA					0
		Outside CA					249
			Inside CA				249
			Outside CA				0
				Bigeye			187
				Yellowfin			21
				Swordfish			5
				Others			36
					Gilled and Gutted		50
					Gutted and Headed		0
					Dress		168
					Whole		24
					Fillet		4
					Others		3
						Longline	249

Appendix Table 5-2. The number of transshipments involving highly migratory fish stocks. That was request written in **paragraph 8 of CMM-2009-06**.

(2) The number of transhipments in 2019 involving highly migratory fish stocks covered by this measure by fishing vessels that is responsible for reporting against, broken down by:

a) offloaded and received	b) transhipped in port, transhipped at sea in areas of national jurisdiction, and transhipped beyond areas of national jurisdiction	c) transhipped inside the Convention Area and transhipped outside the Convention Area	d) caught inside the Convention Area and caught outside the Convention Area	e) fishing gear	number of transhipments
Offloaded					3
Received					0
	In port				0
	At sea in NJ				0
	At sea beyond NJ				3
		Inside CA			0
		Outside CA			3
			Inside CA		0
			Both inside/outside CA		3
			Outside CA		0
				Longline	3

Appendix Table 6. 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: other sharks

Distant water and offshore longlines

Year	BSH	LMD	POR	SMA	OCS	THR	FAL	SPN	RHN	O-shk
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	10,140	128	0	640	0	61	0	0	0	1
2018	(9,687)	(241)	(0)	(682)	(0)	(18)	(0)	(0)	(0)	(0)
2019	(9,793)	(204)	(0)	(743)	(0)	(35)	(0)	(0)	(0)	(0)

Small offshore longline

Year	BSH	LMD	POR	SMA	OCS	THR	FAL	SPN	RHN	O-shk
2014	836	325	0	4	0	2	0	0	0	1
2015	581	448	0	2	0	1	0	0	0	0
2016	1,036	1,272	0	55	0	6	0	0	0	0
2017	1,605	3,097	0	66	0	82	0	0	0	1
2018	(2,026)	(2,287)	(0)	(88)	(0)	(31)	(0)	(0)	(0)	(0)
2019	(1,729)	(2,263)	(0)	(75)	(0)	(13)	(0)	(0)	(0)	(0)

Appendix Table 7. The estimated and observed number of released oceanic whitetip shark on longline vessels in 2019 (calendar year). The estimated number of releases was calculated by raising observed number to total number based on the observer coverage ratio in 2019 (see Appendix Table 10). This table was request written in **paragraph 3 of CMM-2011-04**.

	Observed (number)	Estimated (number)
Alive	30	403
Dead	28	349

Appendix Table 8. The estimated and observed number of released silky shark on longline vessels in 2019 (calendar year). The estimated number of releases was calculated by raising observed number to total number based on the observer coverage ratio in 2019 (see Appendix Table 10). This table was request written in **paragraph 3 of CMM-2013-08**.

	Observed (number)	Estimated (number)
Alive	303	4,193
Dead	320	4,424

Appendix Table 9. Observer coverage for the Japanese longline fishery. Values in 2018 and 2019 are provisional. This table was request written in **paragraph 4 of CMM-2007-01**.

		No. of Hooks			Days Fished			Days at Sea			No. of Trips		
Year	Fishery	T.	O.	%	Total	Observer	%	T.	O.	%	T.	O.	%
2015	Ice/Fresh,	***	***	***	28176	1226	4.35%	***	***	***	***	***	***
	Frozen,	***	***	***	7996	651	8.14%	***	***	***	***	***	***
2016	Ice/Fresh,	***	***	***	26256	874	3.33%	***	***	***	***	***	***
	Frozen,	***	***	***	8392	690	8.22%	***	***	***	***	***	***
2017	Ice/Fresh,	***	***	***	24166	919	3.80%	***	***	***	***	***	***
	Frozen,	***	***	***	8110	586	7.23%	***	***	***	***	***	***
2018	Ice/Fresh,	***	***	***	24688	938	3.80%	***	***	***	***	***	***
	Frozen,	***	***	***	8508	614	7.22%	***	***	***	***	***	***
2019	Ice/Fresh,	***	***	***	26527	1473	5.55%	***	***	***	***	***	***
	Frozen,	***	***	***	7785	888	11.41%	***	***	***	***	***	***

Appendix Table 10-1. 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)
2014	1416
2015	1402
2016	851
2017	835
2018	(975)
2019	(608)

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

Year	Vessels	Albacore catch (mt)
2014	1	0
2015	3	0
2016	3	7
2017	2	2
2018	(1)	(39)
2019	(0)	(0)

Appendix Table 10-2. Catch (mt) 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
2019	A01	6	0	0	2	0	0
2019	A02	15	0	1	2	0	0
2019	A03	58	2	12	2	1	0
2019	A04	3	0	0	1	0	0
2019	A05	7	0	0	2	0	0
2019	A06	24	4	1	5	1	0
2019	A07	9	0	0	2	0	0
2019	A08	63	15	13	5	2	17
2019	A09	5	0	0	1	0	0
2019	A10	12	0	0	2	0	0
2019	A11	36	11	5	5	1	16
2019	A12	8	0	0	1	0	0
2019	A13	47	3	5	3	3	0
2019	A14	11	0	0	3	0	0
2019	A15	53	3	6	3	3	0
2019	A16	7	0	0	1	0	0
2019	A17	2	0	0	1	0	0
2019	A18	16	0	0	3	0	0
2019	A19	7	0	0	1	0	0
2019	A20	71	13	9	4	5	4
2019	A21	71	14	14	4	3	12
2019	A22	2	0	0	2	0	0
2019	A23	2	0	0	1	0	0
2019	A24	7	0	0	2	0	0
2019	A25	7	0	0	2	0	0
2019	A26	12	0	0	2	0	0
2019	A27	7	0	0	2	0	0

Appendix Table 11-1. Effort, observed and estimated seabird captures by the longliners larger than 20 GRT (approximately >= 24m) by years for Japan [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). This table was request written in **paragraph 9 of CMM-2017-06**.

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	412,667	3.0%	72	0.174
2016	39	13,809,603	253,454	1.8%	35	0.138
2017	39	11,593,499	194,725	1.7%	63	0.324
2018	36	11,845,510	328,315	2.8%	61	0.186

23˚N - 30˚S

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2015	85	21,754,654	745,253	3.4%	6	0.008
2016	81	21,411,574	1,000,013	4.7%	2	0.002
2017	75	22,102,450	803,403	3.6%	2	0.002
2018	78	22,433,422	900,841	4.0%	0	0.000

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	6,559,955	516,459	7.9%	28	0.054
2018	27	7,003,023	170,738	2.4%	37	0.217

Appendix Table 11-2. Effort, observed and estimated seabird captures by the longliners less than 20 GRT (approximately < 24m) by years for Japan [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). This table was request written in **paragraph 9 of CMM-2017-06**.

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	1,162,277	2.3%	219	0.188
2016	219	53,229,832	978,704	1.8%	371	0.379
2017	208	53,134,160	771,526	1.5%	215	0.279
2018	205	50,148,264	856,333	1.7%	55	0.064

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	738,148	3.1%	1	0.001
2016	153	21,418,736	363,282	1.7%	3	0.008
2017	138	18,962,112	706,718	3.7%	2	0.003
2018	150	20,455,592	634,995	3.1%	7	0.011

Appendix Table 11-3. Effort, observed and estimated seabird captures by the longliners larger than 20 GRT (approximately >= 24m) by fishing year for Japan [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). This table was request written in **paragraph 13 of CMM-2018-03**.

North of 23˚N

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2019	35	12,155,744	379,310	3.1%	83	0.219

23˚N - 25˚S

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2019	64	20,699,408	798,284	3.9%	4	0.005

25˚S - 30˚S

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2019	9	864,181	165,091	19.1%	0	0.000

South of 30˚S

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2019	27	5,499,584	962,377	17.5%	1,140	1.185

Appendix Table 11-4. Effort, observed and estimated seabird captures by the longliners less than 20 GRT (approximately < 24m) by fishing year for Japan [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). This table was request written in **paragraph 13 of CMM-2018-03**.

North of 23˚N

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2019	198	51,216,784	1,570,492	3.1%	437	0.278

23˚N - 25˚S

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2019	141	21,984,100	792,447	3.6%	1	0.001

Appendix Table 12-1. Proportion of observed effort by seabird bycatch mitigation types used by longliners in 2015-2018. 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	2018
No mitigation measure	5.8%	4.2%	0.0%	0.0%
TL + NS	3.8%	0.3%	0.0%	0.0%
WTL + NS	1.6%	0.7%	0.0%	0.0%
TL + NS + MOD	0.6%	4.0%	3.0%	1.1%
WTL + NS + MOD	5.9%	1.1%	0.3%	2.2%
TL + WB + MOD	0.0%	2.7%	6.5%	0.0%
WTL + WB + MOD	0.0%	0.0%	3.2%	0.0%
TL + WB + NS + MOD	0.0%	0.8%	3.0%	0.0%
WTL + WB + NS + MOD	0.0%	0.0%	2.3%	0.0%
NS	0.1%	0.3%	0.0%	0.0%
TL	5.1%	2.3%	0.0%	0.0%
WTL	4.6%	3.6%	0.0%	0.0%
TL + MOD	13.7%	30.6%	26.4%	20.5%
WTL + MOD	10.5%	6.5%	1.2%	12.9%
NS + MOD	2.2%	1.1%	0.8%	1.9%
WB + MOD	0.0%	0.0%	6.7%	0.0%
MOD	46.2%	41.8%	46.7%	61.4%
Total	100.0%	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 12-2. Proportion of mitigation types used by the fleet in 2019. This table was request written in **paragraph 13 of CMM-2018-03**.

2019	Combination of mitigation measures	Proportion of observed effort using mitigation measures			
		South of 30^0S	25^0S – 30^0S	25^0S to 23^0N	North of 23^0N
Options required south of 30^0S	TL + NS + MOD	18.1%	N/A	0.0%	3.5%
	TL + WB + MOD	13.0%	N/A	0.0%	0.0%
	WB + NS + MOD	0.7%	N/A	0.1%	0.0%
	TL + WB + NS + MOD	3.9%	N/A	0.0%	0.0%
Other options 25^0S – 30^0S	TL + MOD	57.2%	N/A	0.2%	70.5%
	WB + MOD	1.9%	N/A	3.3%	0.0%
Other options north of 23^0N	NS + MOD	1.4%	N/A	0.3%	0.6%
	MOD	3.9%	N/A	96.0%	25.4%
Total		100.0%	N/A	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, HS=hook-shielding device.

Appendix Table 13-1. Number of observed seabird captures in the longliners larger than 20 GRT (approximately >= 24 m), by year, species and area. This table was request written in **paragraph 9 of CMM2017-06**.

2015

Species	South of 30S	23N-30S	North of 23N	Total
Antipodean albatross	1	0	0	1
Black-browed albatross	3	0	0	3
Black-browed albatross group	8	0	0	8
Black-footed albatross	0	0	16	16
Buller's albatross group	131	0	0	131
Campbell albatross	30	0	0	30
Flesh-footed shearwater	1	0	0	1
Gibson's albatross	5	0	0	5
Grey petrel	1	0	0	1
Large albatrosses	1	0	0	1
Laysan albatross	0	0	30	30
Light-mantled albatross	6	0	0	6
Northern giant petrel	1	0	0	1
Other albatrosses	4	0	0	4
Shy-type albatrosses	159	0	0	159
Sooty shearwater	1	0	0	1
Streaked shearwater	0	3	0	3
Unidentified albatrosses	24	0	26	50
Unidentified birds	31	2	0	33
Unidentified petrels	6	0	0	6
Wandering albatross	12	0	0	12
Wandering albatross group3	13	1	0	14
Westland petrel	4	0	0	4
White-chinned petrel	64	0	0	64
Total	506	6	72	584

2016

Species	South of 30S	23N-30S	North of 23N	Total
Black-browed albatross	1	0	0	1
Black-browed albatross group	10	0	0	10
Black-footed albatross	0	0	8	8
Buller's albatross group	110	1	0	111
Campbell albatross	43	0	0	43
Flesh-footed shearwater	1	0	0	1
Gibson's albatross	6	0	0	6
Grey petrel	2	0	0	2
Grey-headed albatross	3	0	0	3
Large albatrosses	10	0	0	10
Laysan albatross	0	0	14	14
Light-mantled albatross	3	0	0	3
Northern giant petrel	1	0	0	1
Other albatrosses	193	1	0	194
Parkinson's petrel	1	0	0	1
Shy-type albatrosses	121	0	0	121
Southern Buller's albatross	6	0	0	6
Unidentified albatrosses	285	0	12	297
Unidentified birds	1	0	0	1
Unidentified gulls	0	0	1	1
Unidentified petrels	60	0	0	60
Wandering albatross	13	0	0	13
Wandering albatross group2	3	0	0	3
Wandering albatross group3	9	0	0	9
Wandering albatross group5	1	0	0	1
White-chinned petrel	53	0	0	53
Total	936	2	35	973

2017

Species	South of 30S	23N-30S	North of 23N	Total
Black-browed albatross	1	0	0	1
Black-footed albatross	0	0	16	16
Buller's albatross group	14	0	0	14
Campbell albatross	2	0	0	2
Laysan albatross	0	0	22	22
Masked booby	0	2	0	2
Shy-type albatrosses	4	0	0	4
Southern Buller's albatross	1	0	0	1
Unidentified albatrosses	1	0	25	26
Wandering albatross group3	1	0	0	1
White-chinned petrel	4	0	0	4
Total	28	2	63	93

2018

Species	South of 30S	23N-30S	North of 23N	Total
Black-browed albatross group	4	0	0	4
Black-footed albatross	0	0	18	18
Buller's albatross group	14	0	0	14
Campbell albatross	4	0	0	4
Gibson's albatross	1	0	0	1
Laysan albatross	0	0	43	43
Northern giant petrel	1	0	0	1
Other albatrosses	1	0	0	1
Shy-type albatrosses	5	0	0	5
Sooty shearwater	1	0	0	1
Wandering albatross	1	0	0	1
Wandering albatross group3	1	0	0	1
White-chinned petrel	4	0	0	4
Total	37	0	61	98

Appendix Table 13-2 Number of observed seabird captures in the longliners less than 20 GRT (approximately < 24m), 2015- 2018, by species and area. This table was request written in **paragraph 9 of CMM 2017-06**.

2015

Species	23N-30S	North of 23N	Total
Black-footed albatross	0	73	73
Flesh-footed shearwater	1	0	1
Laysan albatross	0	117	117
Streaked shearwater	0	3	3
Unidentified albatrosses	0	22	22
Unidentified birds	0	3	3
Unidentified petrels	0	1	1
Total	1	219	220

2016

Species	23N-30S	North of 23N	Total
Black-footed albatross	0	89	89
Laysan albatross	0	247	247
Streaked shearwater	1	4	5
Unidentified albatrosses	0	20	20
Unidentified birds	0	9	9
Unidentified gulls	0	1	1
Unidentified petrels	0	1	1
Wedge-tailed shearwater	2	0	2
Total	3	371	374

2017

Species	23N-30S	North of 23N	Total
Black-footed albatross	0	20	20
Laysan albatross	0	168	168
Streaked shearwater	0	9	9
Unidentified albatrosses	0	18	18
Unidentified petrels	2	0	2
Total	2	215	217

2018

Species	23N-30S	North of 23N	Total
Black-footed albatross	0	15	15
Flesh-footed shearwater	1	0	1
Laysan albatross	0	40	40
Streaked shearwater	6	0	6
Total	7	55	62

Appendix Table 13-3 Number of observed seabird captures in Japan longline fisheries in the longliners larger than 20 GRT (approximately >=24m), 2019, by species and area. This table was request written in **paragraph 13 of CMM 2018-03**.

2019

Species	South of 30S	25S-30S	23N-25S	North of 23N	Total
Black-browed albatross	4	0	0	0	4
Black-browed albatross group	39	0	0	0	39
Black-footed albatross	0	0	1	12	13
Brown booby	0	0	2	0	2
Buller's albatross group	339	0	0	0	339
Campbell albatross	51	0	0	0	51
Gibson's albatross	7	0	0	0	7
Laysan albatross	0	0	0	35	35
Light-mantled albatross	2	0	0	0	2
Northern giant petrel	4	0	0	0	4
Other albatrosses	2	0	0	0	2
Parkinson's petrel	2	0	0	0	2
Red-footed booby	0	0	1	0	1
Shy-type albatrosses	328	0	0	0	328
Southern fulmar	1	0	0	0	1
Southern giant petrel	1	0	0	0	1
Unidentified albatrosses	176	0	0	36	212
Unidentified birds	8	0	0	0	8
Unidentified giant petrels	1	0	0	0	1
Unidentified petrels	36	0	0	0	36
Wandering albatross	18	0	0	0	18
Wandering albatross group2	2	0	0	0	2
Wandering albatross group3	7	0	0	0	7
Wandering albatross group5	10	0	0	0	10
White-chinned petrel	102	0	0	0	102
Total	1140	0	4	83	1227

Appendix Table 13-4 Number of observed seabird captures in the longliners less than 20 GRT (approximately < 24m), 2019, by species and area. This table was request written in **paragraph 9 of CMM 2018-03**.

2019

Species	23N-25S	North of 23N	Total
Black-footed albatross	0	82	82
Laysan albatross	0	338	338
Streaked shearwater	1	2	3
Unidentified albatrosses	0	15	15
Total	1	437	438

Appendix Table 14-1. Albacore catch by fishery in mt in the WCPCA north of the Equator. Figures in parentheses indicate provisional data. That was request written in **paragraph 4 of CMM-2005-03 and paragraph 3 of CMM2019-03**.

Year	LL Coastal	LL Offshore & distant-water	PL Coastal	PL Offshore & distant-water	PS Coastal	PS Offshore & distant-water	Gillnet	Troll	Setnet	Others
2014	15703	4211	81	29352	0	2009	11	197	24	197
2015	17106	3849	86	21208	4	1068	138	239	17	170
2016	13118	3397	33	14402	3	3676	19	148	28	128
2017	13589	3681	30	20861	17	1233	40	107	48	119
2018	(10121)	(3179)	(119)	(17756)	(2)	(3037)	(35)	(78)	(13)	(70)
2019	(10259)	(2975)	(119)	(17770)	(2)	(3037)	(35)	(78)	(13)	(70)

Appendix Table 14-2. Fishing effort in fishing days by fishery directed as albacore in the WCPCA north of the Equator. Figures in parentheses indicate provisional data. NA indicates data not available. That was request written in **paragraph 4 of CMM-2005-03**.

Year	LL Coastal	LL Offshore & distant-water	PL Coastal	PL Offshore & distant-water	PS Coastal	PS Offshore & distant-water	Gillnet	Troll	Setnet	Others
2014	35362	13305	NA	12147	NA	6996	NA	NA	NA	NA
2015	37801	11763	NA	12743	NA	7326	NA	NA	NA	NA
2016	37308	10419	NA	13923	NA	6616	NA	NA	NA	NA
2017	(35566)	(10154)	NA	(12659)	NA	(6766)	NA	NA	NA	NA
2018	(34725)	(10126)	NA	(13236)	NA	(6920)	NA	NA	NA	NA

Note that values for 2019 was shown in Appendix Table 14-2.

Appendix Table 14-3. Fishing effort in fishing days and vessel days by fishery directed as albacore in the WCPCA north of the Equator. Figures in parentheses indicate provisional data. NA indicates data not available. That was request written in **paragraph 3 of CMM2019-03**.

CCM	Area	Fishery	2002-04 Average		2019	
			No. of vessels	Vessel days	No. of vessels	Vessel days
Japan	WCPCA north of the Equator.	LL Coastal	266	42292	(222)	(35237)
		LL Offshore & distant-water	198	22827	(67)	(10708)
		PL Coastal	NA	NA	NA	NA
		PL Offshore & distant-water	135	18483	(73)	(10438)
		PS Coastal	NA	NA	NA	NA
		PS Offshore & distant-water	25	4208	(14)	(6297)
		Gillnet	NA	NA	NA	NA
		Troll	NA	NA	NA	NA
		Setnet	NA	NA	NA	NA
		Others	NA	NA	NA	NA