National Report of JAPAN (2007)

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Fisheries Research Agency (FRA)
and
Fisheries Agency, Government of Japan

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1. General Fisheries Statistics

1-1. Longline fishery

The latest available Japanese tuna longline data is that of 2006 although it is preliminary. The data of 2005 is nearly final. All catch and effort statistics were compiled using logbook.

1-1-1. Fishing vessels

Japanese longline fishery is classified into three categories (coastal, offshore and distant water) according to the operation area and boat size (coastal: 10-20 GRT: gross tonnage within Japan's EEZ, offshore: 10-120GRT, mainly in the Western Pacific Ocean (for 10-20 GRT excluding Japan's EEZ) and distant: 120-500GRT, all oceans). Basically, all of the longline vessels operating in the Indian Ocean are in the distant water category. Some offshore longliners are licensed to operate in some part of the Ocean, namely off Indonesia, but there are no operations recently.

In the last fifteen years, the number of vessels operated in the Indian Ocean was around 180-250 vessels per year. Although the number of vessels was relatively large (224-251 vessels) during 1995-1999, after then, it decreased to less than 200 except for year 2002 (238 vessels) (Table 1). It declined to 170-190 vessels in 2003 through 2005.

Table 1. Number of Japanese vessels operated in the Indian Ocean.

Fleet/Year	2002	2003	2004	2005	2006
Longliner	228	171	187	172	141
Purse seiner	1	1	1	1	3

1-1-2. Fishing effort

The total fishing effort (the number of hooks) of Japanese longliners (including offshore and distant water longliners) in the Indian Ocean has been kept in similar level since 1971, i.e. around 100 million hooks (Fig. 1).

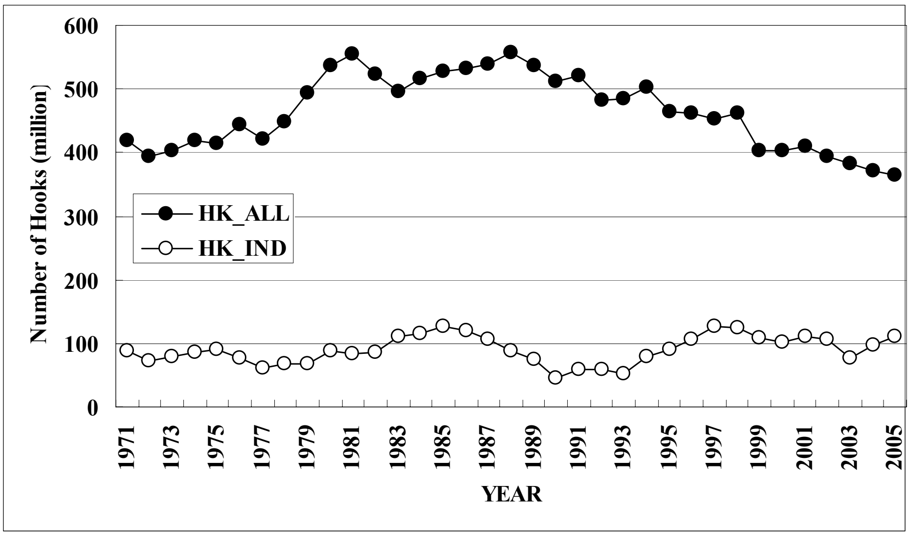

Fig. 1 Historical change in total Japanese longline effort in the Indian Ocean (open circle)

Annual distributions of longline effort from 2001 to 2006 are shown in Fig. 2. Although the geographical distributions of the effort are basically similar, the effort in the African offshore area from off Somalia to off Cape Town and Tanzania seems relatively large and the effort in eastern Indian Ocean decreased in the latest three years (2004 and after) probably by aggregation of longliners due to high yellowfin catch (formation of good yellowfin fishing ground).

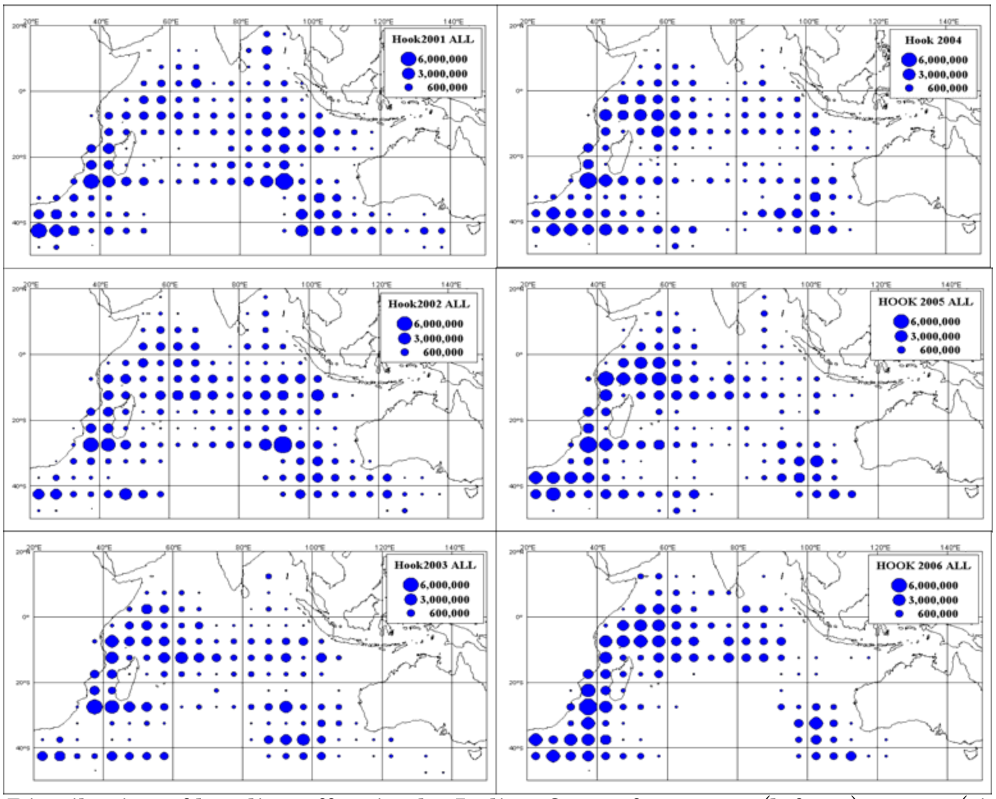

Fig. 2 Distribution of longline effort in the Indian Ocean from 2001 (left-up) to 2006(right-down).

Historically, fishing effort expanded to each of eastern and western Indian Ocean has been the same level, that is, roughly 50% each until 2002 (Fig. 3). However, the effort in western Indian Ocean has been greater than 70% since 2003 and about 85% in 2005 and 2006. Quarterly distributions of fishing effort in 2005 and 2006 are shown in Fig. 4.

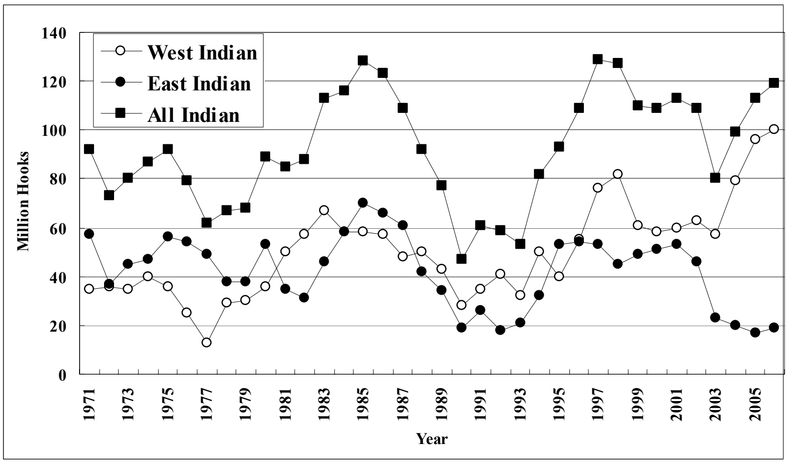

Fig.3. Historical change of effort exerted into each of West and East Indian Ocean.

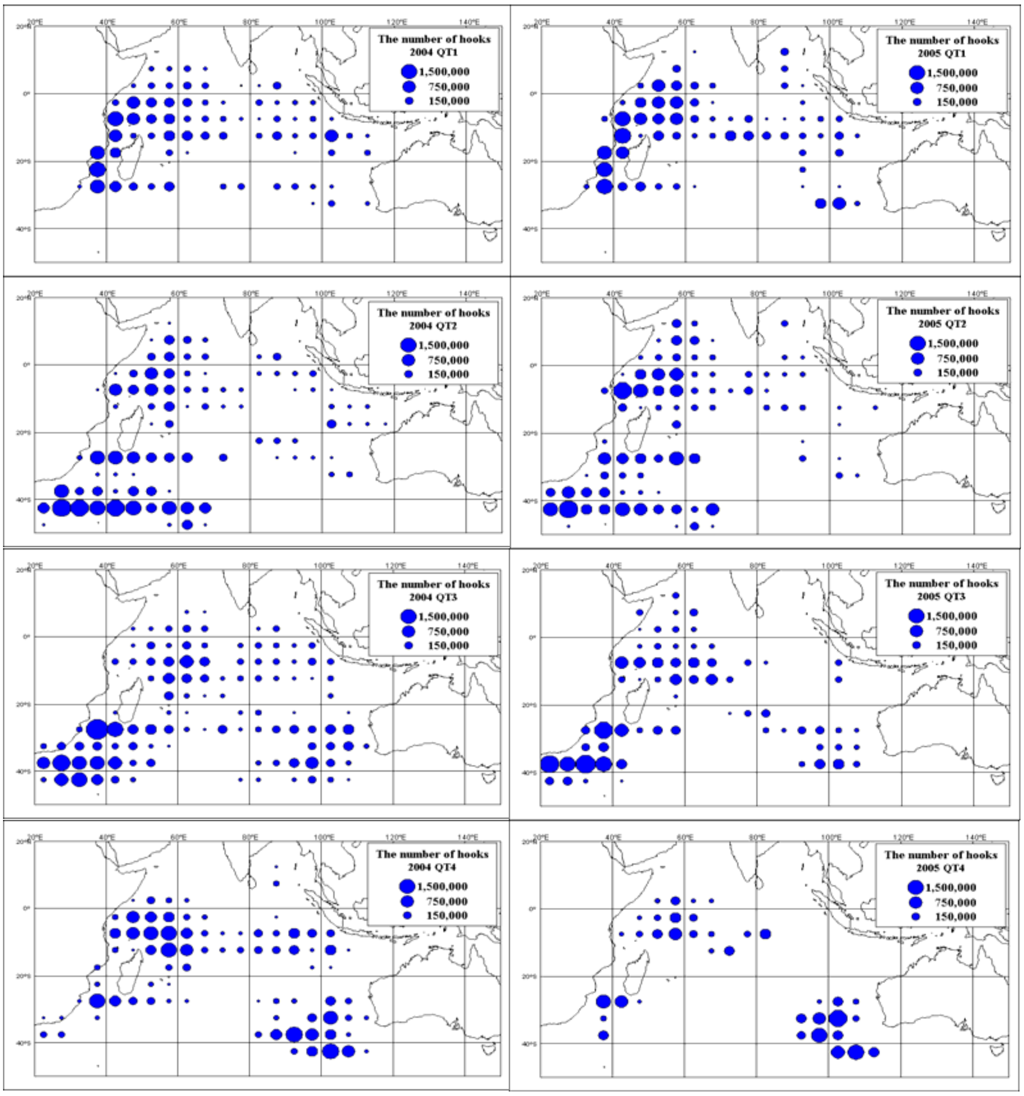

Fig. 4. Quarterly longline effort distribution in the Indian Ocean in 2005 (left) and 2006 (right).

1-1-3. Catch

Catch statistics in weight from 2002 to 2006 by Japanese longliners in the Indian Ocean is shown in Table 2 and geographical quarterly distributions of catch in 2005 and 2006 for major tuna and billfish species are shown in Fig. 5 and Fig. 6 respectively. Total catch includes the catch of southern bluefin tuna, albacore, bigeye, yellowfin, swordfish, striped marlin, blue marlin, black marlin, sailfish, shortbill spearfish, and skipjack. Catches of each species in 2006 (2005) were 3,923MT (5,547MT) for southern bluefin, 6,503MT (4,139MT) for albacore, 11,740MT (12,513MT) for bigeye and 23,222MT (21,824MT) for yellowfin.

Table 2. Fishing effort and catch in weight (MT) by the Japanese longline fishery in the Indian Ocean (IOTC statistical area), 2002-2006. Sets and hooks are in thousand. "Total" includes skipjack catch.

Year	Sets	Hooks	Total	SBF	ALB	BET	YFT	SWO	MLS	BLZ	BLM	SPF	SFA
2002	35	105961	36402	3232	3216	13881	13932	1284	132	517	75	31	102
2003	26	78249	33128	2053	2250	9965	17159	1071	67	370	85	18	88
2004	32	98219	37271	4980	3605	10645	16034	1225	78	455	85	39	120
2005	37	112252	46368	5547	4139	12513	21824	1513	75	459	92	38	165
2006	37	116376	48758	3923	6503	11740	23222	1782	102	740	216	151	366

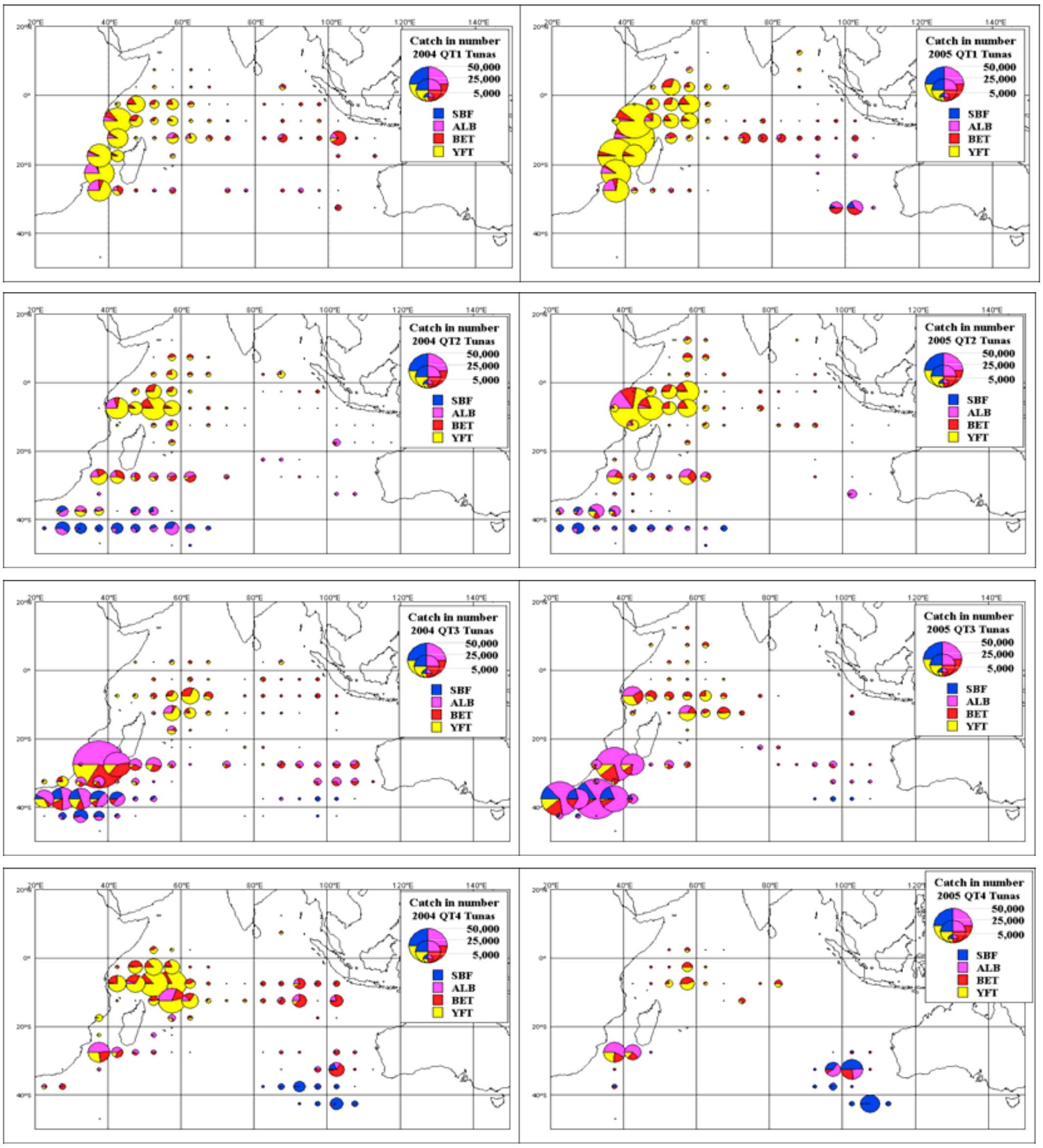

Fig. 5. Geographical quarterly distributions of catch in number of major tuna species caught by Japanese longline fishery in 2005 (left) and 2006 (right). SBF: southern bluefin, ALB: albacore, BET: bigeye, and YFT: yellowfin.

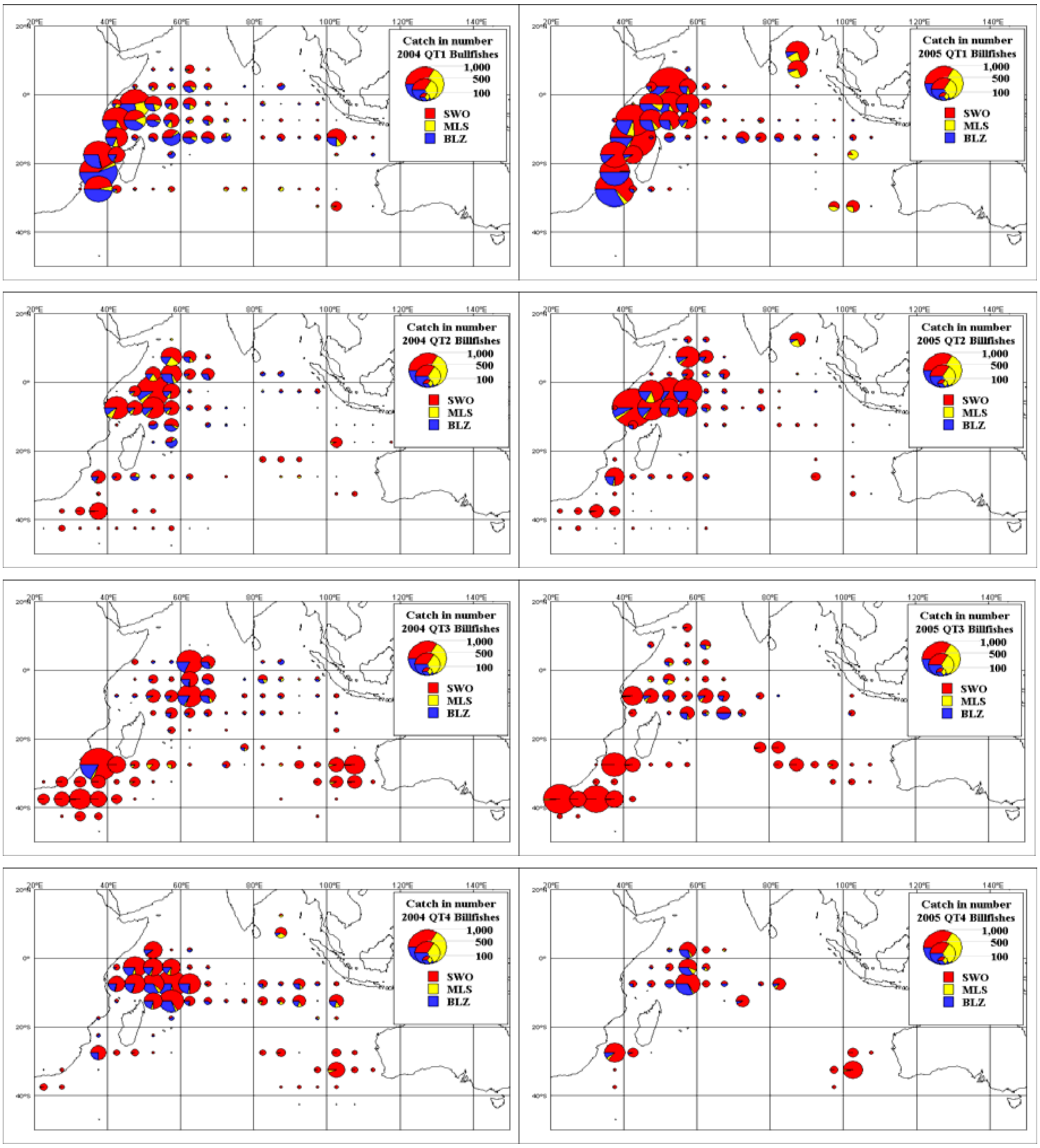

Fig. 6. Geographical quarterly distributions of catch in number of major billfish species caught by Japanese longline fishery in 2005 (left) and 2006 (right).
SWO: swordfish, MLS: striped marlin, and MLZ: Indo-Pacific blue marlin.

In Fig. 7, historical change in species composition in the eastern and western Indian Ocean is shown. In the eastern Indian Ocean, the percentage of bigeye has increased and that of yellowfin which was about 30-40% in the total catch of tunas and billfishes excluding southern bluefin tuna before 1991, has decreased to about 10% in recent five years. The opposite trend is observed in the western Indian Ocean where the ratio of yellowfin was around 30% before 1992 and it has increased to about 50% or more since 1999. As a result, the total catch in weight of yellowfin in the Indian Ocean has exceeded that of bigeye since 1999. The ratio of yellowfin catch in weight in the total of yellowfin and bigeye catch was larger than 60% since 2003. This high yellowfin ratio in recent years seems to be derived from decrease of fishing effort in the eastern Indian Ocean, and the concentration of the fishing effort at the African coastal region from Equator to 30˚S where yellowfin is abundant, especially in the 1st and 3rd quarters (Fig. 4).

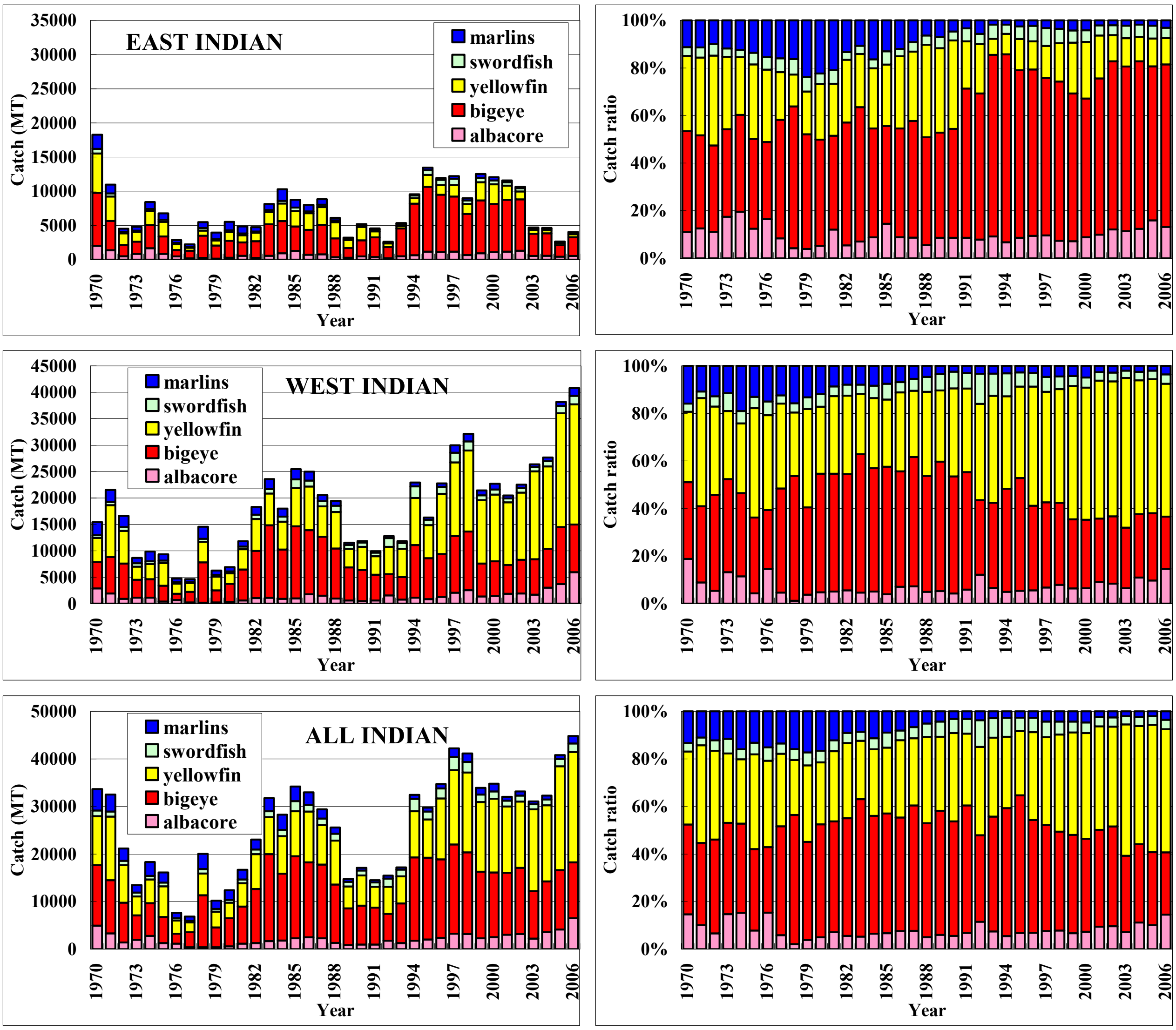

Fig. 7. Historical change of species composition of major tunas, swordfish and marlins in the Indian Ocean.

1-2. Purse Seine Fishery

The latest available data for Japanese purse seine fishery is that for 2006.

1-2-1. Fishing vessels

Japanese purse seine vessels operating in the Indian Ocean are 350-700 GRT class (700-1000 carrying capacity). Change in the number of purse seine vessels in the latest five years is shown in Table 1.

Table 1. Number of Japanese vessels operated in the Indian Ocean.

Fleet/Year	2002	2003	2004	2005	2006
Longliner	228	171	187	172	141
Purse seiner	1	1	1	1	3

1-2-2. Fishing Effort

Total fishing effort (operation days + searching days) was 182 days in 2005 and 76 days in 2006 (Table 3). Geographical distribution of Japanese purse seine effort in 2006 was shown in Fig. 8.

Table 3. Catch and effort statistics for the Japanese purse seine fishery in the Indian Ocean from 2002 to 2006. The unit of catch and effort are metric ton and days (search and operation days), respectively.

Year	Days F.	Total	SKJ	YFT	BET
2002	211	3031	1937	445	649
2003	228	3906	2443	651	812
2004	130	2310	1459	327	524
2005	182	4892	3149	894	849
2006	76	2795	1982	266	547

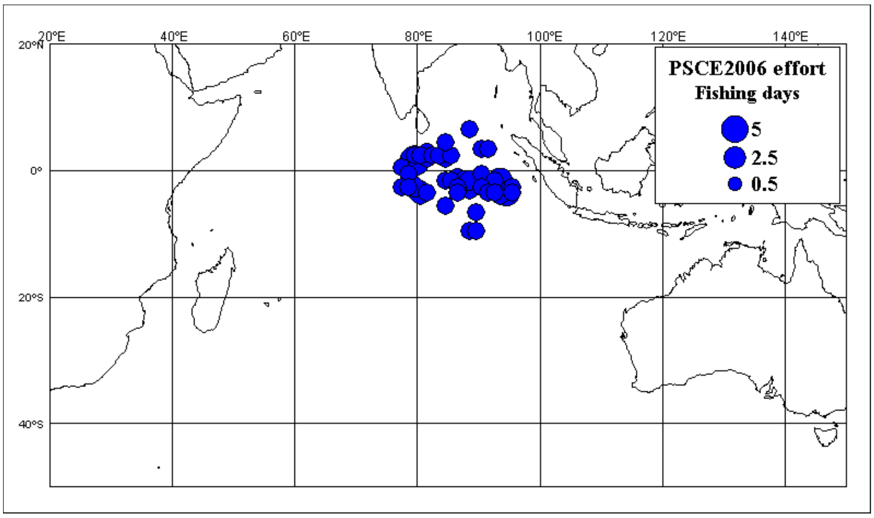

Fig. 8. Distribution of Japanese purse seine effort (days) in the Indian Ocean in 2005.

1-2-3. Catch

Catch in weight of skipjack, yellowfin and bigeye in 2006 (2005) was 1,982MT (3,149MT), 266MT (894MT) and 547MT (849MT), respectively. Geographical distribution of Japanese purse seine catch in 2006 is shown in Fig. 9.

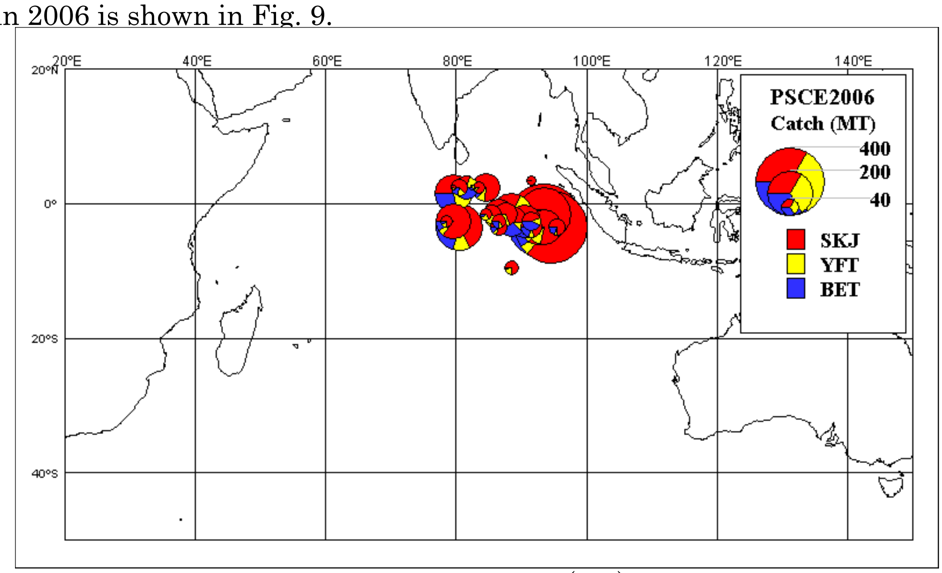

Fig. 9. Distribution of Japanese purse seine catch (MT) in the Indian Ocean in 2006. SKJ: skipjack, YFT: yellowfin, and BET: bigeye.

2. Progress on the implementation of recommendations of the Scientific Committee

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

2-1. Collection of more size data

The Fisheries Agency of Japan requested tuna longline fishers, through tuna longline fisheries organizations and industries in Japan have been to collecting size data based on the request made by the Fisheries Agency of Japan. As it is not mandatory, tuna longline fishers have been collecting size data voluntary basis in the past. Collecting the size data is the extra work load for the tuna longliners skippers who are already occupied by busy fishing operations with limited man powers.

In the Indian Ocean, the large amount of the size data has been collected mainly by the high school training vessels off Java Island, Indonesia. For example, these training vessels collected 10-20% of the total catch in the Indian Ocean before 1992. However, because of the pirate problems, the number of training vessels' operations has been decreasing afterwards, consequently the coverage rates of the size samples have decreased.

To improve this situation, Japan started to deploy scientific observers from 2006.

2-2. Search for the historical weight data

To solve the problem mentioned in the previous Section, it was suggested by the past IOTC SC to search for historical weight data recorded by the skippers of the longline vessels. The situation is explained as follows:

Scientists in the Yaizu tuna fishing port branch of the NRIFSF (National Research Institute of Far Seas Fisheries) were collecting fishers' notes regarding their longline fishing operations from the middle of 1980's, which included individual fish weights (gilled and gutted). Such weight data had been entered to our database. However, these notes are confidential information of these fishers. Hence scientists need to have trusts from fishers and need strong personal will and effort to collect the data. Therefore, the amounts of these weight data depend on the personal efforts of the scientists in Yaizu. In recent years, collection of these kinds of data has become more difficult because all three scientists in Yaizu had retired and they now work as part time scientists. Under such circumstances, we can not expect to obtain similar amount of such weight data from fishers' confidential as before.

However, according to the Fisheries Agency of Japan the Japanese tuna industry organization could contact with skippers to provide and can get such historical confidential weight data on a voluntary basis. Some efforts have been made. As a result, some amount of bigeye size data have been collected through the Japanese tuna industry organization.

Besides the fishers' notes, it was informed that other sources of the historical fish weight data could be found from the sales slips at tuna fishing ports or the tuna fishing companies. But we realized that these data are not useful because of two reasons, i.e., (a) the weight data in the sale slips do not describe precise areas of the fish caught, but they indicate rather larger scale waters such as the eastern or the western Indian Ocean and (b) precise time such as month or season of the weight (catch) collected is not indicated. As a result, these weight data are not at a satisfactory level to be used for tuna resources analyses.

As a conclusion, the industries effort to get the historical confidential weight data from the skippers of the longliners seems to be only possible solution at this stage.

2-3. Improvement of the CPUE Standardization

Two relevant studies have been accomplished, i.e., (a) "Japanese longline CPUE for yellowfin tuna in the Indian Ocean up to 2005 standardized by GLM (IOTC-2007- WPPT9-10) by Okamoto *et al,* (b) Revised CPUE standardization based on the recommendation made by the WPTT9 (IOTC-2007-WPTT9-10 add) by Okamoto *et al,* which was submitted by the deadline (September. 14, 2007) suggested by the WPTT Chair and agreed by all the WPTT members. The revised CPUE was used in the re-trial yellowfin tuna stock assessments using the new parameters by SS2 and ASPM which were also submitted by the agreed deadline (Oct 15, 2007).

3. Progress on national research programs currently in place

3-1. Tag and release research for tunas and skipjack in the eastern Indian Ocean.

3-2-1. Japanese tagging activities based on its own fund (2004)

Tag and release research using Taikei-Maru No.2 was conducted in the eastern Indian Ocean from February to March 2004 by the scientists of NRIFSF of FRA as the contribution of Japan to the IOTTP (Indian Ocean Tuna Tagging Program). Fishing gears used to catch fishes to be tagged were pole and line, hand line and trolling. A total of 606 fishes (572 skipjack, 11 yellowfin and 23 bigeye) was tagged and released. Detail results were reported at WPT in July, 2004 (IOTC-WPTT -2004-02).

3-2-2 JAMARC tagging by Nippon maru

Nippon-Maru (JAMARC, Fisheries Research Agency) started the cooperative work on the IOTC tagging project in 2004 for three years to 2006. In 2006 as its third year, Nippon-Maru conducted tagging in the Indian Ocean using the spaghetti tags provided by the IOTC. In 2004, 2005 and 2006 (until end of March), 214 (39 SKJ, 89 YFT and 86 BET), 368 (154 SKJ, 10 YFT and 204 BET), and 258 (99 SKJ, 48 YFT and 111 BET) fishes were tagged and released using spaghetti tags from its purse seine catch.

3-2-3. IOTC tagging activities in the eastern Indian Ocean by the Japanese fund (2006-2007)

There are two collaborative tagging plans in two areas in the eastern Indian Ocean using the Japanese funds to the IOTC, which are (a) off Sumatra by Japan, Australia and Indonesia and (b) the waters around the Andaman Sea and the Nicobar Island by Japan and India. These plans have been approved by respective Governments and also the IOTC. The Memorandum of Understandings (MOUs) were adopted to implement these tagging experiments. The planning workshop was held in February in 2006 with participations by relevant scientists and officers in order to discuss detail plans before starting the tagging.

Then the tagging off western Sumatra was conducted in October 2006. However, due to the combination of an Indian Ocean Dipole and mild El Nino, the surface waters off West Sumatra were unusually cold with a strong upwelling and tuna and skipjack were not able to be caught using surface fishing techniques at that time. Consequently, the tagging trials ceased at the end of the first leg with Legs 2 & 3 postponed. In August 2007 the second leg of the trials commenced, followed by Leg 3 during September. However, 5 days before the scheduled end of Leg 3, operations were stopped due to the large earthquakes off South and West Sumatra. As a result 396 fish (348 YFT, 48 SKJ) were tagged during Leg 2 and 330 fish (112 YFT, 214 SKJ, 4 Unknown) tagged during Leg 3. So, a total of 726 fish (460 YFT, 262 SKJ, 4 Unknown) were tagged during the West Sumatra trials.

3-2. Shoyo-Maru research in the Arabian Sea

From 28th September 2007 to 10th January 2008, Fisheries Agency of Japan is carrying out the research cruise "Fishery research of Tunas in Indian Ocean using the longline fishing method by Research Vessel "*Shoyo-Maru"* to collect biological data of large pelagic species and oceanographic information in the northwestern area of Indian Ocean. Main purposes of this research cruise are to grasp species composition and catch rate of each species caught by longline operations between October and December 2007 in the research area and to collect biological data and to clarify migration patterns of large pelagic species.

4. Other relevant information.

None