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

National Tuna Fisheries Report of Japan

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Scientific data was provided to the Commission in accordance with the decision relating to the provision of scientific data to the Commission by 30 April, 2011	YES Annual catch data, April 29. Catch and effort data, April 29. Size data for skipjack assessment, May 19. Size data for bigeye assessment, May 30. Size data for yellow fin assessment, May 30. Size data for albacore 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 433 in 2010 which was 11 vessels (2%) less than that in 2009. Total number of pole-and-line vessels (larger than 20 GRT) was 92 in 2010 which was 5 vessels (5%) less than that in 2009. For the purse seine vessels, the number of vessels over 200 GRT was 37 in 2010, which were the same number as that in 2009. Out of the 37 vessels over 200GRT, the number of vessels which are allowed to operate in tropical waters was 35 in 2010 and has been stabilized since 1995.

The total 2010 WCP-CA catch of tunas (Pacific bluefin, albacore, bigeye, yellowfin and skipjack) by the Japanese fishery was still provisional and estimated to be 432,657 mt, and this is corresponding to 104% of 2009 total tuna catch (414,299 mt). In 2010, the total tuna catch by the purse seine fishery was 250,427 mt (58% of the total), with 110,720 mt (26%) by the pole-and-line fishery, 59,252 mt (14%) 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 tuna, billfish and other bycatch species in the WCP-CA in 2010 such as tagging study for tropical tunas and sharks, several research cruises on Pacific bluefin tuna larval sampling and a research cruise to reduce the catch of juvenile bigeye in the purse seine fishing. In addition, as a 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. As for the transshipment information requested by CMM 2009-6, there has been no information reported so far. The catch for key shark species in weight in the WCP-CA is shown in Appendix Table 4.

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 boats 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 2006-2007 data (MAFFJ 2008-2009), and presented in this paper. Although the MAFFJ did not publish as a book, the 2008 data is available on the Web site (http://www.maff.go.jp/j/tokei/kouhyou/kaimen_gyosei/index.html). Although the MAFFJ did not officially publish 2009 data yet at the time when this manuscript was written, the catch statistics for 2009 was made available to be included in this paper by the special arrangement for reference.

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 2006-2010 (coastal longline vessel was not included). As this number of active vessels is estimated basing on submitted logbook data, 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 have decreased from about 500 in 2006 to 444 in 2009 and 433 in 2010 although the data of 2010 is still preliminary. Especially, the declining trend for size categories larger than 100 GRT is more remarkable, and the number of vessels of 100-200 GRT and over 200 GRT in 2009 was 33 and 101 which is 63% and 83% of that in 2006, 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 quickly until 2007, but slowed down thereafter. Reduction rate was faster for the larger boat size (28% over 200 GRT class) than the medium size class

(24% for 50-200 GRT class). The number of medium-sized vessel categories, 50-200 GRT, decreased from 89 in 2005 to 68 in 2010, corresponding to 24% decrease. The number of largest size category (over 200 GRT) vessels also sharply decreased from 39 in 2005 to 28 in 2010 (28% decrease).

Purse seine vessels, which operate in the equatorial 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 30 to 37 during the 2006-2010 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 2010 WCP-CA catch of tunas (Pacific bluefin, albacore, bigeye, yellowfin and skipjack) by the Japanese fishery was still provisional and estimated to be 432,657 mt, and this is corresponding to 104% of 2009 total tuna catch (414,299 mt). In 2009, the total tuna catch by the purse seine fishery was 240,537 mt (58% of the total), with 103,704 mt (25%) by the pole-and-line fishery, 57,799 mt (14%) by the longline fishery, and the remaining 3% by the other gears. In 2010, the total tuna catch by the purse seine fishery was 250,427 mt (58% of the total), with 110,720 mt (26%) by the pole-and-line fishery, 59,252 mt (14%) by the longline, and the remaining (3%) by the other gears. The following is the description of each fishery more in detail including tables of their catch and effort in the WCP-CA.

4.1. Longline fishery

Japanese longline boats are classified into three categories (coastal, offshore and distant water longline fisheries) according to the operation area and boat size. Coastal longliner, whose size is 1-20 GRT, is allowed to fish only in the Japan's EEZ. Offshore longline boats 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 2010 data, though the latest data is 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 2006 to 2010 are shown in Table 2 (top table). 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 100million, thereafter. In 2009 and 2010, fishing effort exerted in the WCP-CA was 65 and 79 million hooks, respectively. This some increase of effort in 2010 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. Bigeye catch which had been relatively stable until 1993 with fluctuation between 30,000 and 50,000 mt, decreased suddenly to between 20,000 and 30,000 mt, thereafter. After 2003, bigeye catch decreased to about 10,000 mt and that in 2010 (2009) was 8483 (8468) mt although value in 2010 is preliminary.

The average quarterly effort distribution for distant water and offshore longline vessels larger for 2009 and

2010 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 2006 to 2010 are shown in Table 2 (bottom table). Total number of hooks deployed by small offshore longliner is about 68,000 to 76,000 thousand hooks. In the case of distant water and offshore longliners, catch of bigeye tuna is largest followed by yellowfin and albacore, while albacore catch is largest (10,000-13,000 mt) in the small offshore catch. Bigeye catch of them are about 10,000 mt, about same level as that of albacore, while yellowfin catch is 3,000 to 4,000 mt, about one third of albacore catch. 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 major target species.

The catch estimates for the longline boats less than 20 GRT for pacific bluefin, albacore, swordfish and sriped 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 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 from 2006 to 2010. In addition to this, historical changes in catch by species and effort are shown in Fig. 7 for the period of 1972-2010. The data for 2010 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 2010, the number of fishing days (including no catch) was 14,865, slightly declined (5%) from that in 2009, and the number of poles was 282,000, also decreased by the same percent (5%) from 2009. Total catch of major species (skipjack, bigeye, yellowfin, albacore and bluefin) in 2010 was 99,153 mt, slightly increased (6%) from that in 2009 (Table 3). The skipjack catch was 73,837 mt in 2010 and considerably increased (29%) from 57,100 mt in 2009. The albacore catch was 20,492 mt in 2010, sharply decreased (35%) from 31,484 mt in 2009.

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 2009-2010. 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 1st, 2nd, and 4th quarters of the year. In the 3rd 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 3rd 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 Japan.

4.3. Purse seine fishery

Annual catch of the purse seine fishery has varied from 240,000 to 280,000 mt in recent five years. The majority of the catch has been skipjack which accounted for 80 % of the total catch in recent five years (Table 4 and Fig. 10). Annual total catch by species in 2010 obtained from the logbook in the WCP-CA by this fishery was 201,000 mt, 39,000 mt and 3,300 mt for skipjack, yellowfin and bigeye, respectively. The catch of bigeye remarkably decreased in 2010, whereas yellowfin catch increased (Table 4). Note that catch statistics for purse seine in 2010 is still preliminary but near final. Geographical distributions of catches for skipjack, yellowfin and bigeye are shown in Fig. 11. In most cases, skipjack was the largest portion of the catch among three species in each 1˚ x 1˚ block as shown in Fig. 11.

Fishing effort (fishing and searching days) fluctuated between 7,500 to 9,500 days after the mid 1980s (Table 4 and Fig. 10). In the tropical waters purse seine fishing grounds were formed widely between 10˚N, 130˚E and 10˚S, 180˚ (Fig. 12) with some seasonal fishing ground shifts. However, in 3rd quarter in 2010, the fishing grounds in equatorial area distributed narrower than usual. In near shore Japan at Pacific side skipjack fishing season starts in April and continue until 3rd quarter.

This fishery utilizes tuna schools in association with natural log, whale shark and FADs mainly in equatorial fishing grounds (Fig. 13). The operations for free swimming schools were found both in equatorial waters and in coastal waters of Japan.

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, set-net and gillnet fisheries. The catches for such fisheries for the 2006-2010 is shown in Table 5. The figures in 2010 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.

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 set-net (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 2006-2010. The data in 2010 are preliminary. Total catch of bigeye declined from 35,037 mt at a peak in 2006 to 20,204 mt in 2010 (58%) due to the decline of the both distant water and offshore and small offshore longline catches. Total catch of yellowfin shows an increase trend from 49,849 mt in 2006 to 63,345 mt in 2010 (127%). Total catch of skipjack shows substantial declining trend from 322,037 mt in 2006 to 263,510 mt in 2009 (82%) mainly due to large decline of distant water and offshore

pole-and-line catches, however 2010 skipjack catch somewhat recovered to 287,244 mt in 2010..

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 observer trips of Japanese distant water fisheries 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 in the past is 42 for the past 16 years before 2010 (Table 8).

Two purse seine cruises were observed from August 2010 in tropical waters in the western Pacific Ocean (Table 9). Days spent for these cruises were 22 and 28 days, respectively, which are shorter than the durations for the Japanese purse seiner operated in the tropical waters. These two cruises targeted on the free school.

The observer program for longline in the WCP-CA started in 2008. The information of fishing boats, fishing operations and almost all the catches in each operation were identified and measured as much as observer can. Four cruises of offshore longline boats were observed in 2010 (Table 10). The number of operations which was recorded by the observers ranged from 7 to 26. The total number of catches which was recorded by each observer ranged from 323 to 1079 individuals. The largest number of catch was blue shark, ranging from 8 to 849 individuals. Other dominant species were yellowfin and bigeye tunas, number of them ranged 0-491 and 7-265, respectively.

5.3. Port sampling

NRIFSF has collected size data (weight and/or length) of tunas and billfishes in major landing port of Japan. The following is a summary of size sampling, focusing on length measurements, carried out mainly in 2010. Note that size measurement for tunas and billfishes has been carried out on board of research vessels and training vessels in addition to the port sampling for commercial vessels and that sex-specific size sampling on board of commercial longline vessels for billfishes in the North Pacific was started in 2003.

Size sampling

Length data of tunas and billfishes caught mainly nearshore of Japan have been collected in major landing ports in Japan. Such size measurements have been conducted for longline (excluding the distant-water longline), pole-and-line, troll and offshore purse seine. In 2010, the number of length data collected for albacore and skipjack were 82,800 and 87,000, respectively. Length data for tropical tunas (bigeye and yellowfin) and billfishes have been collected in Kesen-numa (north part of Japan) and Kii-Katsuura (central Japan on Pacific coast) ports since 2005.

Length sampling for distant water purse seiners

In addition to the size samplings mentioned above, port sampling programs have been conducted to collect species composition data and length data for skipjack, yellowfin and bigeye caught by distant water purse seine fishery in Yaizu, Makurazaki and Yamagawa ports. The first port located at central of Japan and the later two located in southwest Japan. We performed the port sampling 13 times in 2010 in Yaizu port and 14 times at Makurazaki port and seven samplings at Yamagawa port. The annual total measurement number in 2010 was 19,796 fishes 7,497 and 2,371 for skipjack, yellowfin and bigeye, respectively. For all three species, the majority of the catch was small fish less than about 80 cm in fork length in 2010 (Fig. 14) and there were three or four modes.

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

With respect to the research activities for tunas and billfishes, tagging studies for tropical tunas and sharks, research cruises for bluefin tuna larval sampling and the mitigation for juvenile bigeye were conducted.

6.1. Tagging

Tropical tuna tagging project in Japan

Regarding tropical tuna (mainly bigeye and yellowfin) tagging activity in 2010, 39 bigeye, 675 yellowfin and 65 skipjack were released at area from Kagosima to Okinawa, and 70, 5 and 0 individuals were recaptured for each species. In addition to conventional tagging, 2 bigeye were tagged with electronic tag (archival tag) and released. But no recapture of archival tag was reported. Furthermore, 277 bigeye and 40 skipjack were released with conventional tag attached from East off Honshu in which 21 bigeye and 3 bigeye were released with archival tag and popup-archival tag attached, respectively.

Skipjack tagging

Four research/training pole-and-line vessels were involved in the skipjack tagging in 2010. The tagging was conducted in a wide area of Western Pacific ranged from 12˚N to 33˚N, from 128˚E to 149˚E. Total of 1322 skipjack were released in 2010 and 48 skipjack were recovered to date. Most recaptures were recorded in the second or third quarter and within 60 days after release.

In addition, skipjack tagging in the coastal area of southwestern Japan 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 including migration rate from Nansei Islands area to Pacific coast of Japan. The fish caught by coastal pole-and-line vessels were tagged and released. Both dummy and real archival tags (Lotek LAT2510 and its dummy) were also deployed on some individuals. In 2010, a total of 3,017 fish (mainly 40-45cm FL) including 44 fish with archival tag and 33 fish with dummy archival tag were released around Amami Island (Nansei Islands, around 28˚N, 130˚E) and off Kochi (around 32˚N, 133˚E) during April-June. So far 91 fish (not including the fish with real or dummy archival tag) were recaptured mainly around Nansei Islands.

Also, some skipjack were released during tropical tuna tagging mentioned above. In 2010, 65 and 40 fish were released in the Nansei Islands and off central Honshu, respectively.

Shark tagging

Shark tagging program has been conducted since 1996 to examine migration, population structure and life history parameters of pelagic sharks. In 2010, tags were attached to 1,029 blue sharks, 11 bigeye threshers, 37 shortfin makos, 25 salmon sharks and 5 others (total 1,107) in the Pacific. Thirteen tags attached to blue sharks were recovered and the tag recovery data indicated seasonal latitudinal migration of blue shark.

6.2. Research cruise conducted

Tuna larval sampling by Shunyo-Maru

Two research cruises were conducted in 2010 for ecological study of larval PBF by R/V Shunyo-Maru. Around Nansei islands, which is a major spawning ground of PBF, a dense patch (>50 individuals) of PBF larvae was found and tracked with using drifter composed of GPS radio buoy and a drogue, and PBF larvae were sampled repeatedly for two days during late June 2010. In the Sea of Japan, which is another spawning ground of PBF, juvenile PBF (4-12cm TL) were collected by surface trawling between Noto peninsula and Sado Island in August 2010. Spatial and temporal distribution of PBF spawning spots would be investigated by simulating particle flow models using the compiled information of distribution and daily age of larvae.

Research on mitigation of juvenile bigeye catch

Joint research by two research vessels (Shoyo Maru and Nippon Maru) and two commercial purse seine vessels (No. 83 Fukuichi Maru, Fuji Maru) was conducted in October to December 2010 at western tropical Pacific Ocean to investigate the mitigation measures that avoid juvenile bigeye tuna catch in the tuna purse seine operation on floating objects such as FADs. This research consists of two main objectives; 1) investigate and confirm the escapement of juvenile bigeye through the large mesh size, 2) observe the reaction of bigeye, yellowfin and skipjack to the stimulus of blinking flush light.

Another collaborate work was conducted to investigate the effect of large mesh aperture of tuna purse seine net that avoid juvenile bigeye tuna. Two commercial purse seine vessels (No. 1 Taikei Maru, No. 88 Miya Maru) applied the large mesh size net (mesh size 36cm, 45cm) for their operation in October 2010 to January 2011, and during these cruises underwater observations by video camera, measurements of length of tuna, tagging experiment for confirmation of escapements of fish through the net, and oceanographic observations using XCTD were conducted.

6.3. Bycatch species related research

Mitigation studies for seabirds

To explore effective and safe designs of tori line in the North Pacific, performance of two types of tori-lines, light streamer and hybrid streamer (long and short streamers), was compared using 20 commercial longline vessels with 449 sets. Performance of single tori line and double tori lines was also compared using same vessels with 396 sets. There were no significant difference in albatross CPUEs between different tori-line types and number of tori lines. These low CPUE of Laysan and black-footed albatrosses suggested all design of tori-lines would be similarly effective to reduce the albatross take, and thus, the further research on the design of tori-line should be useful to reduce incidental seabird bycatch in the north Pacific.

Performance of weighted and un-weighted branchlines deployed with revised “hybrid” tori lines on two Japanese vessels participating in the 2010 tuna joint venture fishery in the South Africa EEZ was compared in collaboration with the Washington Sea Grant, University of Washington and Japan. This study showed that branchline weighting was highly effective at preventing seabird attacks within the aerial extent of streamer lines and allowing none between the two hybrid streamer lines in diving seabirds dominated system. The higher rate of tangling of weighted branchlines relative to un-weighted branchlines is the only remaining barrier to making branchline weighting practical.

Mitigation studies for sea turtles

Experiment of large circle hooks (Koshina type 4.5-sun, 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 2010. 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.

Stock assessment of pelagic sharks

Short-term trend in standardized CPUE of shortfin mako was analyzed using the data collected by Japanese research and training vessels in the North Pacific from 1992 to 2008. Although there were some fluctuations in standardized CPUEs of this shark, no constant trend of increase or decrease was observed during this study period. Long-term trend in standardized CPUE of blue shark was analyzed using the logbook data from Japanese tuna long line fisheries in the Pacific Ocean from 1971 to 2009. In North Pacific, increasing trend was observed from 1990 to 2004. In South Pacific, there was a slight decreasing trend from 1998 to 2002, and then recovery was observed. Total catch and weight of blue, salmon and shortfin mako sharks caught by Japanese offshore and

distant-water longliners in the North Pacific from 1994 to 2009 were estimated.

References

MAFFJ 2008-2009. Annual report of catch statistics on fishery and aquaculture, 2006-2007. Statistics Department, Minister's Secretariat, the Ministry of Agriculture, Forestry and Fisheries of Japan.

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

Longline

	10-50 ton	50-100 ton	100-200 ton	200- ton	Total
2006	279	44	52	122	497
2007	281	42	48	108	479
2008	275	42	40	107	464
2009	272	38	33	101	444
2010	272	29	28	104	433

Pole-and-line

	20-50 ton	50-200 ton	200- ton	Total
2006	1	83	30	114
2007	1	77	29	107
2008	1	69	29	99
2009*	1	68	28	97
2010*	1	63	28	92

Purse Seine

	50-200 ton	200-500 ton	500- ton	Total
2006	31	35	1	67
2007	35	35	1	71
2008	37	35	1	73
2009	35	34	3	72
2010	30	34	3	67

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

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

	#hooks	PBF	ALB	BET	YFT	SWO	MSL	BLZ	BLM	SFA	SSP	Total
2006	87,267	74	7,568	14,311	9,631	6,148	515	1,634	67	109	114	40,169
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	65,220	15	6,383	8,468	10,246	4,229	264	1,257	68	80	77	31,087
2010	(79,045)	-	(6,621)	(8,483)	(11,924)	(4,229)	(264)	(1,455)	(72)	(153)	(104)	(33,304)

Small offshore longline (10-20 GRT)

	#hooks	PBF*	ALB	BET	YFT	SWO	MSL	BLZ	BLM	SFA	SSP	Total
2006	74,601	-	16,734	11,384	3,831	1,316	432	986	25	18	0	34,725
2007	76,073	-	18,409	10,663	3,713	1,846	717	1,104	17	14	0	36,483
2008	69,222	-	13,679	8,947	3,062	1,678	448	1,142	20	20	0	28,997
2009	71,844	-	18,183	8,182	3,358	1,478	435	1,060	13	25	1	32,734
2010	(67,869)	-	(18,683)	(6,082)	(4,462)	(931)	(558)	(1,285)	(13)	(29)	(0)	(32,042)

* 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	#pole	SKJ	YFT	BET	PBF*	ALB	Total
2006	16,770	310,725	93,744	2,690	3,745	108	15,328	115,614
2007	17,086	319,874	81,668	2,312	1,804	236	37,664	123,683
2008	16,304	311,039	82,546	2,612	1,477	64	19,025	105,723
2009	15,727	298,002	57,100	3,560	1,419	50	31,172	93,301
2010	(14,865)	(282,198)	(73,837)	(2,673)	(2,091)	(83)	(21,666)	(100,350)

* The catch for PBF includes the catch by the PL less than 20GRT vessels.

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. Figures in parentheses indicate provisional data.

	#days	SKJ	YFT	BET	PBF*	ALB	Total
2006	7,940	216,991	28,272	4,620	8,880	336	267,039
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)	(296)	(252,290)

* The catch for PBF is from not only tuna purse seine vessels but other purse seine vessels.

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	BLZ+BLM	Total
2006	11	1,197	699	-	2,422	189	107	105	4,730
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	(6)	(1,281)	(499)	-	(2,642)	(70)	(171)	(241)	(4,910)

Coastal pole-and-line

	SKJ	YFT	BET	PBF*	ALB	Total
2006	6,213	1,650	75	-	78	8,016
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	(8,609)	(1,494)	(151)	-	(91)	(10,345)

Coastal purse seine

	SKJ	YFT	BET	PBF*	ALB	Total
2006	564	23	52	-	28	667
2007	715	18	12	-	3	748
2008	364	59	4	-	1	428
2009	515	30	0	-	12	557
2010	(515)	(30)	(0)	-	(12)	(557)

Gillnet

	SKJ	YFT	BET	PBF*	ALB	Total
2006	311	13	11	-	221	556
2007	480	16	3	-	226	725
2008	332	23	13	-	1,531	1,899
2009	324	12	7	-	149	492
2010	(324)	(12)	(7)	-	(149)	(492)

Troll

	SKJ	YFT	BET	PBF	ALB	Total
2006	3,624	2,262	101	1,544	460	7,991
2007	3,249	2,297	124	2,385	519	8,574
2008	4,178	2,436	138	2,767	549	10,068
2009	3,819	2,534	115	1,897	410	8,775
2010	(3,819)	(2,534)	(115)	(1,315)	(410)	(8,193)

Setnet

	SKJ	YFT	BET	PBF	ALB	Total
2006	330	18	0	1,421	55	1,824
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	(274)	(86)	(5)	(1,047)	(33)	(1,445)

* 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 statistic 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.

	2006	2007	2008	2009	2010
Skipjack					
Total	322,037	323,465	308,769	263,510	(287,244)
Distant water and Offshore LL	61	45	98	57	(78)
Distant water and Offshore PL	93,744	81,668	82,546	57,100	(73,837)
Tuna PS	216,991	228,505	212,053	192,523	(199,502)
Small offshore LL	2	1	2	5	(2)
Coastal LL	11	7	14	6	(6)
Coastal PL	6,213	8,026	8,651	8,609	(8,609)
Coastal PS	564	715	364	515	(515)
Gill net	311	480	332	324	(324)
Troll	3,624	3,249	4,178	3,819	(3,819)
Set net	330	535	315	274	(274)
Unclassified	186	235	217	278	(278)
Yellowfin					
Total	49,849	46,552	55,068	56,003	(63,345)
Distant water and Offshore LL	9,631	10,014	8,714	10,246	(11,924)
Distant water and Offshore PL	2,690	2,312	2,612	3,560	(2,673)
Tuna PS	28,272	25,264	35,272	33,066	38,514
Small offshore LL	3,831	3,711	3,062	3,358	4,462
Coastal LL	1,197	1,383	1,418	1,281	(1,281)
Coastal PL	1,650	1,189	954	1,494	(1,494)
Coastal PS	23	18	59	30	(30)
Gill net	13	16	23	12	(12)
Troll	2,262	2,297	2,436	2,534	(2,534)
Set net	18	53	94	86	(86)
Unclassified	263	295	425	335	(335)
Bigeye					
Total	35,037	34,587	27,609	22,386	(20,204)
Distant water and Offshore LL	14,311	15,413	10,587	8,468	(8,483)
Distant water and Offshore PL	3,745	1,804	1,477	1,419	(2,091)
Tuna PS	4,620	5,384	5,626	3,447	2,679
Small offshore LL	11,384	10,663	8,947	8,182	(6,082)
Coastal LL	699	947	610	499	(499)
Coastal PL	75	173	127	151	(151)
Coastal PS	52	12	4	0	(0)
Gill net	11	3	13	7	(7)
Troll	101	124	138	115	(115)
Set net	0	1	3	5	(5)
Unclassified	39	64	77	93	(93)

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		2006	2007	2008	2009	2010
Distant water longline	(over 120 GRT)	91%	92%	90%	99%	88%
Offshore longline	(10-120 GRT)	95%	96%	91%	92%	85%
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%	93%
Distant water pole-and-line (over 120 GRT)		100%	100%	100%	100%	100%
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	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Number of cruises	2	4	3	4	3	3	3	3	3	1	1	2	3	3	2	2	42

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

cruise number	1	2
area of operation	3S - 4S 156E -159E	5N - 5S 152E-165E
departure - return	Yaizu - Yaizu	Ponape - Ponape
date of departure	2010/7/25	2010/8/23
date of return	2010/8/15	2010/9/19
days of cruise	22	28
days of fishing	8	25
number of set	17	34
free school	17	34
associated school	0	0
total catch (metric ton)	1050	935
skipjack	915	529
yellowfin	135	392
bigeye	0	14

Table 10. Number of operations and catch number for longline observer program in the western central Pacific in 2010.

Cruise number	1	2	3	4
Number of operations	26	7	20	23
Number of catch	1079	323	796	1057
Squids	1	0	0	0
Albacore	13	0	0	9
Yellowfin tuna	0	161	145	491
Bigeye tuna	7	97	41	265
Skipjack tuna	0	11	4	117
Sailfish	0	1	22	2
Black marlin	0	0	1	0
Blue marlin	0	9	29	20
Shortbill spearfish	0	2	0	6
Striped marlin	0	0	0	5
Swordfish	100	1	9	3
Unidentified fishes	0	3	0	5
Lancetfishes	2	9	248	13
Longnose lancetfish	0	0	0	2
Opah	0	3	7	3
Southern sennet	0	0	0	3
Dagger pomfret	0	0	3	0
Atlantic pomfret	0	0	1	0
Pomfrets	1	0	1	0
Bigscale pomfret	0	0	37	0
Dolphin fish	0	4	1	14
Gemfishes	0	0	13	0
Snake mackerel	0	2	1	12
Escoler	16	0	16	7
Oilfish	6	0	0	0
Black gemfish	0	0	8	0
Wahoo	0	4	1	19
Sharptail sunfish	0	0	1	0
Unidentified sharks	0	0	5	0
Unidentified thresher shark	0	0	25	7
Pelagic thresher	0	0	4	0
Great white shark	0	0	0	4
Shortfin mako	77	0	0	0
Unidentified requiem shark	0	0	1	0
Silky shark	0	0	12	0
Oceanic whitetip shark	0	0	0	6
Hardnose shark	0	0	1	0
Tiger shark	0	0	0	1
Blue shark	849	8	71	25
Unidentified ray	0	0	1	0
Sting ray	3	8	81	18
Other albatrosses	1	0	0	0
Unidentified albatrosses	2	0	0	0
Arctic tern	0	0	0	0
Unidentified sea turtles	1	0	1	0
Olive ridley turtle	0	0	5	0

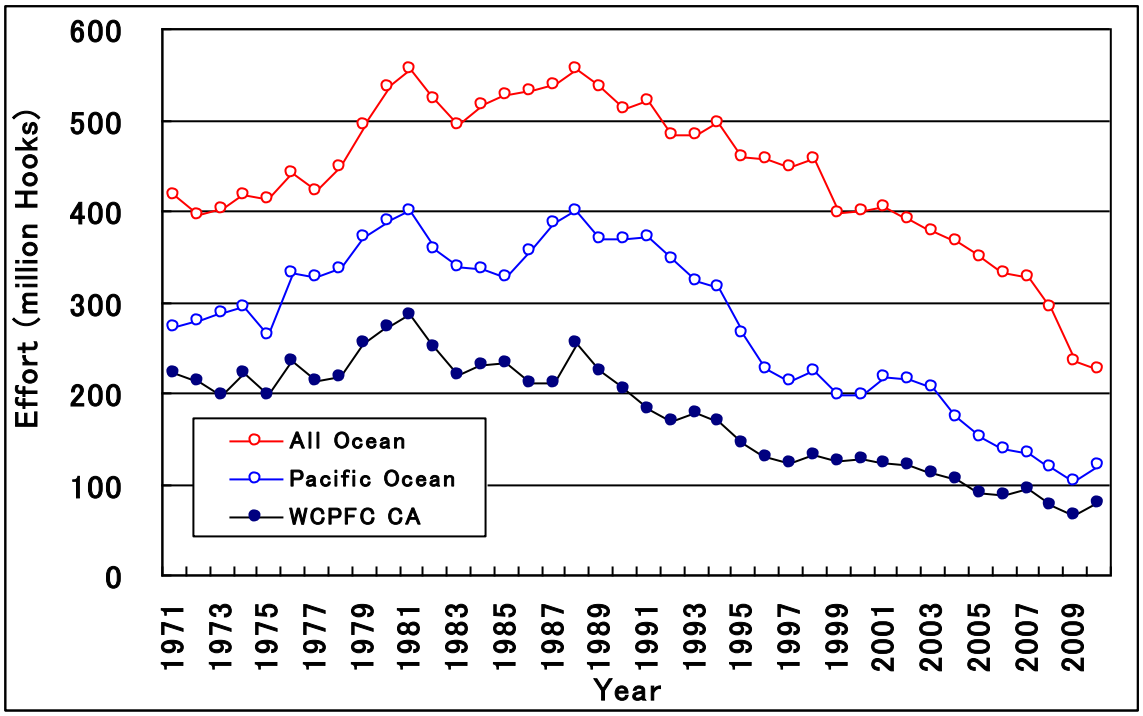

Fig. 1. Historical change in fishing effort of the Japanese distant water and offshore longline fishery (not including small offshore) in the WCPFC Convention Area.

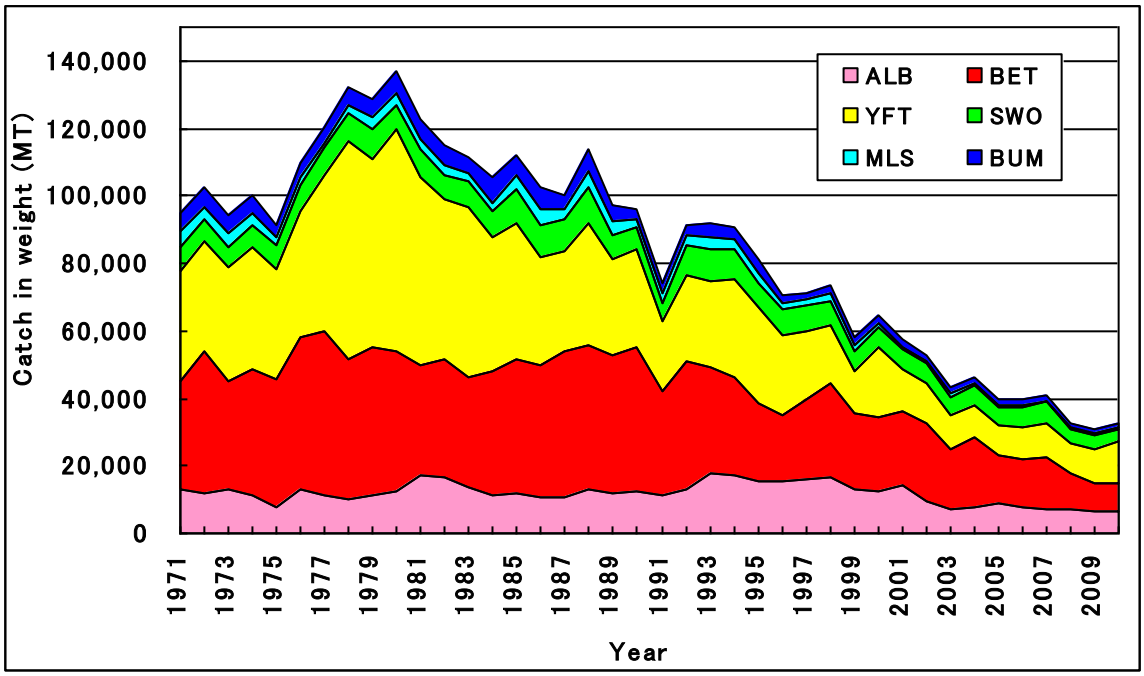

Fig. 2. Historical change of catches for major species for the Japanese distant water and offshore longline fishery (not including small offshore) in the WCPFC Convention Area. ALB: albacore, BET: bigeye, YFT: yellowfin, SWO: sword fish, MLS: striped marlin, BUM: blue marlin.

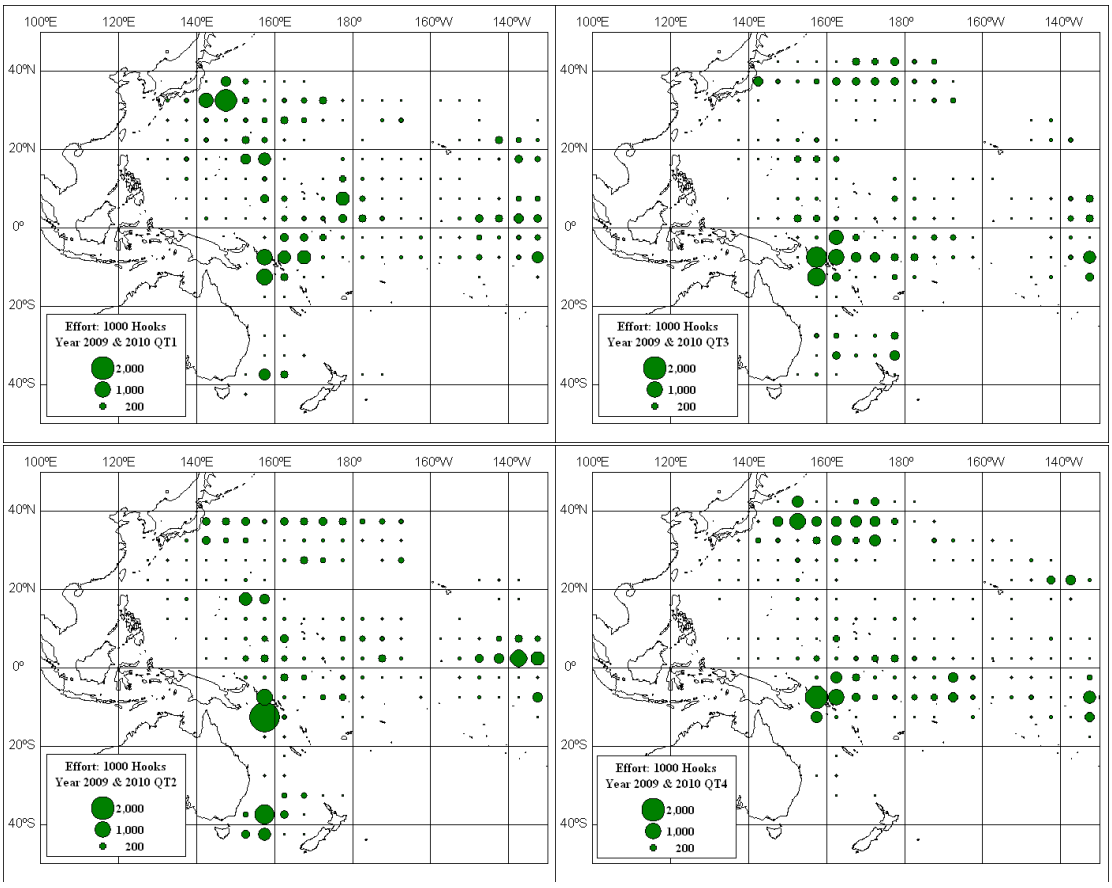

Fig. 3. Quarterly distribution of fishing effort for the Japanese offshore and distant water longline fisheries in the western and central Pacific Ocean in average of 2009-2010.

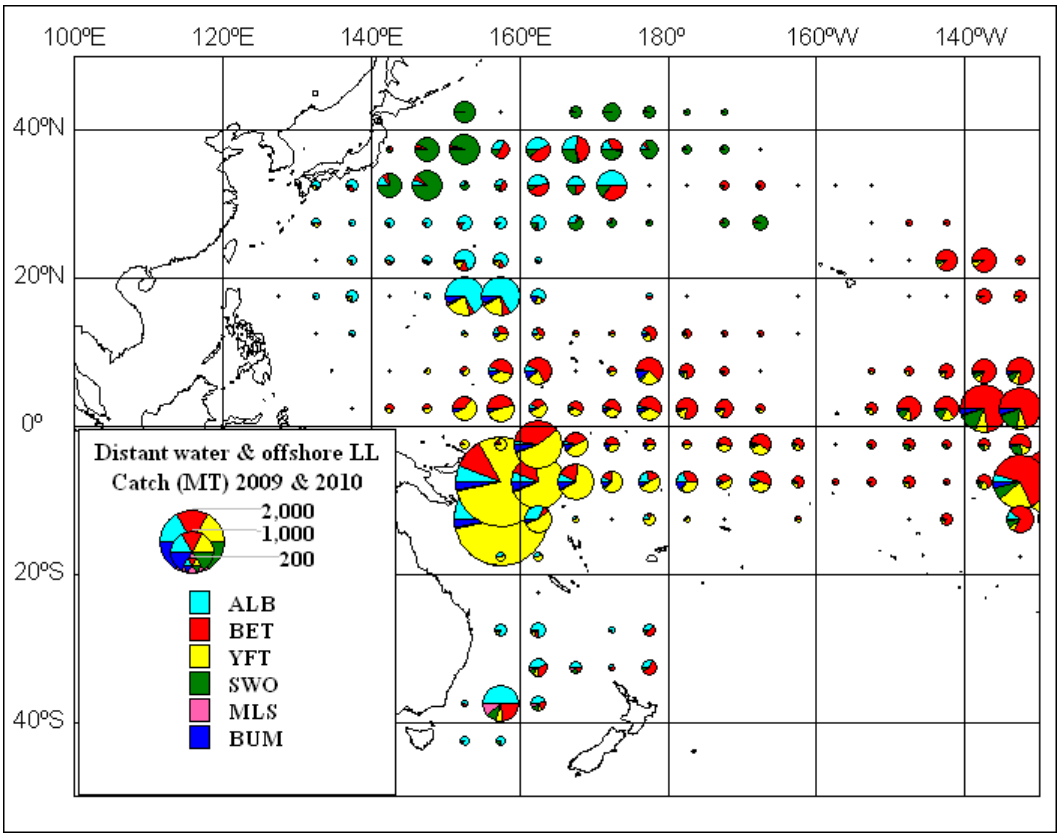

Fig. 4. Distributions of offshore and distant water longline catch (in weight) by species in average of 2009-2010 for six main species (ALB: albacore, BET: bigeye tuna, YFT: yellowfin tuna, SWO: swordfish, MLS: striped marlin and BUM: blue marlin).

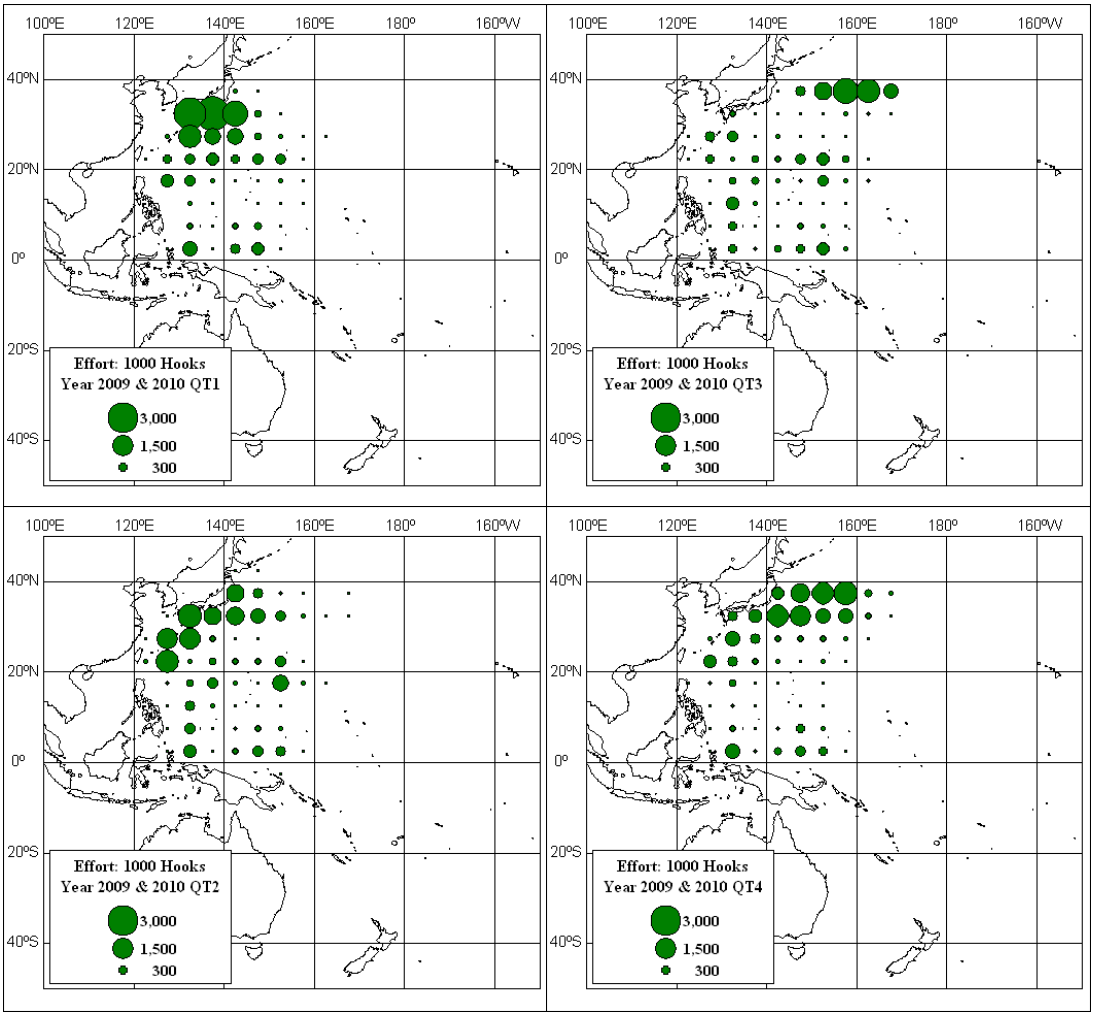

Fig. 5. Quarterly distribution of fishing effort for the Japanese small offshore longline fisheries (10- 20 GRT) in the western and central Pacific Ocean in average of 2009-2010.

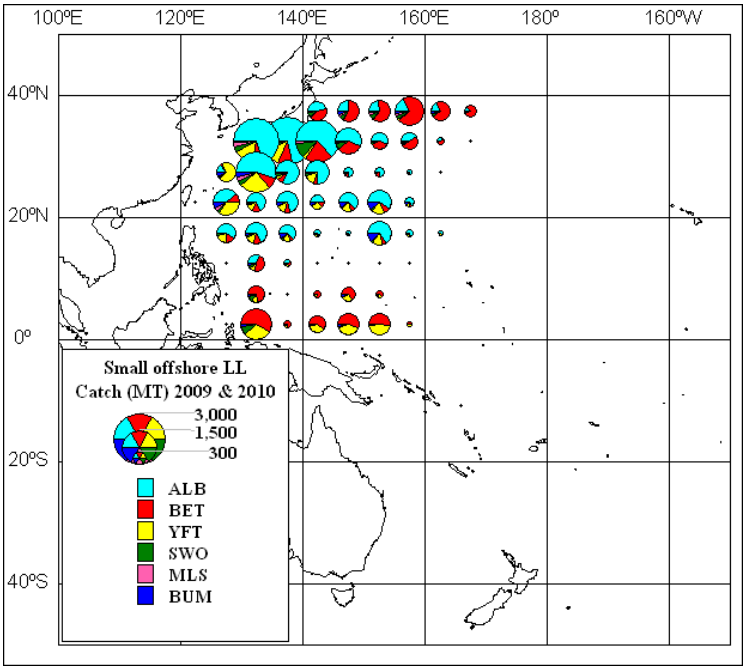

Fig. 6. Distributions of small offshore longline catch (in weight) by species in average of 2009-2010 for six main species (ALB: albacore, BET: bigeye tuna, YFT: yellowfin tuna, SWO: swordfish, MLS: striped marlin and BUM: blue marlin).

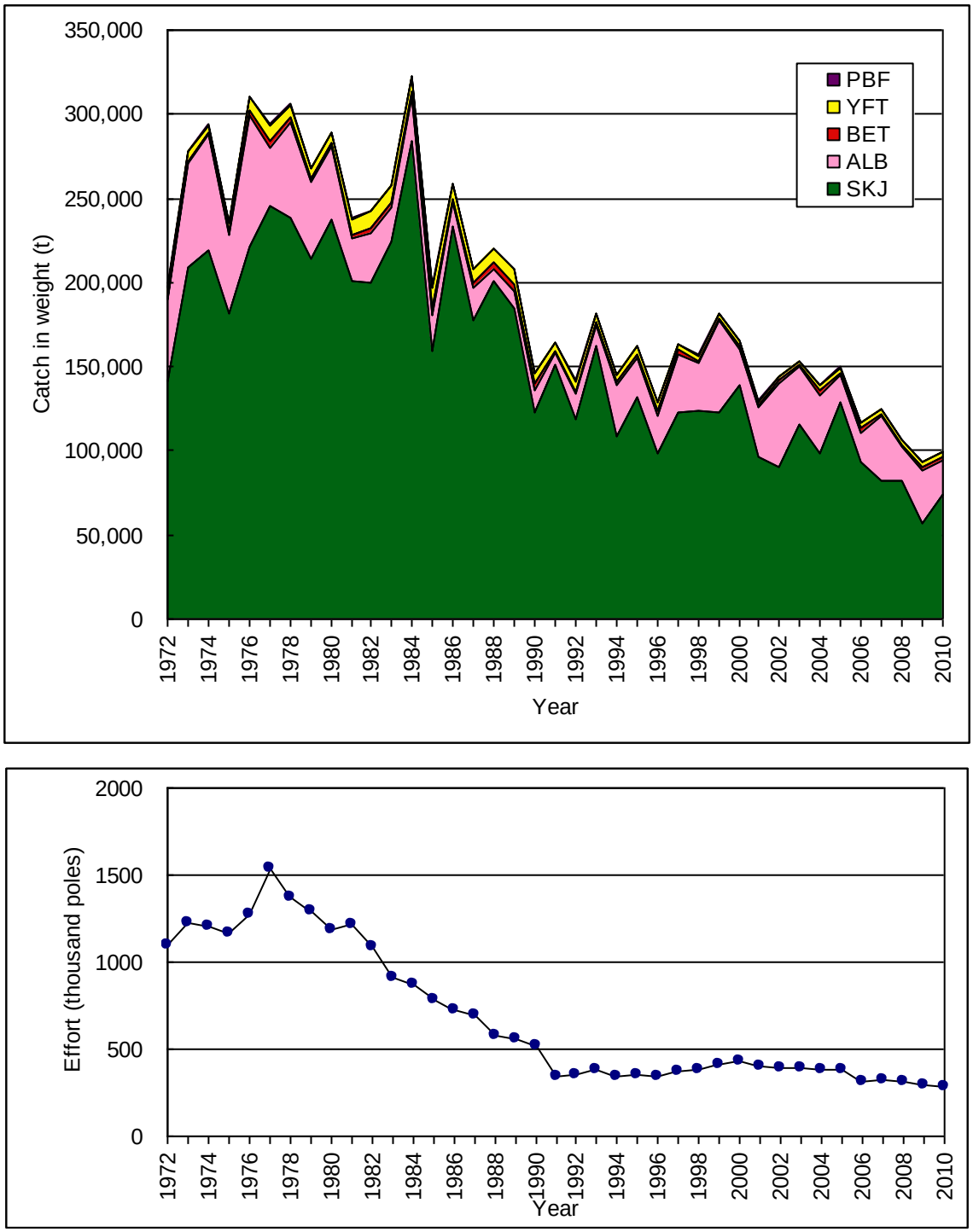

Fig. 7. Historical change of fishing effort and catches by species for the Japanese pole-and-line fishery (>20GRT) in the WCPFC Convention Area. Values in 2010 are provisional.

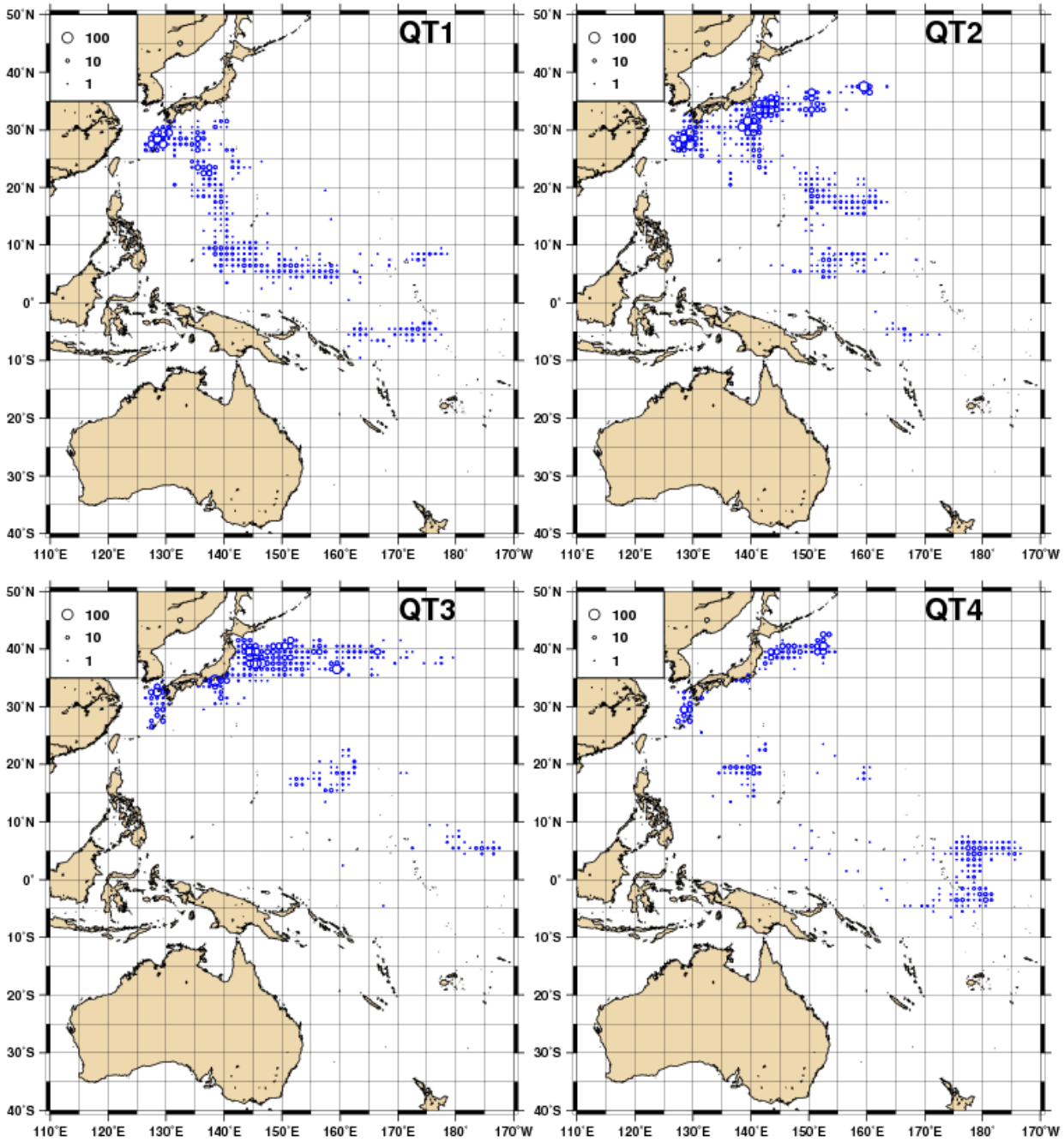

Fig. 8. Quarterly distribution of fishing effort (days) for the Japanese pole-and-line fishery (offshore and distant water licenses) in the Pacific Ocean in average of 2009-2010.

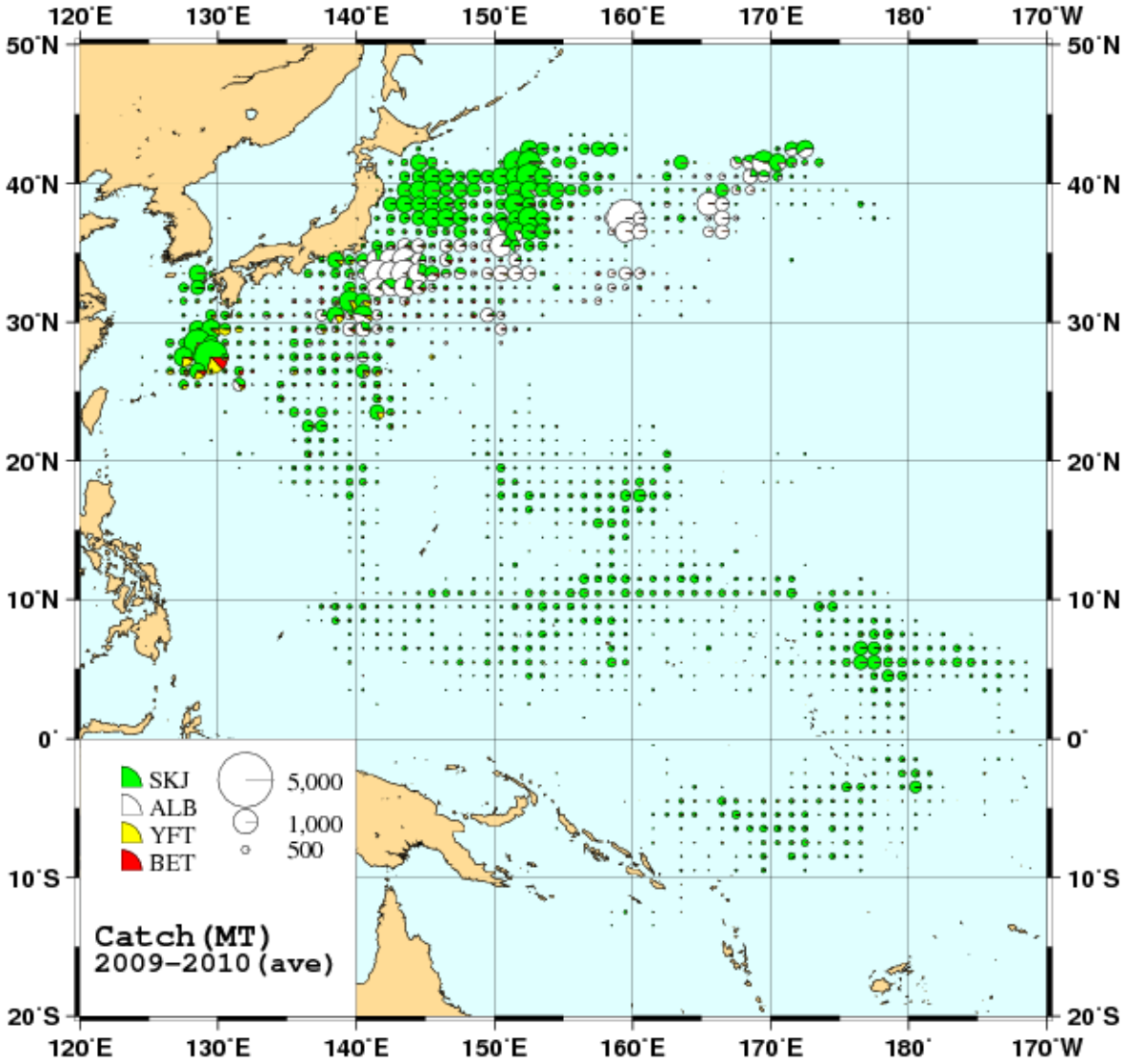

Fig. 9. Distribution of catch and its species composition for the Japanese offshore and distant water pole-and-line fishery in average of 2009-2010.

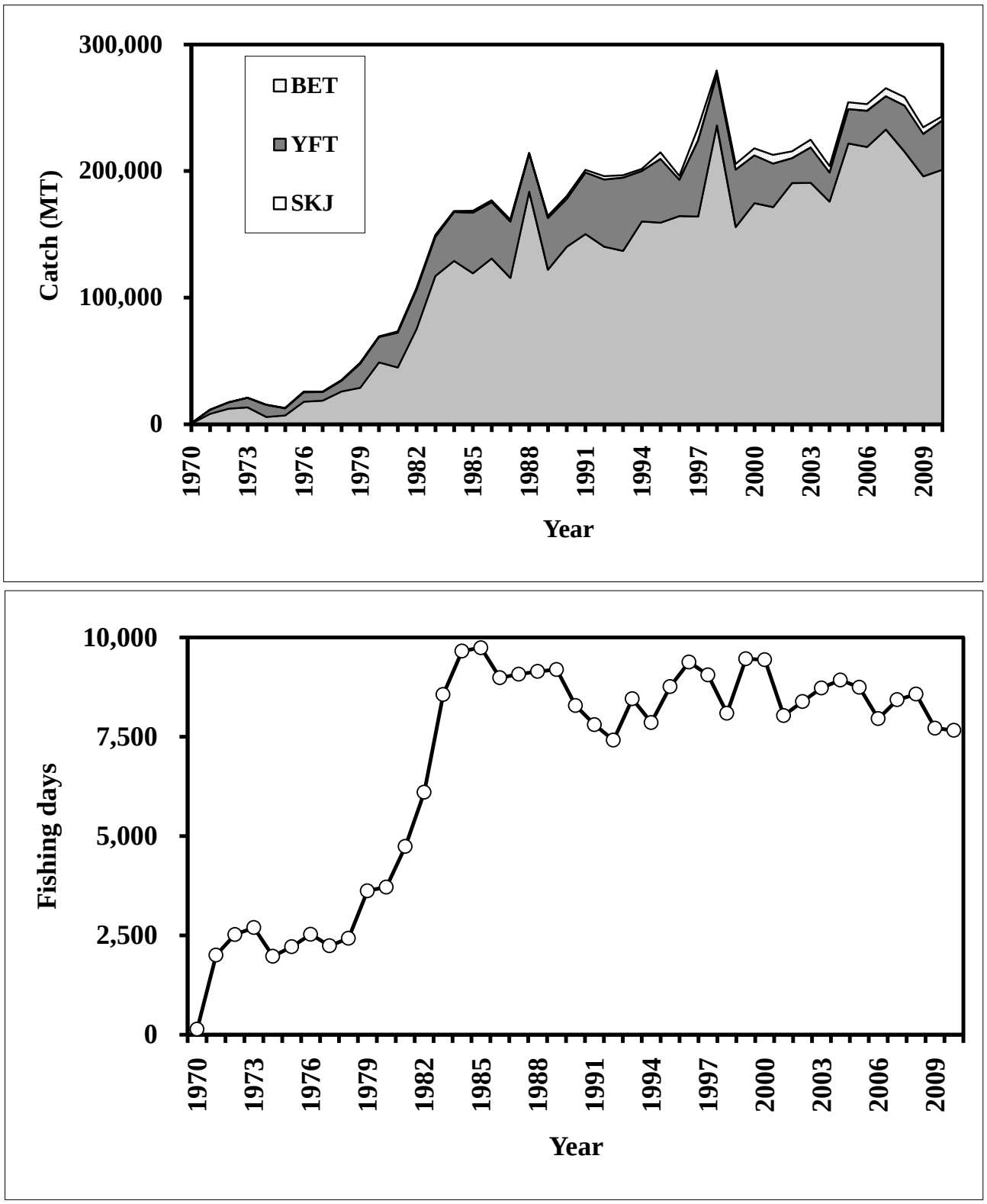

Fig. 10. Trends of fishing effort and catches by species for the Japanese tuna purse seine fishery in the WCPFC Convention Area.

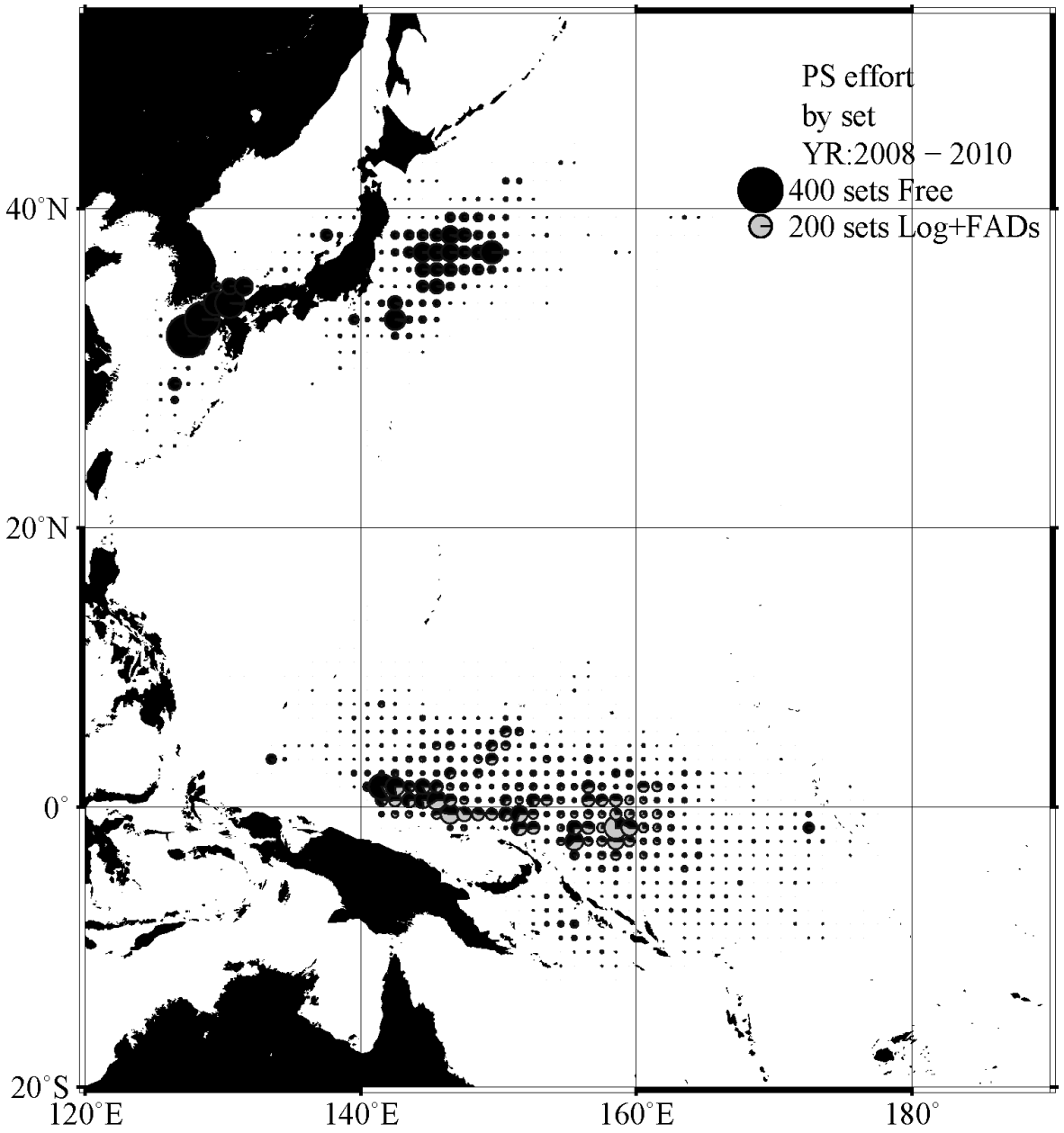

Fig. 11. Distribution of tuna purse seine catch (mt) by species (skipjack, yellowfin and bigeye) combined for 2008-2010.

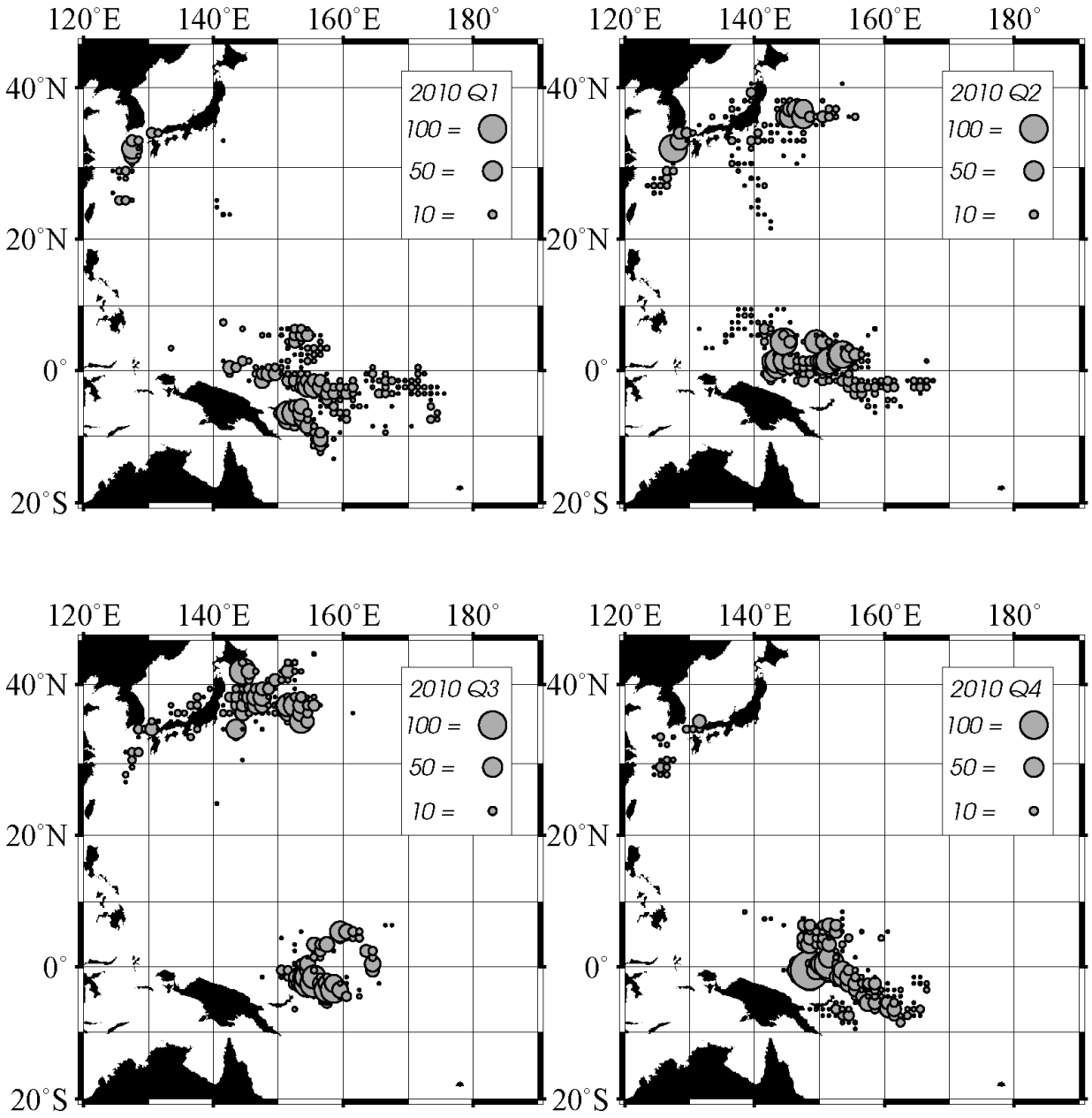

Fig. 12. Quarterly distributions of fishing effort (number of set) for the Japanese tuna purse seine fishery in the Pacific Ocean in 2010.

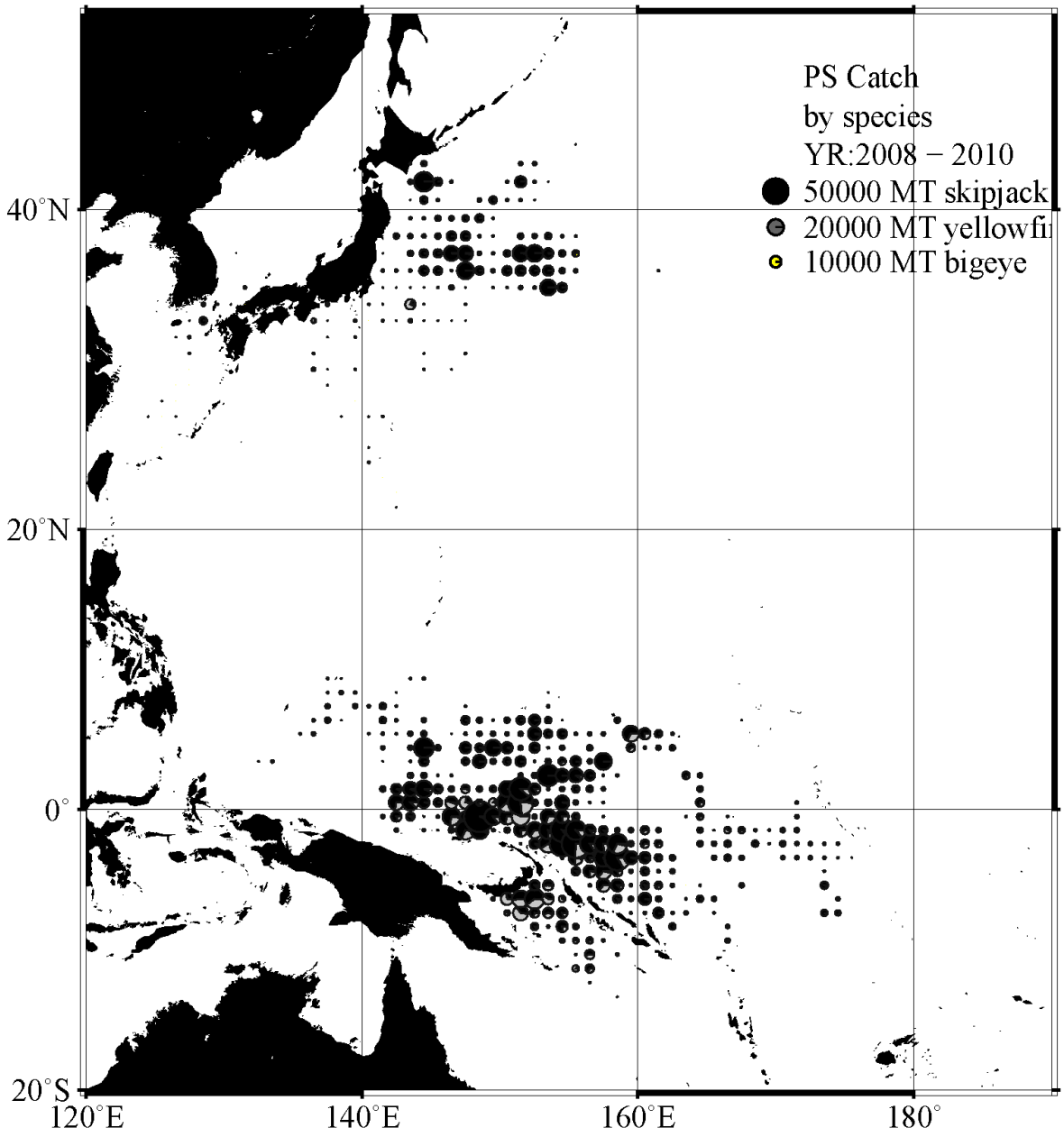

Fig. 13. Distribution of sets by type of school for 2008-2010 deployed by the tuna purse seine fishery by Japan.

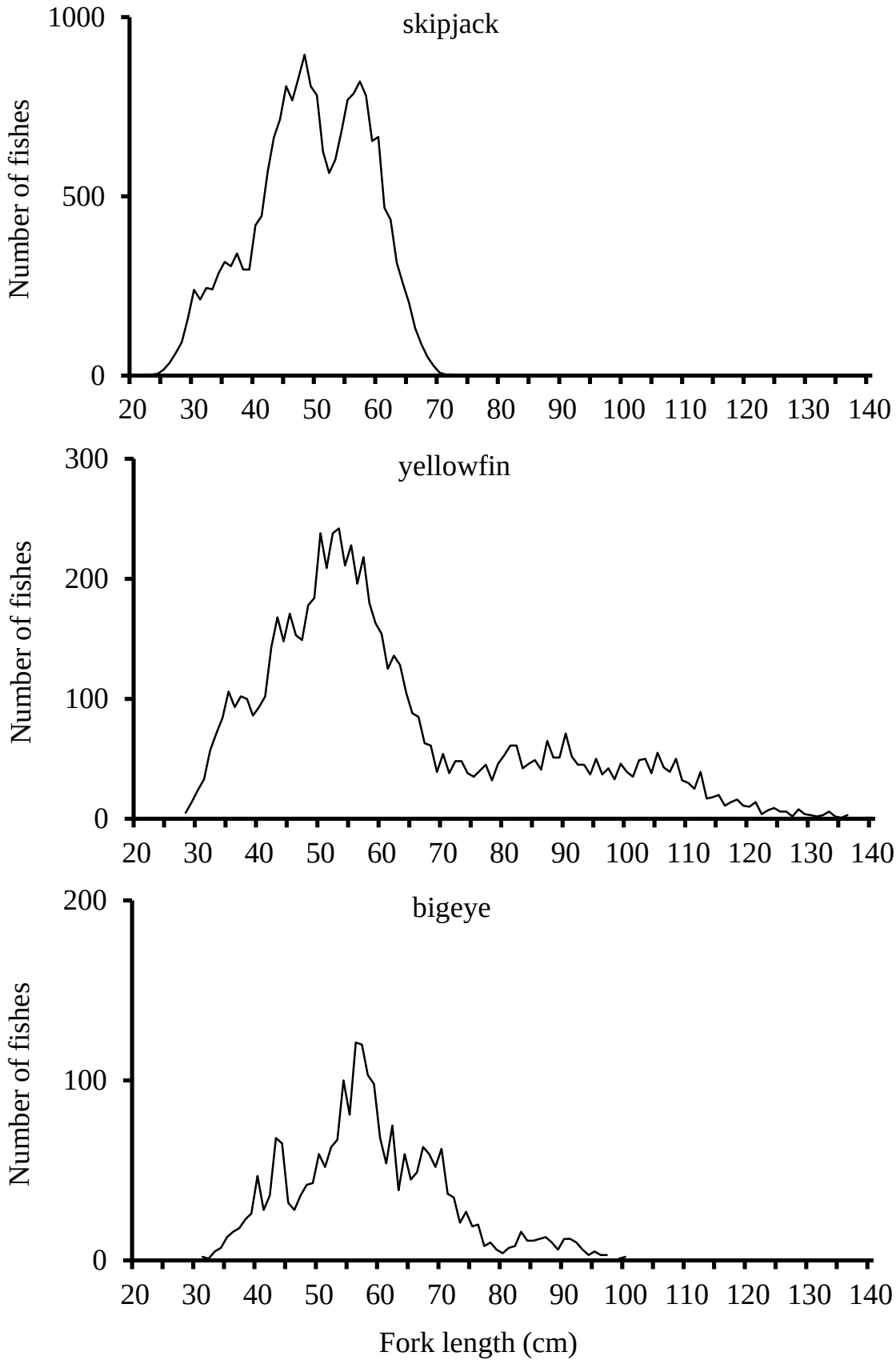

Fig. 14. Annual length frequency distribution of purse seine-caught fish in equatorial waters in 2010.

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	BLZ	BLM	SKJ
2006	1616	472	109	3	4
2007	1787	411	166	1	9
2008	1222	280	59	2	2
2009	1276	453	87	1	5
2010	1662	270	63	6	7

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)			
2006	1058	63	108	8880	1544	1421	777
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	806	-	83	3742	1301	1047	918

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)			
2006	0	11	0	0	0	0	0
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	7	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)			
2006	1058	63	108	8880	1544	1421	777
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	940	-	83	3742	1301	1047	918

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)			
2006	0	10	0	0	0	0	0
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	7	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)			
2006	0	0	0	0	0	0	0
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

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				
2006	16593	4575	78	15322	28	336	221	460	55	42
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	31172	12	2064	149	410	32	43
2010	18683	3751	91	21666	12	296	149	410	32	43

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				
2006	141	5045	0	6	0	0	0	0	0	0
2007	45	4933	0	0	0	0	0	0	0	0
2008	1	3034	0	0	0	0	0	0	0	0
2009	8	4247	0	0	0	0	0	0	0	0
2010	0	4322	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				
2006	16593	4487	78	15322	28	336	221	460	55	42
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	31172	12	2064	149	410	32	43
2010	18683	3633	91	21666	12	296	149	410	32	43

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				
2006	141	3082	0	6	0	0	0	0	0	0
2007	45	3351	0	0	0	0	0	0	0	0
2008	2	2048	0	0	0	0	0	0	0	0
2009	8	2643	0	0	0	0	0	0	0	0
2010	0	2988	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				
2006	0	238	0	0	0	0	0	0	0	0
2007	0	332	0	0	0	0	0	0	0	0
2008	0	26	0	0	0	0	0	0	0	0
2009	0	83	0	0	0	0	0	0	0	0
2010	0	133	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			
2006	1504	6181	796	5	590
2007	2014	6109	829	2	492
2008	1778	4402	648	3	524
2009	1547	4400	682	3	489
2010	1547	4400	682	3	489

Swordfish (2) the Pacific Ocean south of the Equator

Year	LL	LL	Gillnet	Setnet	Others
	Coastal less than 20 GRT	Offshore and distant-water			
2006	0	1437	0	0	0
2007	0	1679	0	0	0
2008	0	1993	0	0	0
2009	0	2049	0	0	0
2010	0	2049	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			
2006	1504	5776	796	5	587
2007	2014	5902	829	2	490
2008	1778	3950	648	3	522
2009	1547	3721	682	3	488
2010	1547	3721	682	3	488

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			
2006	0	371	0	0	0
2007	0	434	0	0	0
2008	0	446	0	0	0
2009	0	508	0	0	0
2010	0	508	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			
2006	0	156	0	0	0
2007	0	183	0	0	0
2008	0	161	0	0	0
2009	0	165	0	0	0
2010	0	165	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			
2006	538	623	1190	30	66
2007	860	306	970	21	63
2008	609	390	1302	26	81
2009	606	166	821	17	94
2010	606	166	821	17	94

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			
2006	0	621	0	0	0
2007	0	630	0	0	0
2008	0	482	0	0	0
2009	0	462	0	0	0
2010	0	462	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			
2006	538	353	1190	30	66
2007	860	270	970	21	63
2008	609	341	1302	26	81
2009	606	111	821	17	94
2010	606	111	821	17	94

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			
2006	0	162	0	0	0
2007	0	151	0	0	0
2008	0	134	0	0	0
2009	0	153	0	0	0
2010	0	153	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			
2006	0	24	0	0	0
2007	0	28	0	0	0
2008	0	12	0	0	0
2009	0	8	0	0	0
2010	0	8	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. "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)	Vessel numbers	Catch (mt)	Vessel numbers	Flag	Catch (mt)	Vessel numbers
2006	154	34	0	0	--	--	--
2007	141	21	0	0	--	--	--
2008	148	19	0	0	--	--	--
2009	168	20	0	0	--	--	--
2010	193	26	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. That 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
2006	10,902	613	726	616
2007	8,729	456	702	612
2008	7,100	646	569	147
2009	7,765	302	543	59
2010	(7,467)	(130)	(518)	(106)

Small offshore longline (10-20 GRT)

	Blue shark	Salmon shark and porbegle	Mako shark	Other sharks
2006	50	6	0	23
2007	41	4	1	1
2008	227	13	15	38
2009	154	40	36	15
2010	(157)	(29)	(19)	(11)