

Japan National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2016

National Research Institute of Far Seas Fisheries, Fisheries Research Agency
and
Fisheries Agency, Government of Japan

Executive Summary

This Japanese national report describes following 8 issues in recent five years (2011-2015), i.e., (1) tuna fisheries (longline fishery and purse seine fishery) (2) fleet information, (3) catch and effort by species and gear, (4) ecosystem and bycatch, (5) national data collection and processing systems including “logbook data collection and verification”, “vessel monitoring system”, “scientific observer program”, “port sampling program” and “unloading and transshipment”, (6) national research programs and (7) Implementation of Scientific Committee recommendations & resolutions of the IOTC relevant to the Scientific Committee and (8) working documents.

INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

<p>In accordance with IOTC Resolution 15/02, final scientific data for the previous year was provided to the IOTC Secretariat by 30 June of the current year, for all fleets other than longline [e.g. for a National Report submitted to the IOTC Secretariat in 2016, final data for the 2015 calendar year must be provided to the Secretariat by 30 June 2016)</p>	<p>YES 30/June/2016</p>
<p>In accordance with IOTC Resolution 15/02, provisional longline data for the previous year was provided to the IOTC Secretariat by 30 June of the current year [e.g. for a National Report submitted to the IOTC Secretariat in 2016, preliminary data for the 2015 calendar year was provided to the IOTC Secretariat by 30 June 2016].</p> <p>REMINDER: Final longline data for the previous year is due to the IOTC Secretariat by 30 Dec of the current year [e.g. for a National Report submitted to the IOTC Secretariat in 2016, final data for the 2015 calendar year must be provided to the Secretariat by 30 December 2016].</p>	<p>YES 30/June/2016</p>
<p>If no, please indicate the reason(s) and intended actions:</p>	

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1. BACKGROUND/GENERAL FISHERY INFORMATION

Longline and purse seine fisheries are two types of Japanese tuna fisheries currently operating in the Indian Ocean. Longline fishery started its operation in 1952 when the limitation of operational area imposed by the GHQ*¹, was removed. On the other hand, commercial purse seine fleet commenced fishing in the Indian Ocean in 1991 after several years of experimental fishing.

The total fishing effort (the number of hooks) of Japanese longliners in the Indian Ocean had been keeping at similar level with fluctuation since 1971, i.e., around 100 million hooks, until 2007. Thereafter, it has been decreasing down to about 28 million hooks in 2011 due to piracy activities. It kept in a low level after that and was 29 million hooks in 2015. Percentage of effort used in this Ocean in the total effort in all oceans fluctuated around 20% until 2003 after when it increased to 35% in 2006 and 2007. Thereafter it has drastically decreased to 16% in 2010 and kept in a low level after that, mainly because of piracy activities off Somalia.

As for the purse seine fishery, fishing took place mainly in the tropical western Indian Ocean until 1993 after when fishing effort shifted almost completely to the eastern Indian Ocean mainly because of economic problem derived from rise of Japanese Yen during that time.

2. FLEET STRUCTURE

All Japanese longline vessels operating in the Indian Ocean have been the distant water category (120-500GRT) with some exceptional offshore vessels (10-120GRT). Historical change in the number of longline vessels from 1987 to 2015 is shown in Table 1. In the last 20 years, the number of vessels operated in this Ocean was around 170-250 per year until 2008. Although the number of operating vessels was relatively large in number (224-251) during 1995-1999, after that it decreased to less than 200 except for 228 in 2002. Although the number of vessels in 2007 increased to 250, it decreased rapidly year by year until 2011 due to effect of piracy activities. The number of longline vessels in 2015 was 52.

Japanese purse seine vessels operating in the Indian Ocean are 350-700 GRT class (700-1000 carrying capacity). Historical change in the number of purse seine vessels from 1987 to 2015 is shown in Table 1. Although more than 10 Japanese purse seiners operated during 1991-1994, it decreased year by year and commercial purse seiner retreated from the Indian Ocean in 2001 leaving only one vessel "Nippon-Maru", the research vessel of Fisheries Research Agency (FRA), which was replaced by another research vessel "No.1 Taikei-Maru" in 2013. In 2015, commercial vessels also operated and the number of total vessels operated increased to 3.

Table 1. Number of vessels operating in the IOTC area of competence, by gear type

Fleet/Year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	
Longliners	272	235	245	216	184	181	206	206	224	251	243	242	223	192	
Purse seiners	1	1	3	4	11	12	11	11	8	5	3	4	3	2	
Fleet/Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Longliners	199	228	172	189	184	188	250	173	130	84	72	75	57	53	52
Purse seiners	2	1	1	1	1	3	3	3	2	1	1	1	1	1	3

* GHQ (General Headquarters) of the occupying forces of the Allies after the World War II

3. CATCH AND EFFORT (BY SPECIES AND GEAR)

3.1 Longline fishery

The latest available longline data is that of 2015 (data for 2015 are preliminary).

Fishing effort

The longline fishery commenced in 1952 in the eastern equatorial waters in the Indian Ocean. In the late 1960s, the effort covered entire fishing ground of the longline in the Indian Ocean. The annual amount of the effort has increased until the late 1960s and fluctuated after that. However, fishing effort had been dramatically decreasing since 2008 and then kept in a low level (Table 2) because of the effect of piracy activities off Somalia. Fishing effort in 2015 (29 thousand hooks) was only about 25% of that in 2007.

Table 2. Annual catch and effort and primary species in the IOTC area of competence (longline fishery, 2011-2015).

(catch in mt and hooks in thousand)

Year	Sets	Hooks	SBF	ALB	BET	YFT	SWO	MLS	BLZ	BLM	SFA	SPF	SKJ
2011	8,804	28,454	1,497	2,427	3,696	4,415	571	319	242	51	68	188	26
2012	9,635	31,466	1,389	2,918	5,474	3,330	619	158	238	53	56	94	15
2013	8,926	29,127	953	2,275	5,582	4,158	657	94	195	51	56	87	24
2014	9,800	31,786	1,272	3,737	5,310	3,639	770	56	173	51	72	112	26
2015	9,203	29,062	1,868	2,918	4,929	3,149	709	23	138	49	60	110	14

Geographical distributions of longline effort for 2015 and average of 2011-2015 are shown in Fig. 1. In 2015, the effort in African offshore area from off Cape Town to Mozambique and in the eastern part west off Australia and Indonesia seems relatively larger than that for 2011-2015. The effort in the northwestern area has dramatically decreased since 2008 and the effort in 2015 is still few because the threat of activity of piracy still remains off Somalia.

Catch

Historical catch in weight by species and catch statistics for 2011-2015 by Japanese longliners in the Indian Ocean are shown in Fig. 2 and Table 2, respectively, and geographical distributions of catch in 2015 and average of 2011-2015 for major tuna and billfish species are shown in Fig. 3. Catch of albacore, yellowfin and southern bluefin tunas were very high during 1950s and 1960s, and then sharply decreased. After mid 1990s bigeye and yellowfin tunas have been main components of the catch.

Total catch (the catch of southern bluefin tuna, albacore, bigeye, yellowfin, swordfish, striped marlin, blue marlin, black marlin, sailfish, shortbill spearfish, and skipjack) in 2014 and 2015 was 15,218MT and 13,967MT, respectively. It should be noted that the catch of yellowfin and bigeye drastically decreased during 2007-2010, although the catch of albacore was roughly at the same level during this period. Furthermore, bigeye catch in 2011 and yellowfin catch in 2015 were lowest after 1980s, and this decrease was mainly derived from decrease in effort especially in the tropical area.

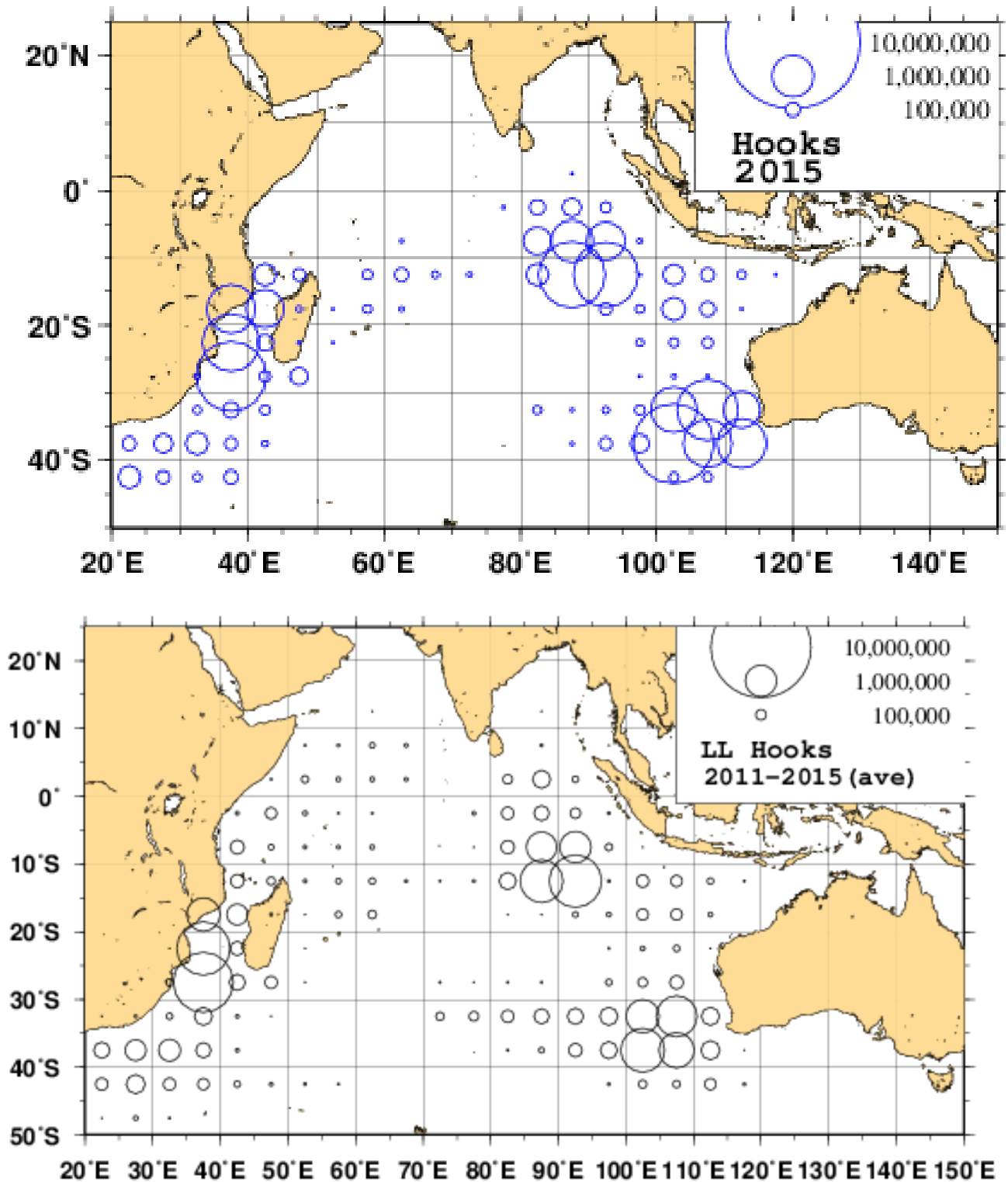


Fig 1. Geographical distributions of longline effort for 2015 (above) and average of 2011-2015 (below).

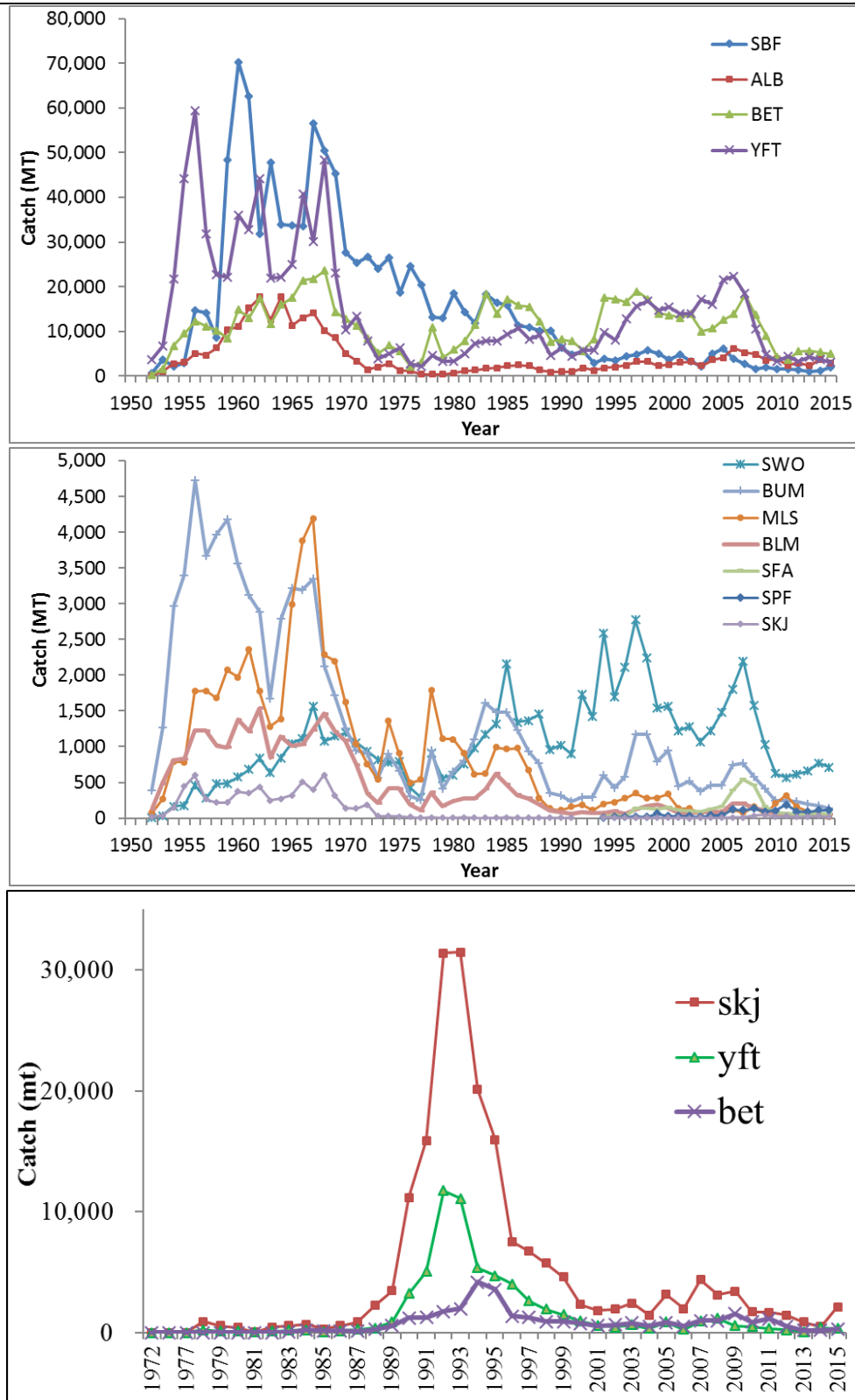


Fig. 2. Historical change in longline and purse seine catch of main tuna and tuna-like species in the Indian Ocean. Upper: longline (tuna species), middle: longline (skipjack and billfish species), lower: purse seine.

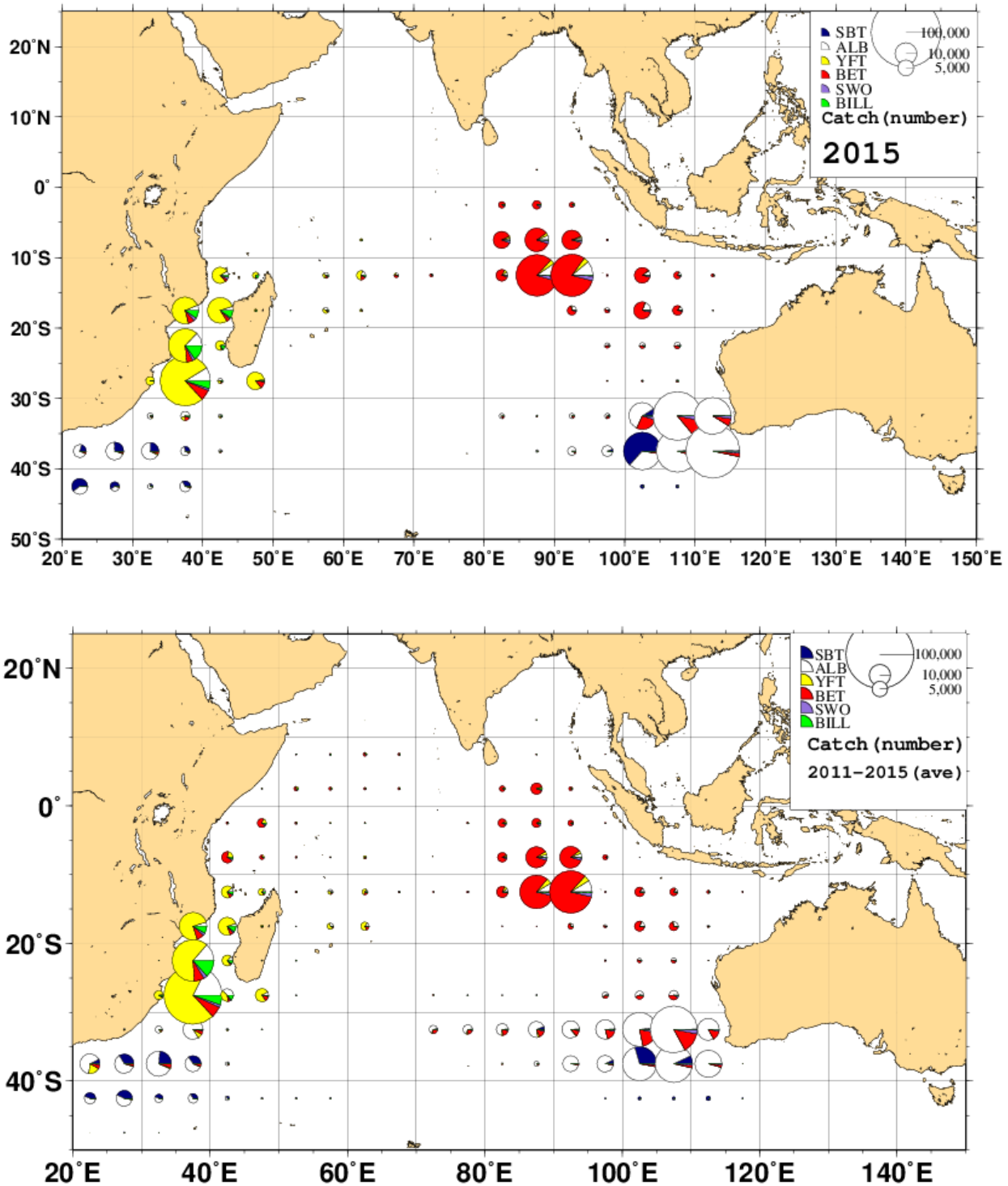


Fig. 3 Geographical distributions of longline catch (in number) of major species in 2015 (upper) and in average of 2011-2015 (lower). Southern bluefin tuna (SBT), albacore (ALB), bigeye tuna (BET), yellowfin tuna (YFT), swordfish (SWO) and billfishes (BILL).

Seeing geographical distribution of the catch, yellowfin and bigeye tunas are mainly caught in the western and eastern part, respectively. Albacore is mainly caught in the temperate area west off Australia and subsequently around South Africa, where this species is one of main components of the catch. In 2015 there was little effort in the northwestern area and so yellowfin was mainly caught in the area around Madagascar.

3.2 Purse seine fishery

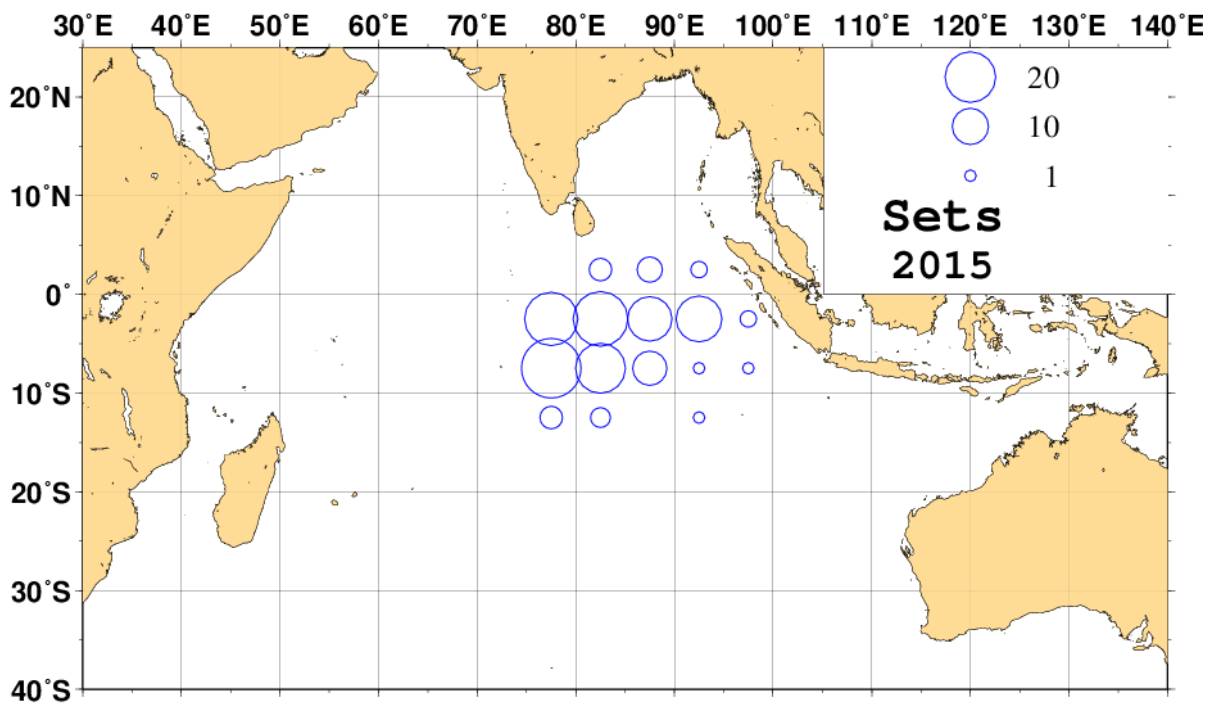
The latest available data for Japanese purse seine fishery is that for 2015.

Fishing Effort

Total fishing effort (number of set) was 51 in 2014 and 154 in 2015 (Table 3). Geographical distributions of effort for 2015 and the average of 2011-2015 are shown in Fig. 4. Operations were conducted almost only in the eastern part in recent years.

Table 3. Annual catch and effort and primary species in the IOTC area of competence (2011-2015) (purse seine fisheries).

Year	Number of set	Catch (mt)				Total
		SKJ	YFT	BET	others	
2011	105	1,675	352	1,130	0	3,157
2012	72	1,437	232	536	0	2,205
2013	27	861	95	197	0	1,153
2014	51	496	433	192	0	1,121
2015	154	2,140	338	295	0	2,773



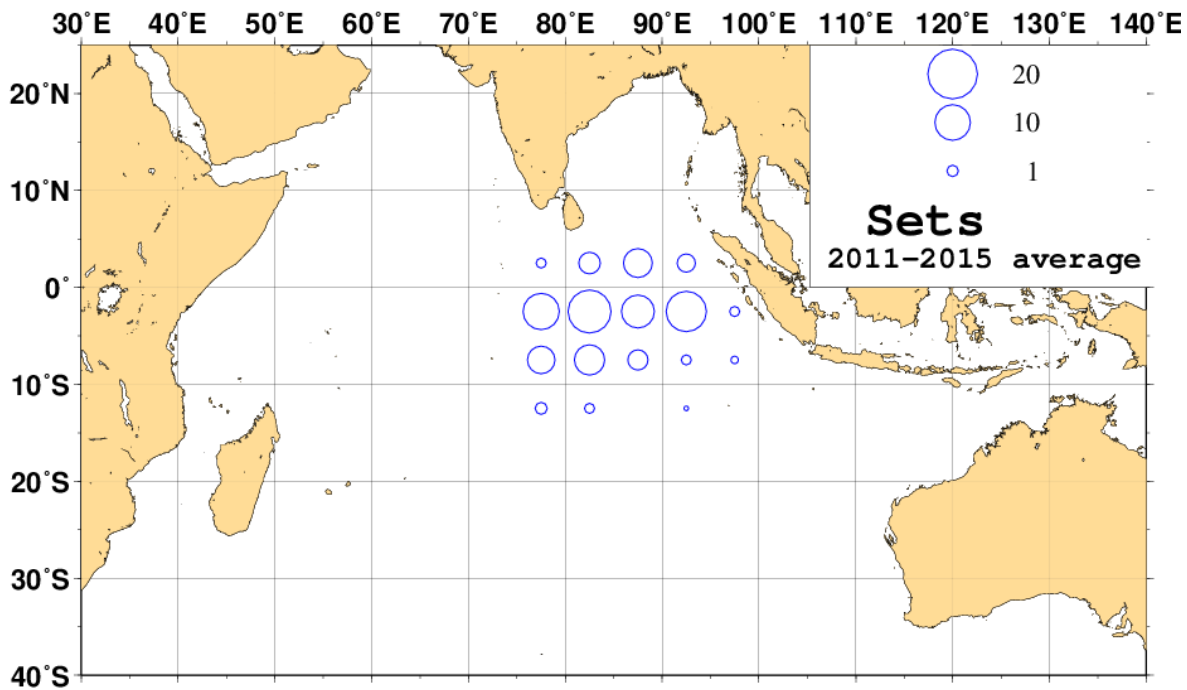


Fig. 4. Distributions of purse seine fishing effort in the Indian Ocean in 2015 (upper) and average of 2011-2015 (lower).

Catch

Total catch was low (around 1,000 MT or less) until mid-1980s, then increased rapidly to about 45 thousand MT in 1992 and 1993 after when it decreased to 10 thousand MT in 1997 and 10 thousand MT in 1999 (Fig. 1). Thereafter it has fluctuated between 2.0 and 8.6 thousand MT until 2012 and total catch in 2013 and 2014 decreased to approximately 1 thousand MT. Total catch in 2015 increased to 2.7 thousand MT because of increase in the number of vessels operated. Catch in weight of skipjack, yellowfin and bigeye in 2015 (2014) was 2,140 (496) MT, 338 (433) MT and 295 (192) MT, respectively. Geographical distributions of catch in 2015 and average of 2011-2015 for major tuna species are shown in Fig. 5. Main component of the catch was usually skipjack tuna in all the area operating, and was partly yellowfin and/or bigeye tuna.

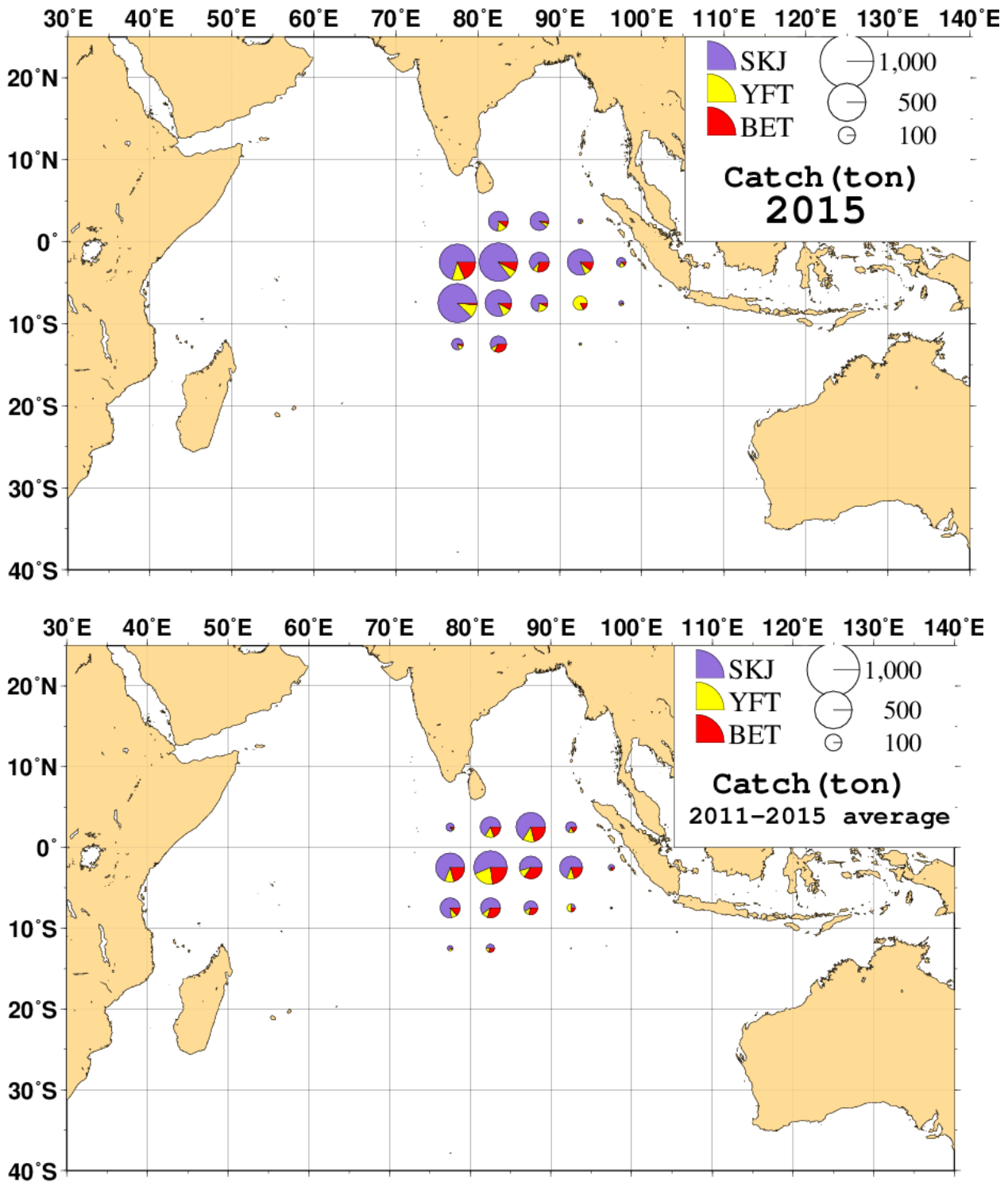


Fig. 5 Geographical distributions of purse seine catch of major species in 2015(upper) and average of 2011-2015 (lower).

4. RECREATIONAL FISHERY

None

5. ECOSYSTEM AND BYCATCH ISSUES

5.1 National Action Plans

In accordance with FAO International Action Plans on sharks and seabirds, Japan established the National Action Plans on sharks and seabirds in 2001 then revised in 2009 and 2011. In addition, Japan has been taking actions in accordance with the FAO Guidelines on sea turtle by-catch. Japan has been taking actions in accordance with IOTC conservation and management measures on by-catch of sharks, sea turtles and seabirds.

5.2 Logbooks information (Sharks)

Table 4 shows annual catch of three major shark species by Japanese tuna longliners (1994-2015). These catch data were collected through the logbook and compiled in the National Research Institute of Far Seas Fisheries (NRIFSF). In August 2008, the Japanese government obliged Japanese distant water longliners to land all the parts of sharks (although heading, gutting and skinning are allowed) and the quantities given in Table 4 represents the whole weight including the weight of fins. These figures are based on the new conversion factors introduced in 2013 (for details on the new conversion factors, refer to National Report in 2013). In April 2013, silky and hammerhead sharks were added into shark species to be recorded in the logbooks for longline fishery, in addition to blue, Porbeagle, shortfin mako, oceanic whitetip, thresher and other sharks. Statistics of newly added species will be available in the near future.

Table 4. Reported annual catch (tons) of three major sharks species caught by Japanese tuna longliners in the Indian Ocean (1994 -2015). (* 2015 is preliminary.

Year	Blue shark	Porbeagle	Shortfin mako
1994	414	145	425
1995	724	47	328
1996	736	51	666
1997	805	62	494
1998	645	48	283
1999	557	37	372
2000	530	39	310
2001	477	33	246
2002	433	25	224
2003	355	10	126
2004	330	10	297
2005	577	20	276
2006	398	24	216
2007	790	12	162
2008	2,240	53	208
2009	2,657	26	154
2010	1,503	13	170
2011	1,390	18	155
2012	1,557	8	148
2013	1,102	2	99
2014	832	2	112
2015	988	4	111

5.2 Observer data

Under the IOTC ROS starting July 1, 2010, scientific observers have been deployed to the Japanese tuna longliners and collecting bycatch data in the Indian Ocean as a part of the southern bluefin tuna observer program. Observers take photo of bycatch species according to the procedures given in the observer manual made by the NRIFSF scientists. Bycatch experts in the NRIFSF identified species using these photos. Table 5 shows the summary of bycatch information (2010-2014).

Table 5 Summary of bycatch information (number of individuals recorded) observed by scientific observers on board to Japanese tuna longline vessels

IOTC code	English name	2010	2011	2012	2013	2014
Sharks						
BSH	Blue shark	833	2621	611	829	2596
BTH	Bigeye thresher	161	0	0	0	0
FAL	Silky shark	19	2	7	7	7
LMA	Longfin mako	0	1	2	15	21
OCS	Oceanic whitetip shark	10	1	1	4	0
POR	Porbeagle	153	367	113	52	283
PSK	Crocodile shark	78	109	33	63	227
SMA	Shortfin mako	68	142	88	79	148
SPL	Scalloped hammerhead	2	0	1	0	0
SPZ	Smooth hammerhead	0	0	0	1	0
TIG	Tiger shark	2	0	0	0	0
Manta and Rays						
PSL	Pelagic stingray	309	193	234	169	759
RAJ	Rays and skates nei	5	0	16	0	0
MAM	Mantas and devil rays nei	0	3	0	0	7
Unidentified sharks, rays and skates						
SKH	Sharks, rays, skates, etc. nei	45	42	26	33	0
Sea turtles						
TTX	Marine turtles nei	11	0	4	33	34
Sea birds						
	Sea bird	38	184	34	28	12

6. NATIONAL DATA COLLECTION AND PROCESSING SYSTEMS

6.1 Logbook data collection and verification

Longline

In the logbook 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 and time of starting and setting the gear are included. The number of hooks per basket is important information as it suggests the depth of the gear and target species. As for tuna and tuna-like fishes, six tunas (bluefin, southern bluefin, albacore, bigeye, yellowfin and skipjack), and six billfishes (swordfish, striped marlin, blue marlin, black marlin, sailfish and shortbill spearfish) are recorded by species in the logbook. 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 and branch lines) are asked to fill on the top part of the sheet by each cruise. Japan revised the logbook format for distant water fishing vessels in accordance with IOTC Resolution 12/03,13/03 and 15/01.

Submitted logbooks are processed into electronic data files. Various error checks, such as date, location, range of weight of the fish, CPUE, are conducted before these data are finalized. Vessel characteristics (call sign, name, license number, etc) are verified with a register.

Purse seine

The logbooks of purse seiners are required to be submitted every month to the Japanese government. 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).

6.2 Vessel Monitoring System

VMS installation on all distant water and offshore longline and distant water purse seine vessels is obligated since 1st August in 2007.

6.3 Scientific Observer programme

In July, 2010 Japan started the observer programs under IOTC ROS. During 2010-2014, 6, 8, 10, 9 and 8 observers were dispatched to the IOTC area respectively. They covered 5.5% in average of the total sets (Table 6). Japanese observer program in the IOTC area is a part of the southern bluefin tuna one. Data in 2010-2014 have been submitted to the IOTC Secretariat. Fig. 6 shows areas where observers covered in 2010-2014.

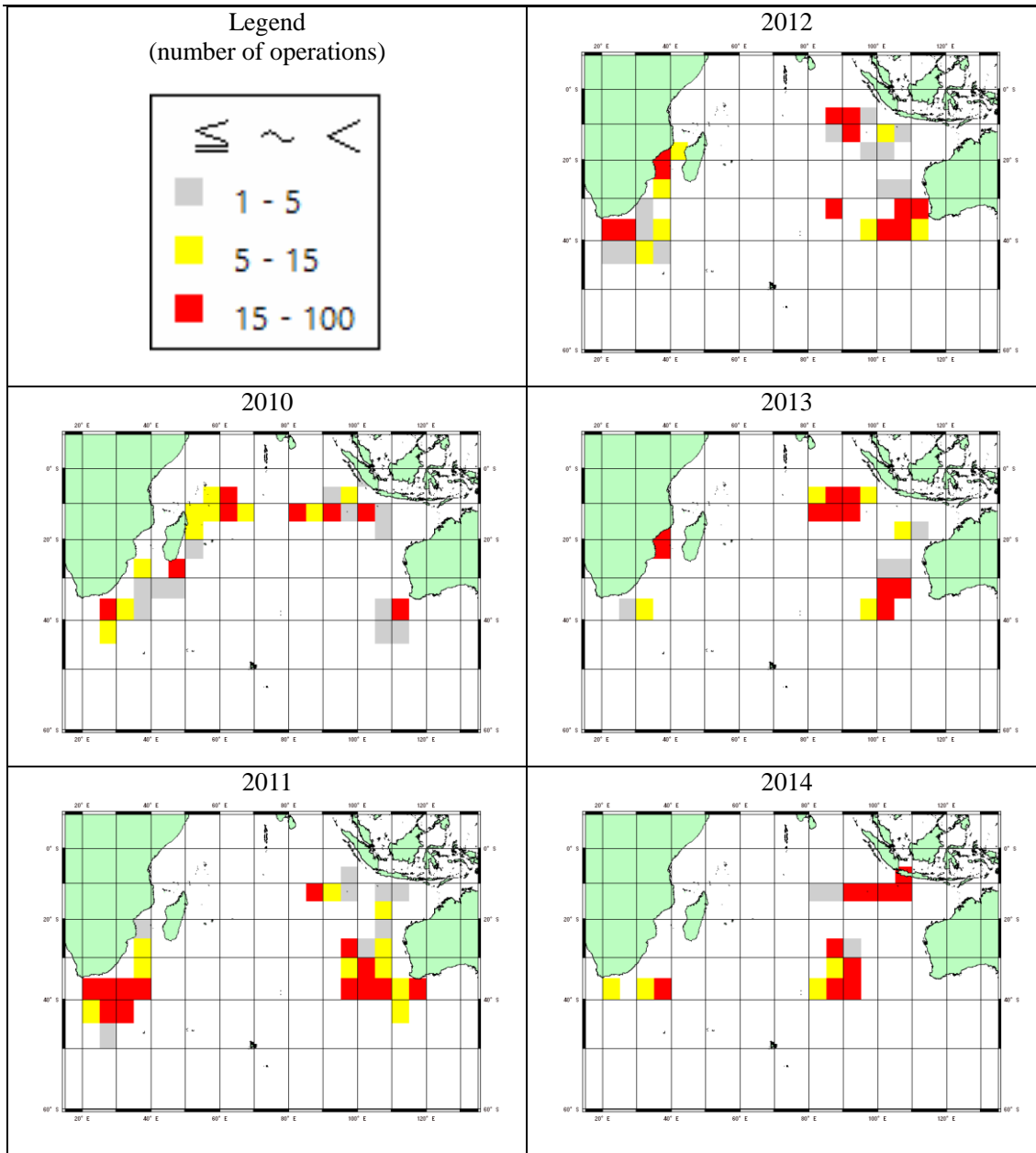


Fig. 6 5°x5° areas covered by scientific observers in the Japanese tuna longline fisheries (2010/July-Dec - 2014)
 (Red: 15 operations or more, Yellow: 5-14 operations and Grey: 1-4 operation)

6.4 Port sampling program

Because catch in the Indian Ocean is mainly unloaded abroad, the port sampling in Japanese ports was held only once in 2008 recently.

6.5 Unloading/Transshipment

Unloading

The owners of fishing vessels are required to submit relevant documents to the Japanese Government 10 days before the planned landing date including unloading abroad. In case of unloading abroad the owner of fishing vessels are required to obtain approval from the Government of Japan in advance.

Transshipment

The owners of fishing vessels are required to obtain approval from the Government of Japan for at port transshipments in advance. To apply for at port transshipment, fishers have to submit relevant documents to the Government of Japan 10 days before the planned transshipment date. Fishers shall complete the IOTC transshipment declaration and transmit it to the Government of Japan not later than 15 days after the transshipment. Japan also controls at sea transshipments by its vessels in accordance with the Resolution 08/02 on establishing a programme for transshipment by large-scale fishing vessels.

7. NATIONAL RESEARCH PROGRAMS

7.1 Research cruises by Marine Fisheries Research and Development Center (JAMARC), Fisheries Research Agency (2012-2016)

In recent 5 years, JAMARC has been conducting the experimental purse seine fishing in the eastern Indian Ocean. RV Nippon Maru (2012) and Taikei Maru No.1 (2013-2016) were used for the study. The main object of the research program is to mitigate bycatch of juvenile yellowfin and bigeye tunas in purse seining with FADs. Two kinds of study have been conducted; (a) Study on the application of light stimuli to force juvenile tuna escaping through large mesh panels of the purse seine net and (b) Study on preset estimation of species and size composition of schools associated with FADs using wide band echo sounder. With accurate estimation, sets on FADs with larger concentration of juvenile tunas could be avoided and would lead to protection of juveniles.

7.2 Development of Kobe plots I+II and ADMB_SCAA/ASPM software (2009-2016)

Since 2009, the project to develop software for ADMB implemented SCAA (Statistical-Catch-At-Age)/ASPM (Age Structure Production Model) and Kobe plots I + II has been implemented to 2016. This project was funded by Fisheries Research Agency (FRA) (2009-2015) and Fisheries Research and Education Agency (FRA) (2016). Software is available at:

<http://ocean-info.ddo.jp/kobeaspm/kobeplot/KobePlot.zip>

<http://ocean-info.ddo.jp/kobeaspm/aspm/ASPM.zip>

7.3 IOTC-OFCF projects (2002-2016)

The IOTC-OFCF joint project to improve tuna fisheries statistics in the IOTC water have been implemented for last 15 years in four phases, i.e., 1st phase for 5 years: 2002-2006, 2nd phase for 3 years: 2007-2009, 3rd phase: 2010-2012 and 4th phase: 2013-2016 (last year).

8. IMPLEMENTATION OF SC RECOMMENDATIONS & RESOLUTIONS OF THE IOTC RELEVANT TO THE SC.

Progress on the implementation of recommendations of the past SCs relating to Japan is as below:

8.1 Observer coverages

In accordance with the Resolution 10/04 (IOTC ROS), Japan started to deploy observers from July, 2010. The observer coverages (2010-2014) are 7.7%, 5.8%, 5.3%, 4.3 % and 5.7% respectively (average =5.5%) based on the number of sets (Table 6).

Table 6 Observer coverage rates of the Japanese tuna longline fisheries based on the number of sets (as of November 2016).

Table 6 Observer coverage rates of the Japanese tuna longline fisheries (No. of sets) (as of Nov, 2016).

Color legend of coverage

5% ≤

< 5%

Year	2010 (July-Dec)	2011	2012	2013	2014	Average
Total Sets	4,470	9,635	8,926	9,800	9,203	8,407
Observed sets	345	557	472	420	526	464
Coverage (%)	7.7	5.8	5.3	4.3	5.7	5.5

8.2 Collection of size data

Tuna longliners in Japan have been collecting size data voluntary basis to now, except the observer program under the IOTC Regional Observer Scheme (ROS) started in July, 2010. In 1960-70's, size data were covered up to 20% of the total catch, afterwards the coverage decreased to a few %. In 1980-1990's, high school training vessels off Java Island, Indonesia collected size data in high coverage rates. For example, as for bigeye tuna, its coverage of size data was 10-20% of the total catch in the Indian Ocean before 1992. But, afterwards it sharply decreased to only a few %. This is mainly because these training vessels shifted their operations to the Pacific Ocean due to the pirate problems in the Strait of Malacca. Under such situation, size data sampled have been limited. After the IOTC ROS started in July, 2010, Japanese observer started to collect more size data (Table 7).

Table 7 Number of size measured (4 major species) in 2010- 2014 under the IOTC ROS.

() Numbers recommended by IOTC (1 fish per ton in the annual catch) and (%) coverage

Color legend of coverage

< 60%

60%-100%

100% <

Year	No of observers (vessels)	Yellowfin	Bigeye	Albacore	Swordfish
2010 (July-December)	6	2,195	2,794	2,628	232
2011	8	452 (4,415) (10%)	2,501 (3,696) (68%)	5,904 (2,427) (243%)	95 (571) (17%)
2012	10	1,784 (3,330) (54%)	4,096 (5,474) (75%)	3,316 (2,918) (114%)	234 (619) (38%)
2013	9	2,817 (4,558) (62%)	3,678 (5,583) (66%)	3,713 (2,275) (163%)	216 (657) (33%)
2014	8	247 (3,639) (7%)	4,755 (5,310) (90%)	14,357 (3,737) (384%)	478 (770) (62%)
Average (%)		33%	74%	226%	37%

8.3 Modification of log-sheet collection system

The owners of fishing vessels larger than or equal to 10 GRT are required to submit the logbook on their operations and catch information to the Japanese government within three months after each cruise was finished. As the duration of one cruise for distant water longliners is long, sometimes longer than one year, it used to take about two years to complete compiling statistics of longline fishery. Starting in August 2008, distant water longliners are required to submit it every ten days. This change in submission rule of logbook has facilitated earlier compilation of tuna statistics.

8.4 Improvement to speed up to submit fisheries data to the IOTC

From August 1, 2008 Japan has mandated that all the long-distance longline vessels submit the logbook more quickly by revising the ministerial ordinance. This change facilitates more speedy data submission to the IOTC secretariat.

9. WORKING DUCUMENTS (total 24 Documents)

9.1 WPTmT06 (Temperate tuna) (Shanghai) (July, 2016) (6)

IOTC–2016–WPTmT06–14 Review of Japanese longline fishery and its albacore catch in the Indian Ocean
(Takayuki Matsumoto)

IOTC–2016–WPTmT06–15 Standardization of albacore CPUE by Japanese longline fishery in the Indian Ocean

(Takayuki Matsumoto and Toshihide Kitakado)

IOTC–2016–WPTmT06–16 Temporal and spatial patterns of Taiwanese, Japanese and South Korean Nominal Albacore CPUE distributions in the Indian Ocean (Yin Chang, Takayuki Matsumoto and Sung Il Lee)

IOTC–2016–WPTmT06–19 Collaborative study of albacore tuna CPUE from multiple Indian Ocean longline fleets. (Simon D. Hoyle, Yin Chang, Doo Nam Kim, Sung Il Lee, Takayuki Matsumoto, Keisuke Satoh, & Yu-Min Yeh)

IOTC–2016–WPTmT06–20 Stock and risk assessments of albacore in the Indian Ocean based on ASPIC (Takayuki Matsumoto)

IOTC–2016–WPTmT06–21 Stock assessment of albacore (*Thunnus alalunga*) in the Indian Ocean using Statistical-Catch-At-Age (SCAA) (Tsutomu Nishida, Toshihide Kitakado & Takayuki Matsumoto)

9.2 WPB14 (Billfish)(Seychelles) (September, 2016) (4)

IOTC–2016–WPB14–19_Rev1 Standardization of catch rate for black marlin (*Istiompax indica*) exploited by the Japanese tuna longline fisheries in the Indian Ocean (1971-2015) (Hiroki Yokoi, Yasuko Semba, Keisuke Satoh and Tom Nishida)

IOTC–2016–WPB14–22 Standardization of catch rate for blue marlin (*Makaira mazara*) exploited by the Japanese tuna longline fisheries in the Indian Ocean from 1971 to 2015 (Hiroki Yokoi, Yasuko Semba, Keisuke Satoh and Tom Nishida)

IOTC–2016–WPB14–24_Rev1 Stock assessments of black marlin (*Makaira indica*) in the Indian Ocean using A Stock-Production Model Incorporating Covariates (ASPIC) (1950-2015) (Hiroki Yokoi and Tom Nishida)

IOTC–2016–WPB14–26 Draft Stock assessments of blue marlin (*Makaira nigricans*) in the Indian Ocean using A Stock-Production Model Incorporating Covariates (ASPIC) (1950-2015) (Tom Nishida and Hiroki Yokoi)

9.3 WPEB12 (Ecosystem and Bycatch) (Seychelles) (September, 2016) (5)

IOTC-2016-WPEB12-38 Update of standardized CPUE of blue shark (*Prionace glauca*) in the Indian Ocean estimated from Japanese observer data between 1992 and 2015. (Yasuko Semba and Mikihiro Kai)

IOTC–2016–WPEB12–INF07 Examination of factors affecting seabird bycatch occurrence rate in southern hemisphere in Japanese longline fishery with using random forest (Yukiko Inoue, Minoru Kanaiwa, Kotaro Yokawa and Kazuhiro Oshima)

IOTC-2016-WPEB12-INF08 MODELING OF BYCATCH OCCURRENCE RATE OF SEABIRDS FOR JAPANESE LONGLINE FISHERY OPERATED IN SOUTHERN HEMISPHERE (Yukiko Inoue, Minoru Kanaiwa, Kotaro Yokawa, Kei Okamoto and Kazuhiro Oshima)

IOTC-2016-WPEB12-INF09 Operational pattern of Japanese longliners in the south of 25S in the Atlantic and the

Indian Ocean for the consideration of seabird bycatches (Kotaro Yokawa, Kazuhiko Oshima, Yukiko Inoue and Nobuhiro Katsumata)

IOTC-2016-WPEB12-INF10 Information of seabirds bycatch in area south of 25 S latitude in 2010 from 2015 (Nobuhiro Katsumata, Kotaro Yokawa¹ and Kazuhiro Oshima)

9.4 WPTT18 (Tropical tuna) (Seychelles) (November, 2016) (5)

IOTC-2016-WPTT18-13 Japanese longline CPUE for bigeye tuna in the Indian Ocean standardized by GLM (Takayuki Matsumoto, Tsutomu Nishida, Keisuke Satoh and Toshihide Kitakado)

IOTC-2016-WPTT18-17 Stock and risk assessments of bigeye tuna in the Indian Ocean based on ASPIC (Takayuki Matsumoto)

IOTC-WPTT18-2016-18_REV_1 Stock assessment of bigeye tuna (*Thunnus obesus*) in the Indian Ocean using Statistical-Catch-At-Age (SCAA) (Tom Nishida, Toshihide Kitakado and Takayuki Matsumoto)

IOTC-2016-WPTT18-19 Bayesian state-space production models for the Indian Ocean bigeye tuna (*Thunnus obesus*) and their predictive evaluation (Kento Otsuyama and Toshihide Kitakado)

IOTC-2016-WPTT18-25 Japanese longline CPUE for yellowfin tuna in the Indian Ocean standardized by generalized linear model (Takayuki Matsumoto, Tsutomu Nishida, Keisuke Satoh & Toshihide Kitakado)

9.5 WPM07 (Method) (Seychelles) (November, 2016) (2)

IOTC-2016-WPM07-11 Collaborative study of tropical tuna CPUE from multiple Indian Ocean longline fleets in 2016. (Simon D. Hoyle, Doo Nam Kim, Sung Il Lee, Takayuki Matsumoto, Keisuke Satoh, & Yu-Min Yeh)

IOTC-2016-WPM07-INF01 REPORT OF THE 5th WORKSHOP on MSE, IOTC WPM (Kitakado T, I Mosqueira, M.S. Adam, N. Bentley, D. Kolody, Merino G, H. Murua, G. Scott)

9.6 WPDCS12 (Data collection and statistics) (Seychelles) (November, 2016) (2)

IOTC-2016-WPDCS12-16 Consideration on the difference of average weight by estimation method for tunas caught by Japanese longline in the Indian Ocean (Takayuki Matsumoto)

IOTC-2016-WPDCS12-21 (Draft) Comments on the interim observer reporting template for LL (tuna longline fisheries) (National Research Institute of Far Seas Fisheries (NRIFSF) and Fisheries Agency of Japan)