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PART 1: INFORMATION ON FISHERIES, RESEARCH, AND STATISTICS

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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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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, 2013	YES Annual catch data, April 30. Catch and effort data, April 27. Size data, April 27.
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. Total number of commercial longline vessels shows a declining trend, from 466 vessels in 2008 to 370 in 2012. Total number of pole-and-line vessels (larger than 20 GRT) has decreased during the 2008-2012. For the purse seine vessels, the number of vessels over 200 GRT was 38 in 2012, which was one vessel increase that in 2011. Out of the 38 vessels over 200GRT, the number of vessels which are allowed to operate in tropical waters was 35 in 2012 and has been stabilized since 1995.

The total 2012 WCP-CA catch of tunas (Pacific bluefin, albacore, bigeye, yellowfin and skipjack) by the Japanese fishery was still provisional and estimated to be 345,339 mt, and this is corresponding to 92% of 2011 total tunas catch (375,095 mt). In 2012, the total tuna catch by the purse seine fishery was 212,745 mt (62% of the total), with 77,521 mt (22%) by the pole-and-line fishery, 45,532 mt (13%) by the longline, 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 2012 and early 2013 such as tagging study for skipjack, several research cruises on Pacific bluefin tuna larval sampling and bycatch species related research, tori-line experiments using commercial longline vessels to mitigate sea birds and experimental use of circle hooks in reducing hooking mortality of sea turtles were conducted.

1. Introduction

This paper describes recent trends in the Japanese tuna and billfish fisheries, e.g., longline, pole-and-line, purse seine and the 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, where is the duplicate area to 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, tables which requested by several CMMs was given in the Appendix tables with list of 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, longliner larger than 10 GRT, and tuna purse seine). The other minor fisheries are referred to the publication of the Statistics Department, Minister's Secretariat, Ministry of Agriculture, Forestry and Fisheries for 2008-2011 data (MAFFJ 2010-2012, MAFFJ 2013), 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 2008-2012 (coastal longline vessel was 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.

Japanese commercial longline vessels show a declining trend, from 466 vessels in 2008 to 370 in 2012. Especially, the declining trend for size categories 50-100 GRT and 100-200 GRT are remarkable, the number of vessels of those categories were 21 and 221 vessels in 2012 which is 50% and 53% of that in 2008, respectively.

In March, 2009, the Government of Japan implemented the fleet reduction program for logline vessels, which is to meet the reduced catch quota for Japan and to reduce the excess fishing capacity resulted from the strengthened management measures that were agreed in the various tuna RFMOs. The number of vessels reduced by this plan was a total of 87 vessels, 64 distant-water longline vessels and 23 offshore longline vessels. These vessels had stopped their operation and returned to Japan by the end of March, 2009. The large number of vessel reduction for distant water and offshore longliners in recent years is due to price of fuel especially since 2007 and this fleet reduction program in 2009.

Total number of pole-and-line vessels (larger than 20 GRT) has decreased during the 2008-2012. Reduction rate was higher for category 50-200 GRT than category over 200 GRT. The number of vessels for category 50-200 GRT decreased from 69 in 2008 to 50 in 2012, corresponding to 28% decrease. The number of vessels for category over 200 GRT slightly decreased from 29 in 2008 to 27 in 2012, corresponding to 7% decrease.

Purse seine vessels, which operate in the tropical waters of the western and central Pacific, are greater than 200 GRT (most of them are 349 GRT), and 50 - 200 GRT class vessels operate in the coastal and offshore waters of Japan north of 20˚N. The number of vessels of 50-200GRT that engaged in tuna fishery ranged from 33 to 40 without apparent trend during the 2008-2012 period. Note that the number of distant water purse seiners which are allowed to operate in tropical waters by government regulation was 35 and has been stabilized since 1995.

4. Trends in catch and effort

The total 2012 WCP-CA catch of tunas (Pacific bluefin, albacore, bigeye, yellowfin and skipjack) by the Japanese fishery was still provisional and estimated to be 345,339 mt, and this is corresponding to 92% of 2011 total tunas catch (375,095 mt). In 2012, the total tuna catch by the purse seine fishery was 212,745 mt (62% of the total), with 77,521 mt (22%) by the pole-and-line fishery, 45,532 mt (13%) by the longline, and the remaining (3%) by the other gears, whereas, in 2011, the total tuna catch by the purse seine fishery was 198,945 mt (53% of the total), with 113,514 mt (30%) by the pole-and-line fishery, 51,779 mt (14%) by the longline, and the remaining (3%) by the other gears. The following is the description of each fishery more in detail 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 longliner, whose size is 1-20 GRT, is allowed to fish only in the Japan's EEZ. Offshore longline vessels are further divided into two categories, small offshore, 10-20 GRT, and offshore, 10-120 GRT, longlines, both of which are able to go beyond the Japan's EEZ in the Pacific with exceptional area in the eastern Pacific Ocean. Although the vessel size of two offshore categories is duplicated in the range 10-20 GRT, most vessels of latter category are larger than 50 GRT. Distant water longliners are over 120 GRT and basically can fish at all oceans, but need to follow the various domestic regulations that will ensure the management measures in place by the respective tuna RFMO.

Most recent statistics available are 2012 data, though the 2011and 2012 data are still preliminary. Catch in weight of tuna species (Pacific bluefin, albacore, yellowfin, and bigeye), 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 2008 to 2012 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 1971-2010. Total effort (in number of hooks) of distant water and offshore longline fishery in all oceans which was 556 million hooks in 1981 decreased to 495 million in 1983 and increased again to 557 million in 1988 after when it has decreased steadily to less than 400 million since 1999. The ratio of the fishing effort exerted in the Pacific Ocean to that of 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 1980s. The fishing effort of distant water and offshore longlines in the WCP-CA, which was 106 million hooks in 2004, decreased to less than 100 million, thereafter. In recent years, the fishing effort was 65 million hooks in 2009, which is historical lowest, and recovered in the following years (Table 2A). This recovery seems to be partially caused by the shift of fishing ground from Indian Ocean because of the expanding piracy activity in the western Indian Ocean. Primary species for the longline catch is 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, but decreased to between 20,000 and 30,000 mt during the mid-1990s to early 2000s. Further, bigeye catch continue to decrease, was less than 20,000mt after 2005, was less than 10,000 after 2009. In recent five years, yellowfin catch fluctuated with no apparent trend, was 6,915 mt in 2012, and bigeye catch showed decreasing trend, was 7,854 mt in 2012 (Table 2A).

The average quarterly effort distribution for distant water and offshore longline vessels during the 2010-2012 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 pattern of the effort does not show remarkable seasonal change, but in overall area, the fishing effort appeared to decrease in the second quarter than in the other quarters. Distribution of the catch by species for this fleet is shown in Fig. 4. They are classified into several clear patterns, swordfish targeting near Japan, albacore targeting in the middle latitudes between 15-30˚N and 25-40˚S, and tropical tuna (mostly bigeye and yellowfin) targeting in the equatorial waters.

As for the small offshore longline fishery, catch in the WCP-CA from 2008 to 2012 are shown in Table 2B.

Total number of hooks deployed by small offshore longliner ranged between 69,000 thousand and 80,000 thousand hooks. Bigeye catch for the small offshore longline showed a declining trend was 4,842 mt in 2012which is 54% of that in 2008. Yellowfin catch was relatively stable ranging between 3,106 mt and 5,249 mt during this period, was 2,154 mt in 2012. Geographical distributions of fishing effort and catch by species for the small offshore longliners were 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. At 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 2008-2012. In addition to this, historical changes in catch by species and effort are shown in Fig. 7 for the period of 1972-2012. The data for 2011 and 2012 are preliminary. Both the catch and effort which were at a peak around the late 1970s gradually decreased throughout 1980s. After 1991, total catch and effort had been relatively stable until the mid-2000s, though the catch showed some fluctuation. After that the catch decreased though the effort was relatively stable. Total annual catches which ranged from 250,000 to 300,000 mt in 1970s and early 1980s, decreased to around 150,000 mt in 1990s and around 100,000 mt in 2009 and 2010. Skipjack occupied the major part of catches being followed by albacore and yellowfin. Number of fishing days exceeded 60,000 in 1970s but it is about 15,000-17,000 days from 2006 onward.

In recent five years, the number of fishing days (including no catch) for this fishery showed a decrease trend, was 16,344 days which is 59% of that in 2008 (Table 3). Total catch of tunas (skipjack, bigeye, yellowfin, albacore and bluefin) in 2012 was 66,436 mt, which 37decrease of that in 2011. The skipjack catch was 36,768 mt in 2012 which is 49% decrease of that in 2011. The albacore catch was 28,490 mt in 2012.

Seasonal distributions of fishing effort (fishing days in 1x1 degree area) of the pole-and-line fishery are shown in Fig 8 as average of 2010-2012. 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 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 during June to October. In the case of the offshore vessels (smaller than 300 GRT), this fleet primarily catches skipjack tuna. Its fishing starts at sub-tropical area east of Northern Mariana Islands in February. This fishing ground gradually moves northward, and then reaches area just nearshore of 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 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 of the offshore vessel operate at the Izu Islands area, south of Tokyo, almost all year round.

In most of the fishing grounds of pole-and-line fishery, skipjack dominated among species, except for at some region north east Japan, in which albacore dominated (Fig. 9). Most of yellowfin catch was made at the waters around Nansei Islands located in south 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 2008 to 2012. In addition to this, historical changes in catch by species and effort are shown in Fig. 10 for the period of 1970-2012. The data for 2012 are preliminary. The fishing effort was less than 5,000 days in the 1970s, rapidly increased early 1980s, after that the effort fluctuated between 7,500 to 9,500 days (Fig. 10). The total catch of this fishery showed rapid increase in early 1980s, after that, still gradually

increased until the late 2000s. Skipjack occupied the major part of catches being followed by yellowfin.

In recent five years, annual total catch of the purse seine fishery showed a declining trend, was 219,586 mt in 2012, which is 80% of that in 2008 (271,815 mt). Skipjack catch showed a declining trend, was 178,342 mt in 2012, which is 84% of that in 2008 (212,053 mt). Especially the catch sharply decreased in 2012, which is 76% of that in 2010, due to poor skipjack catches both in northern waters (-57% of that in 2010) and in tropical waters (-16%). Yellowfin catch fluctuated ranging between 26,465 mt and 38,973 mt without apparent trend.

Fishing effort (fishing and searching days) for the purse seine distributed two regions, one is in tropical waters and the other is in northern waters, those are clearly separated by 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 northern waters, skipjack fishing season starts in April and continue until third quarter at 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 portion of the catch among 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). The operations for free swimming schools were found both in equatorial waters and northern waters.

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 catches for such fisheries during the 2008-2012 is shown in Table 5. The figures in 2012 are preliminary.

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

The troll fishery takes various pelagic species including tunas. The size of troll vessels are generally small, mostly less than 10 GRT, and make one-day trip. Skipjack is very important resources for troll fishermen and decline and remained at a low level skipjack catch by troll along the Pacific coast in the western Japan is getting big 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

Total catch for tropical tunas for all gears combined, including coastal fisheries (longline, pole-and-line, troll and other miscellaneous gears), are shown in Table 6 for 2008-2012. The data in 2011 and 2012 are preliminary. Total catch of skipjack decreased from 309,014 mt in 2008 to 228,394 mt in 2012 (74%) mainly due to large decline of tuna purse seine catch, to the lesser extent distant water and offshore pole-and-line catch. Total catch of yellowfin was 55,113 mt in 2008 to 43,531 mt in 2012. Total catch of bigeye shows a declining trend, from 27,670 mt in 2008 to 18,282 mt in 2012 (56%) due to the decrease of the both distant water and offshore and small offshore longline catches.

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 have to

submit it by each cruise in three months after the cruise was finished while distant water longliners are required to submit it every ten days. In the log sheet of longline, 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 are included. Catch weight information was not included in the logbook till 1993. The number of hooks per basket is important 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 logsheets. Additionally, information on the cruise (date and port of departure and arrival of the cruise), vessel (name, size, license number and call sign), number of crew and the configurations of the fishing gear (material of main line and branch line) are asked to fill on the top part of the sheet by each cruise.

Submitted logsheets are processed into electronic data files. Various error checks, 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 a register.

Because the coverage rate of logsheets is not 100% for longline fishery, it is necessary to raise the sample values to represent 100 %. For both of the distant water and offshore longline fisheries (20-120 GRT, excluding 10-20 GRT vessels that operate outside of Japanese EEZ), coverage rate has been about 90 - 95% of total operation (Table 7). In the case of 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, 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 coastal and small offshore longliners, reliable information of coverage rate is not available. But it is considered to be about 90% or more for small offshore as far as basing on the number of registered vessels.

Catch in weight in logsheet data is in processed weight, so that conversion factors by species are used to convert processed weight to whole weight.

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 logsheet on their operations and catch information to the Japanese government within 30 days after the cruise. The logsheets submitted to the government are forwarded to the NRIFSF, and are then compiled. Although the logsheet 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 logsheet system (1970's), 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 logsheet 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 to owner or other relevant person to get revised information.

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, reporting system from fishermen to government was changed for the cruises for which purse seine vessels operates in Sea of Japan or East China Sea. Such fishermen submit single kind of logsheets regardless target species, while fishermen select two kinds of logsheets to fill out for tunas and small pelagic species, such as mackerel sardines and anchovies in the past. As the result, the logbook data which operated in the Sea of Japan or

the East China Sea have large quantity of zero tunas catch records, so it is need to interpret the fishing effort for tunas using the data carefully.

5.2. Observer program

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

The observer program for purse seine boats has been implemented in the tropical Pacific Ocean since 1995. The detail of time and position at each operation, type of association, and the length frequencies samples were taken by scientific observers in each operation. In 2012, it is first attempt for observer program for tuna purse seine in vicinity of Japan water. Three purse seine cruises were observed from June to July 2012, July to August 2012, and September 2012 in vicinity of Japan (Table 8). Days spent for these cruises were 16, 20 and 15 days, respectively., which are shorter than the average duration (36 days) for the past Japanese purse seine observer program in the tropical area of western Pacific Ocean. They returned their port frequently without filling up their fish wells in one cruise.

The observer program for longline in the WCP-CA started in 2008. The information of fishing vessels, fishing operations and almost all the catches in each operation were identified and measured as much as observer can. Six cruises of distant water longline vessels and 32 cruises of small offshore longline vessels were observed in the 2012 calendar year. The data from 4 distant water cruises and 32 small offshore cruises were inputted to the database and the remaining data will be inputted soon. The number of operations which was recorded by the observers ranged from 2 to 26 in the small offshore longline vessels and 72 to 113 in the distant water longlines. The total number of catches which was recorded by each observer ranged from 163 to 858 individuals and 1,014 to 10,600 individuals, respectively (Table 9).

5.3. Size data collection and compilation

NRIFSF have 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.

5.3.1. At-sea sampling on commercial fishing vessels

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

5.3.2. At-sea sampling on training and research vessels

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

5.3.3. Port sampling

Port sampling is important way to collect size data in the view of largeness of sampling size which NRIFSF have been conducted. Measurement is done at a timing between unloading from fishing vessel and starting auction. Sampler randomly takes measurement in general or takes measurement all individual in some case. In general,

size data collected by port sampling is compiled with monthly basis as temporal resolution and with specific blocks of 1˚x1˚, 5˚x5˚, 5˚x10˚, 10˚x20˚ as geographical resolution depending on 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 of the interview to the captain or fishing master of the fishing vessel at unloading site and/or logbook data reported by fishermen.

As a special case, skipjack unloaded as unfrozen fish was recorded in a different way from above. In most case of measurement of such skipjack, since fishing date and position can specify with daily basis and finer than 1˚x1˚ block, the fishing date and position is recorded as it is on the database for skipjack size.

Port sampling for distant water purse seine has been carried out in a different 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) in cruise number basis. Size data is collected for skipjack, yellowfin and bigeye. Fish form a commercial vessel was selected from single well, which is filled up fish caught by single operation. Thus, the fishing date, fishing location and school type (associated school, free school) for these fish are identified by hatch plan (fish unloading plan describing amount of catch by species for each well with the operational information) sent from vessel captain 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 its individual length and partially its weight. About 1,000 kg fish par well were measured in average.

Followings are species, type of gear/fishery and location of sampling site for port sampling conducted in 2011;

- Size data is collected for albacore and skipjack caught by distant water pole-and-line vessels by NRIFSF staff at Yaizu.
- Size data is collected for albacore caught by offshore pole-and-line vessels by NRIFSF staff at Katsuura a few times one year.
- Size data is collected for skipjack, yellowfin, and bigeye caught by distant-water purse seine vessels at Yaizu, Makurazaki and Yamagawa.
- Size data is collected for skipjack caught by the middle-sized pole-and-line vessels which unload unfrozen fishes at Kesennuma by NRIFSF staff.
- Size data is collected for albacore, swordfish and striped marlin and sharks caught by the offshore longline vessel at Kesennuma by NRIFSF staff.
- Size data is collected for Pacific bluefin caught by the vessels of most of fishing gear at most of prefecture which bluefin is unloaded by nationwide port sampling project. Also size data 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 by the same project.

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

6.1. Tagging

Skipjack tagging

We have been conducting skipjack tagging mainly to know migration pattern to the fishing ground off Japan and its mechanism.

One offshore pole-and-line vessel was chartered and tagging was conducted in the south off Japan between February and March in 2012. A total of 3,308 skipjack tuna including 109 fish with archival tag (Lotek LAT2910) were released. To date 153 fish including 7 fish with archival tag were recaptured. In addition, skipjack tagging has been being conducted in cooperation with Ajinomoto Co., Inc. in the coastal area of southwestern Japan since 2009. In 2012, 3,168 skipjack tuna including 169 fish with archival tag were released at around Yonaguni Island (24˚N, 123˚E), and so far 64 fish including 7 fish with archival tag were recaptured.

Besides above research, three research/training pole-and-line vessels conducted skipjack tagging in the area 13-35˚N, 129- 152˚E in 2012. Total of 660 skipjack were released with the conventional tag in 2012, and 25 were recovered. By one of these vessels, collaborative study of archival tagging with NRIFSF has been being

conducted since 2010. In 2012, a total of 79 archival tags were deployed in the south off Japan, and to date 3 fish were recaptured.

6.2. Research cruise conducted

PBF larval/juvenile sampling

In 2012, research cruises were conducted for ecological study of larval/juvenile PBF by R/V Syoyo-Maru, Shunyo-Maru, Yoko-Maru, Tenyo-Maru, and six prefectural R/Vs. Larval surveys were conducted in the south of Japan around Nansei Islands area, which is a major spawning ground of PBF, from 7 May to 26 July and found that PBF larvae was abundant in the south of Yaeyama Islands and in the area between Miyako Island and Okinawa-Main Island. Larval surveys were conducted also in the Sea of Japan, which is another spawning ground of PBF, from 2 July to 5 September, however only two PBF larvae were captured in the east of Oki Islands. This information would be utilized to estimate spawning grounds of PBF by simulating backward Lagrangian trans-port. The previous studies suggest that PBF larvae hatched around Nansei Islands are transported to the Kuroshio Current area as they grow. To elucidate the oceanographic relationship between the distribution of PBF juveniles and the Kuroshio, distribution of PBF juveniles were studies nearby Yakushima Island from 22 May through 29 June in 2012 by the pelagic trawls. In total, 78 individuals of PBF juveniles (FL: 11.4-109.8cm) were captured mainly in the Kuroshio Current and its northern edge region in the west Yakushima, where north-eastern ward Kuroshio Current turns to the east. The results well correspond to the prediction by the juvenile migration model of PBF, which suggest that some of PBF juvenile migrate across the Kuroshio off-west of Yakushima Island toward the Sea of Japan, while some migrate to the east toward the Pacific coast of Shikoku and Honshu.

Tropical tuna species and skipjack larval/juvenile sampling

In order to better understand the relationship between recruitment variability and growth during early life stage of tropical tunas and skipjack, the aims of the cruise are to (1) describe the variations of early life stage growth among areas and (2) describe the horizontal distribution of tropical tunas. The survey area of this research cruise was economic exclusive zone (eez) of Federated States of Micronesia (FSM) and high sea. We leaved from Shimizu (Japan) port at 28 Nov. 2012, and then enter economic exclusive zone (eez) of Federated States of Micronesia (FSM) at 3 Dec. 2012, on the same date we had started investigation at 10˚N, and 147˚E. Oceanographic conditions were observed by CTD, and tuna larvae were collected by 2-m Ring net, and juvenile were collected using mid water trawl. We collected tropical tuna and skipjack larvae for 29 and 76, respectively, and tropical tuna and skipjack juveniles for 253 and 182 respectively. Lantern fish, lizard fish were dominant species for mid water trawl, crustacean and squids were also collected. Sea temperature profile indicated that NECC (north equatorial counter current) and NEC (north equatorial current) distributed from 3˚ to 4˚N, and from 9˚ to 11˚N, respectively.

6.3. Bycatch species related research

Mitigation studies for seabirds

Effectiveness of aerial extent of tori line (long aerial extent: 85m, middle: 70m and short: 50m) to reduce seabird bycatch using Japanese research vessel was examined in the North Pacific from Apr. to June 2013. The results showed that long and middle aerial extent of tori line was more effective in preventing seabird attacks and incidental catch of seabirds than short aerial extent.

Effectiveness of hybrid tori-lines with and without weighted branch lines to a control of no mitigation was compared in the North Pacific from December 2011 to June 2012.The results suggest that sole deployment of well-designed tori-lines dramatically reduce albatross bycatch by pelagic longline fisheries in the western North Pacific, and therefore are recommended as best-practice seabird mitigation for these fisheries.

Mitigation studies for sea turtles

Experiment of large circle hooks (Koshina type 4.5-sun similar to foreign type 18/0) on catch rates of target

species and sea turtles are on the way through operations of commercial longline in the North Pacific 2012. The use of circle hooks is effective to reduce incidental catch or deep hooking of sea turtles. Most of sea turtles caught by shallow longlines were retrieved alive. The result indicates that careful live retrieval and release is effective in improving the post-hooking survival of hooked sea turtles.

References

MAFFJ 2010-2012. Annual report of catch statistics on fishery and aquaculture, 2008-2010. Statistics Department, Minister's Secretariat, the Ministry of Agriculture, Forestry and Fisheries of Japan.

MAFFJ 2013. Annual report of catch statistics on fishery and aquaculture 2011, on the portal site for governmental statistics "e-Stat" (published in May 14, 2013). http://www.e-stat.go.jp/SG1/estat/GL08020103.do?_toGL08020103_&listID=000001104479&requestSender=dsearch

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 ton	50-100 ton	100-200 ton	200- ton	Total
2008	277	42	40	107	466
2009	277	38	33	100	448
2010	290	29	28	113	460
2011	271	24	25	111	431
2012	(235)	(21)	(21)	(93)	(370)

Pole-and-line

	20-50 ton	50-200 ton	200- ton	Total
2008	1	69	29	99
2009	1	68	28	97
2010	1	66	28	95
2011	0	62	28	90
2012	(0)	(50)	(27)	(77)

Purse Seine

	50-200 ton	200-500 ton	500- ton	Total
2008	37	35	1	73
2009	35	34	3	72
2010	33	33	4	70
2011	39	33	4	76
2012	(40)	(34)	(4)	(78)

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	Total
2008	77,917	27	7,279	10,587	8,714	4,300	449	1,323	66	50	82	32,877
2009	64,948	15	6,357	8,383	10,187	4,103	249	1,243	68	80	72	30,758
2010	79,145	12	6,720	8,607	11,702	4,066	313	1,423	71	148	109	33,170
2011	(70,215)	20	(7,351)	(8,255)	(7,033)	(2,996)	(442)	(1,478)	(29)	(75)	(130)	(27,808)
2012	(66,848)	-	(7,470)	(7,854)	(6,915)	(3,500)	(438)	(1,060)	(19)	(41)	(110)	(27,422)

Small offshore longline (10-20 GRT)

	#hooks	PBF	ALB	BET	YFT	SWO	MLS	BUM	BLM	SFA	SSP	Total
2008	69,435	-	-	9,006	3,106	1,686	448	1,147	21	20	0	25,527
2009	74,549	-	-	8,514	3,439	1,536	451	1,094	14	25	1	28,913
2010	80,003	-	-	7,320	5,249	1,084	641	1,482	16	43	0	30,148
2011	(74,243)	-	-	(8,361)	(3,869)	(870)	(698)	(1,158)	(13)	(34)	(1)	(26,625)
2012	(48,588)	-	-	(4,842)	(2,157)	(648)	(558)	(744)	(7)	(14)	(0)	(18,725)

* The catches for PBF and ALB are 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
2008	16,344	311,608	82,791	2,612	1,479	-	19,025	106,411
2009	15,884	300,666	57,769	3,565	1,429	-	31,081	94,412
2010	16,132	305,017	80,435	2,874	2,250	-	19,426	106,574
2011	(14,365)	(271,605)	(72,012)	(2,551)	(2,124)	-	(28,484)	(104,936)
2012	(9,708)	(188,479)	(36,768)	(1,136)	(1,329)	-	(28,490)	(66,436)

* 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
2008	8,567	212,053	35,272	5,626	-	824	271,815
2009	7,709	192,713	33,031	3,452	-	2,064	246,722
2010	7,879	203,893	38,973	2,758	-	303	257,312
2011	8,154	153,138	32,814	2,479	-	303	205,077
2012	(7,357)	(178,342)	(26,465)	(3,302)	-	(303)	(219,586)

* 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
2008	14	1,418	610	-	-	100	161	168	2,485
2009	6	1,281	499	-	-	70	171	241	3124
2010	7	1,844	414	-	-	72	191	164	2,116
2011	7	1,701	525	-	-	81	212	153	2,270
2012	(7)	(1,701)	(525)	-	-	(81)	(212)	(153)	(2,270)

Coastal pole-and-line

	SKJ	YFT	BET	PBF*	ALB	Total
2008	8,651	954	127	-	35	9,767
2009	8,609	1,494	151	-	91	10345
2010	7,632	1,693	124	-	135	9,584
2011	9,144	1,815	100	-	57	11,116
2012	(9,144)	(1,815)	(100)	-	(57)	(11,116)

Coastal purse seine

	SKJ	YFT	BET	PBF*	ALB	Total
2008	364	59	4	-	1	428
2009	515	30	0	-	12	557
2010	2,361	50	32	-	27	2,470
2011	1,257	389	48	-	18	1,712
2012	(1,257)	(389)	(48)	-	(18)	(1,712)

Gillnet

	SKJ	YFT	BET	PBF*	ALB	Total
2008	332	23	13	276	1,531	2,175
2009	324	12	7	103	149	595.221025
2010	315	22	2	140	24	503
2011	111	6	1	61	12	191
2012	(111)	(6)	(1)	(61)	(12)	(191)

Troll

	SKJ	YFT	BET	PBF	ALB	Total
2008	4,178	2,436	138	2,767	549	10,068
2009	3,819	2,534	115	1,897	410	8775
2010	4,729	3,167	157	1,813	588	10,454
2011	1,780	2,497	141	2,409	443	7,270
2012	(1,780)	(2,497)	(141)	(2,409)	(443)	(7,270)

Setnet

	SKJ	YFT	BET	PBF	ALB	Total
2008	315	94	3	2,358	101	2,871
2009	274	86	5	2,236	33	2634
2010	333	103	4	1,603	42	2,085
2011	625	111	2	1,651	50	2,439
2012	(625)	(111)	(2)	(1,651)	(50)	(2,439)

* 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.

	2008	2009	2010	2011	2012
Skipjack					
Total	309,014	264,369	299,995	(238,297)	(228,344)
Distant water and Offshore LL	98	57	82	(125)	(213)
Distant water and Offshore PL	82,791	57,769	80,435	(72,012)	(36,768)
Tuna PS	212,053	192,713	203,893	153,138	(178,342)
Small offshore LL	2	5	3	(5)	(3)
Coastal LL	14	6	7	7	(7)
Coastal PL	8,651	8,609	7,632	9,144	(9,144)
Coastal PS	364	515	2,361	1,257	(1,257)
Gill net	332	324	315	111	(111)
Troll	4,178	3,819	4,729	1,780	(1,780)
Set net	315	274	333	625	(625)
Unclassified	217	278	205	93	(93)
Yellowfin					
Total	55,113	55,994	66,098	(53,125)	(43,531)
Distant water and Offshore LL	8,714	10,187	11,702	(7,033)	(6,915)
Distant water and Offshore PL	2,612	3,565	2,874	(2,551)	(1,136)
Tuna PS	35,272	33,031	38,973	32,814	(26,465)
Small offshore LL	3,106	3,439	5,249	(3,869)	(2,157)
Coastal LL	1,418	1,281	1,844	1,701	(1,701)
Coastal PL	954	1,494	1,693	1,815	(1,815)
Coastal PS	59	30	50	389	(389)
Gill net	23	12	22	6	(6)
Troll	2,436	2,534	3,167	2,497	(2,497)
Set net	94	86	103	111	(111)
Unclassified	425	335	421	339	(339)
Bigeye					
Total	27,670	22,648	21,748	(22,174)	(18,282)
Distant water and Offshore LL	10,587	8,383	8,607	(8,255)	(7,854)
Distant water and Offshore PL	1,479	1,429	2,250	(2,124)	(1,329)
Tuna PS	5,626	3,452	2,758	2,479	(3,302)
Small offshore LL	9,006	8,514	7,320	(8,361)	(4,842)
Coastal LL	610	499	414	525	(525)
Coastal PL	127	151	124	100	(100)
Coastal PS	4	0	32	48	(48)
Gill net	13	7	2	1	(1)
Troll	138	115	157	141	(141)
Set net	3	5	4	2	(2)
Unclassified	77	93	80	138	(138)

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

Type of fishery	2008	2009	2010	2011	2012
Distant water longline	90%	99%	100%	100%	84%
Offshore longline	91%	92%	92%	100%	67%
Small offshore longline	N/A	N/A	N/A	N/A	N/A
Coastal longline	N/A	N/A	N/A	N/A	N/A
Offshore pole-and-line (20-120 GRT)	100%	100%	100%	98%	81%
Distant water pole-and-line (over 120 GRT)	100%	100%	100%	100%	100%
Purse seine (>200GRT)	100%	100%	100%	100%	100%

Table 8. Information of observer programs for Japanese purse seiner operated in the tropical waters. Days of fishing is including fishing days and search days.

cruise number	1	2	3
area of operation	Off Sanriku	Off Sanriku	Off Sanriku
departure - return	Yaidu - Ishinomaki	Ishinomaki - Onagawa	Ishinomaki - Ishinomaki
date of depature	2012/06/23	2012/07/13	2012/09/02
date of return	2012/07/08	2012/08/01	2012/09/16
days of cruise	16	20	15
days of fishing	14	18	11
number of set	20	18	13
total catch (mt)	615	342	207

Table 9. Number of operations and catch number for longline observer program in the western central Pacific in 2012.

	Offshore LL	Distant LL
Number of Cruises	32	4
Number of Operation	574	311
Number of Catch Observed	16,893	25,479
Albacore	5,678	9,610
Yellowfin tuna	2,307	7,167
Southern bluefin tuna	0	748
Bigeye tuna	3,307	947
Bluefin tuna	0	2
Skipjack tuna	230	767
Sailfish	23	108
Black marlin	3	3
Blue marlin	351	313
Shortbill spearfish	92	87
Striped marlin	140	40
Swordfish	232	256
Lancetfishes	1,259	519
Opah	218	270
Pomfrets	615	684
Dolphin fish	123	471
Escoler	145	784
Other fishes	208	1,061
Thresher sharks	313	25
Shortfin mako	59	73
Blue shark	743	436
Other Sharks	161	310
Sting ray	571	755
Other Rays	86	6
Sea Birds	3	23
Sea Turtles	14	6
Mammals	10	0
Unidentified	2	8

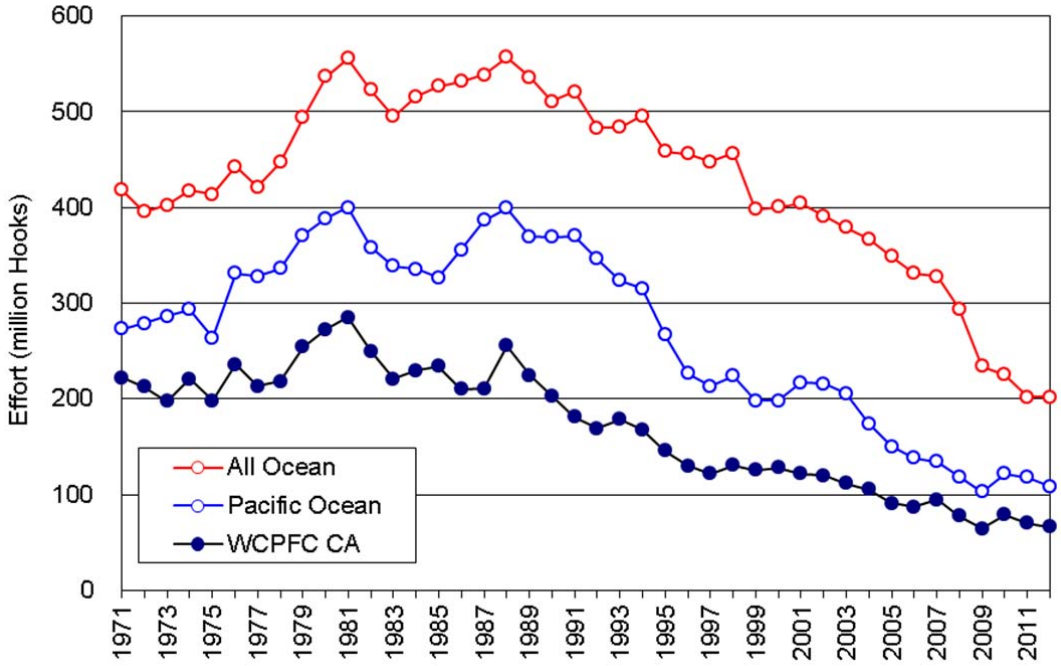

Fig. 1. Historical change in fishing effort of the Japanese distant water and offshore longline fishery (not including small offshore) in the WCPFC Convention Area. Values in 2011 and 2012 are provisional.

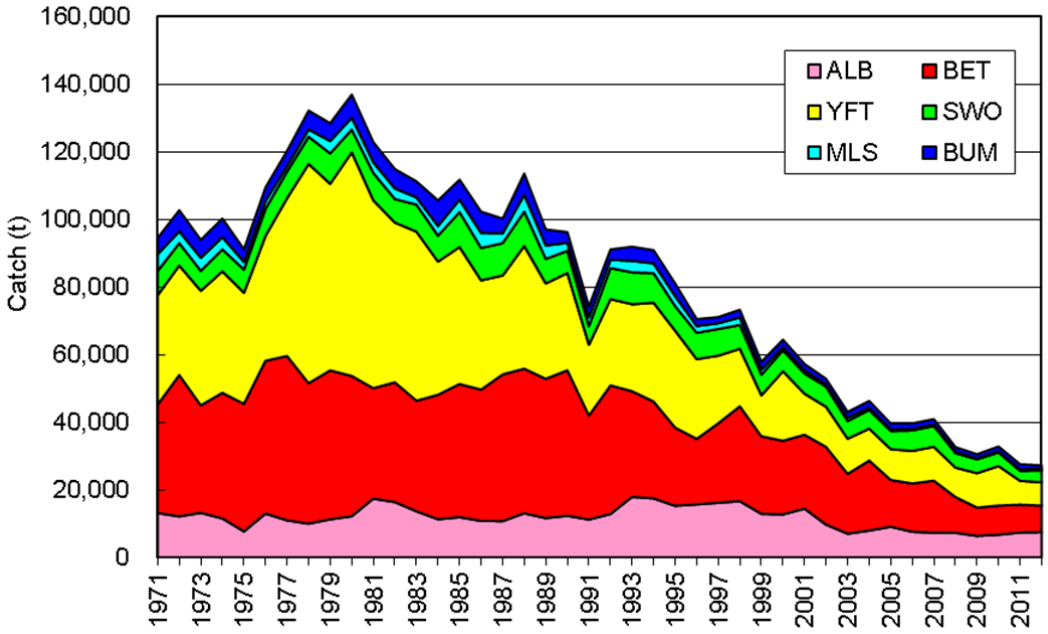

Fig. 2. Historical change of catches for major species for the Japanese distant water and offshore longline fishery (not including small offshore) in the WCPFC Convention Area. ALB: albacore, BET: bigeye, YFT: yellowfin, SWO: sword fish, MLS: striped marlin, BUM: blue marlin. Values in 2011 and 2012 are provisional.

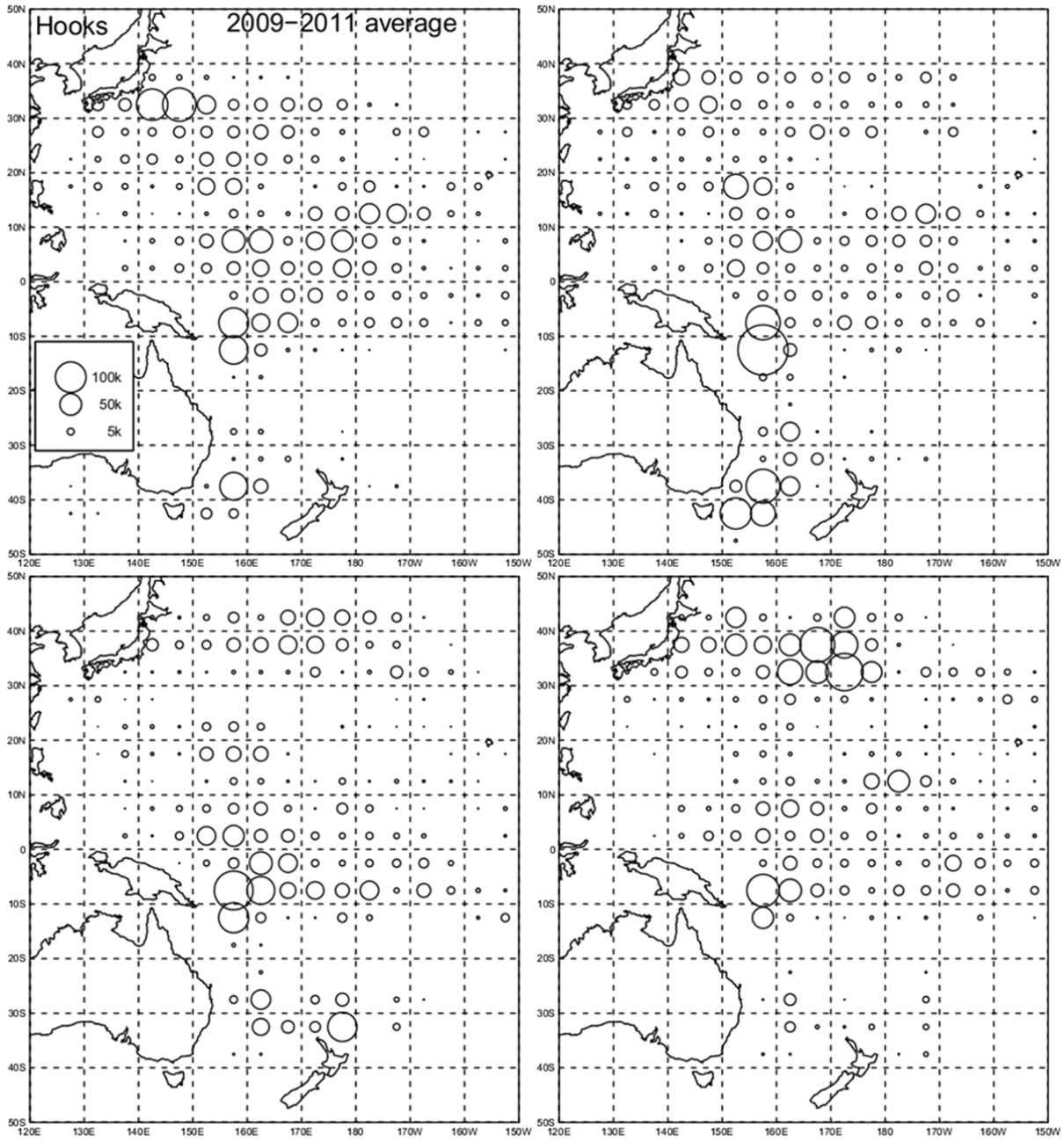

Fig. 3. Quarterly distribution of fishing effort for the Japanese offshore and distant water longline fisheries in the western and central Pacific Ocean in average of 2010-2012.

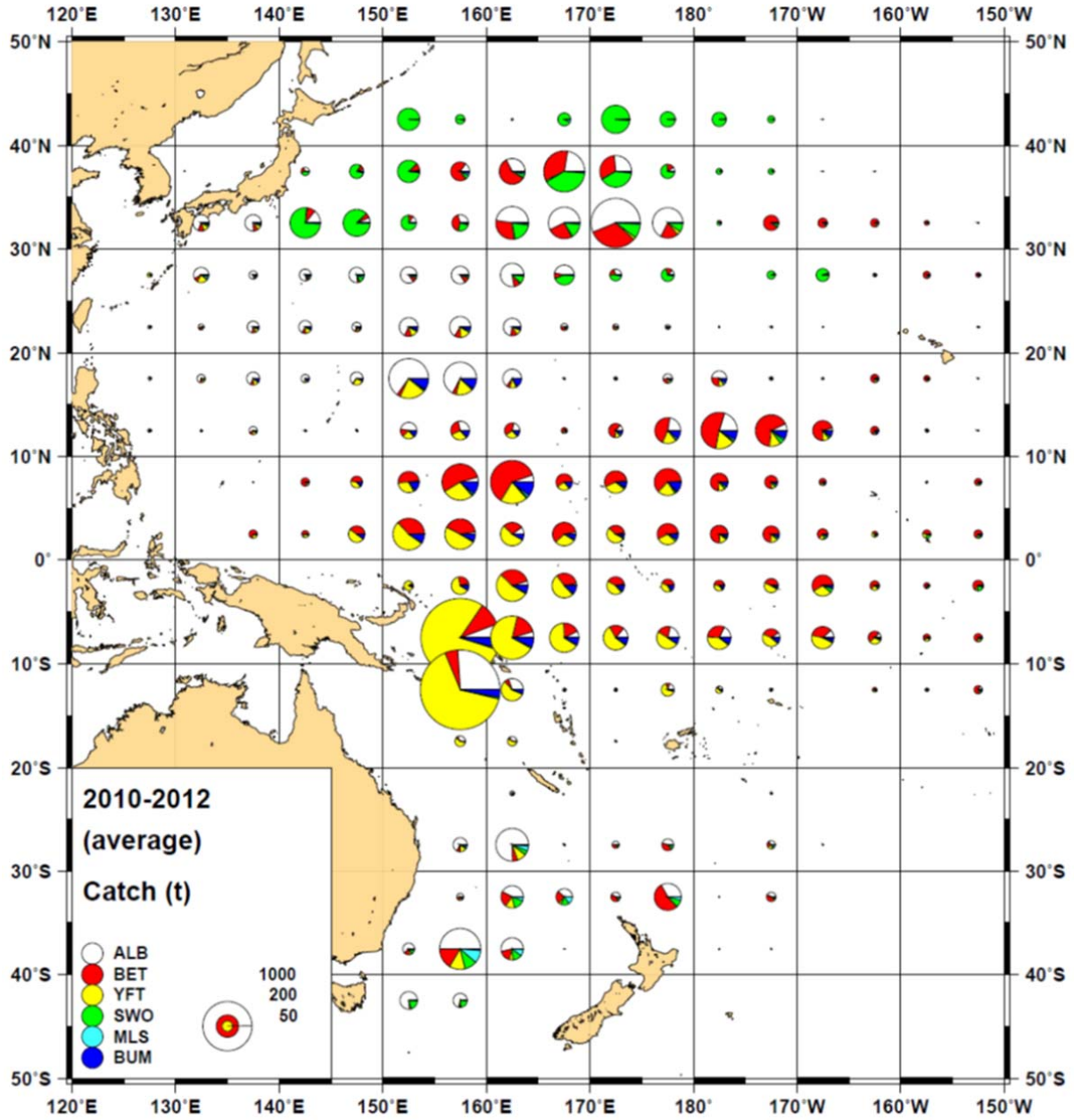

Fig. 4. Distributions of offshore and distant water longline catch (in weight) by species in average of 2010-2012 for six main species (ALB: albacore, BET: bigeye tuna, YFT: yellowfin tuna, SWO: swordfish, MLS: striped marlin and BUM: blue marlin).

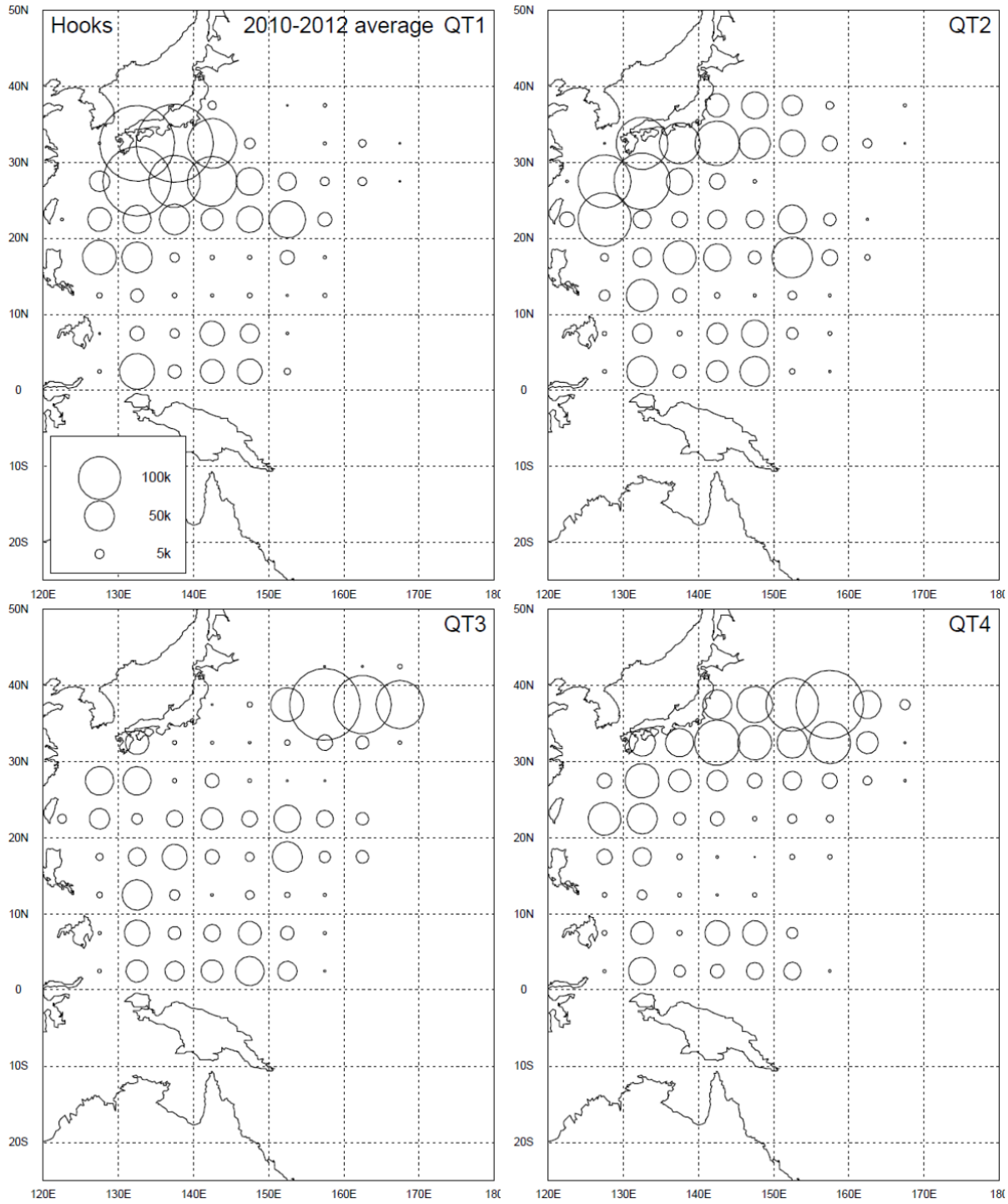

Fig. 5. Quarterly distribution of fishing effort for the Japanese small offshore longline fisheries (10- 20 GRT) in the western and central Pacific Ocean in average of 2010-2012.

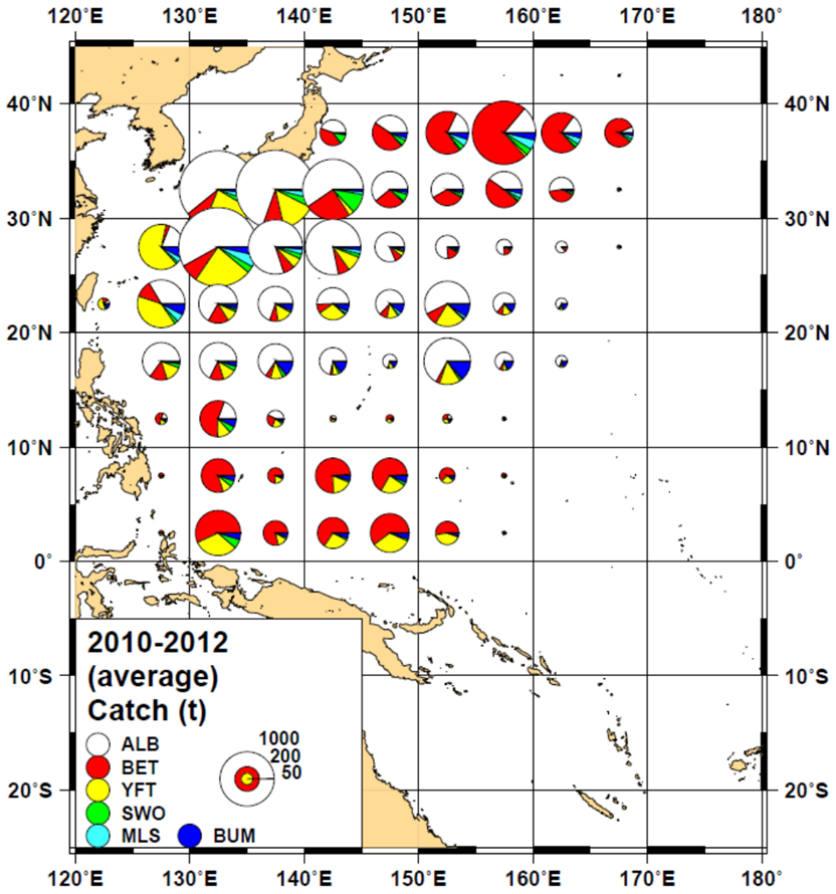

Fig. 6. Distributions of small offshore longline catch (in weight) by species in average of 2010-2012 for six main species (ALB: albacore, BET: bigeye tuna, YFT: yellowfin tuna, SWO: swordfish, MLS: striped marlin and BUM: blue marlin).

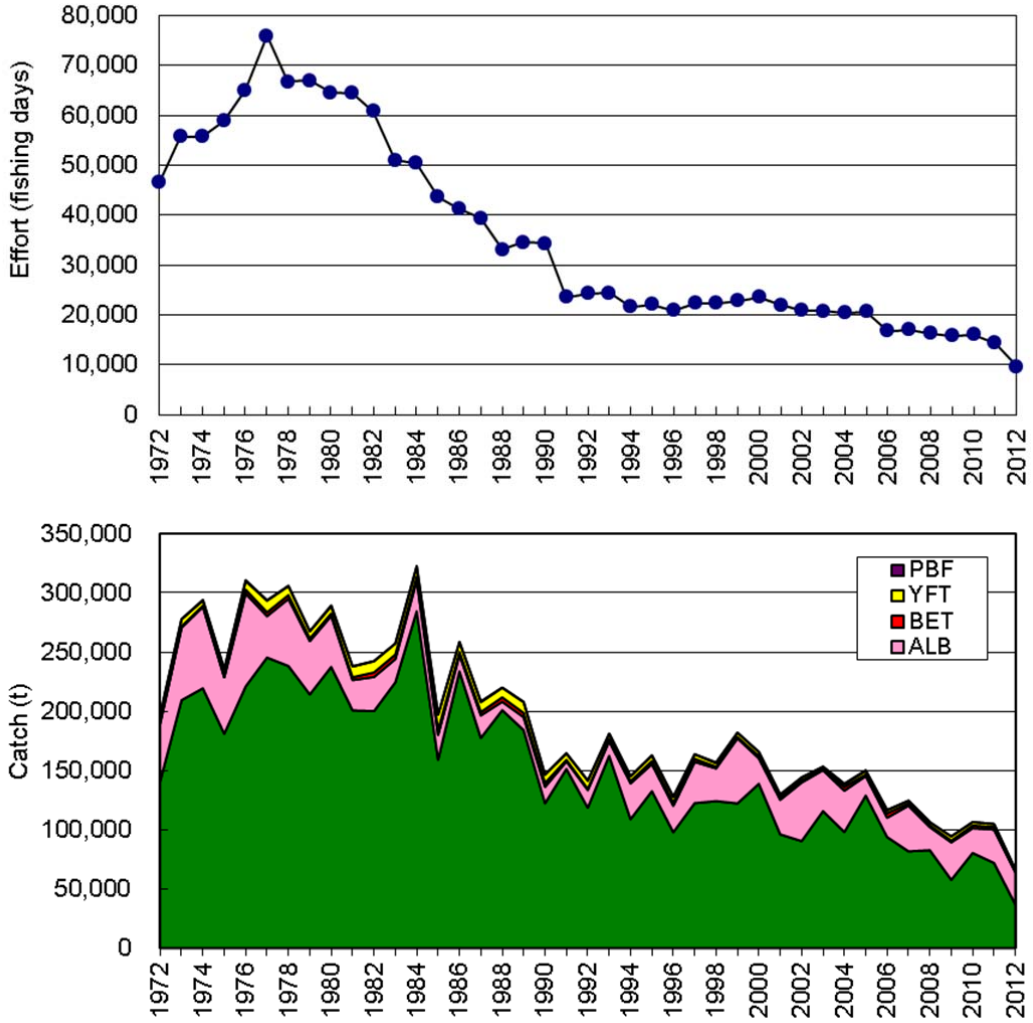

Fig. 7. Historical change of fishing effort and catches by species for the Japanese pole-and-line fishery (>20GRT) in the WCPFC Convention Area. Values in 2011 and 2012 are provisional.

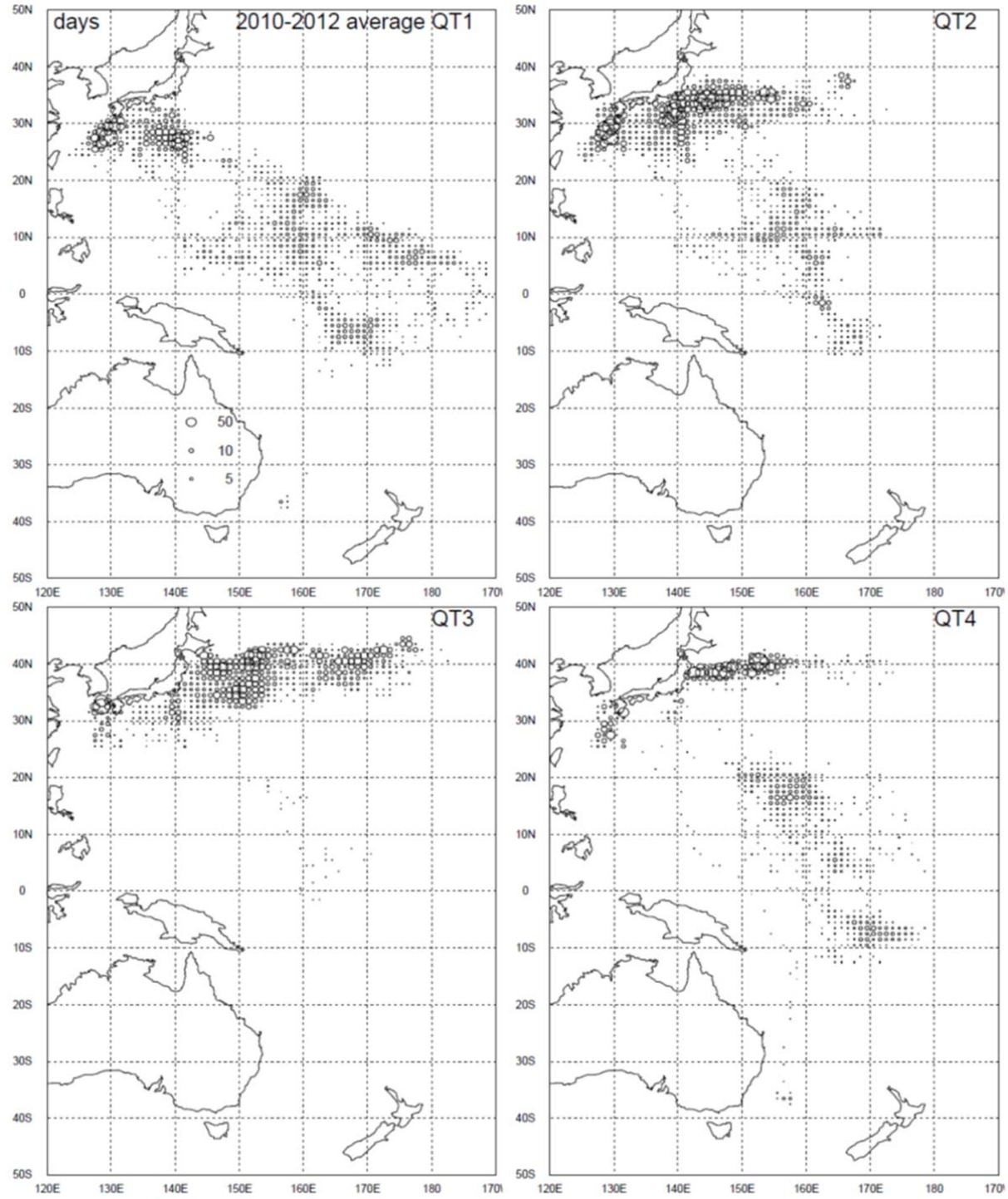

Fig. 8. Quarterly distribution of fishing effort (days) for the Japanese pole-and-line fishery (offshore and distant water licenses) in the Pacific Ocean in average of 2010-2012.

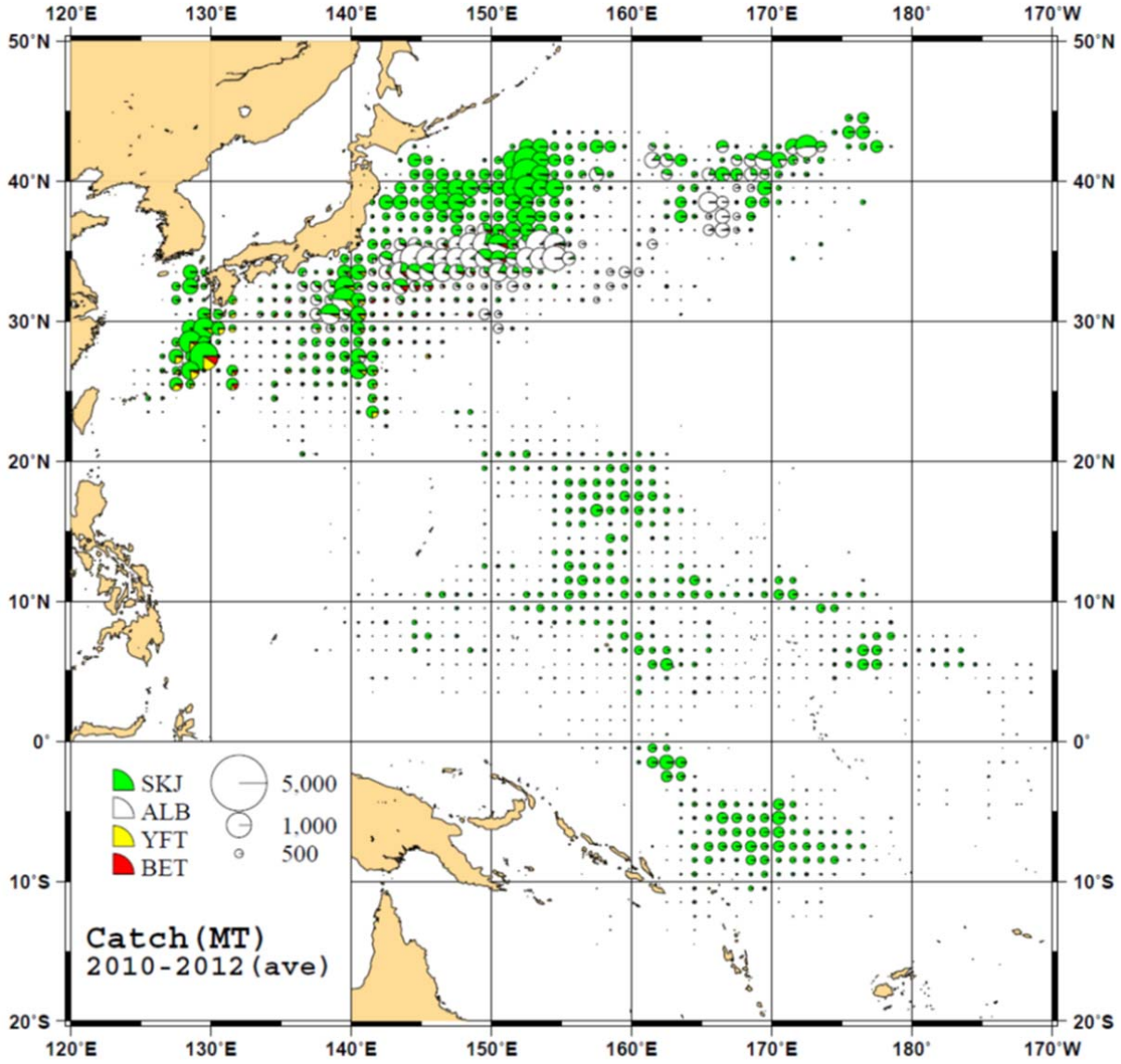

Fig. 9. Distribution of catch and its species composition for the Japanese offshore and distant water pole-and-line fishery in average of 2010-2012.

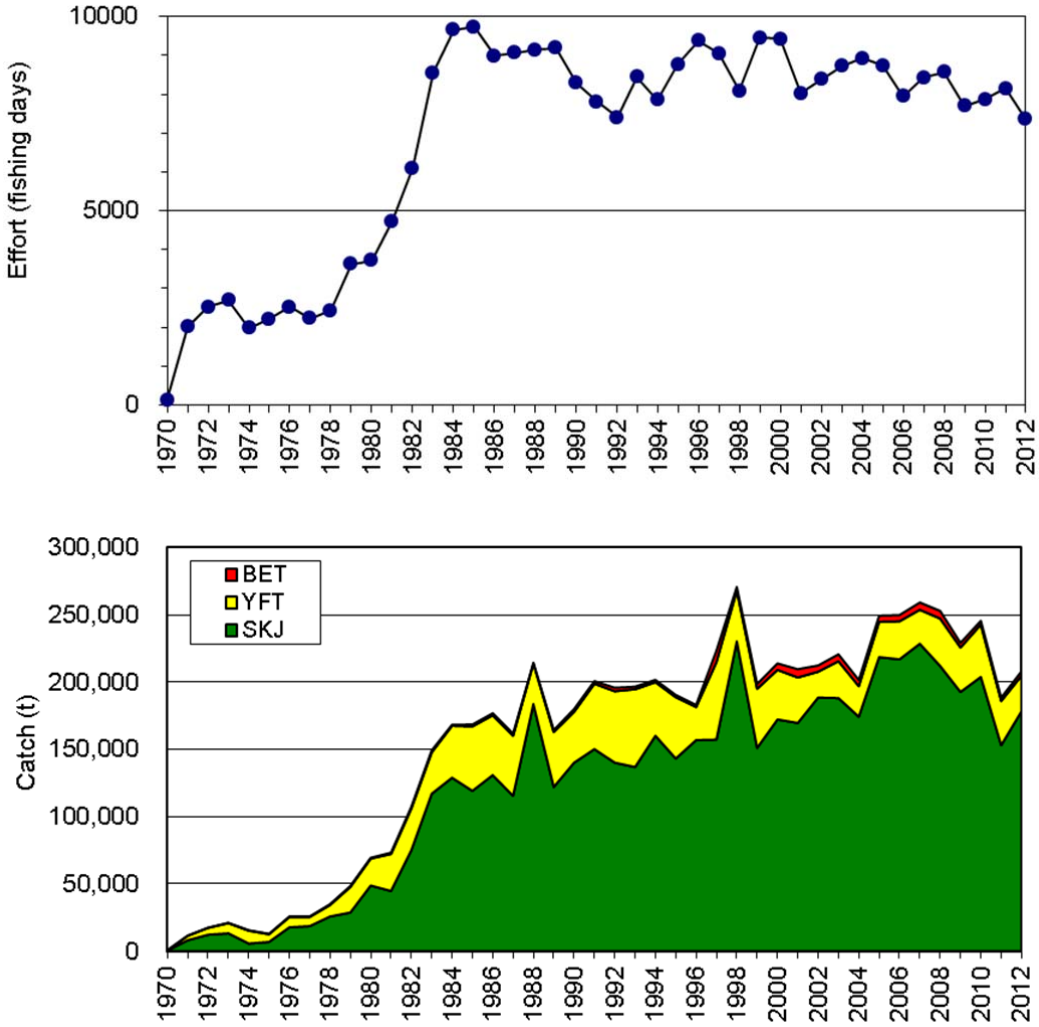

Fig. 10. Trends of fishing effort and catches by species for the Japanese tuna purse seine fishery in the WCPFC Convention Area. Values in 2011 and 2012 are provisional.

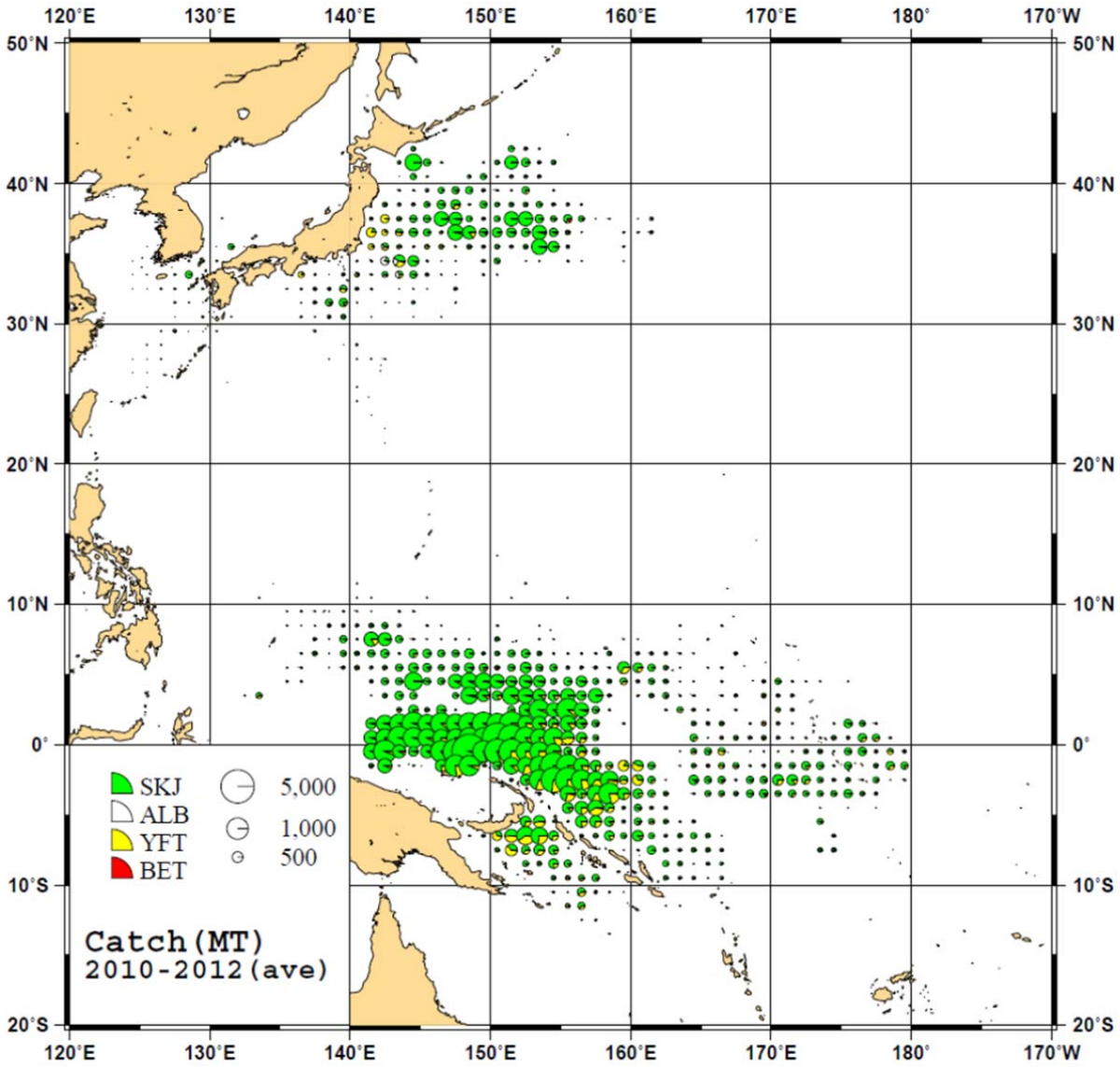

Fig. 11. Distribution of tuna purse seine catch (t) by species (skipjack, yellowfin and bigeye) combined for 2010-2012.

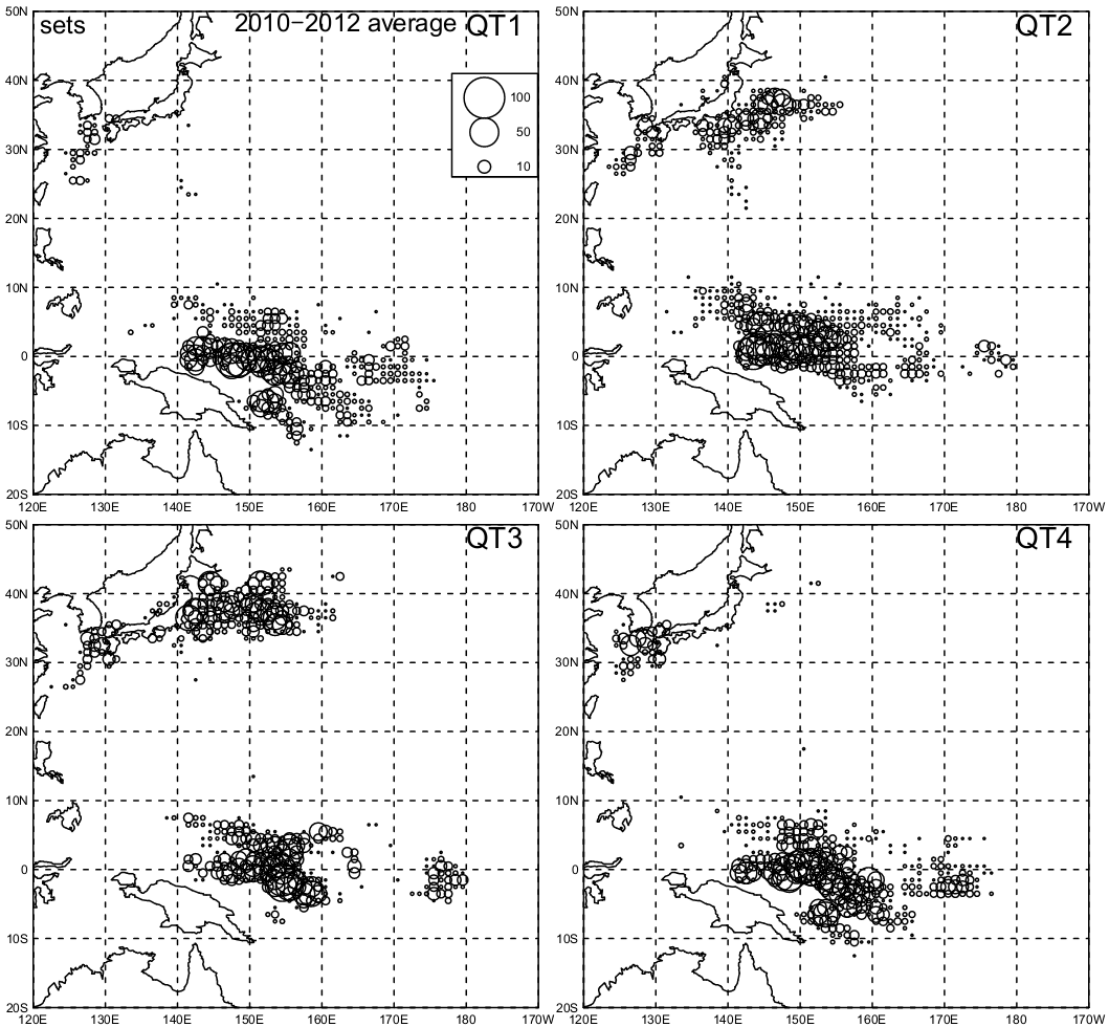

Fig. 12. Quarterly distributions of fishing effort (number of sets) for the Japanese tuna purse seine fishery in the Pacific Ocean in 2010-2012.

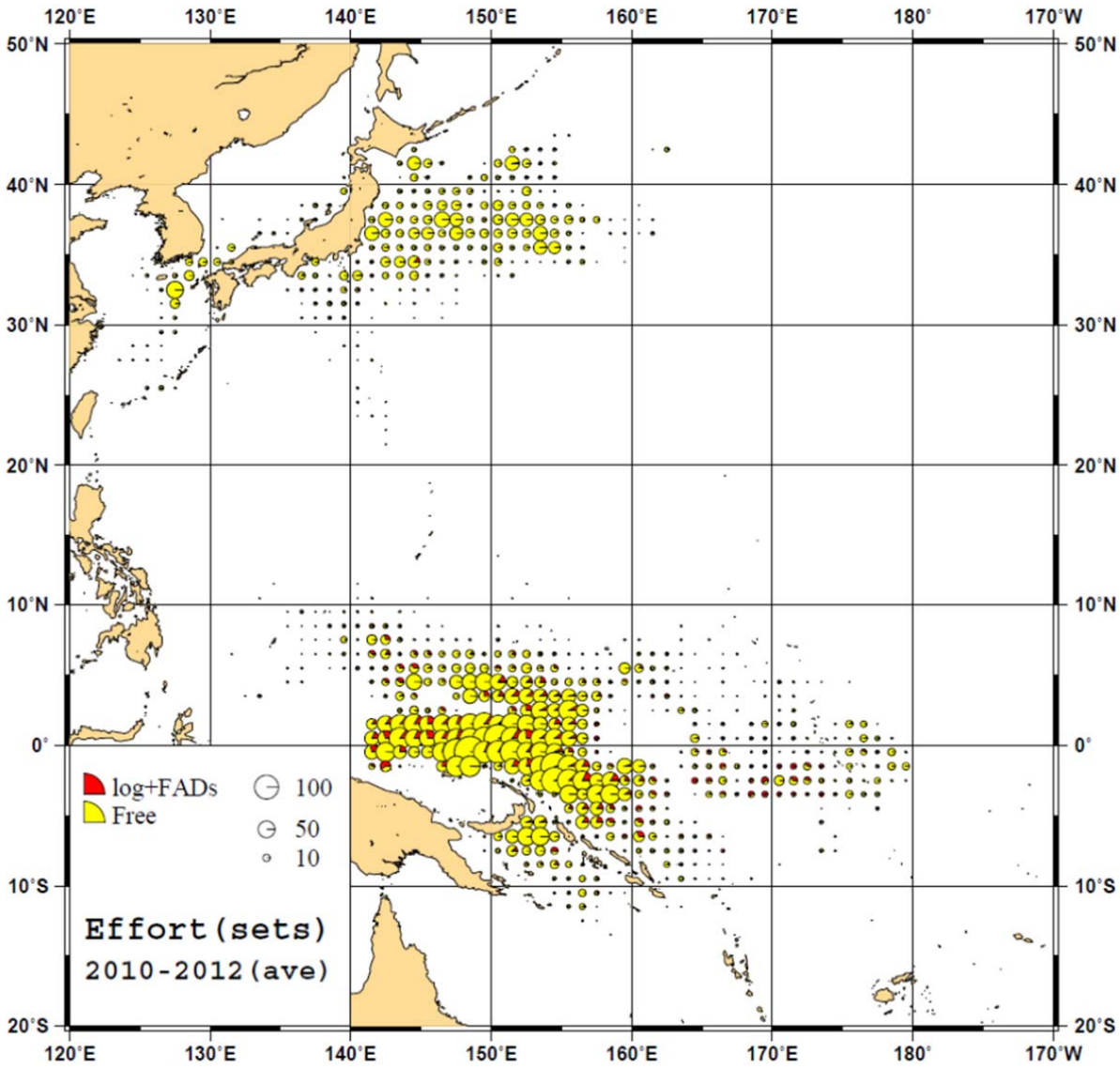

Fig. 13. Distribution of sets by type of school for 2010-2012 deployed by the Japanese tuna purse seine fishery.

List of Appendix Tables, with the relation to the request by CMM

Table number	Title	Correspondence
Appendix Table 1	Catches (mt) for bigeye, yellowfin, blue marlin, black marlin and skipjack in the portion of the WCPFC Convention Area east of the 150˚ meridian of west longitude caught by distant-water and offshore longline fisheries.	-
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.	-
Appendix Table 3	Albacore catch in mt and fishing effort in fishing days in the WCPCA north of the Equator.	CMM-2005-03 (4)
Appendix Table 4	Fishing effort in days of fished and hooks and striped marlin catch for the Japanese offshore and distant water longline fishery in the WCPCA south of 15S.	CMM-2006-04 (4)
Appendix Table 5	Effort, observed and estimated seabird captures by fishing year [South of 30˚S; North of 23˚N; or 23˚N - 30˚S].	CMM 2007-04 Seabirds (9)
Appendix Table 6	Number of observed seabird captures in longline fisheries, 2012, by species and area.	CMM 2009-03 (8)
Appendix Table 7	Catch in weight, of swordfish at south of 20° South of WCPFC statistical area by year with vessel statistics.	CMM-2009-03. (3)
Appendix Table 8	The total quantity (mt) of highly migratory fish stocks transshipped by fishing vessels in 2012.	CMM 2009-06 Annex II Transshipment (11)
Appendix Table 9	The number of transshipments involving highly migratory fish stocks in 2012.	CMM 2009-06 Annex II Transshipment (11)
Appendix Table 10	Fishing effort and albacore catch for the Japanese offshore and distant water longline fishery in the south of 20˚S in the WCPCA.	CMM-2010-05 (4)
Appendix Table 11	Catch (mt) for shark species in the WCPFC Convention Area by species for the Japanese distant and offshore and small offshore longline fisheries.	CMM-2010-07 (4)

Appendix Table 1. Catches (mt) for bigeye, yellowfin, blue marlin, black marlin and skipjack 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
2008	1,222	280	2	59	2
2009	1,228	414	4	83	1
2010	1,778	290	7	64	5
2011	1,144	244	4	45	1
2012	(1,410)	(339)	(6)	(68)	(1)

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 2011 and 2012 area 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)			
2008	1476	19	64	10221	2377	2358	1192
2009	1304	8	50	8077	2003	2236	913
2010	903	5	83	3742	1583	1047	918
2011	933	9	63	8340	1820	1957	654
2012	594	-	113	2462	570	1765	779

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)			
2008	0	8	0	0	0	0	0
2009	0	7	0	0	0	0	0
2010	0	6	0	0	0	0	0
2011	0	11	0	0	0	0	0
2012	0	-	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)			
2008	1476	19	64	10221	2377	2358	1192
2009	1304	8	50	8077	2003	2236	913
2010	903	5	83	3742	1583	1047	918
2011	933	9	63	8340	1820	1957	654
2012	594	-	113	2462	570	1765	779

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)			
2008	0	8	0	0	0	0	0
2009	0	7	0	0	0	0	0
2010	0	6	0	0	0	0	0
2011	0	11	0	0	0	0	0
2012	0	-	0	0	0	0	0

Pacific bluefin tuna (5) in 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)			
2008	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0
2012	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	PS	Gillnet	Troll	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water	Coastal	Offshore and distant-water	Coastal	Offshore and distant-water				
2008	13677	5415	35	19025	1	824	1531	549	101	15
2009	18175	3820	91	31081	12	2064	149	410	32	43
2010	17224	3943	135	19426	27	303	24	588	42	37
2011	16098	4858	57	25648	18	462	12	443	50	78
2012	16290	5025	57	27060	18	462	12	443	50	78

Albacore (2) the Pacific Ocean south of the Equator

Year	LL	LL	PL	PL	PS	PS	Gillnet	Troll	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water	Coastal	Offshore and distant-water	Coastal	Offshore and distant-water				
2008	1	3034	0	0	0	0	0	0	0	0
2009	8	4205	0	0	0	0	0	0	0	0
2010	0	4252	0	0	0	0	0	0	0	0
2011	0	5355	0	9	0	0	0	0	0	0
2012	0	4461	0	15	0	0	0	0	0	0

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

Year	LL	LL	PL	PL	PS	PS	Gillnet	Troll	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water	Coastal	Offshore and distant-water	Coastal	Offshore and distant-water				
2008	13677	5231	35	19025	1	824	1531	549	101	15
2009	18175	3740	91	31081	12	2064	149	410	32	43
2010	17277	3800	135	19426	27	303	24	588	42	37
2011	17386	4721	57	28475	18	303	12	443	50	37
2012	17386	4870	57	28475	18	303	12	443	50	37

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

Year	LL	LL	PL	PL	PS	PS	Gillnet	Troll	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water	Coastal	Offshore and distant-water	Coastal	Offshore and distant-water				
2008	2	2048	0	0	0	0	0	0	0	0
2009	8	2618	0	0	0	0	0	0	0	0
2010	0	2920	0	0	0	0	0	0	0	0
2011	0	2630	0	9	0	0	0	0	0	0
2012	0	2600	0	15	0	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	PS	Gillnet	Troll	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water	Coastal	Offshore and distant-water	Coastal	Offshore and distant-water				
2008	0	26	0	0	0	0	0	0	0	0
2009	0	62	0	0	0	0	0	0	0	0
2010	0	136	0	0	0	0	0	0	0	0
2011	0	104	0	0	0	0	0	0	0	0
2012	0	201	0	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			
2008	1785	4402	648	3	524
2009	1536	4400	682	3	489
2010	1084	4240	483	8	342
2011	870	3046	189	2	245
2012	648	3243	300	0	300

Swordfish (2) the Pacific Ocean south of the Equator

Year	LL	LL	Gillnet	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water			
2008	0	1982	0	0	0
2009	0	2036	0	0	0
2010	0	2835	0	0	0
2011	0	3437	0	0	0
2012	0	3642	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			
2008	1785	3859	648	3	522
2009	1536	3600	682	3	488
2010	1084	3507	483	8	342
2011	870	2356	189	2	245
2012	648	2881	300	0	300

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			
2008	0	442	0	0	0
2009	0	503	0	0	0
2010	0	560	0	0	0
2011	0	641	0	0	0
2012	0	618	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			
2008	0	160	0	0	0
2009	0	162	0	0	0
2010	0	220	0	0	0
2011	0	250	0	0	0
2012	0	216	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			
2008	609	390	1302	26	81
2009	451	166	821	17	94
2010	641	187	899	20	104
2011	698	319	333	30	113
2012	558	314	500	100	0

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			
2008	0	470	0	0	0
2009	0	461	0	0	0
2010	0	567	0	0	0
2011	0	764	0	0	0
2012	0	748	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			
2008	609	315	1302	26	81
2009	451	97	821	17	94
2010	641	116	899	20	104
2011	698	205	333	30	113
2012	558	256	500	100	0

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			
2008	0	134	0	0	0
2009	0	152	0	0	0
2010	0	197	0	0	0
2011	0	237	0	0	0
2012	0	183	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			
2008	0	12	0	0	0
2009	0	8	0	0	0
2010	0	14	0	0	0
2011	0	21	0	0	0
2012	0	26	0	0	0

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

(a) Catch

Year	LL Offshore & distant-water	LL Small offshore	LL Coastal	PL Offshore & distant-water	PL Coastal	PS Offshore & distant-water	PS Coastal	Gillnet	Troll	Setnet
2008	5,231	9,694	2,056	19,521	35	819	1	1,531	549	101
2009	3,740	13,496	2,642	31,638	91	2,211	12	149	410	32
2010	3,800	14,116	1,689	20,955	135	293	27	24	588	42
2011	4,721	11,472	1,824	28,169	57	331	18	12	443	50
2012	4,870	9,669	1,824	27,117	57	1,987	18	12	443	50

(b)Effort

Year	LL Offshore & distant-water	LL Small offshore	LL Coastal	PL Offshore & distant-water	PL Coastal	PS Offshore & distant-water	PS Coastal	Gillnet	Troll	Setnet
2008	17,823	37,446	NA	15,667	NA	4,172	NA	NA	NA	NA
2009	12,060	40,701	NA	15,248	NA	3,939	NA	NA	NA	NA
2010	13,084	43,976	NA	15,541	NA	3,242	NA	NA	NA	NA
2011	12,683	40,199	NA	13,234	NA	7,658	NA	NA	NA	NA
2012	13,666	25,647	NA	9,588	NA	8,450	NA	NA	NA	NA

Appendix Table 4. Fishing effort in days of fished and hooks and 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	Days fished	Hooks (x 1,000)	Striped marlin catch (t)
2008	1,819	6,319	103
2009	1,826	6,259	131
2010	1,834	6,238	158
2011	3,057	10,351	203
2012	(2,819)	(9,521)	(157)

Appendix Table 5. Effort, observed and estimated seabird captures by fishing year [South of 30˚S; North of 23˚N; or 23˚N - 30˚S]. 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 in the part of seabirds of CMM-2007-04.

South of 30S

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2008	19	5,678,855	169,128	3.0	79	0.467
2009	19	5,913,160	136,310	2.3	6	0.044
2010	26	5,930,334	24,340	0.4	7	0.288
2011	30	8,206,601	308,426	3.8	146	0.473
2012	29	7,842,722	258,031	3.3	23	0.089

23N - 30S

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2008	284	55,362,874	31,486	0.1	0	0
2009	316	57,710,608	103,515	0.2	0	0
2010	324	75,557,937	65,378	0.1	9	0.138
2011	301	65,882,636	1,004,172	1.5	4	0.004
2012	232	49,425,289	1,417,652	2.9	2	0.001

North of 23N

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2008	354	86,344,947	35,991	0.0	0	0
2009	332	79,946,310	44,700	0.1	0	0
2010	330	80,150,640	10,280	0.0	0	0
2011	319	72,587,261	115,870	0.2	8	0.069
2012	262	47,363,759	104,748	0.2	1	0.010

Appendix Table 6. Number of observed seabird captures in longline fisheries, 2012, by species and area. This table was request written in paragraph 9 in the part of seabirds of CMM-2007-04.

Species	South of 30˚S	North of 23˚N	23˚N-30˚S	Total
Wandering albatross group	4	0	0	4
Campbell albatross	5	0	0	5
Buller's albatross group	3	0	0	3
Shy-type albatrosses	1	0	0	1
Black-footed albatross	0	1	0	1
Southern giant petrel	1	0	0	1
White-chinned petrel	3	0	0	3
Streaked shearwater	0	0	2	2
Unidentified petrels	6	0	0	6
Total	23	1	2	26

Appendix Table 7. 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. That was request written in paragraph 8 of CMM-2009-03.

Year	Japan-flagged vessels south of 20˚S		Chartered vessels		Other vessels fishing within the Japan's waters south of 20˚S		
	Catch (mt)	Vessel numbers	Catch (mt)	Vessel numbers	Flag	Catch (mt)	Vessel numbers
2008	148	19	0	0	--	--	--
2009	167	19	0	0	--	--	--
2010	192	26	0	0	--	--	--
2011	267	34	0	0	--	--	--
2012	308	29	0	0	--	--	--

Appendix Table 8. The total quantity (mt) of highly migratory fish stocks transshipped by fishing vessels in 2012.

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	659	853	0	524
Yellowfin	385	154	0	116
Swordfish	60	73	0	78
Others	424	71	0	212
Total	1,528	1,151	0	930

1.1.2. Catch outside the CA

	Port inside the CA	HS inside the CA
Bigeye	63	280
Yellowfin	4	49
Swordfish	27	39
Others	2	31
Total	96	399

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	1,122	1,019	0	649
Gutted and Headed	128	73	0	78
Whole	60	26	0	79
Fillets	0	0	0	0
Others	218	33	0	124
Total	1,528	1,151	0	930

1.2.2. Catch outside the CA

	Port inside the CA	HS inside the CA
Gilled and Gutted	68	336
Gutted and Headed	26	39
Whole	0	18
Fillets	1	0
Others	1	6
Total	96	399

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	925	94
Yellowfin	156	23
Swordfish	167	43
Others	130	83
Total	1,377	243

2.1.2. Catch outside the CA

	HS inside the CA	Port inside the CA
Bigeye	177	191
Yellowfin	12	31
Swordfish	18	24
Others	179	53
Total	385	298

Appendix Table 8. The number of transshipments involving highly migratory fish stocks in 2012.

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	7	5	0	7
Caught both inside and outside the CA	6	11	0	22
Caught outside the CA	0	0	0	0
Total	13	16	0	29

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	16	3
Caught both inside and outside the CA	7	6
Caught outside the CA	2	0
Total	25	9

Appendix Table 10. Fishing effort and albacore catch for the Japanese offshore and distant water longline fishery in the south of 20S in the WCPCA. This table was request written in paragraph 4 of CMM-2010-05

(a) Offshore and distant water longline

Year	Vessels	Days fished	Hooks (x1,000)	Albacore catch (t)
2008	19	1,796	6,245	909
2009	19	1,822	6,245	1,111
2010	26	1,752	5,965	896
2011	34	2,976	10,128	1,803
2012	(29)	(2,639)	(9,009)	(1,369)

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

Year	Vessels	Days fished	Albacore catch (t)
2008	0	0	0
2009	0	0	0
2010	0	0	0
2011	2	35	9
2012	(2)	(21)	(15)

Appendix Table 11. 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 porbegle was counted only in south of 20° south. This table was request written in paragraph 4 of CMM-2010-07.

(a) Offshore and distant water longline

	Blue shark	Salmon shark and porbegle	Mako shark	Other sharks
2008	7,100	0	569	147
2009	7,765	2	543	59
2010	7,421	0	533	107
2011	3,913	1	535	142
2012	(6,171)	(0)	(664)	(25)

(b) Small offshore longline

	Blue shark	Salmon shark and porbegle	Mako shark	Other sharks
2008	227	0	15	38
2009	163	0	35	15
2010	181	0	20	12
2011	262	0	18	9
2012	(179)	(0)	(2)	(4)