(IOTC-2008-SC10_INF___)

National Report of JAPAN (2008)

National Research Institute of Far Seas Fisheries (NFIFSF),
Fisheries Research Agency (FRA)
and
Fisheries Agency, Government of Japan

December, 2008

1. General Fisheries Statistics

1-1. Longline fishery

The latest available longline data is that of 2007 although it is preliminary. The data of 2006 is nearly final, but still preliminary one. All catch and effort statistics were compiled using logbook data whose coverage at present is about 86% and 58% for 2006 and 2007, respectively.

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 the longline vessels operating in the Indian Ocean have been the distant water category. Although some offshore longliners are also allowed to operate in this Ocean, there is no operation by them recently. In the last fifteen years, the number of vessels operated in this Ocean was around 180-250 vessels per year. Although the number of operating vessel was relatively large in number (224-251) during 1995-1999, after when it decreased to less than 200 except for 228 in 2002. Although the number of vessel in 2007, 199 vessel, is still preliminary, it is largest in the recent five years.

Table 1. Number of Japanese vessels operated in the Indian Ocean. Data of 2006 and 2007 for longliner are preliminary.

Fleet/Year	2003	2004	2005	2006	2007
Longliner	172	189	184	185	199
Purse seiner	1	1	1	3	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). Percentage of effort used in this ocean in the total effort in all oceans fluctuated around 20% until 2003 after when it has been largely increasing from 20% in 2003 to 36% in 2007 (Fig. 2). In this period of increasing effort in this Ocean, the effort in the Pacific decreased markedly while that in the Atlantic was relatively stable.

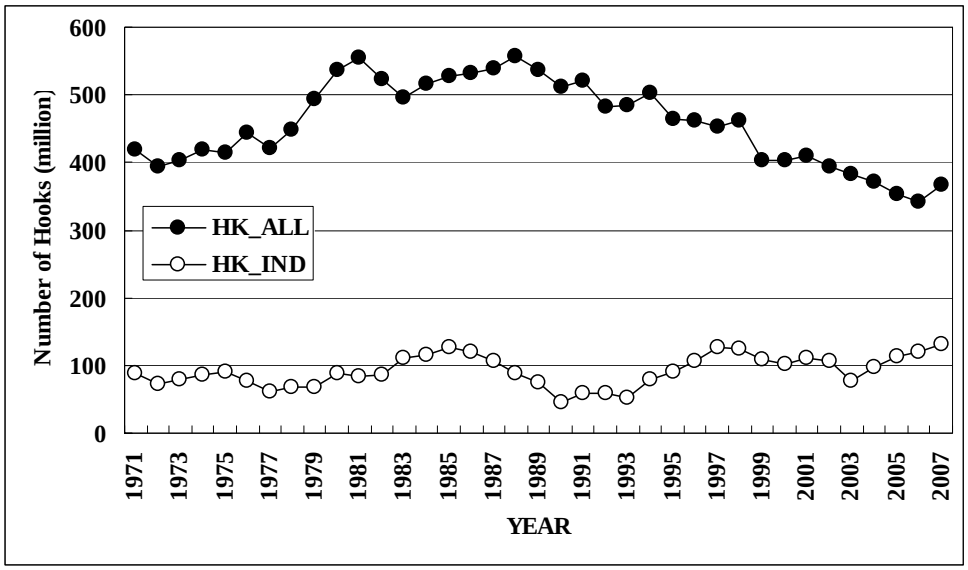

Fig. 1. Historical change in total Japanese longline effort in the all Oceans (solid circle) and the Indian Ocean (open circle)

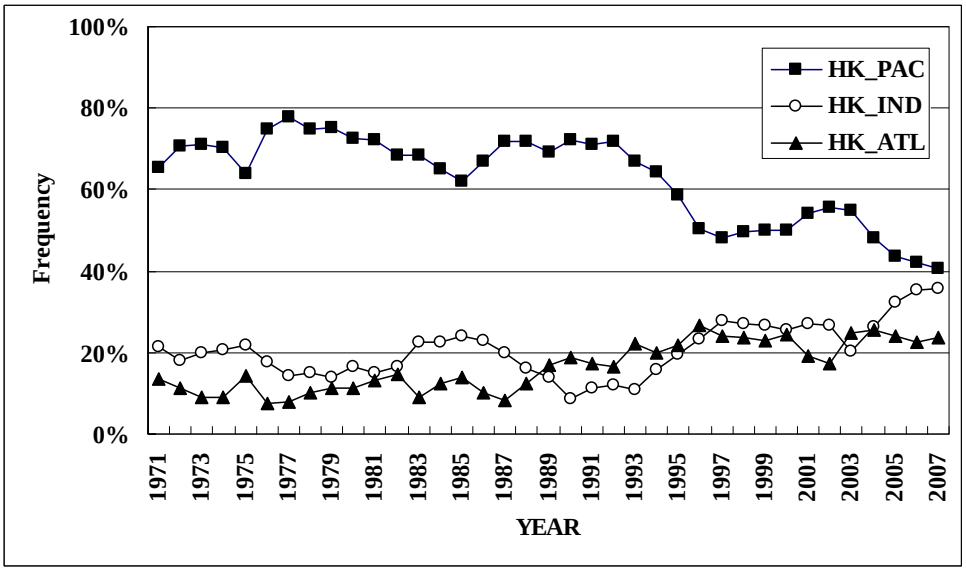

Fig.2. Historical change in the percentage of effort exerted into each Ocean basin.

Annual distributions of longline effort from 2002 to 2007 are shown in Fig. 3. Although the geographical distributions of the effort are basically similar, the effort at 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 four years (2004 and after) probably by aggregation of longliners due to high yellowfin catch (formation of good yellowfin fishing ground).

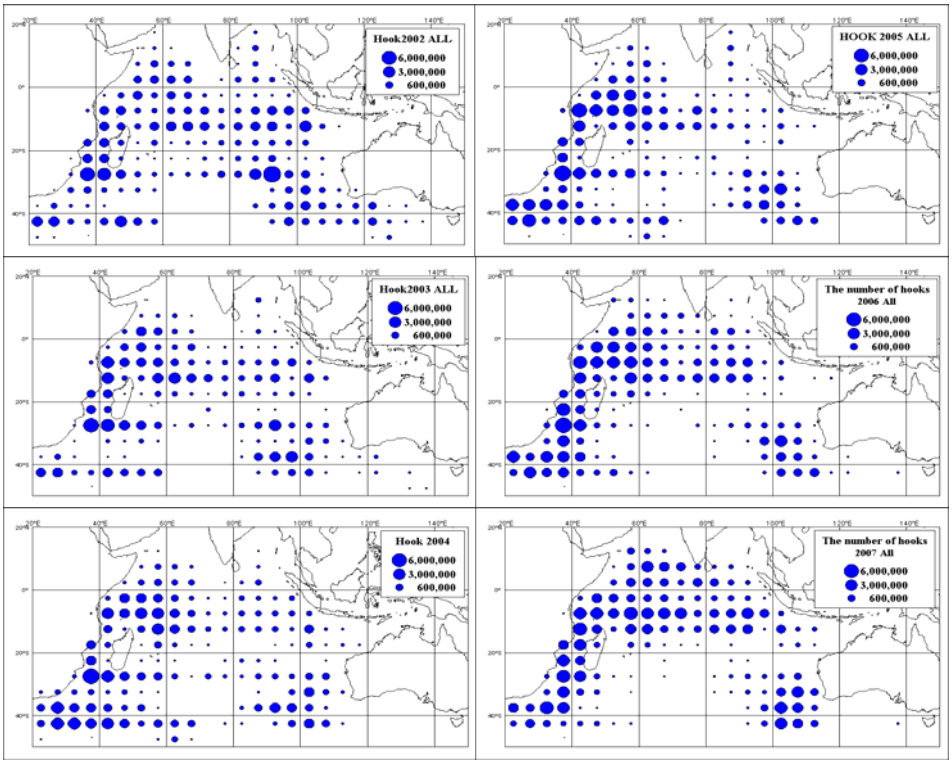

Fig. 3. Distribution of longline effort in the Indian Ocean from 2001 (left- up) to 2006(right-down).

Historically, fishing effort exerted to each of eastern and western Indian Ocean has been the same level, that is, roughly 50% each until 2002 (Fig. 4). However, the effort in western Indian Ocean has been greater than 70% since 2003 and about 82% in 2005 and 2006. Quarterly distributions of fishing effort in 2006 and 2007 are shown in Fig. 5.

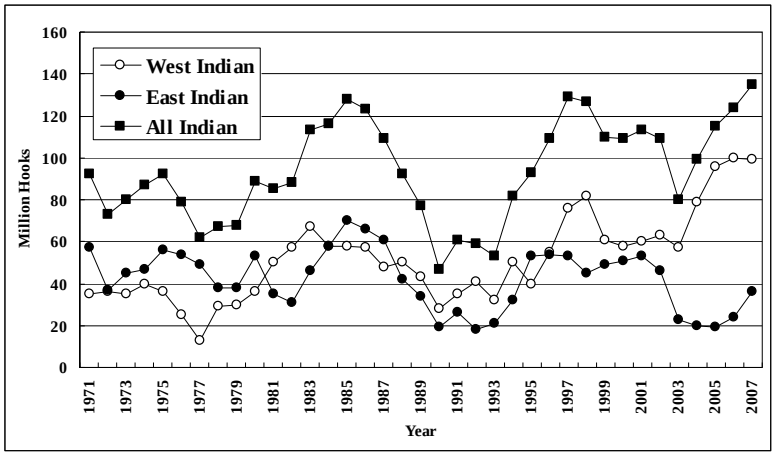

Fig.4. Historical change of effort exerted into each of West and East Indian Ocean.

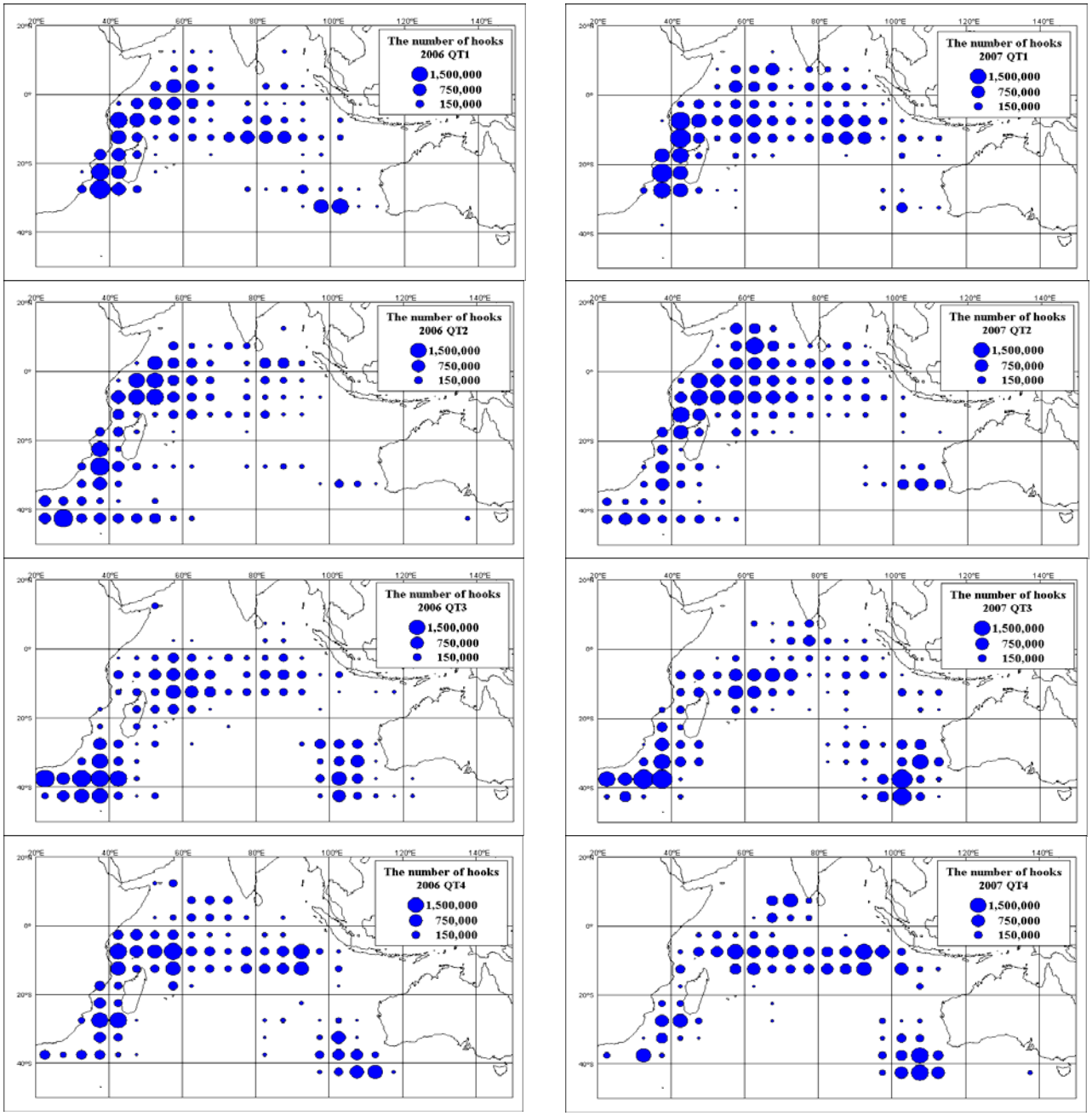

Fig. 5. Quarterly longline effort distribution in the Indian Ocean in 2006 (left) and 2007 (right).

1-1-3. Catch

Catch statistics in weight from 2003 to 2007 by Japanese longliners in the Indian Ocean is shown in Table 2 (Data of 2006 and 2007 are preliminary) and geographical quarterly distributions of catch in 2006 and 2007 for major tuna and billfish species are shown in Fig. 6 and Fig. 7, 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 2007 (2006) were 3,626MT (3,947MT) for southern bluefin, 6,408MT (6,428MT) for albacore, 19,225MT (14,029MT) for bigeye and 20,341MT (23,136MT) for yellowfin.

Table 2. Fishing effort and catch in weight (MT) by the Japanese longline fishery in the Indian Ocean (IOTC statistical area), 2003-2007. Data of 2006 and 2007 are preliminary. Sets and hooks are in thousand. "Total" includes skipjack catch.

Year	Sets	Hooks	Total	SBF	ALB	BET	YFT	SWO	MLS	BLZ	BLM	SPF	SFA
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	113861	46598	6165	4079	12544	21492	1487	74	462	91	37	165
2006	38	121226	51020	3947	6428	14029	23136	1844	118	764	203	129	408
2007	41	130842	53823	3626	6408	19225	20341	2409	78	812	222	108	583

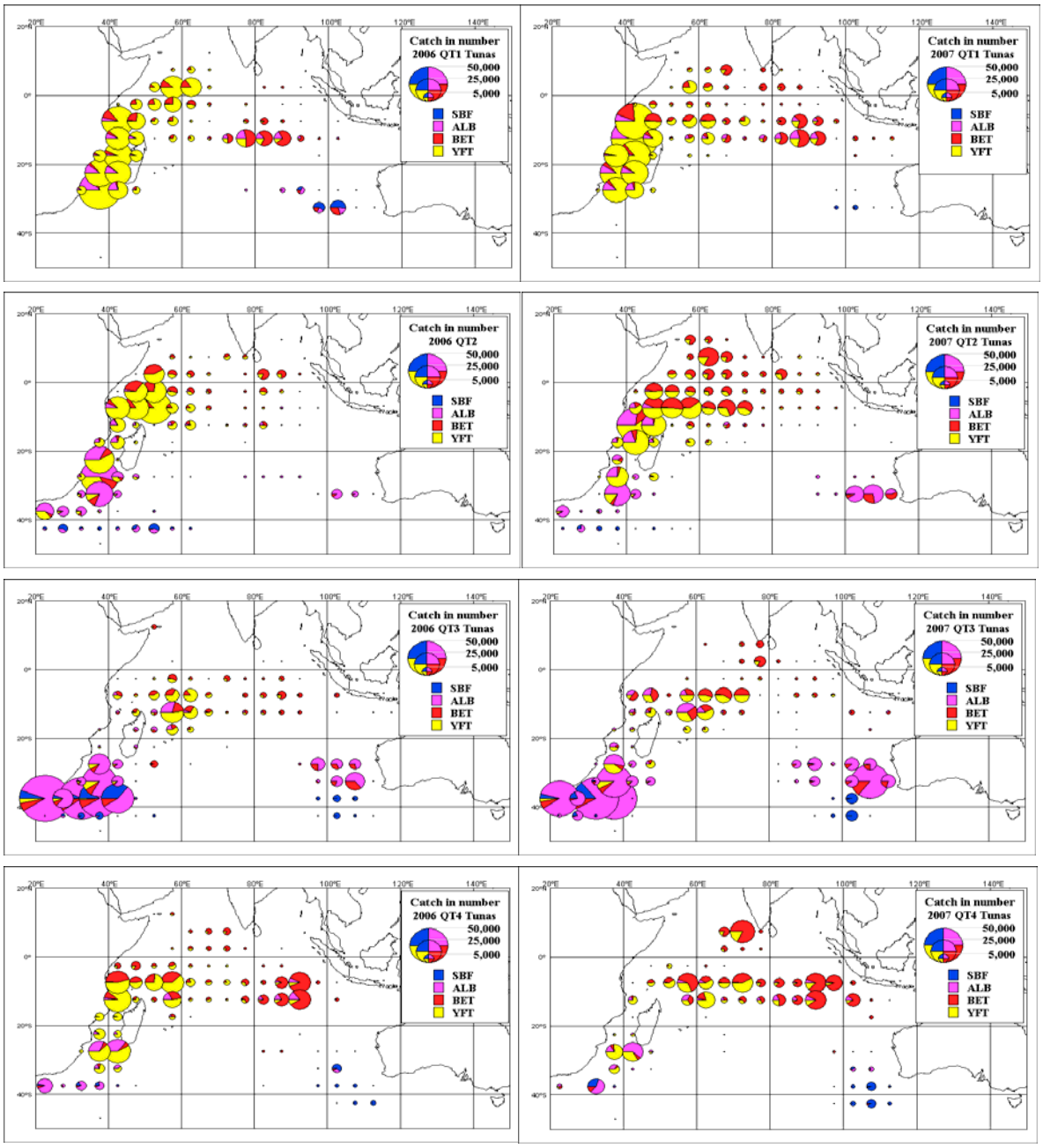

Fig. 6. Geographical quarterly distributions of catch in number of major tuna species caught by Japanese longline fishery in 2006 (left) and 2007 (right). SBF: southern bluefin, ALB: albacore, BET: bigeye, and YFT: yellowfin.

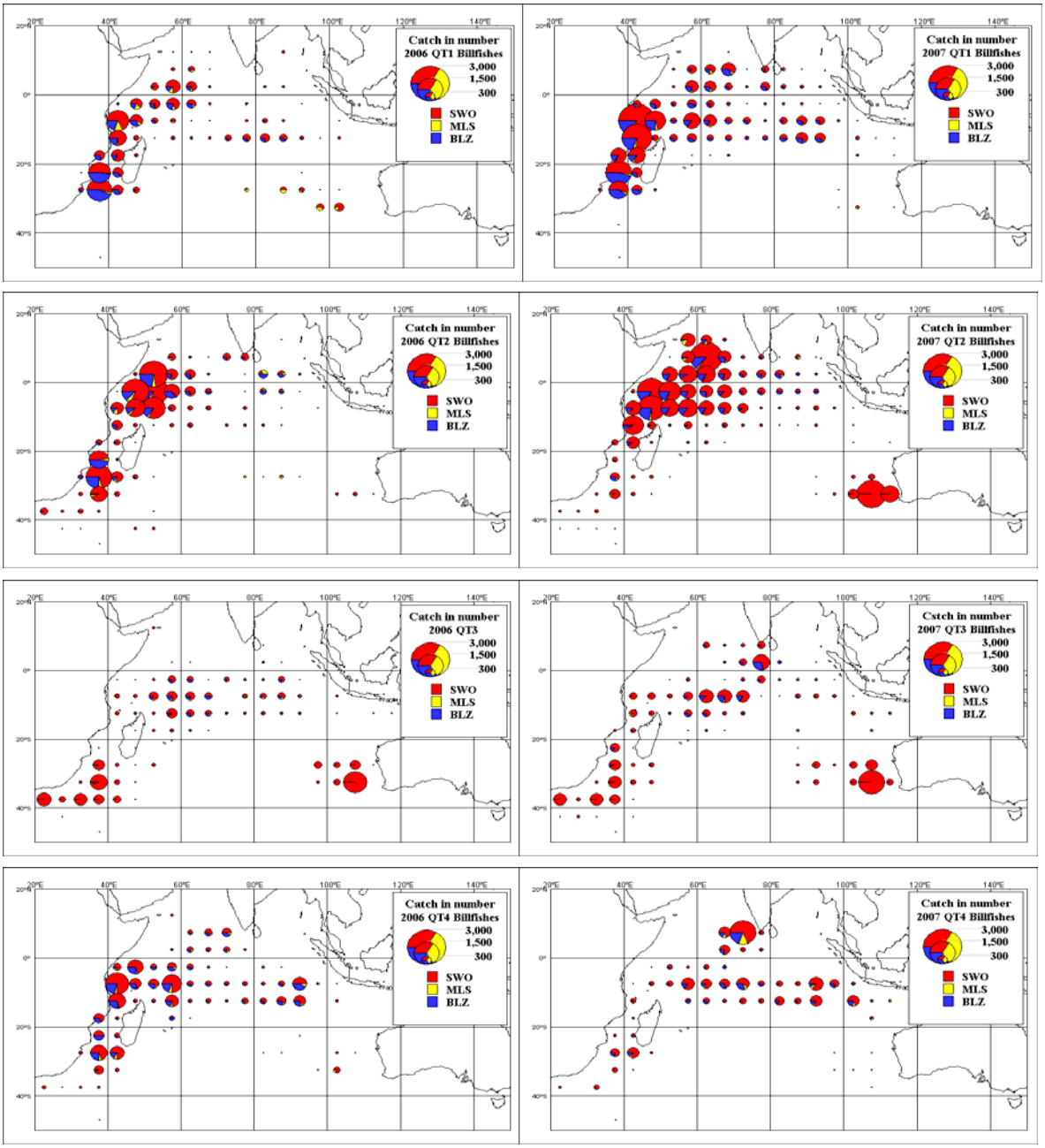

Fig. 7. Geographical quarterly distributions of catch in number of major billfish species caught by Japanese longline fishery in 2006 (left) and 2007 (right). SWO: swordfish, MLS: striped marlin, and MLZ: Indo-Pacific blue marlin.

In Fig. 8, 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. 5). By this shift of the distribution of density of fishing effort, catch in yellowfin, albacore and total catch of tuna species in the latest three years has been highest in the period from 1970 to 2007.

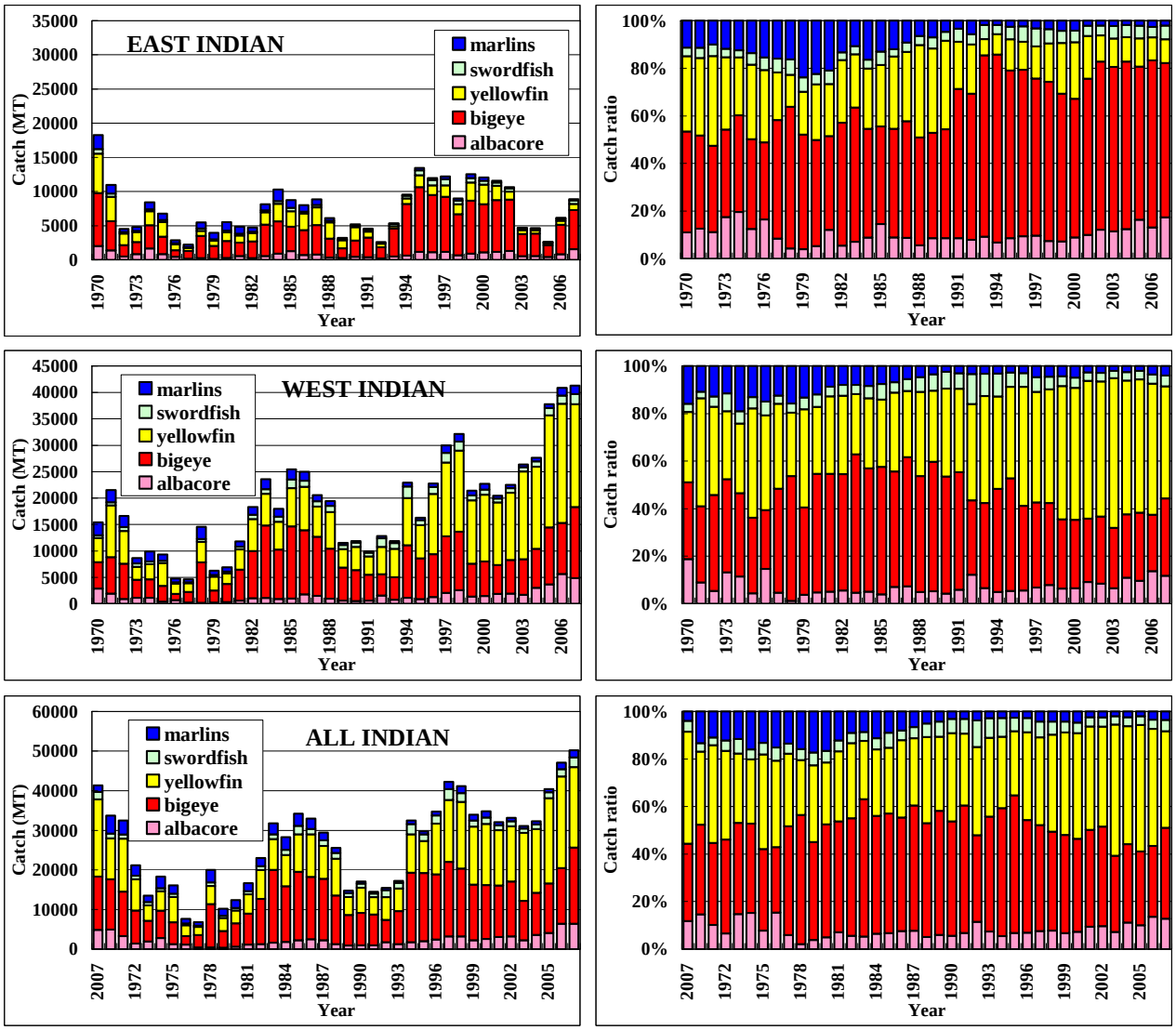

Fig. 8. Historical change of species composition of major tunas, swordfish and marlins in the Indian Ocean.

1-2. Purse Seine Fishery

The latest available data for Japanese purse seine fishery is that for 2007. The catch and effort data in 2007 is preliminary.

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 3. Number of Japanese vessels operated in the Indian Ocean. Data of 2006 and 2007 are preliminary.

Fleet/Year	2003	2004	2005	2006	2007
Longliner	172	189	184	185	199
Purse seiner	1	1	1	3	3

1-2-2. Fishing Effort

Total fishing effort (operation days + searching days) was 76 days in 2006 and 319 days in 2007 (Table 3). The value for 2007 is still preliminary. Geographical distribution of Japanese purse seine effort in 2007 was shown in Fig. 9.

Table 4. Catch and effort statistics for the Japanese purse seine fishery in the Indian Ocean from 2003 to 2007. The unit of catch and effort are metric ton and days (search and operation days), respectively.

Year	Days F.	Total	SKJ	YFT	BET
2003	228	3906	2443	651	812
2004	130	2310	1459	327	524
2005	182	4892	3149	894	849
2006	76	2795	1982	266	547
2007	298	5956	4104	892	960

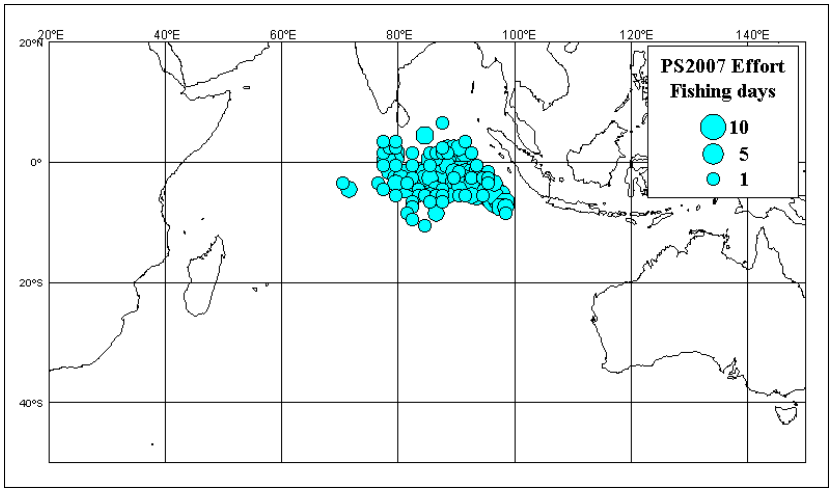

Fig. 9. Distribution of Japanese purse seine effort (days) in the Indian Ocean in 2007.

1-2-3. Catch

Catch in weight of skipjack, yellowfin and bigeye in 2007 (2006) was 4,140MT (1,982MT), 892MT (266MT) and 960MT (547MT), respectively. Geographical distribution of Japanese purse seine catch in 2007 is shown in Fig. 10.

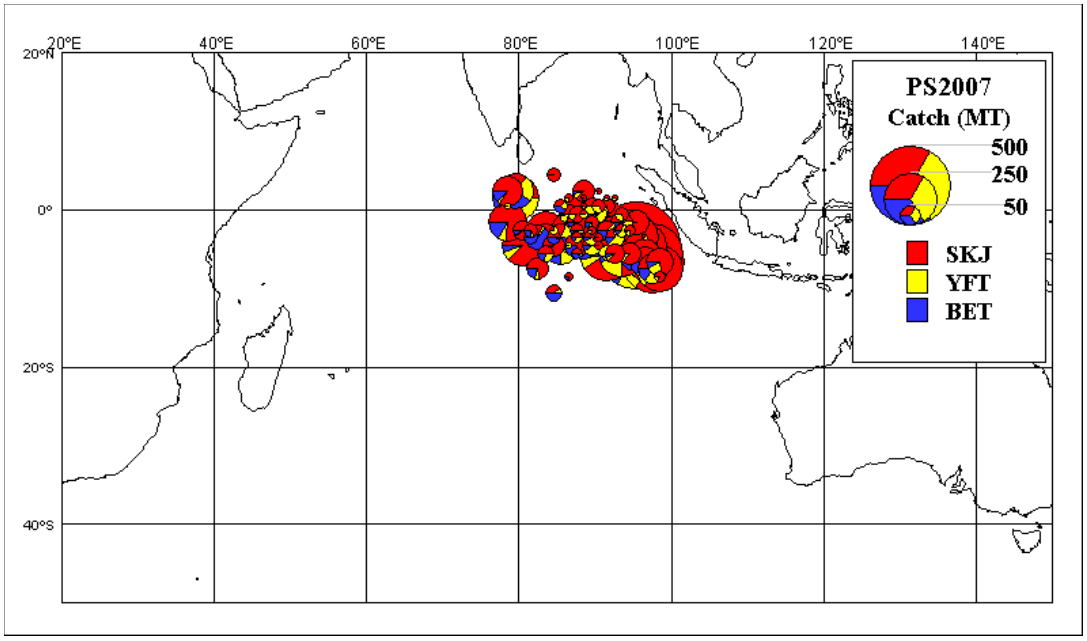

Fig. 10. Distribution of Japanese purse seine catch (MT) in the Indian Ocean in 2007. SKJ: skipjack, YFT: yellowfin, and BET: bigeye.

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

Tuna longline fisheries industries in Japan have been 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 extra work loads for tuna longliner skippers who are already occupied by busy fishing operations with limited man powers.

For the Indian Ocean, the size data have been collected mainly by the high school training vessels off Java Island, Indonesia. For example, the coverage of size data of bigeye tuna was 10-20% of the total catch in the Indian Ocean before 1992, but afterwards it sharply decreased to only a few percents. This is mainly because these training vessels shifted their operation to the

Pacific Ocean due to the pirate problems. Under such situation, size data sampled are limited to the particular waters and not from the whole area. Therefore, they are not effective for the stock assessments.

At this stage it is not anticipated to collect more size data under the current situation. To solve this problem Japan started to deploy observers.

2-2 Improvement to speed up to submit fisheries data to the IOTC

From August 1, 2008 Japan started to mandate all the long distance waters tuna longliners to submit the logbook data in quick manner by revising the current law.

2-3. Improvement of the CPUE Standardization

One study has been accomplished, i.e., "Japanese longline CPUE for yellowfin tuna in the Indian Ocean up to 2007 standardized by GLM (IOTC-2008-WPTT10-19) by Okamoto *et al.* During the 10th tropical tuna working group (WPTT10) meeting in October 2008 in Thailand this Japanese CPUE played a key role in the stock assessments conducted by MULTIFAN-CL, SS2 PM and ASPM.

3. Progress on national research programs currently in place

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

3-1-1 JAMARC tagging by Nippon maru (2004-2006)

Nippon-Maru (JAMARC, Fisheries Research Agency) cooperated the IOTC tagging from 2004 to 2006 using the spaghetti tags provided by the IOTC in the eastern Indian Ocean. 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 from her purse seine catch. After the new Nippon maru started her operation in the late 2006 no tagging has been conducted because it is very difficult to capture individual fish without damage as the new vessel does not have the skiff boat.

3-1-2 IOTC tagging activities based in the Japanese fund (2005-2008)

There have been 3 tagging activities in 3 areas using the Japanese funds to the IOTC, i.e., in the waters off west Sumatra, in the waters around the Andaman Sea and in the Maldivian waters.

(1) Off West Sumatra

The tagging off western Sumatra was conducted in October- November, 2006, but due to the strong El Nino effect, tuna and skipjack were not caught at all due to the cold surface temperature. Thus the tagging was ceased in November after the first leg was over. Then in September, 2007, the second and third legs were resumed. In the 5 days before ending the leg 3, it was stopped due to the large earthquake off southern Sumatra. In the 2nd and 3rd legs about 300 tags were released.

(2) Andaman Sea

The tagging in Andaman waters were conducted from January 19 to February 28, 2008 based in the port of Barmananla, south of Port Blair City in the Andaman Islands. During this period, 28 tagging trips were achieved including 16 live-bait stockings and 18 separate tagging operations.

(3) Maldives

The tagging in the Maldivian waters was held for 2 weeks in October 2007 and tagged 750 fish. Due the bad weather and oceanographic conditions, planned later tagging cruises in 2007-2008 were cancelled.

(4) 2nd workshop

The second workshop was held in May, 2008 Indonesia. The tagging activities off Sumatra, in the Andaman Sea and Maldives were reviewed, As a result, (a) tagging in the Andaman waters will not conducted any more as it is expected that not enough fish could be released, (b) last tagging activities off Sumatra and Maldives will be implemented in the beginning of 2008 using the remaining fund.

3.2 Research cruises by Nippon maru (2007)

In 2007 Nippon maru conducted research cruises on bycatch mitigation of juvenile YFT and BET using large mesh nets, fishing grounds, biology and acoustics monitoring.

4. Other relevant information.

4.1 OFCF-NRIFSF (capacity building) projects

Beside the main IOTC-OFCF project to improve tuna fisheries statistics in the Region, two OFCF-NRIFSF projects for fisheries officers and scientists in the developing counties have been implemented in the past. These two projects are for capacity building, i.e., (a) one month training courses for tuna fishier statistics in Japan (2001-2007) and (b) Atlas project for tuna fisheries and resources (2006-2008). To now Atlases for Thailand and Indonesia have been published and currently two Atlases for Sri Lanka and Maldives are under preparations.

4.2 Working papers (late 2007- late 2008)

Following documents were submitted and presented in the various IOTC meetings during late 2007 to late 2008.

4.1 SC10 (Victoria, Seychelles) (November, 2007) (1 paper)

National Report of JAPAN (2007) National Research Institute of Far Seas Fisheries (NFIFSF), Fisheries Research Agency (FRA) and Fisheries Agency, Government of Japan (IOTC-2007-SC9_INF___)

4.2 Eastern Indian Ocean tagging workshop (Jakarta, Indonesia) (May, 2008) (2)

Asakawa, E. and T. Nishida (2008): Report of the tuna tagging cruise off the Andaman Islands under the IOTC small scale tagging program in the Eastern Indian Ocean IOTC-2008-Tagging WS (Eastern Indian Ocean)-__

Asakawa, E. and T. Nishida (2008): Report of the tuna tagging cruise (leg3) off West Sumatra in 2007 under the IOTC tagging program in the Eastern Indian Ocean. IOTC-2008-Tagging WS (Eastern Indian Ocean)-____

4.3 WPB6 (Victoria, Seychelles) (July, 2008) (6)

Document	Title
IOTC-2008-WPB-03	Standardization of swordfish CPUE of the Japanese tuna longline fisheries in the Indian Ocean. (1980- 2006 and 1992-2006) Yasuko Semba, Tom Nishida and Sheng-Pin Wang
IOTC-2008-WPB-10	CPUE standardization of swordfish (*Xiphias gladius*) caught by Taiwanese longline fishery in the Indian Ocean. *Sheng-Ping Wang, Yasuko Semba, and Tom Nishida*
IOTC-2008-WPB-11	New environmental information (NCEP) applied for standardized swordfish CPUE of tuna longline fisheries (Japan and Taiwan) in the IOTC WPB6. *Tom Nishida, Hiroshi Matsuura and Fransic Marsac*
IOTC-2008-WPB-12	Preliminary stock assessment of swordfish (Xiphias gladius) in the Indian Ocean by A Stock-Production Model Incorporating Covariates (ASPIC). *Tom Nishida and Yasuko Semba*
IOTC-2008-WPB-13	Notes on the standardized swordfish CPUE of tuna longline fisheries (Japan and Taiwan) in WPB6 (1980-2006 and 1992-2006) Tom Nishida
IOTC-2008-WPB-INF02	Preliminary results of standardization of swordfish CPUE of Taiwanese and Japanese tuna longline fisheries in the Indian Ocean (1980- 2006 and 1990-2006) (*)- Preliminary report for the IOTC WPB6. *Semba, Nishida, Wang*

4.4 WPTT10 (Bangkok, Thailand) (October, 2008) (7)

Document	Title
IOTC-2008-WPTT-19	Standardization of annual and quarterly CPUE for yellowfin tuna caught by Japanese longline fishery in the Indian Ocean up to 2007 using general linear model. *Hiroaki OKAMOTO and Hiroshi SHONO*
IOTC-2008-WPTT-21	Updated Stock Assessment for Yellowfin Tuna in the Indian Ocean using Stock Synthesis II (SS2). *Hiroshi SHONO, Hiroaki OKAMOTO and Takayuki MATSUMOTO*
IOTC-2008-WPTT-22	Target strength of Bigeye, Yellowfin and Skipjack measured by split beam echo sounder in a cage. *Tatsuki Oshima*
IOTC-2008-WPTT-23	Effect of mesh size on the size distribution of Bigeye, Yellowfin and Skipjack caught by purse-seiners in the eastern Indian Ocean. *Tatsuki Oshima*
IOTC-2008-WPTT-28	Preliminary stock assessment of yellowfin tuna (Thunnus albacares) in the Indian Ocean by the ADBM based ASPM. *Tom Nishida and Rebecca Rademeyer*
IOTC-2008-WPTT-INF03 (hard copy)	Atlas of Tuna Fisheries and Resources in Thailand (Andaman Sea and Indian Ocean). *Thumawadee Jaiyen, Praulai Nootmorn, Shunji Fujiwara, Kiyoshi Itoh and Tom Nishida.*
IOTC-2008-WPTT-INF04 (hard copy)	Ecology of bigeye tuna in the Indian Ocean (textbook). *Koga, M., Mohri, M., and T. Nishida*

4.5 Method Working group meeting (Nov., 2008) (1)

Nishida (2008) NOTES ON TWO NEW ASPM SOFTWARE BASED ON “AD MODEL BUILDER” AND “SS3”

4.6 SC11 (Victoria, Seychelles) (December, 2008) (2)

National Report of JAPAN (2008) National Research Institute of Far Seas Fisheries (NFIFSF), Fisheries Research Agency (FRA) and Fisheries Agency, Government of Japan (IOTC-2008-SC10_INF___)

EDDRISEA, F., Duto, N., Fujiwara, S., Itoh, K., and Nishida, T. (2008) Atlas of Tuna Fisheries and Resources in Indonesia (Indian Ocean). (IOTC-2008-SC10_INF06) (hard copy)