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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, 2014	YES Annual catch data, April 30. Catch and effort data, April 30. Size data, April 30.
If no, please indicate the reason(s) and intended actions:	

SUMMARY

This paper describes recent trends in the Japanese tuna and billfish fisheries, e.g., longline, pole-and-line, purse seine and other miscellaneous coastal fisheries in the WCPFC Convention Area (WCP-CA), including fleet size, catch and fishing effort statistics. Total number of commercial longline vessels shows a declining trend, from 448 vessels in 2009 to 397 in 2013. Total number of pole-and-line vessels (larger than 20 GRT) has decreased during the 2009-2013. For the purse seine vessels, the number of vessels over 200 GRT was 41 in 2013, which was the same in 2012. Out of the 41 vessels over 200GRT, the number of vessels which are allowed to operate in tropical waters in the Pacific Ocean was 35 in 2013 and has been stabilized since 1995.

The total 2013 WCP-CA catch of tunas (Pacific bluefin, albacore, bigeye, yellowfin and skipjack) by the Japanese fishery was still provisional and estimated to be 384,423 mt, and this is corresponding to 95% of 2012 total tunas catch (403,906 mt). In 2013, the total tuna catch by the purse seine fishery was 213,962 mt (56% of the total), with 112,537 mt (29%) by the pole-and-line fishery, 46,408 mt (12%) 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 2013 and early 2014 such as tagging study for skipjack, several research cruises on pacific bluefin tuna larval sampling and tropical tunas larvae/juvenile, and mitigation studies for bycatch species.

1. Introduction

This paper describes recent trends in the Japanese tuna and billfish fisheries, e.g., longline, pole-and-line, purse seine and the 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.

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 2009-2012 data (MAFFJ 2011-2013, MAFFJ 2014), 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 2009-2013 (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 448 vessels in 2009 to 397 in 2013. Especially, the declining trend for size categories 50-100 GRT are remarkable, the number of vessels of this categories were 20 vessels in 2013 which is 53% of that in 2009. The number of vessels for categories 100-200 GRT and over 200 GRT also shows a declining trend during 2009-2012, but the number of vessels increased in 2013.

Total number of pole-and-line vessels (larger than 20 GRT) has decreased during the 2009-2013. 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 68 in 2009 to 55 in 2013, corresponding to 19% decrease. The number of vessels for category over 200 GRT slightly decreased from 28 in 2009 to 25 in 2013, corresponding to 11% 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 31 to 34 without apparent trend during the 2009-2013 period. Note that the number of distant water purse seiners which are allowed to operate in tropical waters in the Pacific Ocean by government regulation was 35 and has been stabilized since 1995.

4. Trends in catch and effort

The total 2013 WCP-CA catch of tunas (Pacific bluefin, albacore, bigeye, yellowfin and skipjack) by the Japanese fishery was still provisional and estimated to be 384,423 mt, and this is corresponding to 95% of 2012 total tunas catch (403,906 mt). In 2013, the total tuna catch by the purse seine fishery was 213,962 mt (56% of the

total), with 112,537 mt (29%) by the pole-and-line fishery, 46,408 mt (12%) by the longline, and the remaining (3%) by the other gears, whereas, in 2012, the total tuna catch by the purse seine fishery was 232,322 mt (58% of the total), with 106,846 mt (27%) by the pole-and-line fishery, 53,437 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 2013 data, though the 20121and 2013 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 2009 to 2013 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 1971-2013. 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 4,854 mt in 2013, and bigeye catch showed decreasing trend, was 6,382 mt in 2013 (Table 2A).

The average quarterly effort distribution for distant water and offshore longline vessels during the 2011-2013 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 2009 to 2013 are shown in Table 2B. Total number of hooks deployed by small offshore longliner ranged between 74,549 thousand and 80,106 thousand hooks. Bigeye catch for the small offshore longline showed a declining trend was 5,341 mt in 2013 which is 63% of that in 2009. Yellowfin catch was relatively stable ranging between 2,924 mt and 5,251 mt during this period, was 2,924 mt in 2013. 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 2009-2013. In addition to this, historical changes in catch by species and effort are shown in Fig. 7 for the period of 1972-2013. The data for 2012 and 2013 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, The number of fishing days in 2013 was 11,783 days which is 74% of that in 2009 (Table 3). Total catch of tunas (skipjack, bigeye, yellowfin, albacore and bluefin) in 2013 was 98,616 mt, which is 2% decrease of that in 2012. The skipjack catch was 63,504 mt in 2013 which is 1% increase of that in 2012. The albacore catch was 31,864 mt in 2013.

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 2011-2013. 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 2009 to 2013. In addition to this, historical changes in catch by species and effort are shown in Fig. 10 for the period of 1970-2013. The data for 2013 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 218,329 mt in 2013, which is 91% of that in 2009 (238,969 mt). Skipjack catch showed a declining trend, was 181,605 mt in

2013, which is 94% of that in 2009 (192,713 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 showed a declining trend, was 22,513 mt in 2013, which is 68% of that in 2009 (33,031 mt).

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 dominant both in equatorial waters and northern waters.

According to the reports of the master of a vessel, Japanese tuna purse seine set a net on schools of tuna associated with a cetacean unintentionally five times in 2013 and all cetaceans were released alive.

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 2009-2013 is shown in Table 5. The figures in 2013 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 2009-2013. The data in 2012 and 2013 are preliminary. Total catch of skipjack showed no apparent trend ranging from 241,481 mt to 302,306 mt during this period. Total catch of yellowfin shows a declining trend from 56,053 mt in 2009 to 37,375 mt in 2013 (67%). Total catch of bigeye shows a declining trend, from 22,722 mt in 2009 to 17,567 mt in 2013 (77%) 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. After 2012, the observer program for tuna purse seine in vicinity of Japan water has been conducted. Three purse seine cruises were observed from June, July, and June to July 2013 in vicinity of Japan (Table 8). Days spent for these cruises were 13, 18 and 15 days, respectively. 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. Seven cruises of distant water longline vessels and 29 cruises of small offshore longline vessels were observed in the 2013 calendar year. Number of operation and species observed in each fishery was shown in Table 9. The data from 3 distant water cruises and 29 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 3 to 25 in the small offshore longline vessels and 72 to 88 in the distant water longlines. Regarding CMM 2011-04, observers on longline vessels reported that 3 oceanic whitetip sharks were released dead, while 8 oceanic whitetip sharks were released without alive/dead record in 2013_

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 fishing date and location) 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 per well were measured in average.

Followings are species, type of gear/fishery and location of sampling site for port sampling conducted in 2013;

- 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 2013. A total of 3,937 skipjack tuna including 118 fish with archival tag (Lotek LAT2910) were released. To date 400 fish including 6 fish with archival tag were recaptured. Archival tagging of skipjack tuna was conducted in the east off central Honshu area during June to July 2013 using offshore pole-and-line vessel. A total of 81 fish were released with archival tag, and so far 15 fish 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 2013, 786 skipjack tuna including 43 fish with archival tag were released at around Yonaguni Island (24˚N, 123˚E) in April, and so far 4 fish were recaptured.

Besides above research, three research/training pole-and-line vessels conducted skipjack tagging in the area 13-36˚N, 134-145˚E in 2013. Total of 573 skipjack were released with the conventional tag, and 20 were recovered. By one of these vessels, collaborative study of archival tagging with NRIFSF has been being

conducted since 2010. In 2013, a total of 78 archival tags were deployed in the south off Japan, and to date 2 fish were recaptured.

6.2. Research cruise conducted

PBF larval/juvenile sampling

Since 2011, larval studies have been conducted to estimate current core spawning area and time of PBF. In 2013 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 19 June and found that PBF larvae was abundant in the south of Yaeyama Islands and in the southwest Miyako Island. Larval surveys were conducted also in the Sea of Japan, which is another spawning ground of PBF, from 24 June to 20 August, and PBF larvae were captured in the west of Noto Peninsula and the east of Oki Islands. Compiling the three years cruise data from 2011 to 2013, spawning grounds of PBF were estimated by simulating backward Lagrangian transportation model. The results suggest that PBF start spawning late April in the west of Yaeyama Islands and east of Okinawa Main Island, expanding it ranges around Yaeyama Islands to Okinawa Main Island until late July toward the end in the Nansei Islands area. While in the Sea of Japan, PBF start spawning late June off Wakasa Bay and continue to spawn in around Noto to Oki throughout July.

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, 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 research cruise was from 14 Nov. 2013 to 26 Dec. 2013. Main research area was economic exclusive zone (EEZ) of Federated States of Micronesia (FSM) and high seas. During this research cruise, we conducted 20 times CTD observations and mid-water trawl samplings and 2-m ring plankton net tows for 60 times, troll for 18 times. Using these sampling gears, we collected larvae and juveniles of tuna species and skipjack. The number of larval specimen for tuna species was 34 (not yet identified their species), for skipjack was 56. The number of juvenile specimen for tuna species and skipjack were 171 and 639, respectively. We also collected other species such as lantern fish, lizard fish, cephalopoda (squid and octopus) and crustacean mainly by the mid-water trawl. Using the fishing gear, troll, we caught 182 fish in total. Most dominant species in number was yellowfin tuna (N = 67, 204 kg) and the second and third dominant species was skipjack (N = 46, 114 kg) and dolphin fish (N = 17, 50 kg), respectively. In FSM EEZ dominant three species in number were yellowfin tuna (N = 55, 143 kg), skipjack (N = 31, 64 kg) and dolphin fish (N = 14, 46 kg), respectively.

6.3. Bycatch species related research

Mitigation studies for seabirds

Effectiveness of tori line and weighted branchlines (Lumo lead and light stick) to reduce seabird bycatch using Japanese research vessel was examined in the North Pacific from Apr. to May 2014. Hook pods were used tentatively during the survey. The results showed that both tori line and Lumo lead were effective in preventing seabird attacks and incidental catch of seabirds. The results suggest that sole deployment of tori line or Lumo lead reduce albatross bycatch by pelagic longline fisheries in the western North Pacific.

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 2013. The use of circle hooks is effective to reduce incidental catch or deep hooking of sea turtles.

References

MAFFJ 2011-2013. Annual report of catch statistics on fishery and aquaculture, 2009-2011. Statistics Department, Minister's Secretariat, the Ministry of Agriculture, Forestry and Fisheries of Japan.

MAFFJ 2014. Annual report of catch statistics on fishery and aquaculture 2012, on the portal site for governmental statistics "e-Stat" (updated in May 21, 2014). http://www.e-stat.go.jp/SG1/estat/GL08020101.do?_toGL08020101_&tstatCode=000001015174&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
2009	277	38	33	100	448
2010	290	29	28	113	460
2011	274	24	25	111	434
2012	265	21	21	98	405
2013	(246)	(20)	(25)	(106)	(397)

Pole-and-line

	20-50 ton	50-200 ton	200- ton	Total
2009	1	68	28	97
2010	1	66	28	95
2011	0	63	28	91
2012	0	60	27	87
2013	(0)	(55)	(25)	(80)

Purse Seine

	50-200 ton	200-500 ton	500- ton	Total
2009	33	36	3	72
2010	31	35	4	70
2011	33	36	4	73
2012	34	37	4	75
2013	(34)	(37)	(4)	(75)

Table 2. Fishing effort (in 1000 hooks) and catch (MT) in the WCPFC Convention Area by species for the Japanese distant and offshore (top table) and small offshore (bottom table) longline fisheries. By 2012, catches of silky shark, hammerhead sharks and whale shark are included in other shark. Figures in the parentheses indicate provisional data.

PBF: Pacific Bluefin tuna, ALB: Albacore, BET: Bigeye tuna, YFT: Yellowfin tuna, SWO: Swordfish, MLS: Striped marlin, BUM: Blue marlin, BLM: Black marlin, SFA: Sail fish, SSP: Shortbill spearfish, BSH: Blue shark, LMD: Salmon shark, POR: Porbeagle shark, SMA: Shortfin mako shark, OCS: Oceanic white-chip shark, THR: Thresher sharks nei, FAL: Silky sharks, SPN: Hammerhead sharks nei, RHN: Whale shark, O-shk: other sharks

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

	#hooks	PBF	ALB	BET	YFT	SWO	MLS	BUM	BLM	SFA	SSP
2009	67,238	15	6,542	8,457	10,246	4,297	254	1,260	68	80	72
2010	81,428	12	6,875	8,657	11,721	4,302	325	1,431	71	148	109
2011	70,446	20	7,351	8,255	7,033	2,996	442	1,478	29	75	130
2012	(68,123)	(14)	(7,585)	(8,375)	(7,065)	(3,243)	(425)	(1,137)	(20)	(45)	(111)
2013	(67,538)	-	(7,019)	(6,382)	(4,854)	(3,687)	(424)	(991)	(31)	(69)	(179)

	BSH	LMD	POR	SMA	OCS	THR	FAL	SPN	RHN	O-shk	Total
2009	14,297	544	5	770	58	199	-	-	-	61	47,212
2010	14,103	168	3	764	120	180	-	-	-	108	49,084
2011	6,848	62	3	714	268	192	-	-	-	142	36,017
2012	(10,860)	(467)	(1)	(751)	(46)	(84)	-	-	-	(27)	(40,241)
2013	(10,595)	(220)	(1)	(668)	(0)	(114)	(0)	(0)	(0)	(141)	(35,374)

Small offshore longline (10-20 GRT)

	#hooks	PBF	ALB	BET	YFT	SWO	MLS	BUM	BLM	SFA	SSP
2009	74,549	-	-	8,514	3,439	1,536	451	1,094	14	25	1
2010	80,106	-	-	7,326	5,251	1,086	641	1,482	16	43	0
2011	75,675	-	-	8,523	3,908	885	710	1,184	13	34	1
2012	(70,256)	-	-	(7,061)	(2,937)	(962)	(766)	(985)	(10)	(30)	(0)
2013	(63,621)	-	-	(5,341)	(2,924)	(742)	(810)	(1,105)	(15)	(15)	(0)

	BSH	LMD	POR	SMA	OCS	THR	FAL	SPN	RHN	O-shk	Total
2009	285	63	0	46	0	0	-	-	-	15	15,483
2010	317	44	0	26	0	0	-	-	-	12	16,246
2011	459	12	0	24	0	0	-	-	-	9	15,763
2012	(524)	(78)	(0)	(3)	(0)	(0)	-	-	-	(5)	(13,360)
2013	(695)	(168)	(0)	(21)	(0)	(0)	(0)	(0)	(0)	(91)	(11,928)

* 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
2009	15,884	300,666	57,769	3,565	1,429	-	31,081	93,845
2010	16,132	305,017	80,435	2,874	2,250	-	19,426	104,986
2011	14,564	275,484	73,103	2,603	2,239	-	25,656	103,601
2012	(14,804)	(280,356)	(57,266)	(1,679)	(2,036)	-	(33,665)	(94,646)
2013	(11,783)	(222,286)	(63,504)	(1,032)	(2,241)	-	(33,665)	(100,442)

* 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
2009	7,709	192,713	33,031	3,452	-	2,064	238,969
2010	7,879	206,204	38,984	2,758	-	303	256,128
2011	8,036	156,401	33,887	2,675	-	462	201,461
2012	7,370	193,372	28,742	3,493	-	4,180	237,157
2013	(7,210)	(181,605)	(22,513)	(2,820)		(4,180)	(218,329)

* 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
2009	6	1,281	499	-	-	70	171	241	482
2010	7	1,844	414	-	-	72	191	164	427
2011	7	1,701	525	-	-	81	212	153	446
2012	11	1,289	446	-	-	99	200	148	447
2013	(11)	(1,289)	(446)	-	-	(99)	(200)	(148)	(447)

Coastal pole-and-line

	SKJ	YFT	BET	PBF*	ALB	Total
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	9,930	1,994	71	-	92	12,087
2013	(9,930)	(1,994)	(71)	-	(92)	(12,087)

Coastal purse seine

	SKJ	YFT	BET	PBF*	ALB	Total
2009	515	30	0	-	12	557
2010	2,361	50	32	-	27	2,470
2011	87	3	0	-	0	90
2012	58	2	0	-	13	73
2013	(58)	(2)	(0)	-	(13)	(73)

Gillnet

	SKJ	YFT	BET	PBF*	ALB	Total
2009	324	12	7	103	149	595
2010	315	22	2	140	24	503
2011	111	6	1	61	12	191
2012	95	6	2	51	26	180
2013	(95)	(6)	(2)	(51)	(26)	(180)

Troll

	SKJ	YFT	BET	PBF	ALB	Total
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	3,487	2,279	118	1,218	610	7,712
2013	(3,487)	(2,279)	(118)	(1,218)	(610)	(7,712)

Setnet

	SKJ	YFT	BET	PBF	ALB	Total
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	404	113	0	1,932	48	2,497
2013	(404)	(113)	(0)	(1,932)	(48)	(2,497)

* 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.

	2009	2010	2011	2012	2013
Skipjack					
Total	264,369	302,306	241,481	(265,013)	(259,504)
Distant water and Offshore LL	57	82	125	(199)	(220)
Distant water and Offshore PL	57,769	80,435	73,103	(57,266)	(63,504)
Tuna PS	192,713	206,204	156,401	193,372	(181,605)
Small offshore LL	5	3	5	(4)	(2)
Coastal LL	6	7	7	11	(11)
Coastal PL	8,609	7,632	9,144	9,930	(9,930)
Coastal PS	515	2,361	87	58	(58)
Gill net	324	315	111	95	(95)
Troll	3,819	4,729	1,780	3,487	(3,487)
Set net	274	333	625	404	(404)
Unclassified	278	205	93	188	(188)
Yellowfin					
Total	56,053	66,133	53,903	(46,475)	(37,375)
Distant water and Offshore LL	10,246	11,721	7,033	(7,065)	(4,854)
Distant water and Offshore PL	3,565	2,874	2,603	(1,679)	(1,032)
Tuna PS	33,031	38,987	33,887	28,742	(22,513)
Small offshore LL	3,439	5,251	3,908	(2,937)	(2,924)
Coastal LL	1,281	1,844	1,701	1,289	(1,289)
Coastal PL	1,494	1,693	1,815	1,994	(1,994)
Coastal PS	30	50	3	2	(2)
Gill net	12	22	6	6	(6)
Troll	2,534	3,167	2,497	2,279	(2,279)
Set net	86	103	111	113	(113)
Unclassified	335	421	339	369	(369)
Bigeye					
Total	22,722	21,804	22,599	(21,748)	(17,567)
Distant water and Offshore LL	8,457	8,657	8,255	(8,375)	(6,382)
Distant water and Offshore PL	1,429	2,250	2,239	(2,036)	(2,241)
Tuna PS	3,452	2,758	2,675	3,493	(2,820)
Small offshore LL	8,514	7,326	8,523	(7,061)	(5,341)
Coastal LL	499	414	525	446	(446)
Coastal PL	151	124	100	71	(71)
Coastal PS	0	32	0	0	(0)
Gill net	7	2	1	2	(2)
Troll	115	157	141	118	(118)
Set net	5	4	2	0	(0)
Unclassified	93	80	138	146	(146)

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	2009	2010	2011	2012	2013
Distant water longline	99%	100%	100%	100%	94%
Offshore longline	92%	92%	100%	94%	91%
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%	100%	100%
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	Ishinomaki - Ishinomaki	Ishinomaki - Onagawa	Yamagawa - Ishinomaki
Date of departure	2013/06/15	2013/07/01	2013/06/22
Date of return	2013/06/27	2013/07/18	2013/07/06
Days of cruise	13	18	15
Days of fishing	11	16	11
Number of set	12	18	6
Total catch (mt)	135	355	153

Table 9. Number of operations and catch number for longline observer program in the western central Pacific in 2013.

Fishery	Small offshore longline	Distant water longline
Number of Cruises	29	3
Number of Operation	549	222
Number of Catch Observed	17,863	8,377
Albacore	3,406	6,003
Yellowfin tuna	2,785	65
Southern bluefin tuna	0	444
Bigeye tuna	4,013	47
Bluefin tuna	6	0
Skipjack tuna	397	265
Sailfish	36	0
Black marlin	1	1
Blue marlin	503	0
Shortbill spearfish	74	53
Striped marlin	50	18
Swordfish	262	26
Lancetfishes	1,617	647
Opah	202	81
Pomfrets	1,019	73
Dolphin fish	194	162
Escoler	254	178
Other fishes	357	82
Thresher sharks	456	0
Shortfin mako	76	18
Blue shark	1,076	114
Other Sharks	143	0
Sting ray	928	84
Other Rays	0	0
Sea Birds	1	16
Sea Turtles	7	0
Mammals	0	0
Unidentified	0	0

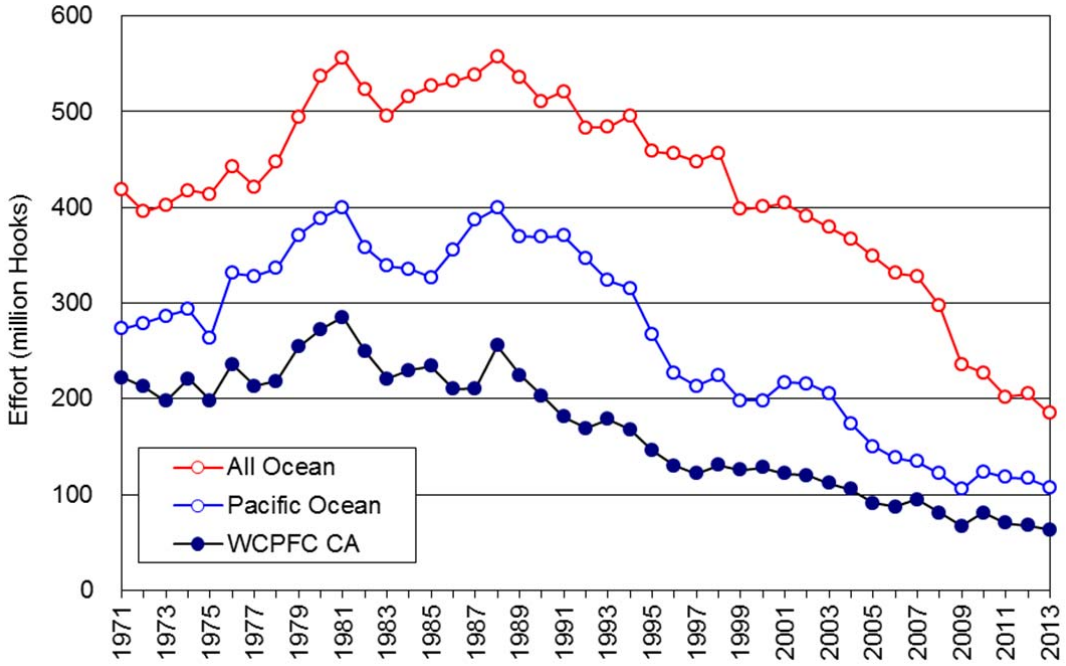

Fig. 1. Historical change in fishing effort of the Japanese distant water and offshore longline fishery (not including small offshore) in the WCPFC Convention Area. Values in 2012 and 2013 are provisional.

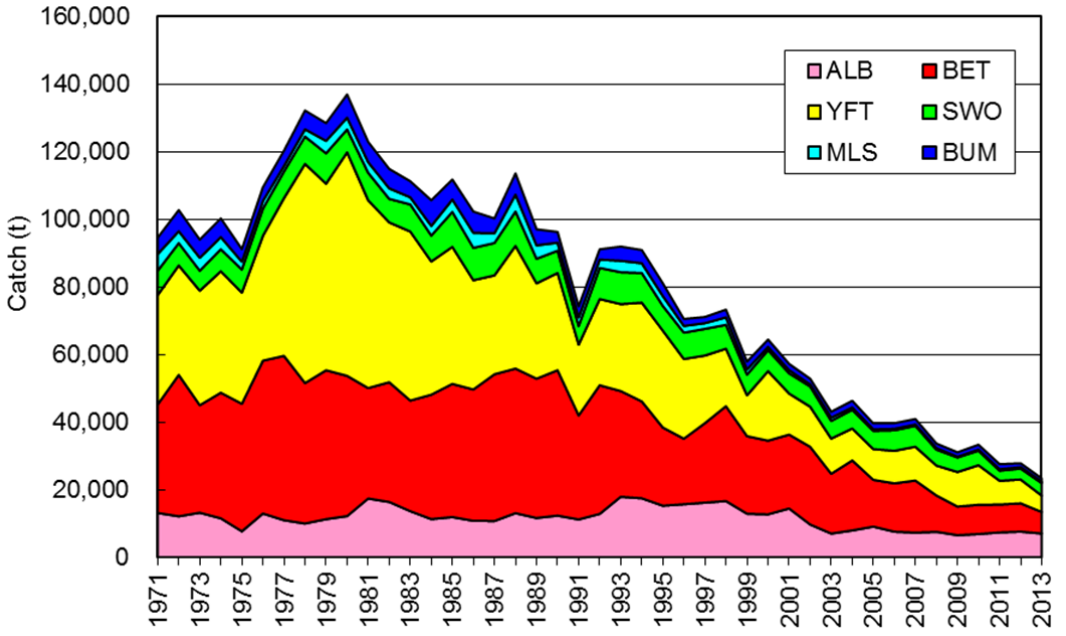

Fig. 2. Historical change of catches for major species for the Japanese distant water and offshore longline fishery (not including small offshore) in the WCPFC Convention Area. ALB: albacore, BET: bigeye, YFT: yellowfin, SWO: sword fish, MLS: striped marlin, BUM: blue marlin. Values in 2012 and 2013 are provisional.

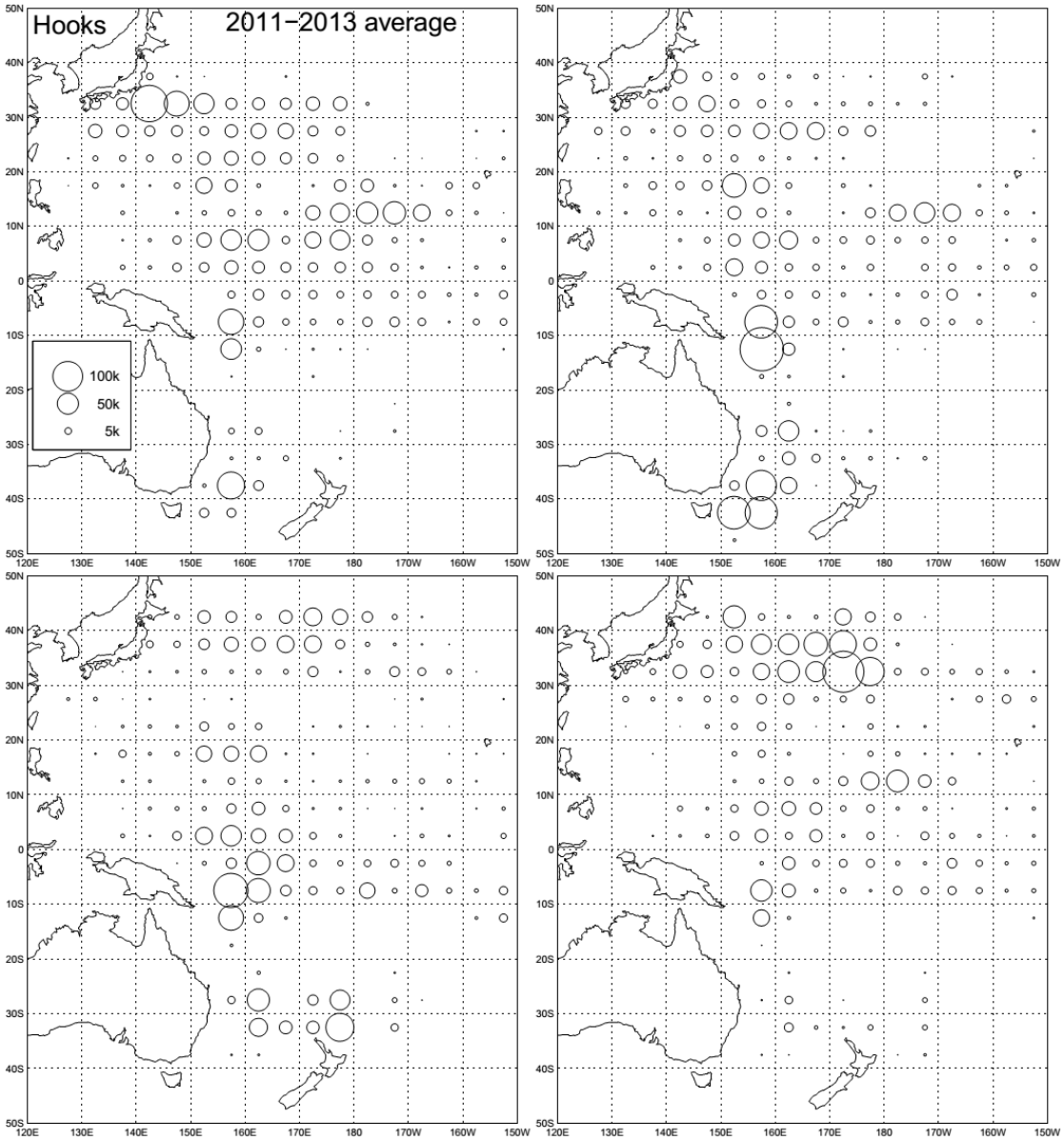

Fig. 3. Quarterly distribution of fishing effort for the Japanese offshore and distant water longline fisheries in the western and central Pacific Ocean in average of 2011-2013.

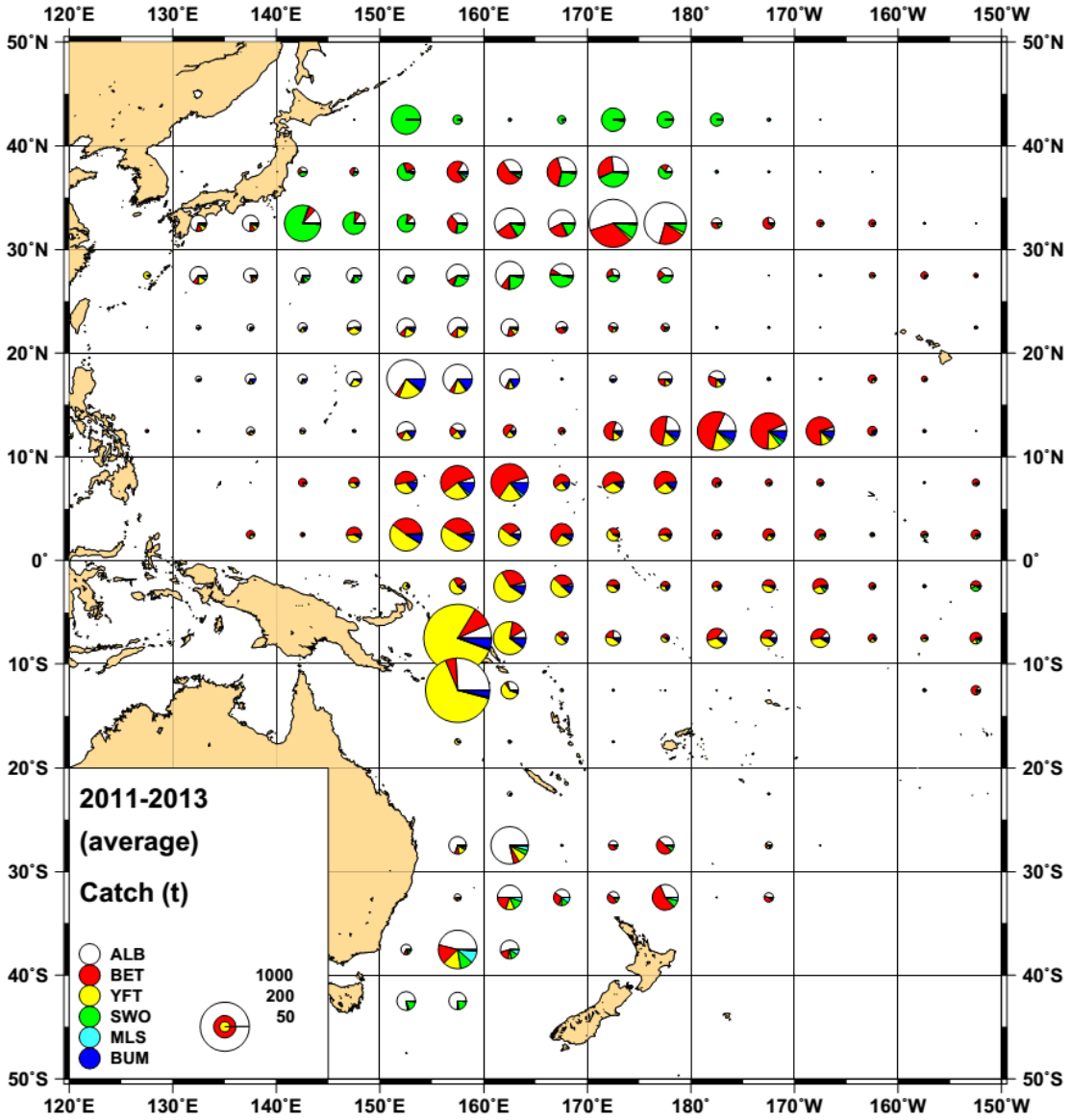

Fig. 4. Distributions of offshore and distant water longline catch (in weight) by species in average of 2011-2013 for six main species (ALB: albacore, BET: bigeye tuna, YFT: yellowfin tuna, SWO: swordfish, MLS: striped marlin and BUM: blue marlin).

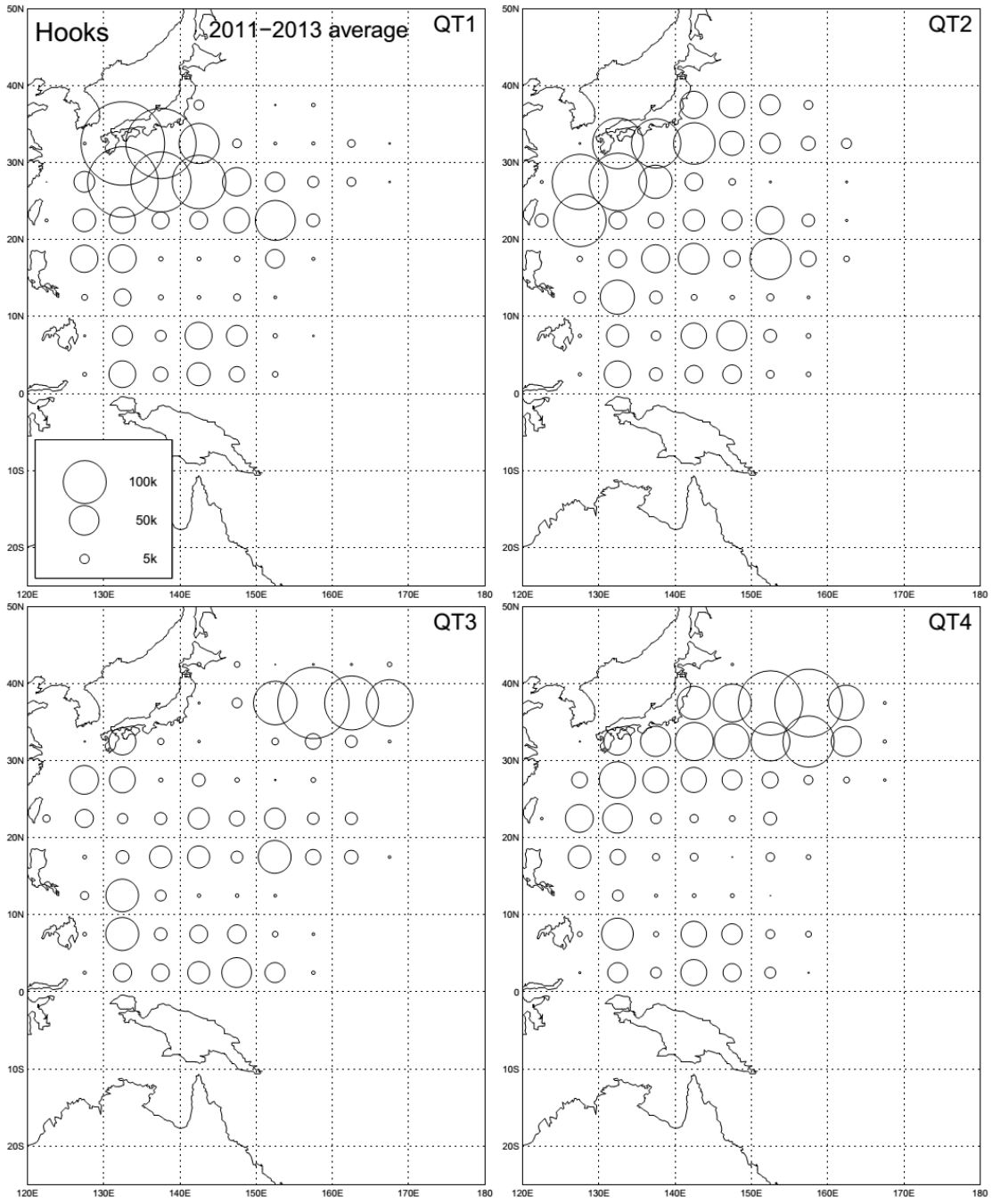

Fig. 5. Quarterly distribution of fishing effort for the Japanese small offshore longline fisheries (10- 20 GRT) in the western and central Pacific Ocean in average of 2011-2013.

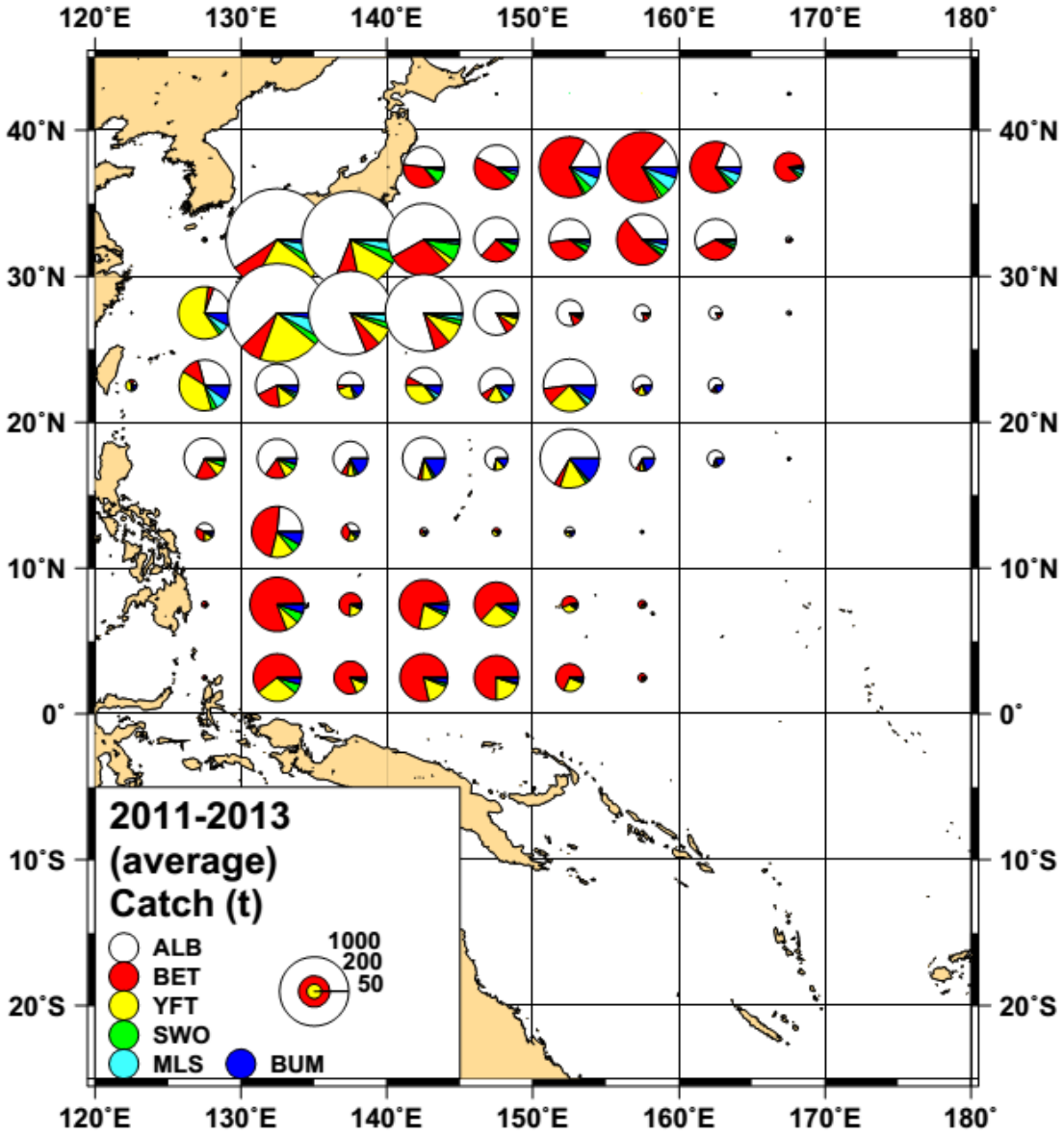

Fig. 6. Distributions of small offshore longline catch (in weight) by species in average of 2011-2013 for six main species (ALB: albacore, BET: bigeye tuna, YFT: yellowfin tuna, SWO: swordfish, MLS: striped marlin and BUM: blue marlin).

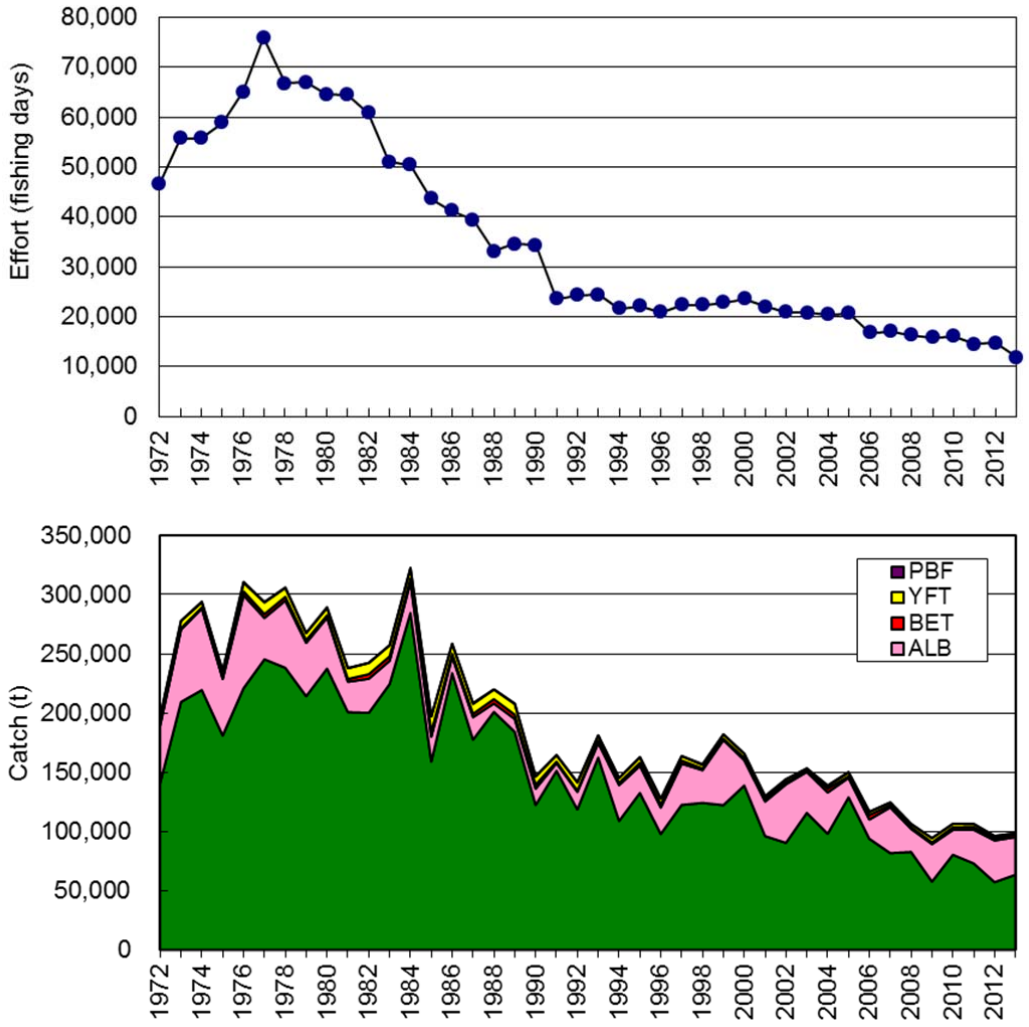

Fig. 7. Historical change of fishing effort and catches by species for the Japanese pole-and-line fishery (>20GRT) in the WCPFC Convention Area. Values in 2012 and 2013 are provisional.

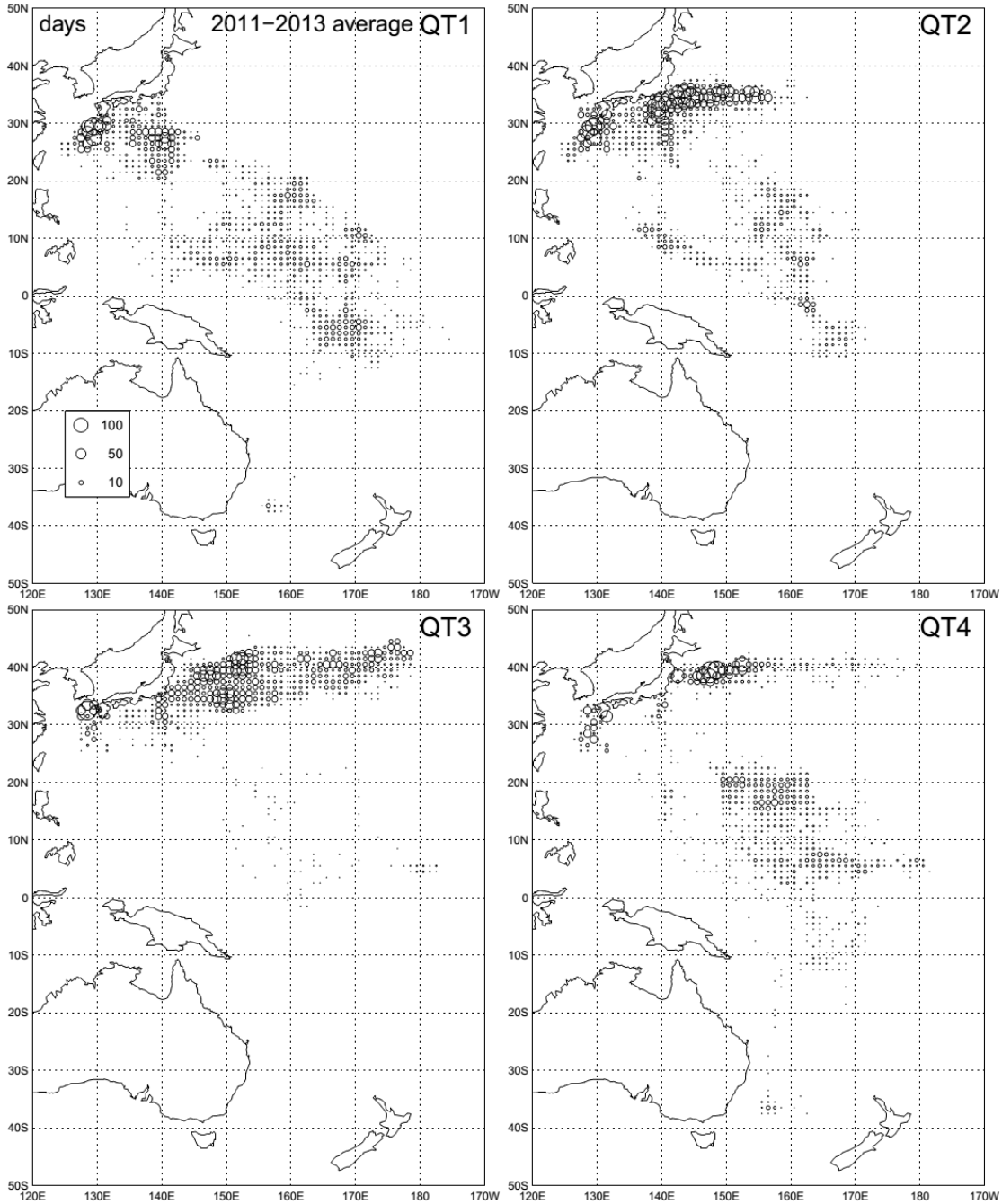

Fig. 8. Quarterly distribution of fishing effort (days) for the Japanese pole-and-line fishery (offshore and distant water licenses) in the Pacific Ocean in average of 2011-2013.

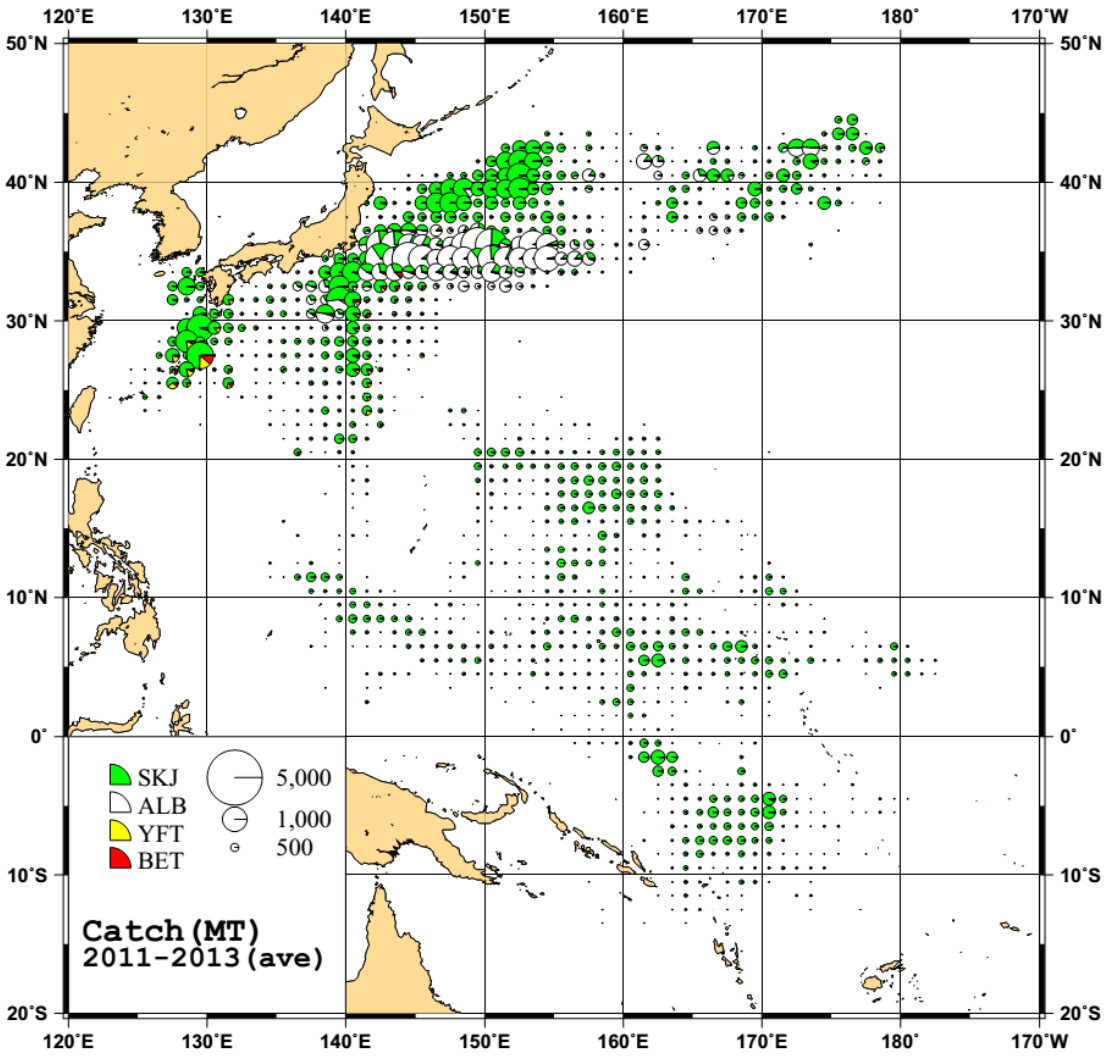

Fig. 9. Distribution of catch and its species composition for the Japanese offshore and distant water pole-and-line fishery in average of 2011-2013.

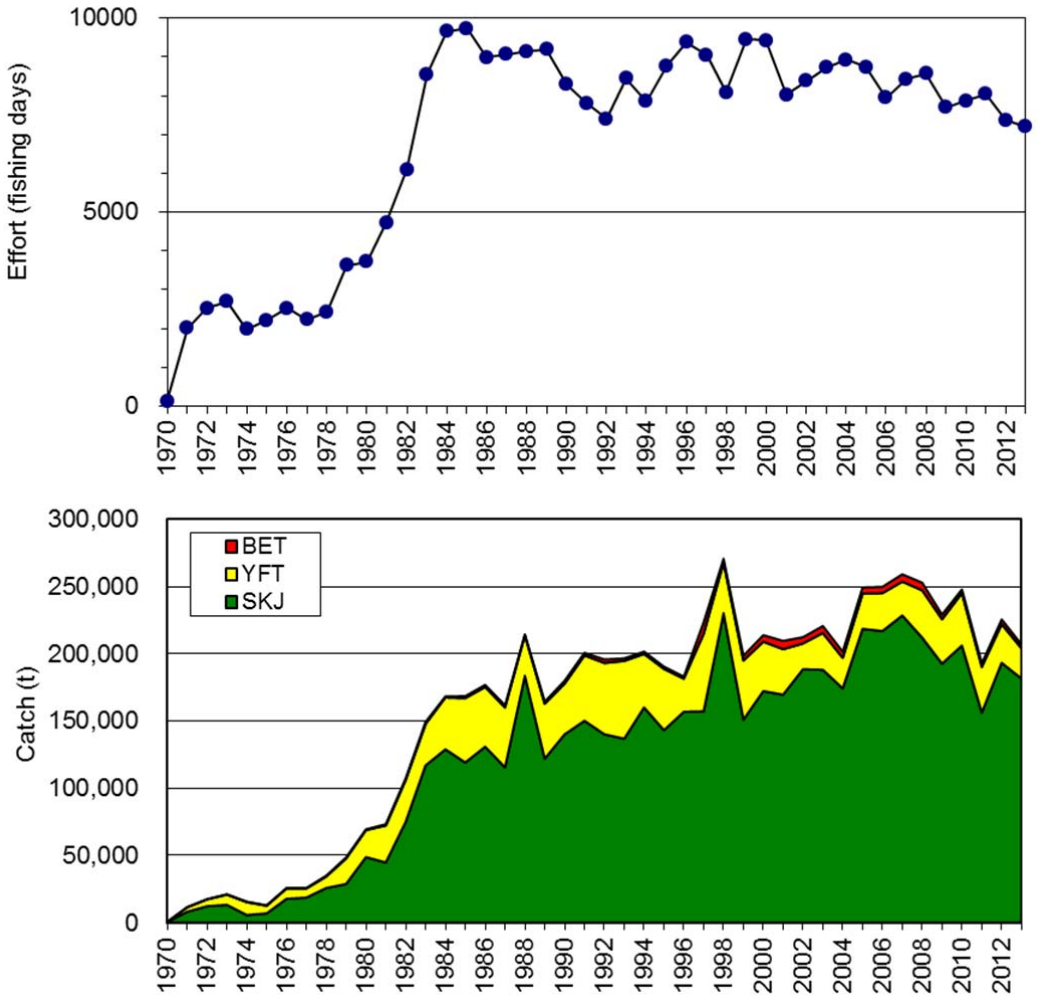

Fig. 10. Trends of fishing effort and catches by species for the Japanese tuna purse seine fishery in the WCPFC Convention Area. Values in 2012 and 2013 are provisional.

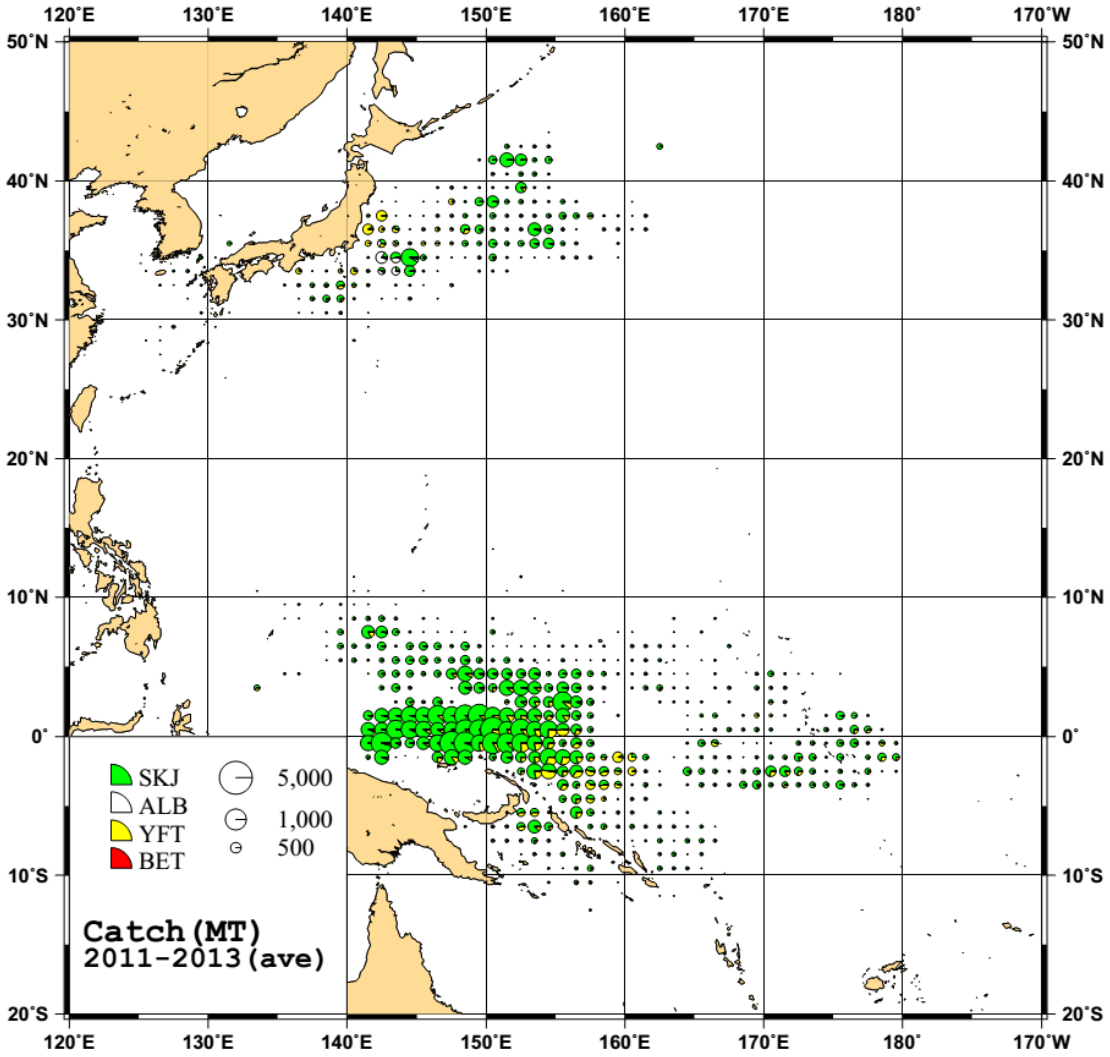

Fig. 11. Distribution of tuna purse seine catch (t) by species (skipjack, yellowfin and bigeye) combined for 2011-2013.

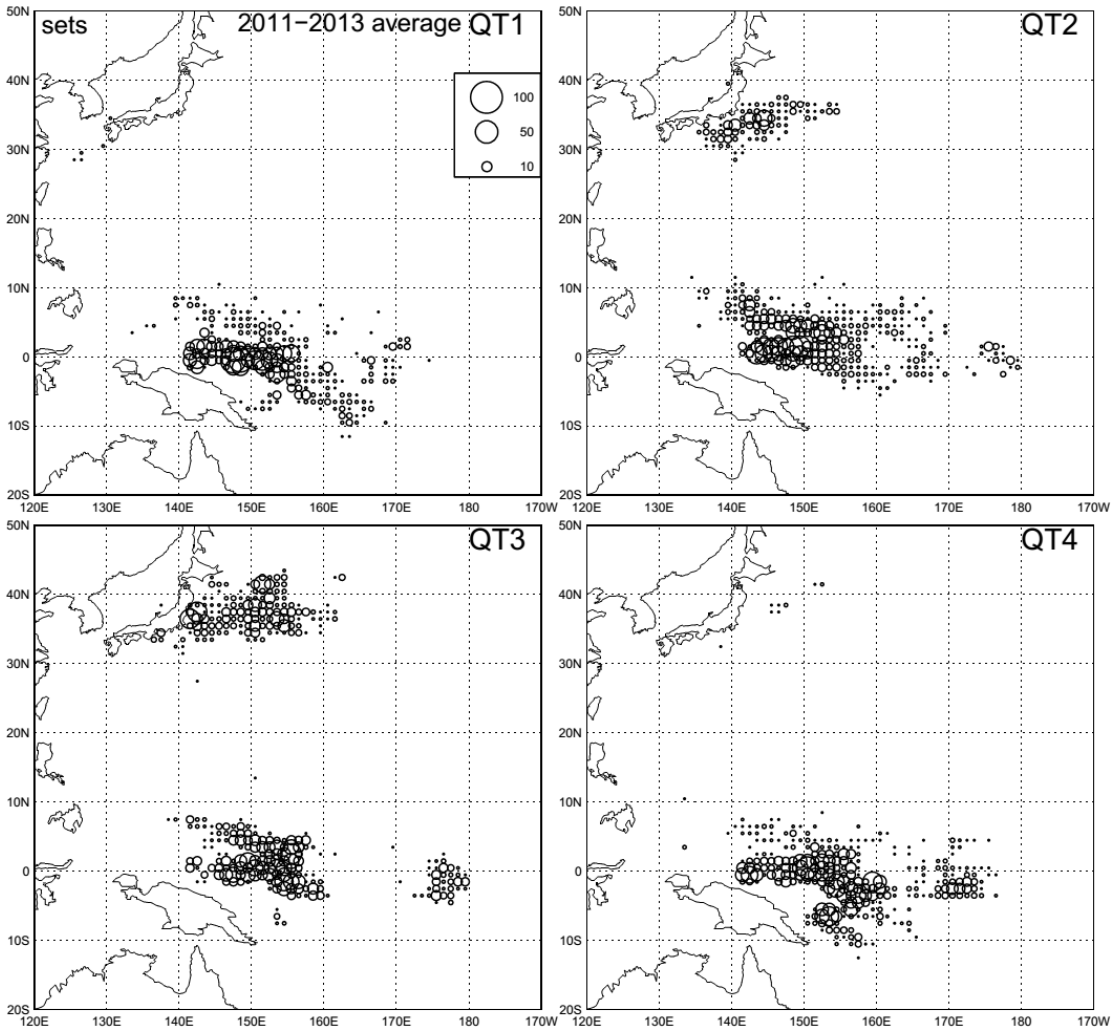

Fig. 12. Quarterly distributions of fishing effort (number of set) for the Japanese tuna purse seine fishery in the Pacific Ocean in 2011-2013.

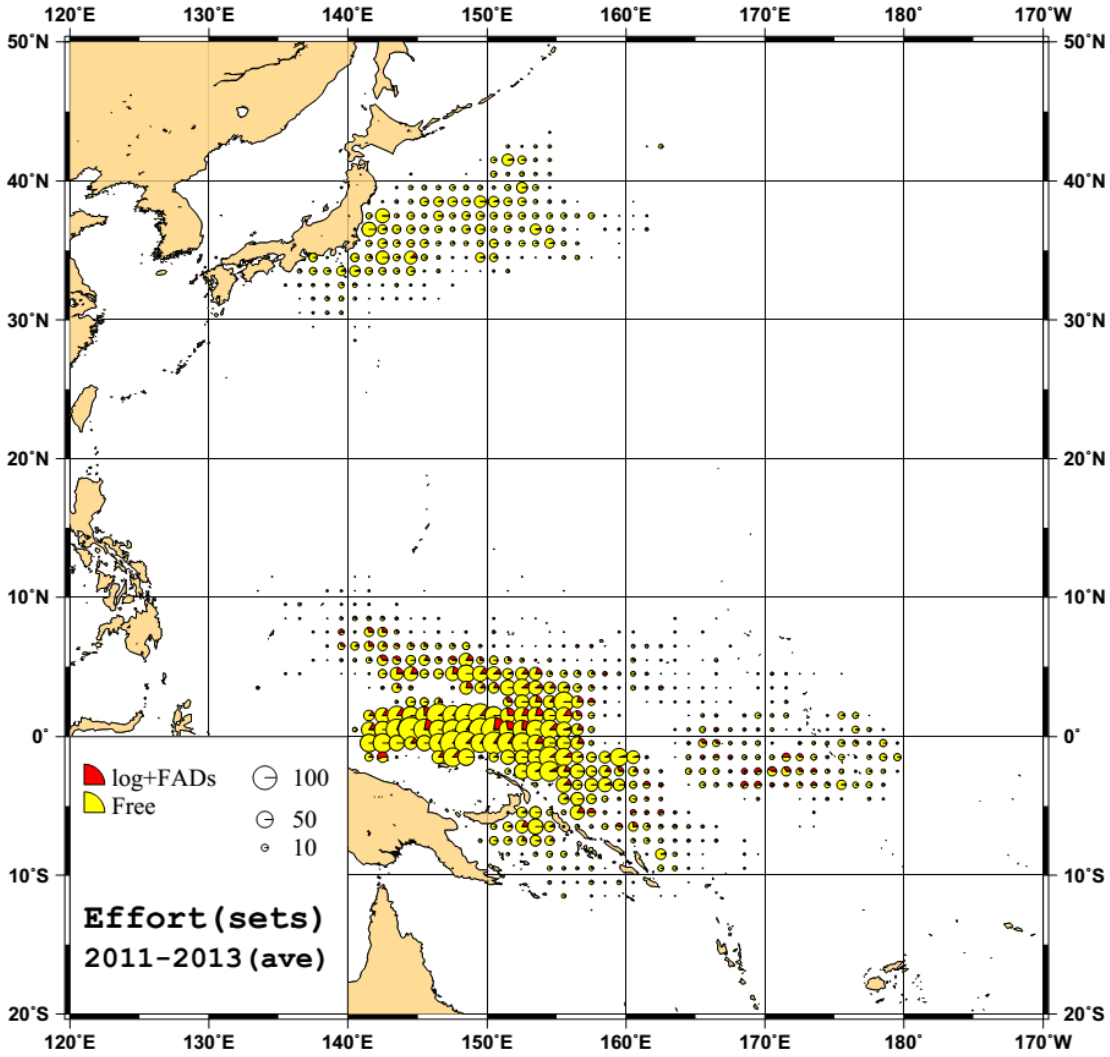

Fig. 13. Distribution of sets by type of school for 2011-2013 deployed by the tuna purse seine fishery by Japan.

Appendix Table 1. Catches (mt) for tunas, billfishes and sharks in the portion of the WCPFC Convention Area east of the 150˚ meridian of west longitude caught by distant-water and offshore longline fisheries. By 2012, catches of silky shark, hammerhead sharks and whale shark are included in other shark. Figures in parentheses indicate provisional data.
PBF: Pacific Bluefin tuna, ALB: Albacore, BET: Bigeye tuna, YFT: Yellowfin tuna, SWO: Swordfish, MLS: Striped marlin, BUM: Blue marlin, BLM: Black marlin, SFA: Sail fish, SSP: Shortbill spearfish, BSH: Blue shark, LMD: Salmon shark, POR: Porbeagle shark, SMA: Shortfin Mako shark, OCS: Oceanic White-chip shark, THR: Thresher sharks nei, FAL: Silky sharks, SPN: Hammerhead sharks nei, RHN: Whale shark, O-shk: other sharks

Year	BET	YFT	SKJ	BUM	BLM	BSH	LMD	POR	SMA	OCS	THR	FAL	SPN	RHN	O-shk
2009	1,228	414	4	83	1	2	0	0	3	1	9	-	-	-	2
2010	1,778	290	7	64	5	25	0	2	4	2	4	-	-	-	4
2011	1,144	244	4	45	1	87	0	1	22	9	2	-	-	-	11
2012	(1,836)	(387)	(7)	(86)	(2)	(128)	(0)	(1)	(18)	(0)	(2)	-	-	-	(1)
2013	(1,435)	(343)	(9)	(116)	(2)	(52)	(0)	(1)	(5)	(0)	(2)	(0)	(0)	(0)	(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 2012 and 2013 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)			
2009	1304	8	50	8077	2003	2236	913
2010	903	5	83	3742	1583	1603	918
2011	933	9	63	8340	1820	1651	654
2012	792	6	113	2462	570	1932	779
2013	740	-	8	2771	904	1579	1012

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)			
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	8	0	0	0	0	0
2013	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)			
2009	1304	8	50	8077	2003	2236	913
2010	903	5	83	3742	1583	1603	918
2011	933	9	63	8340	1820	1651	654
2012	792	6	113	2462	570	1932	779
2013	740	-	8	2771	904	1579	1012

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)			
0	7	0	0	0	0	0	0
0	6	0	0	0	0	0	0
0	11	0	0	0	0	0	0
0	8	0	0	0	0	0	0
0	-	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)			
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	0
2013	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				
2009	18175	3820	91	31081	12	2064	149	410	33	43
2010	17224	3943	135	19426	27	303	24	588	42	37
2011	16098	4858	57	25647	18	462	12	443	50	78
2012	17668	5160	92	33650	13	4180	26	610	48	129
2013	17921	4946	92	33665	13	4180	26	610	48	129

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				
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	4583	0	15	0	0	0	0	0	0
2013	0	3708	0	0	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				
2009	18175	3925	91	31081	12	2064	149	410	33	43
2010	17224	3955	135	19426	27	303	24	588	42	37
2011	16098	4721	57	25647	18	462	12	443	50	78
2012	17668	5004	92	33650	13	4180	26	610	48	129
2013	17921	4840	92	33665	13	4180	26	610	48	129

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				
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	2581	0	15	0	0	0	0	0	0
2013	0	2179	0	0	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				
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	213	0	0	0	0	0	0	0	0
2013	0	144	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			
2009	1606	4400	682	3	489
2010	1157	4240	483	8	342
2011	965	3046	189	2	245
2012	1057	2946	370	8	351
2013	633	3412	370	8	351

Swordfish (2) the Pacific Ocean south of the Equator

Year	LL	LL	Gillnet	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water			
2009	0	2036	0	0	0
2010	0	2835	0	0	0
2011	0	3437	0	0	0
2012	0	3915	0	0	0
2013	0	3563	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			
2009	1606	3794	682	3	488
2010	1157	3742	483	8	342
2011	965	2356	189	2	245
2012	1057	2568	300	0	300
2013	633	3147	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			
2009	0	503	0	0	0
2010	0	560	0	0	0
2011	0	641	0	0	0
2012	0	675	0	0	0
2013	0	540	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			
2009	0	162	0	0	0
2010	0	220	0	0	0
2011	0	250	0	0	0
2012	0	266	0	0	0
2013	0	228	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			
2009	622	166	821	17	94
2010	832	187	899	20	104
2011	920	319	333	30	113
2012	964	326	582	52	96
2013	761	375	582	52	96

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			
2009	0	461	0	0	0
2010	0	567	0	0	0
2011	0	764	0	0	0
2012	0	759	0	0	0
2013	0	610	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			
2009	622	102	821	17	94
2010	832	128	899	20	104
2011	920	205	333	30	113
2012	964	261	582	52	96
2013	761	266	582	52	96

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			
2009	0	152	0	0	0
2010	0	197	0	0	0
2011	0	237	0	0	0
2012	0	164	0	0	0
2013	0	158	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			
2009	0	8	0	0	0
2010	0	14	0	0	0
2011	0	21	0	0	0
2012	0	29	0	0	0
2013	0	22	0	0	0

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

(a) Catch

Year	LL Coastal	LL Offshore & distant-water	PL Coastal	PL Offshore & distant-water	PS Coastal	PS Offshore & distant-water	Gillnet	Troll	Setnet	Others
2009	18,175	3,740	91	31,081	12	2,064	149	410	33	43
2010	17,224	3,800	135	19,426	25	305	24	588	42	37
2011	16,098	4,721	57	25,647	18	462	12	443	50	78
2012	(17,668)	(5,004)	92	33,650	72	4,121	26	610	48	129
2013	(17,921)	(4,840)	(92)	(33,665)	(72)	(4,121)	(26)	(610)	(48)	(129)

(b)Effort

Year	LL Coastal	LL Offshore & distant-water	PL Coastal	PL Offshore & distant-water	PS Coastal	PS Offshore & distant-water	Gillnet	Troll	Setnet	Others
2009	43,523	12,060	NA	15,248	NA	3,939	NA	NA	NA	NA
2010	45,863	13,084	NA	15,541	NA	3,304	NA	NA	NA	NA
2011	42,661	12,683	NA	13,433	NA	7,596	NA	NA	NA	NA
2012	(38,235)	(13,818)	NA	14,646	NA	8,449	NA	NA	NA	NA
2013	(35,327)	(13,970)	NA	(11,462)	NA	(7,521)	NA	NA	NA	NA

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

Year	Striped marlin catch (t)
2009	131
2010	158
2011	203
2012	(134)
2013	(133)

Appendix Table 5-1. Effort, observed and estimated seabird captures by the longliner larger than 20 GRT (approximately >=24m) 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). Figures in parentheses indicate provisional data. 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
2011	30	8,206,601	670,698	8.2	149	0.222
2012	(29)	(7,871,072)	597,048	7.6	23	0.039
2013	(28)	(6,993,643)	665,158	9.5	15	0.023

23N - 30S

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2011	135	44,335,997	1,024,288	2.3	1	0.001
2012	(120)	(38,508,607)	1,177,065	3.1	0	0.000
2013	(128)	(29,485,380)	187,498	0.6	1	0.005

North of 23N

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2011	61	15,903,483	103,728	0.7	7	0.067
2012	(56)	(17,467,820)	0	0	-	-
2013	(60)	(18,860,499)	0	0	-	-

Appendix Table 5-2. Effort, observed and estimated seabird captures by the longliner less than 20 GRT (approximately <24m) 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). Figures in parentheses indicate provisional data. This table was request written in paragraph 9 in the part of seabirds of CMM-2012-07.

23N - 30S

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2011	156	21,159,030	107,297	0.5	0	0.000
2012	(125)	(18,583,238)	769,845	4.1	2	0.003
2013	(133)	(19,576,461)	856,609	4.4	0	0.000

North of 23N

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2011	230	54,515,792	33,060	0.1	1	0.030
2012	(204)	(51,672,945)	163,098	0.3	1	0.006
2013	(193)	(44,044,883)	65,429	0.1	1	0.015

Appendix Table 6-1. Number of observed seabird captures in the longliner larger than 20 GRT (approximately >=24m), 2013, 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	3	-	1	4
Black-browed albatross	3	-	0	3
Campbell albatross	1	-	0	1
Buller's albatross group	5	-	0	5
Shy-type albatrosses	3	-	0	3
Unidentified petrels	0	-	0	0
Total	15		1	16

Appendix Table 6-2. Number of observed seabird captures in the longliner less than 20 GRT (approximately <24m), 2013, 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	-	0	0	0
Black-browed albatross	-	0	0	0
Campbell albatross	-	0	0	0
Buller's albatross group	-	0	0	0
Shy-type albatrosses	-	0	0	0
Unidentified petrels	-	1	0	1
Total		1	0	1

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. Figures in parentheses indicate provisional data. That was request written in paragraph 8 of CMM-2009-03.

Year	Japan-flagged vessels south of 20S		Chartered vessels		Other vessels fishing within the Japan's waters south of 20S		
	Catch (mt)	Vessel numbers	Catch (mt)	Vessel numbers	Flag	Catch (mt)	Vessel numbers
2009	167	19	0	0	--	--	--
2010	192	26	0	0	--	--	--
2011	267	34	0	0	--	--	--
2012	(297)	(29)	0	0	--	--	--
2013	(236)	(28)	0	0	--	--	--

Appendix Table 8. The total quantity (mt) of highly migratory fish stocks transshipped by fishing vessels in 2013. . This table was request written in paragraph 11 of CMM-2009-06.

1. Offloaded by Japanese longliners
1.1. By species
1.1.1 Catch inside the CA

	Port inside the CA	HS inside the CA	Port outside the CA	HS outside the CA
Bigeye	5	1157	0	241
Yellowfin	51	229	0	58
Swordfish	4	180	0	30
Others	131	357	0	61
Total	190	1923	0	390

1.1.2. Catch outside the CA

	Port inside the CA	HS inside the CA
Bigeye	0	258
Yellowfin	0	43
Swordfish	0	95
Others	0	96
Total	0	492

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	56	1386	0	539
Gutted and Headed	4	180	0	30
Others	131	357	0	61
Total	190	1923	0	390

1.2.2. Catch outside the CA

	Port inside the CA	HS inside the CA
Gilled and Gutted	0	301
Gutted and Headed	0	95
Others	0	96
Total	0	492

2. Received by Japanese carriers from longliners.
There was no Japanese carrier vessel which operated in CA and/or received products caught in CA in 2013.

Appendix Table 9. The number of transshipments involving highly migratory fish stocks in 2013. This table was request written in paragraph 11 of CMM-2009-06.

1. The number of transhipment offloaded by Japanese longliners

	Port inside the CA	HS inside the CA	Port outside the CA	HS outside the CA
Caught inside the CA	2	20	0	2
Caught both inside and outside the CA	0	18	0	15
Caught outside the CA	0	0	0	0
Total	2	38	0	17

2. The number of transshipment received by Japanese carriers from longliners.
There was no Japanese carrier vessel which operated in CA and/or received products caught in CA in 2013.

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	Albacore catch (t)
2009	1,111
2010	896
2011	1,803
2012	(1,321)
2013	(1,564)

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

Year	Vessels	Albacore catch (t)
2009	0	0
2010	0	0
2011	2	9
2012	(3)	(15)
2013	(2)	(0)

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. By 2012, catches of silky shark, hammerhead sharks and whale shark are included in other shark. This table was request written in paragraph 4 of CMM-2010-07.
BSH: Blue shark, LMD: Salmon shark, POR: Porbeagle shark, SMA: Shortfin mako shark, OCS: Oceanic white-chip shark, THR: Thresher sharks nei, FAL: Silky sharks, SPN: Hammerhead sharks nei, RHN: Whale shark, O-shk: other sharks

Distant water and offshore longlines

	BSH	LMD	POR	SMA	OCS	THR	FAL	SPN	RHN	O-shk
2009	14,297	544	5	770	58	199	-	-	-	61
2010	14,103	168	3	764	120	180	-	-	-	108
2011	6,848	62	3	714	268	192	-	-	-	142
2012	(10,860)	(467)	(1)	(751)	(46)	(84)	-	-	-	(27)
2013	(10,595)	(220)	(1)	(668)	(0)	(114)	(0)	(0)	(0)	(141)

Small offshore longline

	BSH	LMD	POR	SMA	OCS	THR	FAL	SPN	RHN	O-shk
2009	285	63	0	46	0	0	-	-	-	15
2010	317	44	0	26	0	0	-	-	-	12
2011	459	12	0	24	0	0	-	-	-	9
2012	(524)	(78)	(0)	(3)	(0)	(0)	-	-	-	(5)
2013	(695)	(168)	(0)	(21)	(0)	(0)	(0)	(0)	(0)	(91)