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JAPAN

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

National Tuna Fisheries Report of Japan

Koji Uosaki[1], Hiroshi Minami[1], Osamu Abe[1], Keisuke Satoh[1],
Takayuki Matsumoto[1] and Shuya Nakatsuka[2]

[1] *National Research Institute of Far Seas Fisheries*
Fisheries Research Agency
(FRA NRIFSF)

[2] *Fisheries Agency 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, 2012	YES Annual catch data, April 28. Catch and effort data, April 28. Size data for striped marlin assessment, June 6.
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 (larger than 10 GRT) was 406 in 2011 which was 49 vessels (11%) less than that in 2010. Total number of pole-and-line vessels (larger than 20 GRT) was 90 in 2011 which was 5 vessels (5%) less than that in 2010. For the purse seine vessels, the number of vessels over 200 GRT was 37 in 2011, which were the same number as that in 2010. Out of the 37 vessels over 200GRT, the number of vessels which are allowed to operate in tropical waters was 35 in 2011 and has been stabilized since 1995.

The total 2011 WCP-CA catch of tunas (Pacific bluefin, albacore, bigeye, yellowfin and skipjack) by the Japanese fishery was still provisional and estimated to be 376,027 mt, and this is corresponding to 87% of 2010 total tunas catch (432,973 mt). In 2011, the total tuna catch by the purse seine fishery was 199,084 mt (53% of the total), with 113,682 mt (30%) by the pole-and-line fishery, 48,774 mt (13%) by the longline, and the remaining (4%) 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 2011 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 other miscellaneous coastal 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. Swordfish catch in weight at south of 20˚South of WCPFC statistics area is shown in Appendix Table 3 with vessel numbers, which is requested by the CMM 2009-03. The catch for key shark species in weight in the WCP-CA is shown in Appendix Table 4. The transshipment information requested by CMM 2009-6 is shown in Appendix Tables 5 and 6.

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 2007-2010 data (MAFFJ 2009-2011, MAFFJ 2012), 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 2007-2011 (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 decreased from 479 in 2007 to 448 in 2009, recovered slightly to 455 in 2010, decreased again to 406 in 2011, although the data of 2011 is still preliminary. Especially, the declining trend for size categories 50-100 GRT and 100-200 GRT are remarkable, the number of vessels of those categories was 24 and 25 in 2011 which is 57% and 52% of that in 2007, 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 2007-2011. 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 77 in 2007 to 62 in 2011, corresponding to 29% decrease. The number of vessels for category over 200 GRT slightly decreased from 29 in 2007 to 28 in 2011, corresponding to 3% 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 39

without apparent trend during the 2007-2011 period. Note that the number of distant water purse seiners which are allowed to operate in tropical waters was 35 and has been stabilized since 1995.

4. Trends in catch and effort

The total 2011 WCP-CA catch of tunas (Pacific bluefin, albacore, bigeye, yellowfin and skipjack) by the Japanese fishery was still provisional and estimated to be 376,027 mt, and this is corresponding to 87% of 2010 total tunas catch (432,973 mt). In 2011, the total tuna catch by the purse seine fishery was 199,0847 mt (53% of the total), with 113,682 mt (30%) by the pole-and-line fishery, 48,774 mt (13%) by the longline, and the remaining (4%) by the other gears, whereas, in 2010, the total tuna catch by the purse seine fishery was 247,210 mt (57% of the total), with 114,533 mt (27%) by the pole-and-line fishery, 57,039 mt (13%) 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 2011 data, though the 2010 and 2011 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 2007 to 2011 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. 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 7,097 mt in 2011, and bigeye catch showed decreasing trend, was 7,500 mt in 2011 which is 49% of that in 2007 (Table 2A).

The average quarterly effort distribution for distant water and offshore longline vessels during the 2009-2011 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 2007 to 2011 are shown in Table 2B. Total number of hooks deployed by small offshore longliner ranged between 69,000 thousand and 78,000 thousand hooks. Among species, albacore catch is the largest in the small offshore longline, although bigeye and yellowfin are largest in the distant water and offshore longliners. Bigeye catch for the small offshore longline was secondary largest among species, showed a decreasing trend, was 6,557 mt in 2011which is 61% of that in 2007. Yellowfin catch was relatively stable ranging between 3,106 mt and 5,180 mt during this period, was 3,361 mt in 2011. 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.

The catch estimates for the longline vessels less than 20 GRT for pacific bluefin, albacore, swordfish and striped marlin are given in Appendix Table 2. The sum of catches in the WCPFC Statistical Area north and south of the Equator is not equal to the sum of small offshore longline (10-20 GRT) in the bottom table in Table 2 and coastal longline in Table 5, because the method of the estimation for the catch is different.

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 2007-2011. In addition to this, historical changes in catch by species and effort are shown in Fig. 7 for the period of 1972-2011. The data for 2010 and 2011 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 14,093 days which is 82% of that in 2007 (Table 3). Total catch of tunas (skipjack, bigeye, yellowfin, albacore and bluefin) in 2011 was 104,106 mt, almost the same level (99%) to that in 2010. The skipjack catch was 70,949 mt in 2011 and decreased (12%) from 80,316 mt in 2010. The albacore catch was 28,483 mt in 2011, increased (47%) from 19,426 mt in 2010.

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 2009-2011. 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 2007 to 2011. In addition to this, historical changes in catch by species and effort are shown in Fig. 10 for the period of 1970-2011. The data for 2011 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 209,968 mt in 2011, which is 75% of that in 2007 (280,084 mt). Skipjack catch showed a declining trend, was 152,809 mt in 2011, which is 67% of that in 2007 (228,505 mt). Especially the catch sharply decreased in 2011, 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 25,264 mt and 38,514 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 formed 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 2007-2011 is shown in Table 5. The figures in 2011 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 “trap”) 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 2007-2011. The data in 2010 and 2011 are preliminary. Total catch of skipjack decreased from 323,466 mt in 2007 to 239,451 mt in 2011 (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 shows an increase trend from 46,554 mt in 2007 to 52,961 mt in 2011 (114%). Total catch of bigeye decreased from 34,588 mt in 2007 as the largest during this period to 19,499 mt in 2011 (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 logsheet. 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 logsheet 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, VMS (vessel monitoring system) information is utilized 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).

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. Total number of trips conducted is 44 for the past 17 years before 2011 (Table 8).

Two purse seine cruises were observed from September to October 2011 and February to March 2012 in tropical waters in the western Pacific Ocean (Table 9). Days spent for these cruises were 54 and 46 days, respectively, which are longer than the average duration (38 days) for the past Japanese purse seine observer program. These two cruises mainly targeted on the free school.

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. Three cruises of distant water longline vessels and fourteen cruises of small offshore longline vessels were observed in the 2011 fisical year. The data from three 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 13 to 18 in the small off-shore longline vessels. The total number of catches which was recorded by each observer ranged from 351 to 783 individuals (Table 10).

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 Yamagwa). 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 three 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 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 middle-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

Three research/training pole-and-line vessels were involved in the skipjack tagging in 2011. The tagging was conducted in a wide area of western Pacific ranging from 12˚N to 34˚N, from 132˚E to 154˚E. Total of 734 skipjack were released with conventional tag in 2011, and 32 were recovered to date. By one of above vessels, collaborative study of archival tagging with NRIFSF was conducted in the south off Japan (around 18-24˚N, 130-139˚E) in early 2011 and 2012. A total of 162 archival tags (Lotek LAT2510 or LAT2910) were deployed, and to date 5 fish were recaptured, of which archival tags from 4 fish were recovered.

A skipjack tagging was conducted using chartered commercial offshore pole-and-line vessel in the south off Japan (around Ogasawara Islands, 23-27˚N, 135-141˚E) between February and March 2012. Main objective of this study is to investigate migration to the fishing grounds around Japan. A total of 3,308 skipjack tuna (mainly 35-45cm FL) including 109 fish with archival tag (LAT2910) were released. To date 95 fish including 4 fish with archival tag were recaptured.

In addition, skipjack tagging in the coastal area of southwestern Japan, which is being conducted in cooperation with Ajinomoto Co., Inc. (Japanese food and chemical corporation), started in 2009. Main objective of this study is to investigate migration to the Pacific coast of Japanese water (mainly western part of Japan) along the Kuroshio Current. The fish caught around Yonaguni Island (around 24˚N, 123˚E) by coastal troll vessels were tagged and released in 2011 and early 2012. A total of 3,542 skipjack tuna (mainly 35-45cm FL) including 168 fish with archival tag (LAT2910) and 394 fish with dummy archival tag were released. So far 24 fish including 4 fish with archival tag were recaptured mainly around Nansei Islands.

6.2. Research cruise conducted

PBF larval/juvenile sampling

In 2011, 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 Island area, which is a major spawning ground of PBF, from 9 May to 27 July and found that the east of Miyako Islands was the abundant area of PBF larvae. Larval surveys were conducted also in the Sea of Japan, which is another spawning ground of PBF, from 21 June to 11 August and found that PBF larvae were abundant in the area between Oki Islands and Noto Peninsula. This information would be utilized to estimate spawning grounds of PBF by backward Lagrangian trans-port. 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, PBF juveniles were collected nearby Yakushima Island from 14 June through 11 July in 2011 by the pelagic trawls. In total, 112 individuals of PBF juveniles (FL: 30-140cm) were captured mainly in the Kuroshio Current region. 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.

6.3. Bycatch species related research

Mitigation studies for seabirds

Effectiveness of combination of mitigation techniques (no tori line, single tori line, paired tori lines, weighted branchline, un-weighted branchline) using Japanese research vessel was examined in the North Pacific from December 2011 to June 2012 The results showed that use of tori line was effective in preventing seabird attacks and incidental catch of seabirds with either weighted or un-weighted branch line.

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 in 2011. 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 2009-2011. Annual report of catch statistics on fishery and aquaculture, 2007-2009. Statistics Department, Minister's Secretariat, the Ministry of Agriculture, Forestry and Fisheries of Japan.

MAFFJ 2012. Annual report of catch statistics on fishery and aquaculture 2010, on the portal site for governmental statistics "e-Stat" (published in March 13, 2012). http://www.maff.go.jp/j/tokei/kouhyou/kaimen_gyosei/index.html.

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.

A. Longline

	10-50 ton	50-100 ton	100-200 ton	200- ton	Total
2007	281	42	48	108	479
2008	277	42	40	107	466
2009	277	38	33	100	448
2010	288	29	28	110	455
2011	(253)	(24)	(25)	(104)	(406)

B. Pole-and-line

	20-50 ton	50-200 ton	200- ton	Total
2007	1	77	29	107
2008	1	69	29	99
2009	1	68	28	97
2010	1	66	28	95
2011	(0)	(62)	(28)	(90)

C. Purse Seine

	50-200 ton	200-500 ton	500- ton	Total
2007	35	35	1	71
2008	37	35	1	73
2009	35	34	3	72
2010	33	33	4	70
2011	(39)	(33)	(4)	(76)

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. PBF: Pacific bluefin tuna, ALB: albacore. BET: bigeye tuna, YFT: yellowfin tuna, SWO: swordfish, MLS: striped marlin, BLZ: blue marlin, BLM: black marlin.

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

	#hooks	PBF	ALB	BET	YFT	SWO	MLS	BUM	BLM	SFA	SSP	Total
2007	94,723	91	7,294	15,413	10,014	6,335	420	1,604	78	87	70	41,407
2008	77,917	27	7,279	10,587	8,714	4,396	476	1,323	66	50	82	33,000
2009	64,948	15	6,357	8,383	10,187	4,229	264	1,243	68	80	72	30,898
2010	(78,733)	10	(6,667)	(8,576)	(11,692)	(4,192)	(328)	(1,421)	(71)	(148)	(109)	(33,203)
2011	(68,378)	-	(7,079)	(7,500)	(7,097)	(3,121)	(465)	(1,435)	(27)	(77)	(123)	(26,924)

B. Small offshore longline (10-20 GRT)

	#hooks	PBF	ALB	BET	YFT	SWO	MLS	BUM	BLM	SFA	SSP	Total
2007	76,073	-	18,409	10,663	3,713	1,846	717	1,104	17	14	0	36,483
2008	69,435	-	13,679	9,006	3,106	1,686	448	1,147	21	20	0	29,113
2009	74,333	-	18,183	8,497	3,435	1,531	450	1,091	14	25	1	33,226
2010	(78,267)	-	(17,277)	(7,166)	(5,180)	(1,057)	(629)	(1,459)	(16)	(42)	(0)	(32,826)
2011	(59,712)	-	(17,386)	(6,557)	(3,361)	(685)	(520)	(949)	(10)	(27)	(1)	(29,496)

* The catch for PBF is not available as the category "small offshore". See also Appendix Table 2 for PBF catch by longline.

Table 3. Fishing effort (Days fished and number of poles) and catch by species (mt) for the Japanese pole-and-line fishery (larger than 20GRT) in the WCPFC Convention Area. Figures in parentheses indicate provisional data.

year	#days	#poles	SKJ	YFT	BET	PBF	ALB	Total
2007	17,086	319,874	81,668	2,312	1,804	236	37,664	123,683
2008	16,344	311,608	82,705	2,612	1,479	64	19,025	105,884
2009	15,884	300,666	57,665	3,565	1,429	50	31,081	93,791
2010	(16,132)	(305,017)	(80,316)	(2,874)	(2,250)	(83)	(19,426)	(104,950)
2011	(14,093)	(266,133)	(70,949)	(2,511)	(2,100)	(63)	(28,483)	(104,106)

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
2007	8,413	228,505	25,264	5,384	6,840	5,679	280,084
2008	8,564	212,053	35,272	5,626	10,221	824	272,559
2009	7,713	192,523	33,066	3,447	8,077	2,064	246,890
2010	7,558	199,502	38,514	2,679	3,742	303	252,297
2011	(7,929)	(152,809)	(32,692)	(2,479)	(8,331)	(303)	(209,968)

*The data source for Pacific bluefin is different from that of other species.

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
2007	7	1,383	947	-	3,044	169	143	106	5,799
2008	14	1,418	610	-	2,056	100	161	168	4,527
2009	6	1,281	499	-	2,642	70	171	241	4,910
2010	7	1,844	414	-	1,689	72	191	164	4,381
2011	(7)	(1,844)	(414)	-	(1,689)	(72)	(191)	(164)	(4,381)

Coastal pole-and-line

	SKJ	YFT	BET	PBF*	ALB	Total
2007	8,026	1,189	173	-	104	9,492
2008	8,651	954	127	-	35	9,767
2009	8,609	1,494	151	-	91	10,345
2010	7,632	1,693	124	-	135	9,584
2011	(7,632)	(1,693)	(124)	-	(135)	(9,584)

Coastal purse seine

	SKJ	YFT	BET	PBF*	ALB	Total
2007	715	18	12	-	3	748
2008	364	59	4	-	1	428
2009	515	30	0	-	12	557
2010	2,361	50	32	-	27	2,470
2011	(2,361)	(50)	(32)	-	(27)	(2,470)

Gillnet

	SKJ	YFT	BET	PBF*	ALB	Total
2007	480	16	3	144	226	725
2008	332	23	13	276	1,531	1,899
2009	324	12	7	103	149	492
2010	315	22	2	140	24	363
2011	(315)	(22)	(2)	(41)	(24)	(363)

Troll

	SKJ	YFT	BET	PBF	ALB	Total
2007	3,249	2,297	124	2,385	519	8,574
2008	4,178	2,436	138	2,074	549	10,068
2009	3,819	2,534	115	1,875	410	8,775
2010	4,729	3,167	157	1,301	588	10,454
2011	(4,729)	(3,167)	(157)	(1,688)	(588)	(10,454)

Setnet

	SKJ	YFT	BET	PBF	ALB	Total
2007	535	53	1	1,503	30	2,122
2008	315	94	3	2,358	101	2871
2009	274	86	5	2,236	33	2,634
2010	333	103	4	1,603	42	2,085
2011	(333)	(103)	(4)	(1,957)	(42)	(2,085)

* 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.

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.

	2007	2008	2009	2010	2011
Skipjack					
Total	323,466	308,928	264,075	(295,485)	(239,451)
Distant water and Offshore LL	45	98	57	(82)	(108)
Distant water and Offshore PL	81,668	82,705	57,665	(80,316)	(70,949)
Tuna PS	228,505	212,053	192,523	199,502	(152,809)
Small offshore LL	1	2	5	(3)	(3)
Coastal LL	7	14	6	7	(7)
Coastal PL	8,026	8,651	8,609	7,632	(7,632)
Coastal PS	715	364	515	2,361	(2,361)
Gill net	480	332	324	315	(315)
Troll	3,249	4,178	3,819	4,729	(4,729)
Set net	535	315	274	333	(333)
Unclassified	235	217	278	205	(205)
Yellowfin					
Total	46,554	55,113	56,025	(65,560)	(52,961)
Distant water and Offshore LL	10,014	8,714	10,187	(11,692)	(7,097)
Distant water and Offshore PL	2,312	2,612	3,565	(2,874)	(2,511)
Tuna PS	25,264	35,272	33,066	38,514	(32,692)
Small offshore LL	3,713	3,106	3,435	(5,180)	(3,361)
Coastal LL	1,383	1,418	1,281	1,844	(1,844)
Coastal PL	1,189	954	1,494	1,693	(1,693)
Coastal PS	18	59	30	50	(50)
Gill net	16	23	12	22	(22)
Troll	2,297	2,436	2,534	3,167	(3,167)
Set net	53	94	86	103	(103)
Unclassified	295	425	335	421	(421)
Bigeye					
Total	34,588	27,670	22,626	(21,484)	(19,449)
Distant water and Offshore LL	15,413	10,587	8,383	(8,576)	(7,500)
Distant water and Offshore PL	1,804	1,479	1,429	(2,250)	(2,100)
Tuna PS	5,384	5,626	3,447	2,679	(2,479)
Small offshore LL	10,663	9,006	8,497	(7,166)	(6,557)
Coastal LL	947	610	499	414	(414)
Coastal PL	173	127	151	124	(124)
Coastal PS	12	4	0	32	(32)
Gill net	3	13	7	2	(2)
Troll	124	138	115	157	(157)
Set net	1	3	5	4	(4)
Unclassified	64	77	93	80	(80)

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		2007	2008	2009	2010	2011
Distant water longline	(over 120 GRT)	92%	90%	99%	100%	84%
Offshore longline	(10-120 GRT)	96%	91%	92%	92%	77%
Small offshore longline	(10- 20 GRT)	N/A	N/A	N/A	N/A	N/A
Coastal longline	(10- 20 GRT)	N/A	N/A	N/A	N/A	N/A
Offshore pole-and-line (20-120 GRT)		100%	100%	100%	100%	98%
Distant water pole-and-line (over 120 GRT)		100%	100%	100%	100%	98%
Purse seine (>200GRT)		100%	100%	100%	100%	100%

Table 8. Number of cruises for the purse seine observer program in the tropical waters of western central Pacific.

Year	Number of cruises
1995	2
1996	4
1997	3
1998	4
1999	3
2000	3
2001	3
2002	3
2003	3
2004	1
2005	1
2006	2
2007	3
2008	3
2009	2
2010	2
2011	2

Table 9. Information of observer programs for Japanese purse seiner operated in the tropical waters.

cruise number	1	2
area of operation	PNG, FSM	PNG, FSM and Rep. of Nauru
departure - return	Siogama - Ponape	Ponape - Ponape
date of depature	2011/9/6	2012/2/14
date of return	2011/10/29	2012/3/30
days of cruise	54	46
days of fishing	47	38
number of set	52	46
number of free school	46	42
number of associated school	6	4
total catch (mt)	792	600
skipjack (mt)	486	342
yellowfin (mt)	274	202
bigeye (mt)	32	1

Table 10. Number of operations and catch number for longline observer program in the western central Pacific in 2011.

Cruise number	1	2	3
Number of operations	18	15	13
Number of catch	561	351	783
Albacore	286	5	248
Yellowfin tuna	23	71	6
Bigeye tuna	186	106	111
Skipjack tuna	0	1	11
Sailfish	0	2	0
Blue marlin	7	3	2
Shortbill spearfish	0	0	2
Striped marlin	0	2	0
Swordfish	7	6	6
Lancetfishes	13	0	167
Longnose lancetfish	1	24	0
Shortnose lancetfish	0	2	0
Opahs	2	0	0
Opah	4	7	12
Crestfish	0	0	10
Deal fish	0	0	1
Dagger pomfret	1	18	0
Pomfrets	0	0	1
Bigscale pomfret	3	0	76
Rough pomfret	2	0	0
Sickle pomfret	3	0	1
Dolphin fish	0	1	17
Snake mackerel	0	1	0
Escoler	0	0	12
Wahoo	0	0	1
Ocean sunfish	1	0	0
Trichiuridae	0	0	6
Unidentified sharks	3	0	5
Unidentified thresher shark	0	11	4
Bigeye thresher	5	21	0
Pelagic thresher	10	3	0
Shortfin mako	0	35	2
Silky shark	0	5	0
Galapagos shark	0	1	0
Oceanic whitetip shark	0	1	0
Blue shark	4	0	69
Sting ray	0	25	12
Brown booby	0	0	1

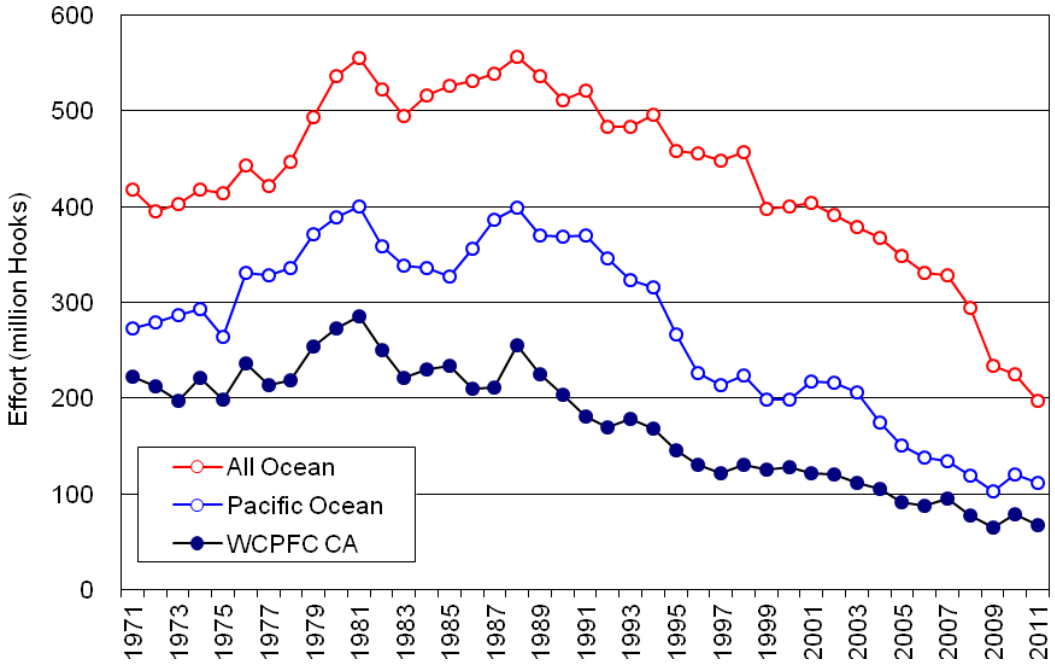

Fig. 1. Historical change in fishing effort of the Japanese distant water and offshore longline fishery (not including small offshore) in the WCPFC Convention Area.

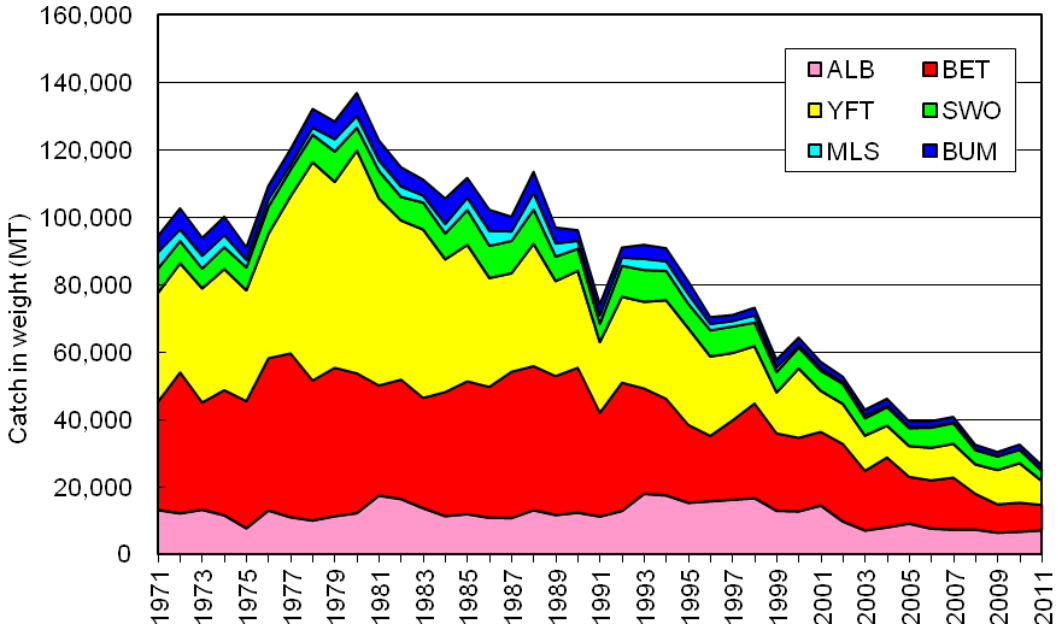

Fig. 2. Historical change of catches for major species for the Japanese distant water and offshore longline fishery (not including small offshore) in the WCPFC Convention Area. ALB: albacore, BET: bigeye, YFT: yellowfin, SWO: sword fish, MLS: striped marlin, BUM: blue marlin.

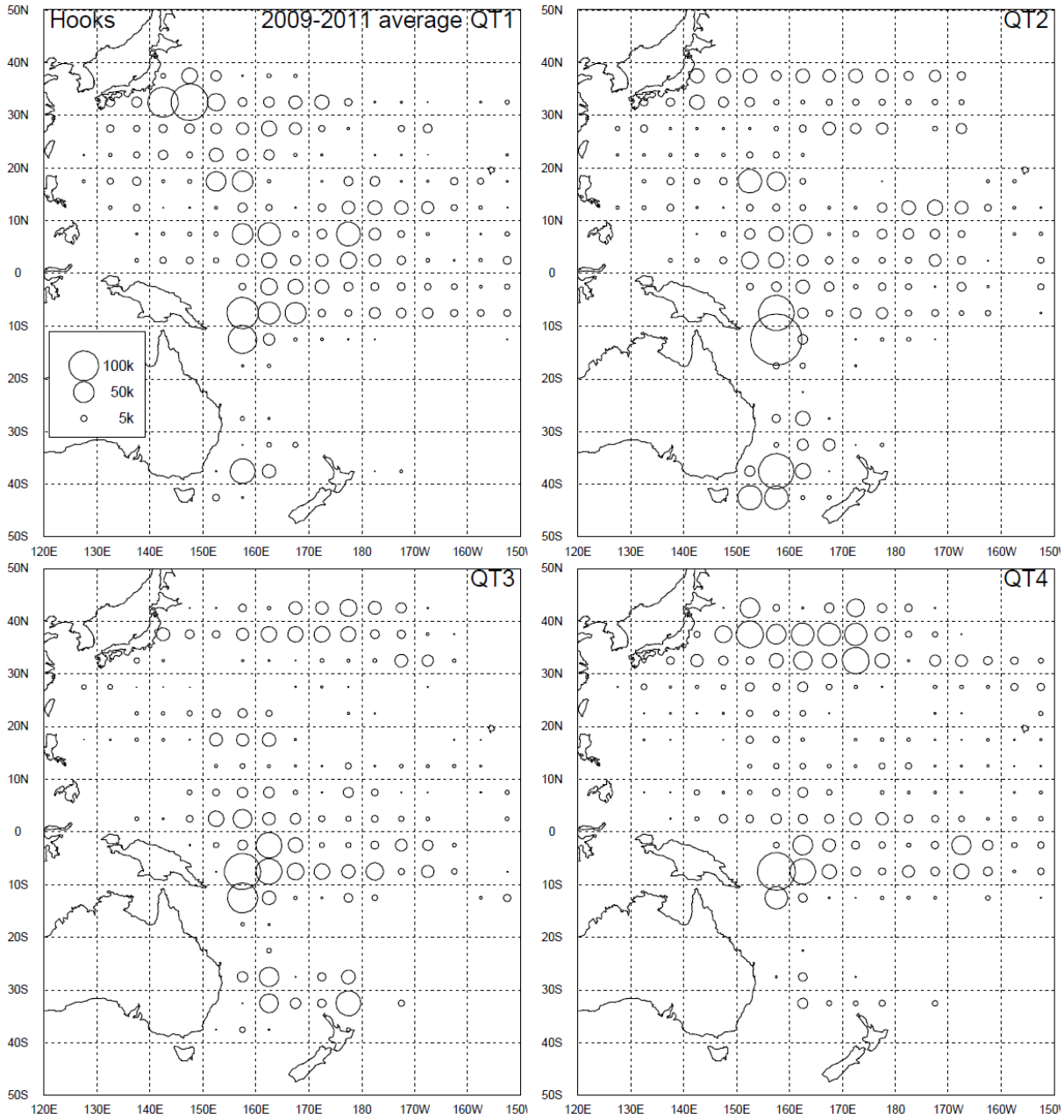

Fig. 3. Quarterly distribution of fishing effort for the Japanese offshore and distant water longline fisheries in the western and central Pacific Ocean in average of 2009-2011.

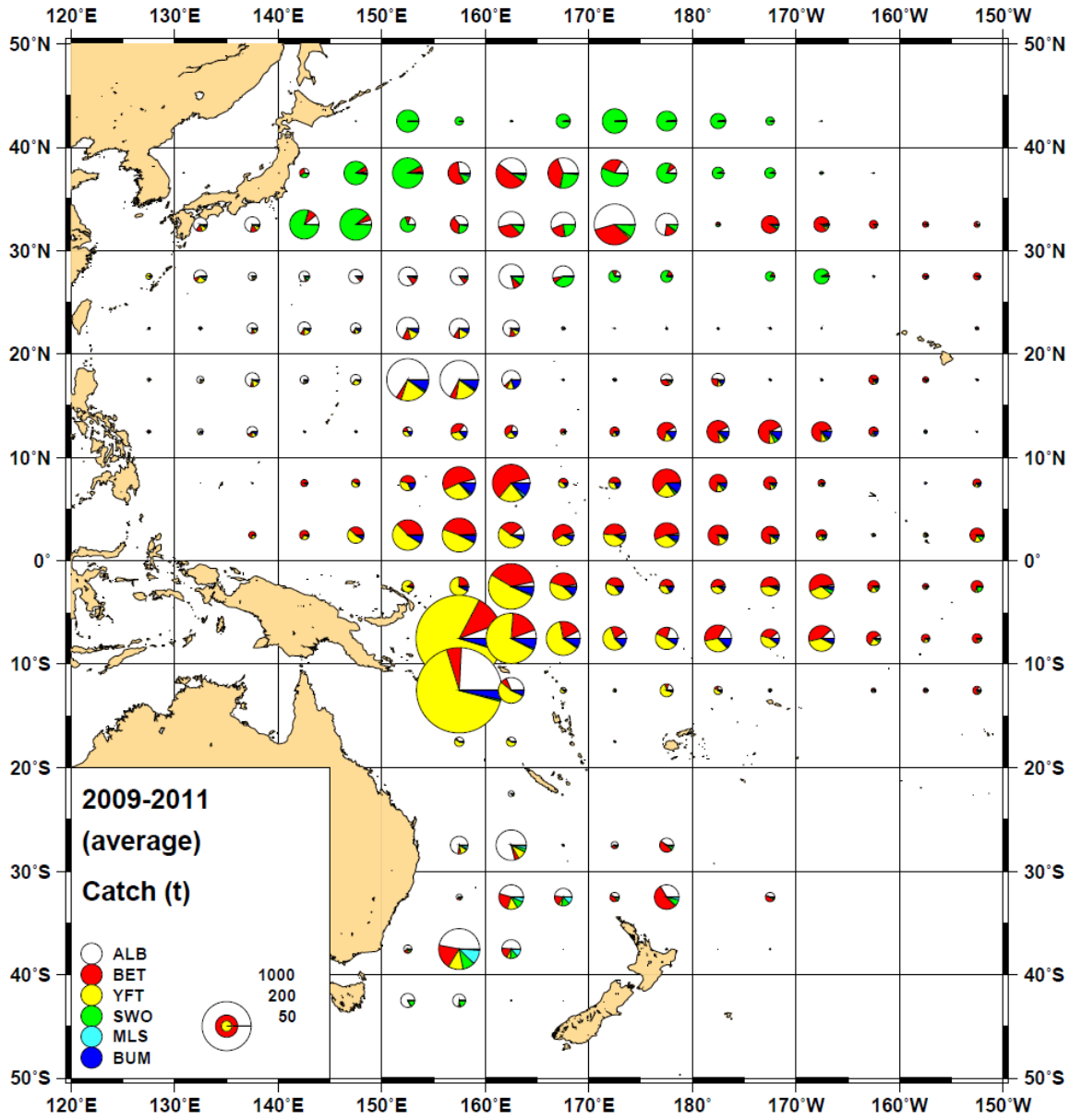

Fig. 4. Distributions of offshore and distant water longline catch (in weight) by species in average of 2009-2011 for six main species (ALB: albacore, BET: bigeye tuna, YFT: yellowfin tuna, SWO: swordfish, MLS: striped marlin and BUM: blue marlin).

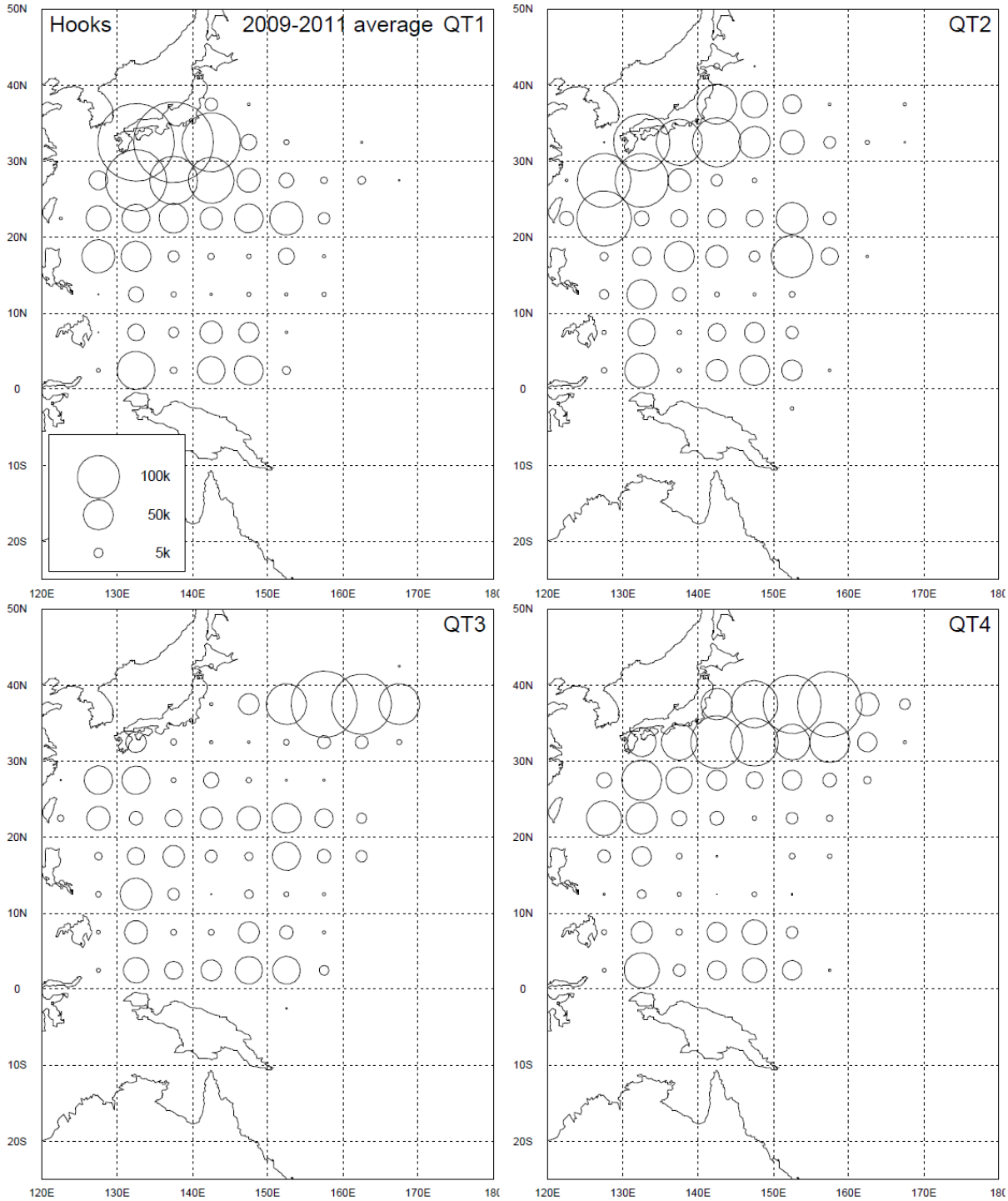

Fig. 5. Quarterly distribution of fishing effort for the Japanese small offshore longline fisheries (10- 20 GRT) in the western and central Pacific Ocean in average of 2009-2011.

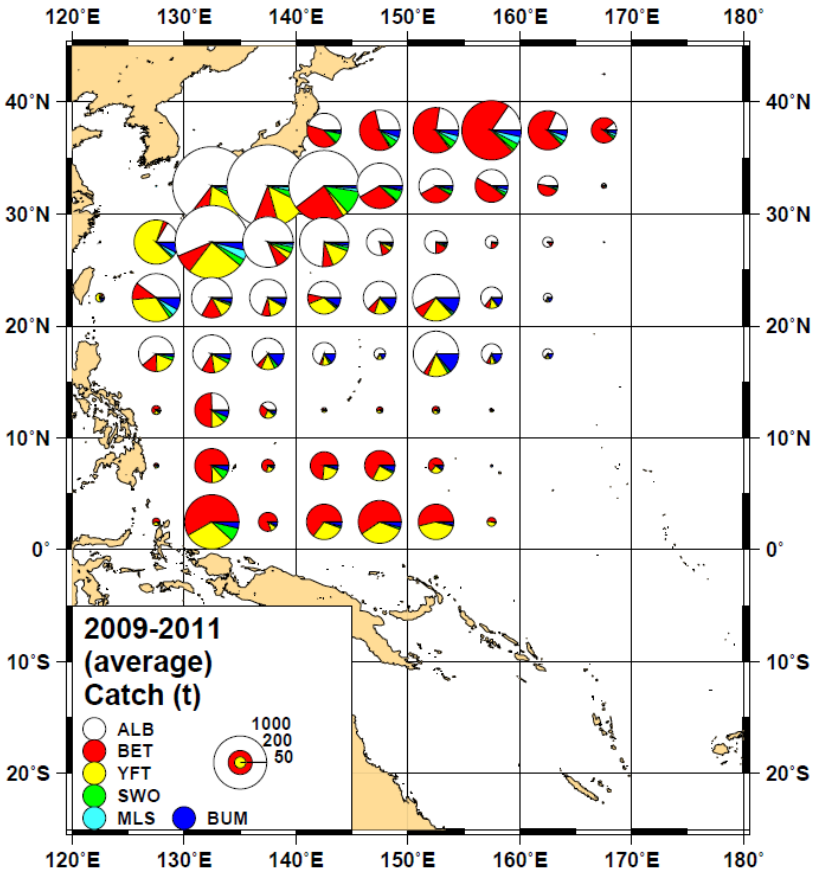

Fig. 6. Distributions of small offshore longline catch (in weight) by species in average of 2009-2011 for six main species (ALB: albacore, BET: bigeye tuna, YFT: yellowfin tuna, SWO: swordfish, MLS: striped marlin and BUM: blue marlin).

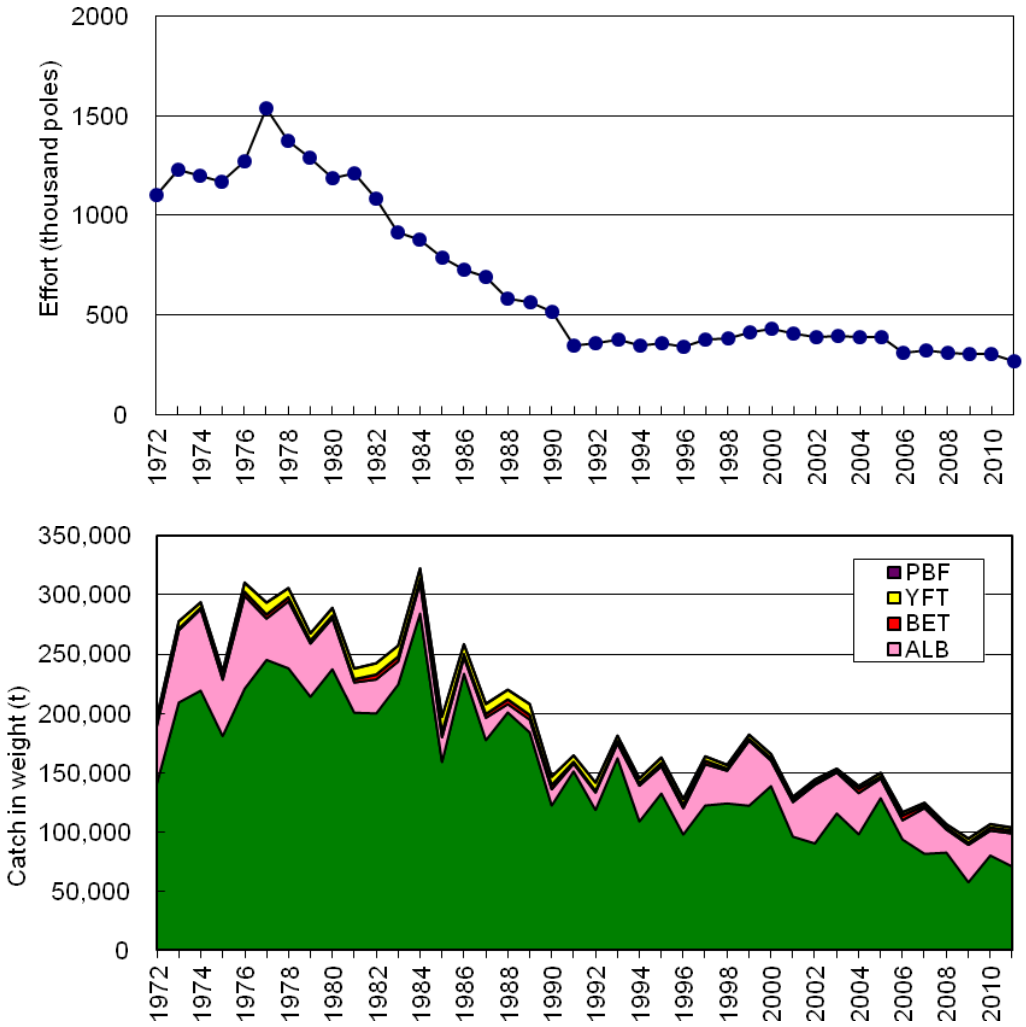

Fig. 7. Historical change of fishing effort and catches by species for the Japanese pole-and-line fishery (>20GRT) in the WCPFC Convention Area. Values in 2010 are provisional.

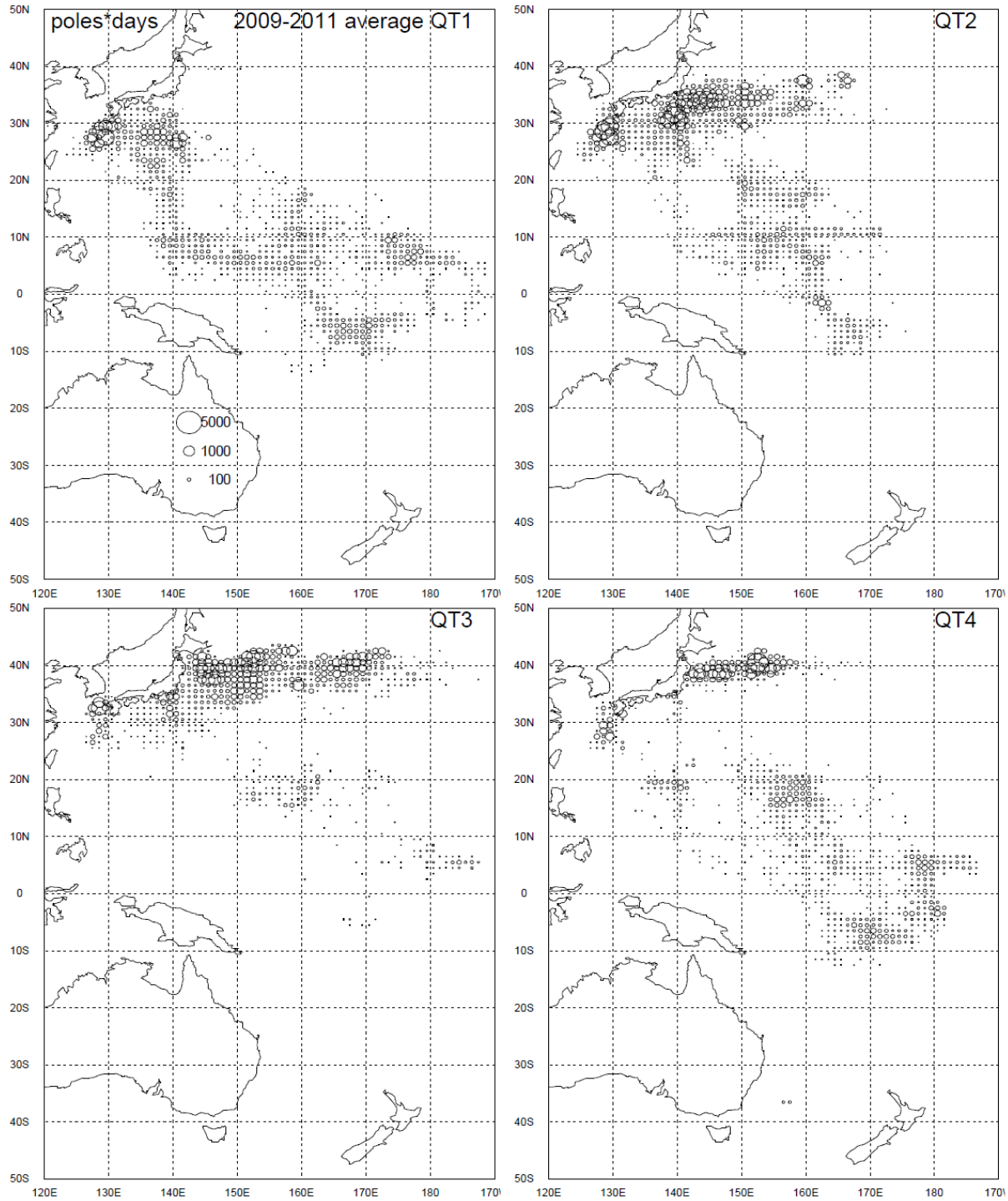

Fig. 8. Quarterly distribution of fishing effort (days) for the Japanese pole-and-line fishery (offshore and distant water licenses) in the Pacific Ocean in average of 2009-2011.

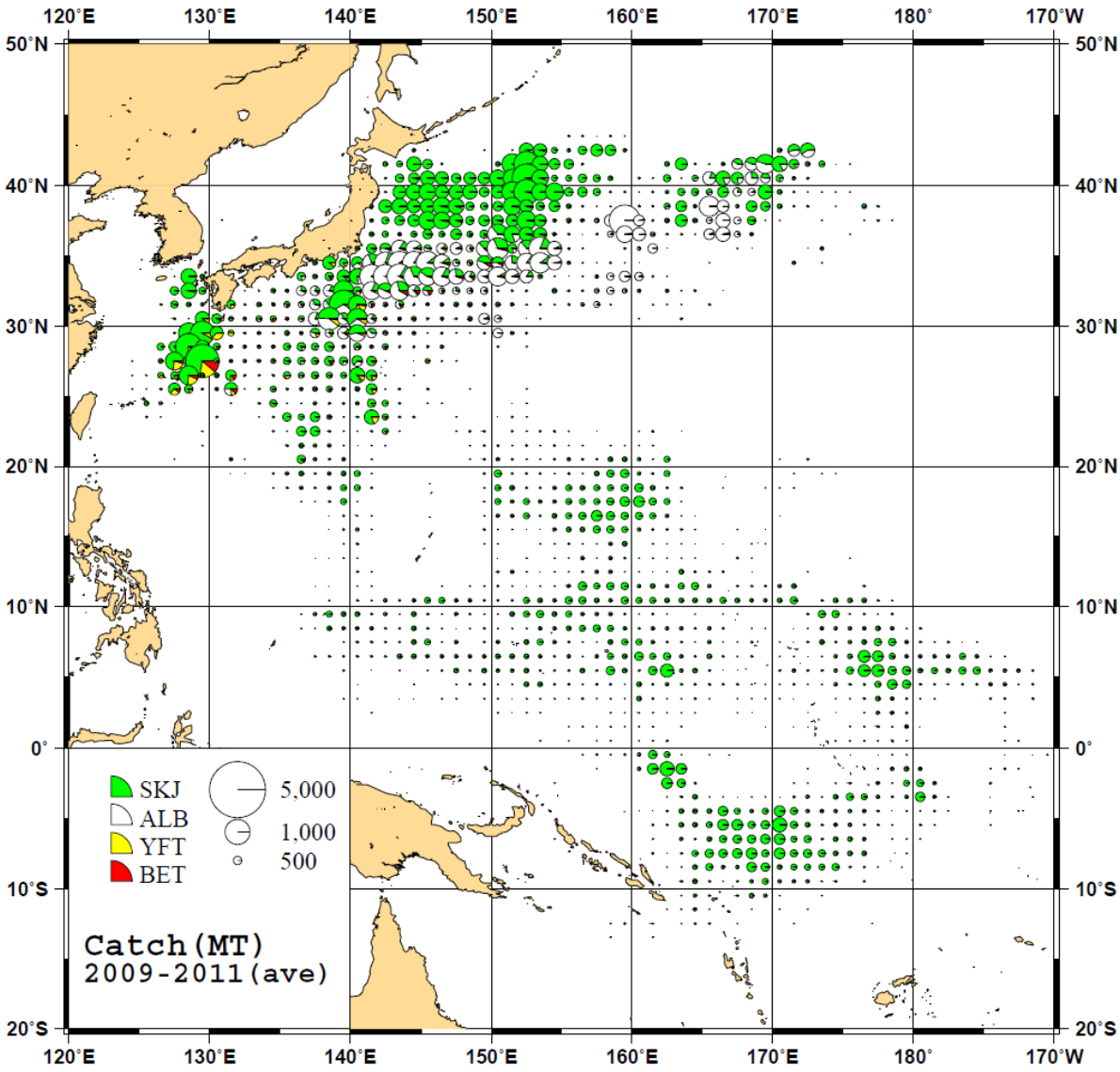

Fig. 9. Distribution of catch and its species composition for the Japanese offshore and distant water pole-and-line fishery in average of 2009-2011.

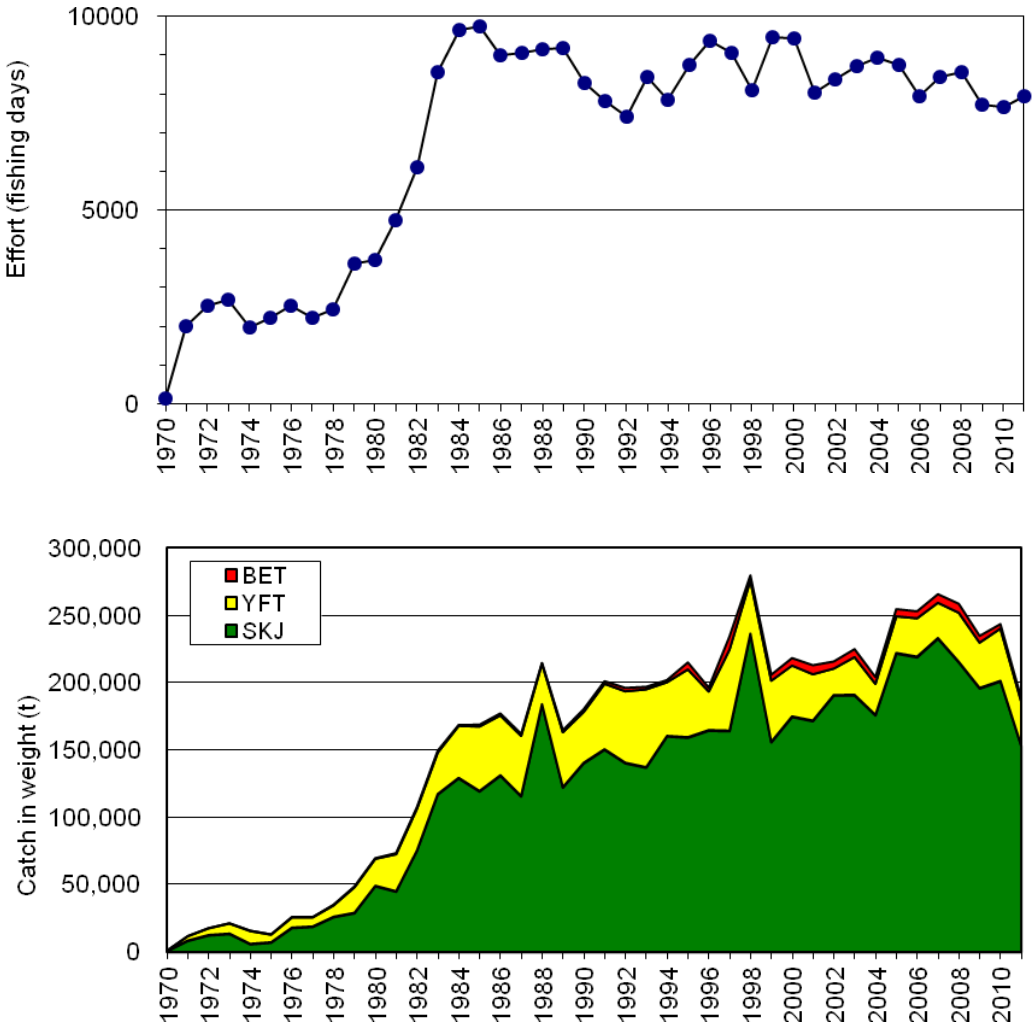

Fig. 10. Trends of fishing effort and catches by species for the Japanese tuna purse seine fishery in the WCPFC Convention Area.

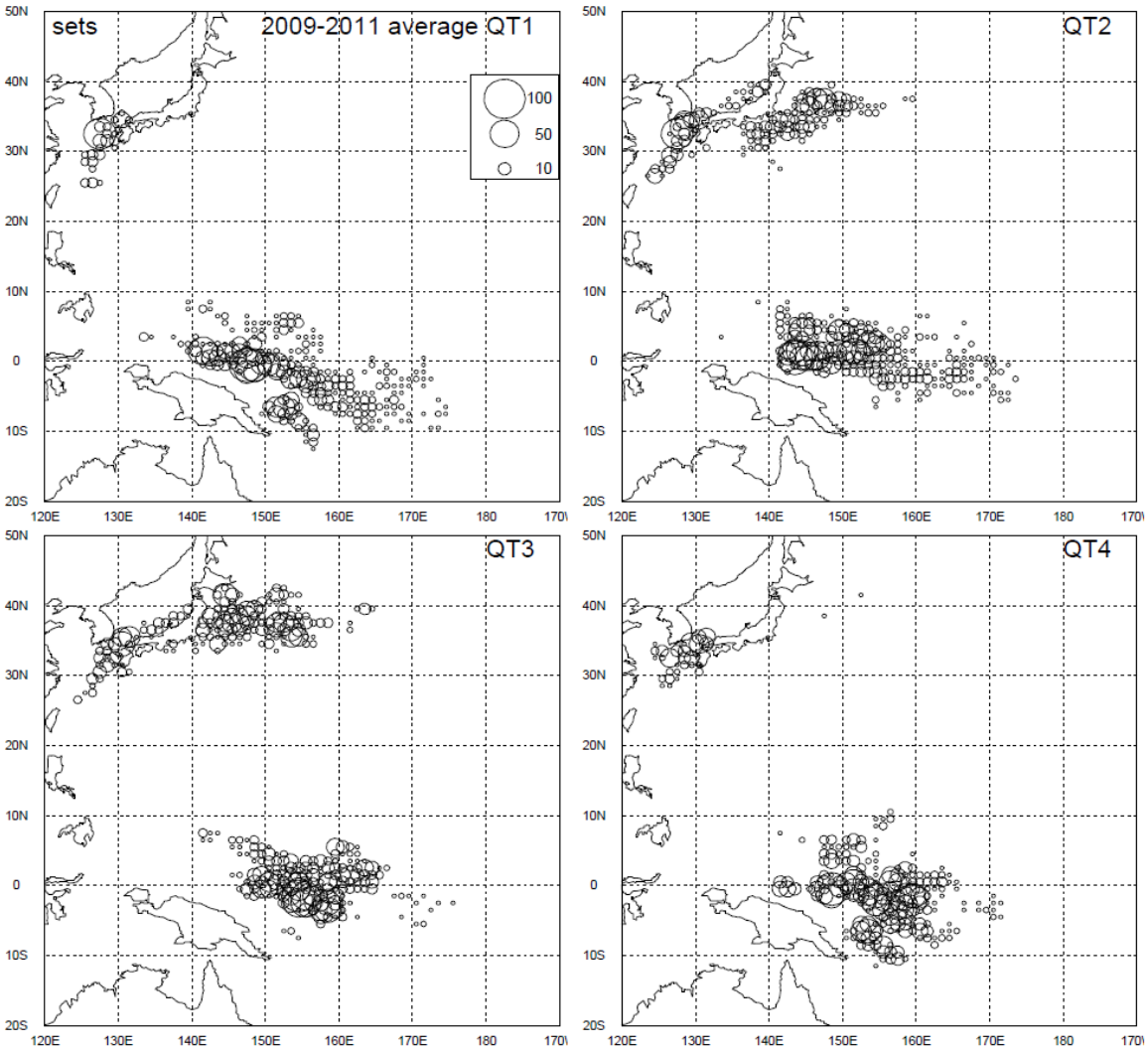

Fig. 11 Quarterly distributions of fishing effort (number of sets) for the Japanese tuna purse seine fishery in the Pacific Ocean in average of 2009-2011.

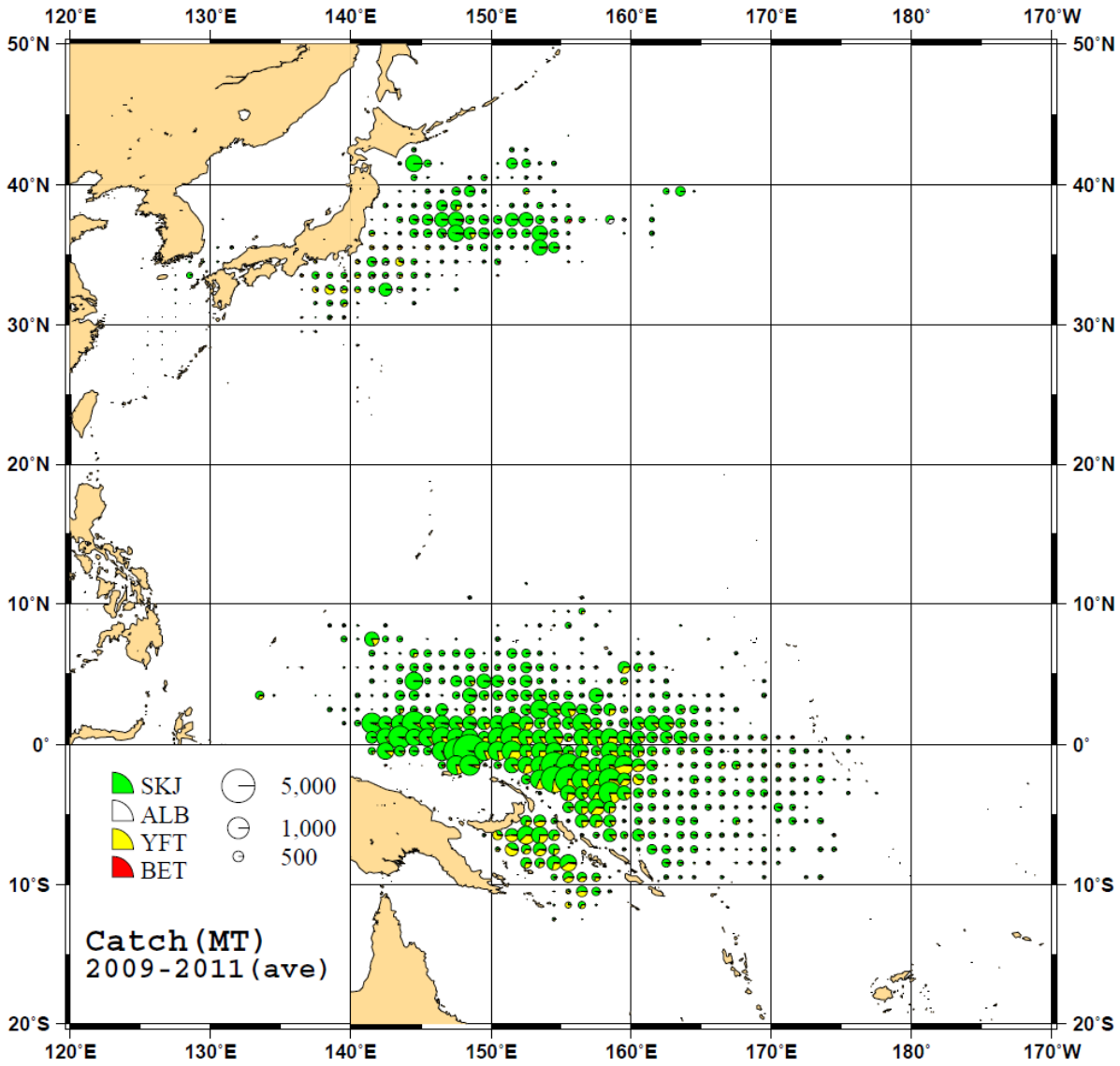

Fig. 12. Distribution of tuna purse seine catch (mt) by species (skipjack, yellowfin, bigeye and albacore) in average of 2009- 2011.

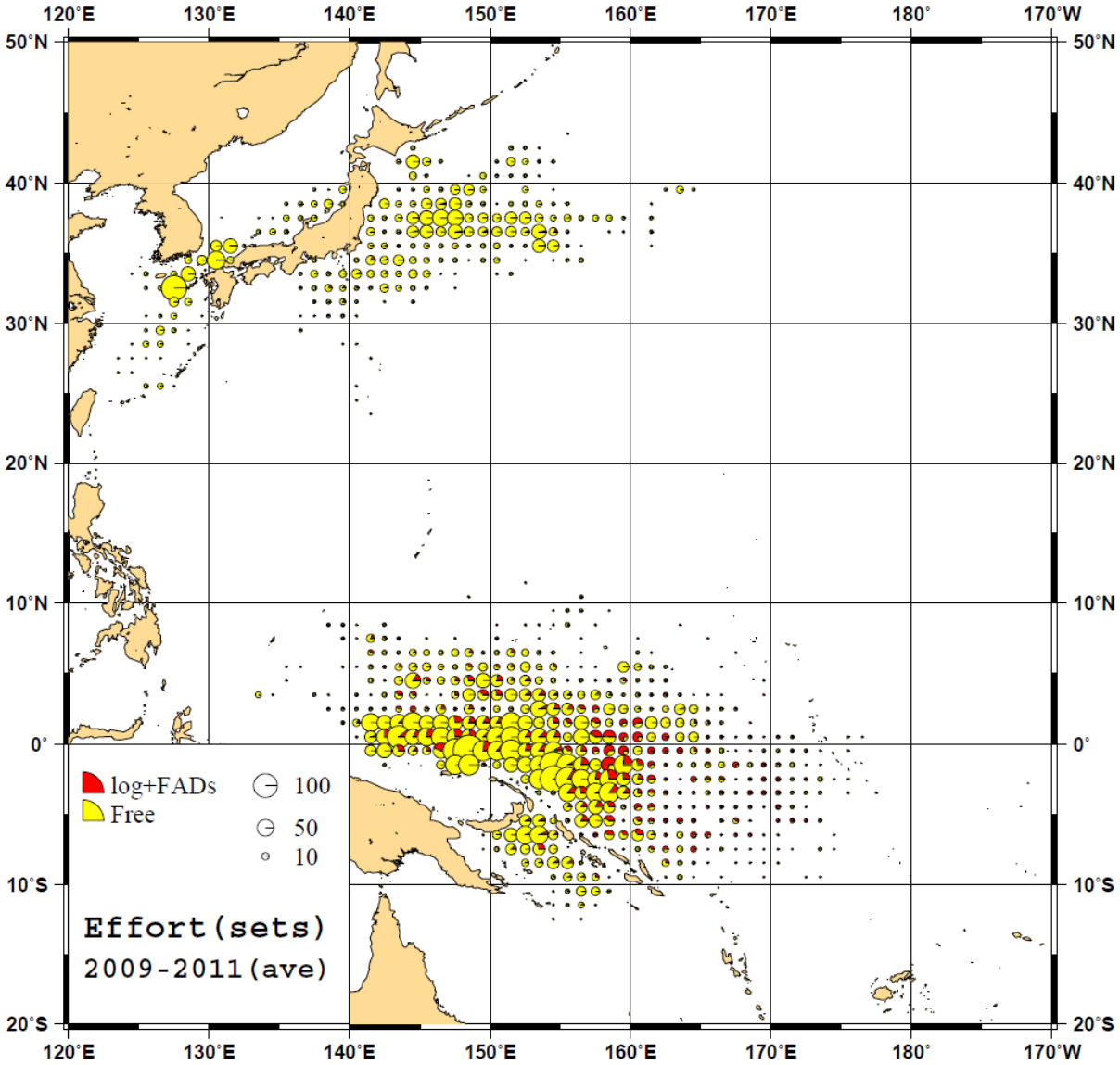

Fig. 13. Distribution of sets by type of school deployed by the tuna purse seine fishery in average of 2008-2011.

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
2007	1,787	411	9	166	1
2008	1,222	280	2	59	2
2009	1,228	414	4	83	1
2010	(1,778)	(290)	(7)	(64)	(5)
2011	(902)	(197)	(3)	(38)	(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.

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)			
2007	2004	83	236	6840	2385	1503	1209
2008	1476	19	64	10221	2074	2358	1192
2009	1304	8	50	8077	1875	2236	913
2010	(904)	(4)	(83)	(3742)	1301	1603	918
2011	(727)	(-)	(63)	(8331)	(1688)	(1957)	(572)

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)			
2007	0	8	0	0	0	0	0
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)	(-)	(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)			
2007	2004	83	236	6840	2385	1503	1209
2008	1476	19	64	10221	2074	2358	1192
2009	1304	8	50	8077	1875	2236	913
2010	(904)	(4)	(83)	(3742)	1301	1603	918
2011	(727)	(-)	(63)	(8331)	(1688)	(1957)	(572)

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)			
2007	0	8	0	0	0	0	0
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)	(-)	(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)			
2007	0	0	0	0	0	0	0
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)

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				
2007	18364	4017	104	37664	3	5679	226	519	30	44
2008	13677	5415	35	19025	1	824	1531	549	101	15
2009	18175	3820	91	31081	12	2064	149	410	32	43
2010	(17277)	(3890)	135	(19426)	27	(303)	24	588	42	37
2011	(17386)	(4497)	(135)	(28475)	27	(303)	(24)	(588)	(42)	(37)

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				
2007	45	4933	0	0	0	0	0	0	0	0
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)	(5758)	0	(8)	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				
2007	18364	3944	104	37664	3	5679	226	519	30	44
2008	13677	5231	35	19025	1	824	1531	549	101	15
2009	18175	3740	91	31081	12	2064	149	410	32	43
2010	(17277)	(3747)	135	(19426)	27	(303)	24	588	42	37
2011	(17386)	(4360)	135	(28475)	27	(303)	(24)	(588)	(42)	(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				
2007	45	3351	0	0	0	0	0	0	0	0
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)	(2719)	0	(8)	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				
2007	0	332	0	0	0	0	0	0	0	0
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)	(90)	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			
2007	2014	6109	829	2	492
2008	1785	4402	648	3	524
2009	1601	4400	682	3	489
2010	(1129)	(4235)	483	8	342
2011	(1129)	(3182)	(483)	(8)	(342)

Swordfish (2) the Pacific Ocean south of the Equator

Year	LL	LL	Gillnet	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water			
2007	0	1679	0	0	0
2008	0	1993	0	0	0
2009	0	2049	0	0	0
2010	(0)	(2852)	0	0	0
2011	(0)	(3211)	(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			
2007	2014	5902	829	2	490
2008	1785	3950	648	3	522
2009	1601	3721	682	3	488
2010	(1129)	(3631)	483	8	342
2011	(1129)	(2527)	(483)	(8)	(342)

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			
2007	0	434	0	0	0
2008	0	446	0	0	0
2009	0	508	0	0	0
2010	(0)	(562)	0	0	0
2011	(0)	(594)	(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			
2007	0	183	0	0	0
2008	0	161	0	0	0
2009	0	165	0	0	0
2010	(0)	(221)	0	0	0
2011	(0)	(187)	(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			
2007	860	306	970	21	63
2008	609	390	1302	26	81
2009	621	166	821	17	94
2010	(820)	(185)	899	20	104
2011	(820)	(308)	(899)	(20)	(104)

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			
2007	0	630	0	0	0
2008	0	482	0	0	0
2009	0	462	0	0	0
2010	(0)	(570)	0	0	0
2011	(0)	(720)	(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			
2007	860	270	970	21	63
2008	609	341	1302	26	81
2009	621	111	821	17	94
2010	(820)	(131)	899	20	104
2011	(820)	(219)	(899)	(20)	(104)

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			
2007	0	151	0	0	0
2008	0	134	0	0	0
2009	0	153	0	0	0
2010	(0)	(197)	0	0	0
2011	(0)	(246)	(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			
2007	0	28	0	0	0
2008	0	12	0	0	0
2009	0	8	0	0	0
2010	(0)	(14)	0	0	0
2011	(0)	(18)	(0)	(0)	(0)

Appendix Table 3. Catch in weight, of swordfish at south of 20° South of WCPFC statistical area by year with vessel statistics. Figures in the parentheses indicate provisional data. "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 20S		Chartered vessels		Other vessels fishing within the Japan's waters south of 20S		
	Catch (mt)	Number of Vessels	Catch (mt)	Number of Vessels	Flag	Catch (mt)	Number of Vessels
2007	115	21	0	0	--	--	--
2008	148	19	0	0	--	--	--
2009	167	19	0	0	--	--	--
2010	(192)	(26)	(0)	(0)	--	--	--
2011	(277)	(34)	(0)	(0)	--	--	--

Appendix Table 4. 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.

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

	Blue shark	Salmon shark and porbegle	Mako shark	Other sharks
2007	8,729	0	702	612
2008	7,100	0	569	147
2009	7,765	2	543	59
2010	(7,421)	(0)	(533)	(107)
2011	(4,101)	(1)	(551)	(148)

Small offshore longline (10-20 GRT)

	Blue shark	Salmon shark and porbegle	Mako shark	Other sharks
2007	16	0	65	33
2008	116	0	81	10
2009	81	2	69	3
2010	(88)	(0)	(93)	(1)
2011	(140)	(1)	(147)	(4)

Appendix Table 5. The total quantity (mt) of highly migratory fish stocks transshipped by fishing vessels in 2011.

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	796	355	112	847
Yellowfin	848	133	212	189
Swordfish	49	51	0	107
Others	406	109	141	153
Total	2,098	647	465	1,295

1.1.2. Catch outside the CA

	Port inside the CA	HS inside the CA
Bigeye	63	53
Yellowfin	6	8
Swordfish	18	12
Others	6	55
Total	94	128

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	1,655	491	324	1,065
Gutted and Headed	292	82	50	144
Whole	80	32	32	68
Fillets	0	3	0	12
Others	71	40	59	6
Total	2,098	647	465	1,295

1.2.2. Catch outside the CA

	Port inside the CA	HS inside the CA
Gilled and Gutted	72	62
Gutted and Headed	19	46
Whole	0	9
Fillets	0	0
Others	3	11
Total	94	128

2. Received by Japanese carriers

2.1. By species

2.1.1 Catch inside the CA

	Port inside the CA	HS inside the CA	HS outside the CA
Bigeye	215	2,886	321
Yellowfin	157	665	70
Swordfish	15	345	28
Others	3	257	60
Total	390	4,153	479

2.1.2. Catch outside the CA

	Port inside the CA
Bigeye	65
Yellowfin	7
Swordfish	18
Others	4
Total	94

Appendix Table 6. The number of transshipments involving highly migratory fish stocks in 2011.

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	17	3	2	8
Caught both inside and outside the CA	3	6	0	20
Caught outside the CA	1	2	0	0
Total	21	11	2	28

2. Received by Japanese carrier vessels
2.2 The number of transhipment

	Port inside the CA	HS inside the CA	HS outside the CA
Caught inside the CA	3	69	7
Caught outside the CA	3	0	0
Total	6	69	7