



Report of the Second Session of the Working Party on Data Collection and Statistics

Victoria, Seychelles December 4 , 2000

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Executive Summary

The Second Meeting of the Working Party on Data Collection and Statistics took place in Mahe, Seychelles on December 4th with the participation of 21 scientists from various countries.

The WPDCS reviewed the situation of the data holdings at the Secretariat, noting the improvement in several areas including a revised database design, better estimation of the NEI catches, the progress of the sampling programmes in Thailand and Malaysia. The situation of the data holdings for nominal catches and catch-and-effort data has improved considerably in the past year, although the scarcity of size-frequency data continues to be a major impediment for the application of a rigorous stock assessment.

Regarding the situation by groups of species, the WPDCS noted the following:

- *Tropical Tunas: Problem areas include the poor knowledge of catches and effort of unreporting small longline vessels, the lack of information for the Indonesian longline fleet, lack of size-frequency information for the Korean longline fishery and lack of information for recent years of the Taiwanese longline fishery. The WPDCS noted the improvements in the levels of catch reporting, collection of vessel registry information, estimation of NEI catches and effort, estimation of Indonesian longline catches, recovery of historical data, establishment of sampling programmes by the Secretariat.*
- *Billfish: Mislabelling, underreporting and non-reporting are widespread problems, indicating that although data in the Secretariat's database are considered accurate and reliable, they are far from complete*
- *Neritic Tunas: The reporting of the catches of neritic tunas has also been worsening. In recent years catches have not been reported, or were reported aggregated. Of the neritic tunas, Longtail tuna and Kawakawa represent the larger share of the catches. Regarding seerfish, the catches of narrow-barred Spanish mackerel amounted to more than third the total catches. Catch and effort and size frequency statistics for these species are conspicuously absent from IOTC databases, because they are rarely included in the data submissions. It is thought, however, that many countries have collected information for these species.*
- *Temperate tunas: The catches of albacore and southern bluefin tunas have been almost fully reported since 1970. The catch and effort statistics for albacore tuna are in very good stand, as most of catches are by longliners from China(Taiwan). In contrast, the size frequency statistics are poorly represented, because of the lack of reporting by this fleet.*

The WPDCS re-issued their last year recommendation regarding the timeliness of data submissions, and encourages countries to provide their data before the stated deadlines. This is important to ensure the Secretariat can process this information in a timely manner for the activities of the Working Parties. Additionally, the Working Party recommends that countries make every possible effort to provide catch data classified by gears and species.

Finally, the WPDCS encouraged the Secretariat to keep expanding the coverage of their port sampling programs, which would provide much needed size frequency and biological information. In this sense, the Working Party extends this recommendation to all countries and encourage them to make every possible effort to improve upon size frequency sampling for all species caught by their longline fleet through dedicated port sampling programmes. In the particular case of Japan, it is also recommended that they

make every possible effort to recover historical weight data that might be available from longline skippers.

OPENING OF THE MEETING AND ADOPTION OF THE AGENDA

The Second Meeting of the Working Party on Data Collection and Statistics (WPTT) opened on December 4th 2000 in Mahé, Seychelles by the Chairman, Ms. Rose Marie Bargain, from the Seychelles Fishing Authority, Seychelles, who welcomed the participants (*Appendix I*). The Agenda for the Meeting was adopted as listed in Appendix II. The documents available for discussion are listed in Appendix III.

PROGRESS REPORT OF THE SECRETARIAT

The Secretariat reviewed its work on the compilation and processing of information relevant to the fisheries for tuna and tuna-like species in the Indian Ocean. The following sections summarize this report.

DATA COLLECTION

GENERAL STATUS OF REPORTING DURING 2000

Table 1 lists the countries to which the Secretariat sent data requests during the year 2000. The countries are sorted by their total catch in 1998. This year the Secretariat produced seven new forms for data submission that are intended to improve the reporting in several ways:

- Easy completion and transmission: The new forms can be downloaded from the IOTC Website, completed and sent by e-mail to the Secretariat. Examples for the completion of the forms have also been added in order to facilitate the task of the Liaison Officers.
- Better understanding of the data reported: Short questionnaires have been included in the forms to improve the knowledge about the system used for the calculation of the catches in each country.
- More flexible reporting of catch and effort and size frequency statistics data: The new forms have been created to allow reporting of aggregated data, particularly from artisanal fisheries.
- A new form, the Foreign Tuna Vessels Activity Form, was also created to replace the Landings Form as requested by the WPDCS during the last year Meeting.

Initial requests were sent to 58 countries between April and May 2000. As only eight countries replied to the first request, reminders were sent later as needed. The number of countries contacted is considerably larger than in 1999 as a consequence of the Secretariat's review of fishing activity by foreign fleets in the Indian Ocean this year. Data requests were sent to all countries with one or more fishing vessels reported by a third party as active in the Indian Ocean.

Only three countries submitted complete data and only six countries, four of them IOTC members, submitted the information before the deadline (30th of June). Therefore, timeliness and completeness in the reporting continue to be one of the main problems faced by the Secretariat. Nevertheless, it is important to note that the situation has improved in relation to the preceding year: this year 30 of the 58 contacted countries provided the requested data. This is in contrast to 1999, when only 10 of the 40 contacted countries provided data. In addition, during this year important datasets were obtained, such as data from Maldives (NC: 1996-1999; SF: 1983-1996), Taiwanese (CE: 1996-1998) and Sri Lankan (detailed statistics for 1999)

It should be noted that three IOTC member countries, Portugal (EC member), Pakistan and the Republic of Korea, did not reply nor acknowledge the requests sent to them. It is also reason for concern that six IOTC members have yet to fully report nominal catches for 1999.

Country	1998 Catch	Gears Operating						Member	Date the Statistics were Received						Years Concerned	
		PS	LL	BB	GL	LN	OT		NC	DI	FC	CE	SF	VR		FTVA
NOT ELSEWHERE INCLUDED	161,168	X	X						11-Sep-00		11-Sep-00	25-Jul-00	25-Jul-00	25-Jul-00		1995-99
INDONESIA	123,801	X	X	X	X	X	X									
MALDIVES	115,124			X	X	X	X		03-Sep-00		03-Sep-00	03-Sep-00	15-Sep-00			1983-99
CHINA	2,816		X					Y	12-Jul-00	12-Jul-00	14-Jul-00		14-Jul-00	N/A		1999
CHINA(TAIWAN)	110,592		X						21-Jun-00		21-Jun-00	21-Jun-00				1996-99
SPAIN	110,523	X	X					Y (EEC)	25-Jul-00		25-Jul-00	25-Jul-00	09-Aug-00			1991-99
INDIA	98,243	X	X		X	X	X	Y	11-Sep-00		11-Sep-00	25-Jul-00	25-Jul-00	09-Aug-00	11-Sep-00	1998-99
SRI LANKA	89,053	X	X	X	X	X	X	Y	14-Sep-00		24-Aug-00	14-Sep-00	14-Sep-00			1999
IRAN	65,038	X	X		X	X	X		02-Oct-00							1999
FRANCE	63,199	X	X				X	Y	25-Jul-00		09-Aug-00	25-Jul-00	25-Jul-00	09-Aug-00		1991-99
FRANCE (REUNION)	IN FRANCE		X			X		Y (EEC)	03-Jul-00	03-Jul-00	03-Jul-00	03-Jul-00	03-Jul-00	03-Jul-00	03-Jul-00	1992-99
JAPAN	48,604		X					Y	19-Jul-00		19-Jul-00	19-Jul-00			N/A	1997-99
THAILAND	47,289	X	X		X		X	Y	03-Jul-00		03-Jul-00	03-Jul-00		05-Sep-00	05-Sep-00	1997-99
PAKISTAN	36,555		X		X			Y								
OMAN	25,867		X				X	Y	25-Jun-00							1999
SEYCHELLES	20,683	X	X			X		Y	06-Jul-00		10-Aug-00	06-Jul-00	25-Jul-00	10-Aug-00		1997-99
UNITED ARAB EMIRATES	17,062				X	X	X									
MALAYSIA	14,246	X			X	X		Y	03-Aug-00			03-Aug-00				1998-99
MADAGASCAR	12,000				X			Y			No Data Available			24-Aug-00	1998-99	
EGYPT	10,774	X					X									
COMOROS	8,680					X	X									
YEMEN	8,450						X									
KOREA	8,410		X					Y								N/A
SAUDI ARABIA	8,377	X	X		X	X	X		19-Jul-00		19-Jul-00					1997-98
MOZAMBIQUE	8,179						X							11-Sep-00		1998-99
AUSTRALIA	8,115	X	X	X	X	X	X	Y	30-Jun-00	30-Jun-00	30-Jun-00	30-Jun-00				1999
ITALY	5,993	X						Y (EEC)	26-Jun-00		10-Aug-00	25-Jul-00	25-Jul-00	30-11-00	N/A	1997-99
MAURITIUS	3,675	X	X			X		Y						18-Jul-00	18-Jul-00	1990-99
PHILIPPINES	3,215	X							01-Feb-00		01-Feb-00	01-Feb-00		01-Feb-00	N/A	1998-99
TANZANIA	2,200						X									
KENYA	1,726				X	X	X									
ERITREA	686				X		X	Y	28-Jun-00		28-Jun-00					1996-99
QATAR	552				X				09-Jul-00							1996-99
KUWAIT	290				X											
PORTUGAL	110		X					Y (EEC)						30-11-00	N/A	
BAHRAIN	100				X				26-Jun-00		26-Jun-00					1998-99
DJIBOUTI	75				X											
BANGLADESH	60				X											
SOUTH AFRICA	14		X			X										
EUROPEAN COMMUNITY	SPLIT	X	X			X		Y	Reported by the individual countries				30-11-00	N/A		
SUDAN							X	Y	No Data Available							
UK	NO CATCH							Y	N/A	N/A	N/A	N/A	N/A	06-Sep-00	06-Sep-00	1999
IRAQ							X									
MYANMAR							X									
SOMALIA							X									
BELIZE	IN NEI (PS)	X	X						25-Jul-00			25-Jul-00	25-Jul-00			N/A
CAMBODIA			X													N/A
EQUATORIAL GUINEA			X													N/A
GUINEA			X													N/A
HONDURAS			X													N/A
IVORY COAST			X													N/A
LIBERIA		X							11-Sep-00		11-Sep-00					N/A
NETHERLANDS ANTILLES	IN NEI (PS)	X							25-Jul-00			25-Jul-00	25-Jul-00	15-Sep-00	N/A	1997-99
PANAMA	IN NEI (PS)	X	X						25-Jul-00			25-Jul-00	25-Jul-00	15-Sep-00	N/A	1991-99
SAINT VINCENT & GRENADINES			X													N/A
SAN MARINO			X													N/A
SINGAPORE			X											26-Sep-00	26-Sep-00	1999
VANUATU			X													N/A
VENEZUELA			X						No Activity According to the Liaison Officer						N/A	
MALTA									25-Jul-00			25-Jul-00	25-Jul-00			N/A
RUSSIAN FEDERATION																N/A
NEW CALEDONIA (SPC)	N/A								N/A	N/A	N/A	N/A	N/A	16-Aug-00	N/A	

Legend: PS (Purse Seine), LL (Longline), BB (Pole and Line), GL (Gill Net), LN (Lines including Hand Line, Troll Line and Hook and Line), OT (Other gears and/or Unclassified)
 NC (Nominal Catches), DI (Discards), FC (Fishing Craft), CE (Catch and Effort), SF (Size Frequency), VR (Vessel Registry), FTVA (Foreign Tuna Vessels Activity)
 DD-MMM-YY: Data Fully Reported

Table 1. Status of the IOTC databases regarding data submissions during the year 2000.

IOTC SAMPLING PROGRAMS: PROGRESS REPORT

During the last Commission Meeting (held in Kyoto in December 1,999) it was decided that more efforts should be allocated to monitor the activities of longline fleets which catches were not reported to IOTC. Ports in six countries were identified as being mainly used by non-reporting vessels, namely Phuket (Thailand), Penang (Malaysia), Jakarta, Bena and Cilacap (Indonesia), Port Louis (Mauritius), Singapore, Cape Town and Durban (South Africa).

The longline fleet operating in the Indian Ocean can be classified into two groups:

- Longliners with a **GRT above 100**: Large longliners, usually above 200 GRT, a LOA between 30 and 60 meters and with deep-freezing holds. The target species are either the albacore or sashimi species, in

particular yellowfin and bigeye tunas. The most common flags they are flying are Belize, Honduras and Equatorial Guinea.

- Longliners with a **GRT below 100**: Small longliners with LOA up to 30 meters. They normally have crushed-ice holds, and in some cases, refrigerated seawater tanks. Yellowfin and bigeye tunas are targeted for the sashimi market. This fleet includes Taiwanese and Chinese vessels, which catches are not reported in the first case, and are only partially reported in the second.

The large longliners usually operate from ports in Mauritius, South Africa and Singapore, while the small longliners operate from Indonesia, Malaysia and Thailand.

With the objective of obtaining information to estimate total catches for these fleets since they started operating, and to assess the possibility of implementing sampling programs, the Secretariat scheduled initial missions to Phuket, Penang and Port Louis. During these missions, the following issues were investigated:

1. Retrieval of historic information: Through research centers, shipping agencies, processing plants, port authorities and Customs.
2. Availability of size-sampling in the ports: Through research centers.

The results were different depending on the fleet:

Large longliners: Monitoring of the longliners unloading to Mauritius, South Africa and Singapore was not considered a priority due to the following reasons:

- **Length of the trips and scarcity of landings**: Trips of up to one year are usual, as are also partial landings. These two factors make it very difficult to keep track of the vessels and monitor their catches.
- **Alternative ways of monitoring the catch**: during the missions, it was confirmed that most of the large longliners flying convenience flags belong to Taiwanese owners, and operate in the same way than vessels flying the Taiwanese flag. Because catches of the Taiwanese longliners have been reported so far, it would be possible to use them to estimate the catches of longliners with convenience flags if the total number of vessels is known. The Albion Fisheries Research Centre (AFRC) and the Seychelles Fishing Authority have provided lists of longliners unloading to Port Louis and Victoria. Other sources for this information are the lists of vessels that exported fish to the sashimi market for 1998 and 1999 (from Japan), and information provided by the Agri-Food and Veterinary Authority of Singapore for 1999 (information for earlier years was also requested).
- **Sampling schemes already existent in Mauritius**: The AFRC has been collecting information on the activities of longliners calling to Port Louis since 1980. Size sampling of Albacore has been conducted since 1999. The IOTC offered co-operation to the AFRC regarding sampling of all other species unloaded or transshipped in Port Louis (including the software to process the data). In addition, Australia (CSIRO) has a program that samples the landings of Taiwanese vessels in Port Louis. The focus of the program is southern bluefin tuna, however, data on other species are collected.

Small longliners: For the reasons explained above, most of the effort of the missions to these countries was allocated to obtain information and monitor the catches of small longliners. In addition the following considerations were also taken into account:

- There are no other ways to estimate the catch for the catches have never been reported to the IOTC.

- Small longliners usually operate from a single port with trips that last one month or less. This allows to keep track of the boats throughout the year. Furthermore, partial landings are unusual.
- The representatives of some processing plants proved to be very cooperative, providing the landing sheets for all the boats the company dealt with on recent years. These sheets are equivalent to a size sampling where the whole catch was handled.

The Andaman Sea Fisheries Development Center (AFDEC) in Phuket and the Fisheries Research Institute (FRI) in Penang appeared to be very interested in cooperating with IOTC in the implementation of sampling programs. Sampling activities started in April in Phuket, and in October in Penang.

The sampling strategy was drawn during the first visits to Phuket and Penang and a sampling manual drafted and provided to the sampling teams before they started operating. The Secretariat also produced the software Longline Database and Data Entry (ILDDE), which includes facilities for data entry, handling and reporting of the collected data. The sampling manual and the software have been updated in several opportunities following recommendations from the sampling teams.

So far the following information has been recovered:

Processing plants records : Document WPDCS-00-02 describes the data retrieved from one of the most important shipping agencies in Phuket and Penang. The Table 2 shows the total number of landings and number of fish sampled by species in these ports. The representatives providing the information engaged to retrieve and photocopy the data of former years. One more set of data has been sent so far and more are expected in the future, therefore we expect to increase the sample size for 1998 by about 20,000 more specimens.

Sampling Programs Data: Samplings conducted in Phuket are shown in Table 2. The Secretariat is expecting to receive an update that includes the months of October and November, which are periods of high activity. A total of 650 landings have been monitored so far, with 65,000 measured specimens. Biological samplings and sharks and shark-fins identification are also being conducted as part of the sampling program in Phuket. In addition to samplings, the AFDEC staff has conducted 84 interviews to fishing masters aboard 76 of the longliners that called to Phuket during the period.

Regarding the historic information, all the landings data for Phuket have been recovered. These include the landings per boat and the amounts unloaded (from Customs) since August 1994, the year the activity started. The sampling team in Penang is also collecting this information from different sources, such as Customs and the Port Authority.

Indonesia has to be considered a separate case because a massive re-flagging (to Indonesia flag) since 1997 has resulted in no foreign vessels in their ports. Contacts were established with the Indonesian Directorate of Fisheries (DOF) with the goal recovering historic data from Indonesian processing plants through this institution. Taking into account that the responsibility of monitoring the longline fleet lies with Indonesian Authorities since 1997, the implementation of a sampling program is under consideration by the Secretariat.

	Port/Year	no. LL	no. Landings	no. spec. sampled	Catch sampled (kg)	YFT	BET	ALB	BLZ	BLM	MLS	SWO	OTH
Processing Plants Records	Penang 1998		177	Data not processed yet (provided in October 2000)									
	Phuket 1999	14	139	13,630	558,912	157,665	332,531		19,847			48,816	
	Penang 1999	27	206	20,880	792,042	203,280	440,361	592	19,276	923	2,961	18,501	669
Sampling Programs	Phuket 2000		114	12339	429,667	203,900	149,464	449	25,738			20,187	63,803
	Penang 2000	Sampling started in October 2000											
Total			636	46,849	1,780,621	564,845	922,356	1,041	64,861	923	2,961	87,504	64,472

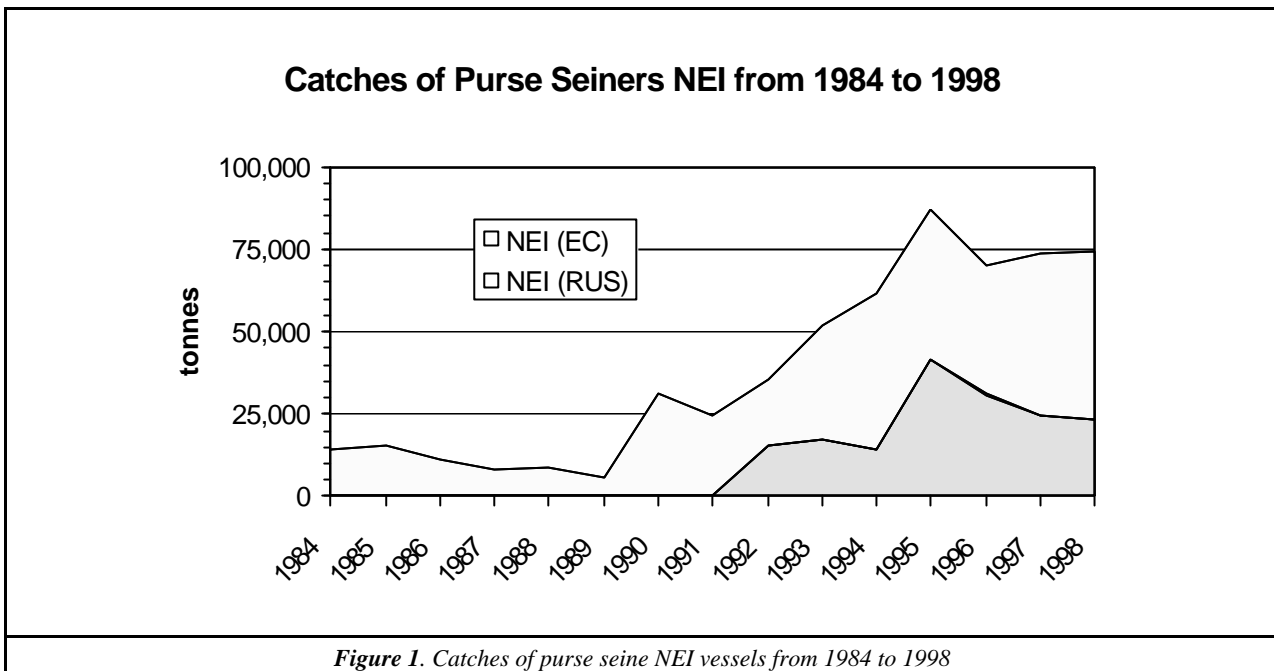
Table 2: Number of landings monitored, specimens measured and weight of these specimens (total and per species) in Phuket and Penang from 1998 to 2,000.

NEIE STIMATION

The acronym **NEI** (Not Elsewhere Included) has been used to record the catches by vessels or fleets which are not officially reported to the IOTC. This category includes two types of vessels:

- Catches of vessels reported by persons or organizations other than the flag state or responsible organization: All catches that are not reported directly (by the IOTC Liaison Officers) or indirectly (obtained through the FAO databases and/or Statistical Bulletins and/or scientific papers) are classified under NEI. The catches by European owned purse seiners flying flags of convenience are a good example for they have been reported by the European Liaison Officers since these vessels started operating in the western Indian Ocean (1984). The quality of this set of data as good as the data for purse seiners flying EU flags (France, Italy and Spain).
- Non-reported catches which the Secretariat has to estimate by using any available sources: Fleets not reporting on their fishing activities are widespread. Registries of Foreign Fishing Vessels, calls, and landing statistics coming from countries in the region are helpful in assessing this issue. However, the information gathered by the Secretariat is still scarce and uneven, to the point that in some cases it is impossible to track fleets down to the year they started operating. Catches by Russian owned purse-seiners (now flying Panama flag) and a large number of longliners flying flags of different countries (Belize, Panama, Honduras, etc.) have been fully estimated by the Secretariat.

Figure 1 shows the recent trends in the catches of purse seine NEI vessels, indicating that the proportions of these have been increasing.

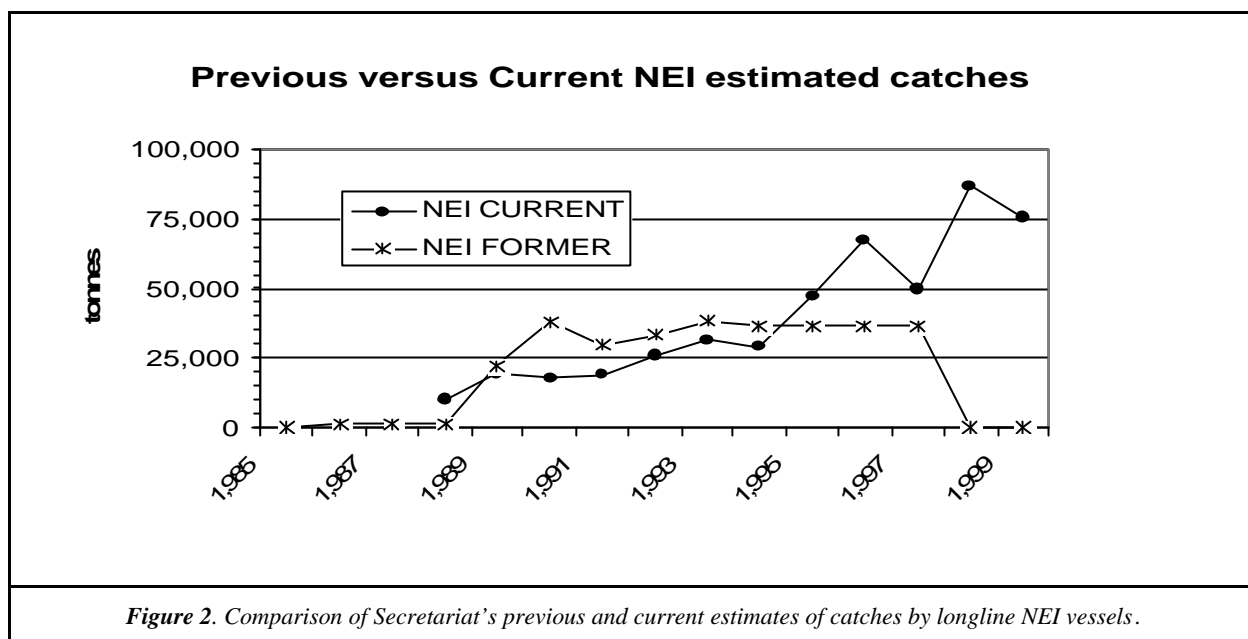


Longline NEI catches have been fully estimated by the Secretariat by using the available sources, which varied depending on the country where the fleets operate and/or the type of boats involved (their size). Most of the catches were estimated based on the number of vessels operating. These numbers were obtained from the vessel registry for recent years and from other bulletins and publications for former years. Because of improvements in reporting, catch estimates for recent years are considered to be more accurate.

Regarding the species composition of the catches, it was calculated based on Taiwanese statistics for large longliners (which GRT is above 100). For small longliners data from the CSIRO's sampling program in Bali-Benoa was used.

It is worth to mention that there has been an increase in the catches, as well as number of large and small longliners, throughout the period. The apparent decrease in the catches and number of boats registered since 1995 is an artifice due to the re-flagging of all Taiwanese longliners operating from Indonesian ports. This massive re-flagging was the result of new regulations implemented by the Indonesian Administration, stating that no foreign vessels will be allowed to operate in the Indonesian EEZ nor to use the country ports from 1st January 2,000. Since 1997 all vessels fishing in the Indonesian EEZ are required to have the Indonesian flag (CSIRO). The Indonesian longline fleet amounted to more than 1,000 boats in 1999 according to the last estimates by the Secretariat (Vessel Registry).

Figure 2 shows the differences between the Secretariat's past and recent years estimations of catches by NEI longline vessels, demonstrating the importance of the new vessel registry and the sampling programs (CSIRO and IOTC) for the calculation of the un-reported catches. To produce better estimates, in particular for years before 1997, it is necessary to collect more information.



In addition to the indicated changes in total catches, there have been also changes in the species composition of the catches. These are as a result of more accurate estimates by the Secretariat, using as sources the sampling programs ran by CSIRO and IOTC in cooperation with local institutions in Indonesia, Malaysia and Thailand.

VESSEL REGISTRY

Table 3 shows the countries that provided the Secretariat with lists of local and/or foreign boats registered to operate from their ports or in their EEZs. So far, 18 countries (of which 12 are IOTC Members) have provided lists of vessels. Data obtained for years prior to 1997 are considered to be incomplete, therefore they have not been included in the VR database. Two international organizations, SPC and ICCAT, provided their vessel registries to the Secretariat. SPC submitted records for all vessels fishing in the western Pacific Ocean, and ICCAT for vessels identified as IUU in the three oceans. Records on more than a thousand vessels operating from Indonesia were obtained through a consultant in 1999.

Reporting Country	IOTC	Total number of boats reported				
	Member	1997	1998	1999	2000	TOTAL
Mauritius	X	324	359	310	179	1172
Seychelles	X	379	297	195	2	873
Japan	X		174	431		605
Thailand	X	223	8	175		406
Singapore				266		266
China	X		148	82		230
France	X	45	48	46	32	171
European Community	X		39	104		143
Mozambique			57	47		104
Madagascar	X	5	44	37		86
UK	X		15	66		81
Korea	X		56			56
Philippines			40			40
Spain	X	2	2	4	30	38
India	X	9	12	11		32
Iran	X	4	4	4		12
Panama					10	10
Russia				5		5
IOTC			1736	546	1	2283
ICCAT (JPN)			95			95
TOTAL NUMBER OF BOATS		798	1746	1792	246	2990

Table 3: Countries having submitted lists of local and/or foreign fishing boats operating in the Indian Ocean from 1997 to 2000

Non-reporting coastal countries which ports or EEZ are thought to register activity of important local or foreign fishing fleets are Australia, Comoros, Kenya, Madagascar (longline), Malaysia, Somalia, South Africa and Sri Lanka. Other non-reporting DWFN are China (Taiwanese boats), Honduras, Belize, Equatorial Guinea, Netherlands Antilles, Cambodia and others.

Other countries thought to have industrial fleets operating from their ports or in their EEZ did not report lists of vessels to the Secretariat. The Secretariat did not receive information from Australia, China (Taiwanese fleet), Indonesia, Madagascar (longline fleets), Malaysia, South Africa, Sri Lanka, Somalia, Kenya and Comoros.

To date, there are 6,708 entries (one for each time a vessel is reported) referring to 2,917 vessels, of which 2,802 are longliners, 100 purse seiners and 15 carrying other gears or other types of vessels (as fish carriers or supply vessels). Table 4 shows the situation of the data holdings. The total number of boats for each flag in the data holdings is compared with the number of boats for which the Lloyd's registration number, the national registration number (NRN), the radio call sign (RCS), the length overall (LOA) and the gross registered tonnage (GRT) were reported. The identification of the vessel is based on these three fields and are important to identify duplicate records. In addition, the Lloyd's registration number allows keeping track of a given vessel over time. The LOA and GRT are convenient to classify vessels based on their size. This information is useful to estimate catches of un-reporting fleets on the basis of the number of boats operating.

The NRN and RCS are reported (25-30% of the vessels) more frequently than the Lloyd's registration number (2%). For the size-related variables, GRT is reported (60%) more often than LOA (30%).

The information for purse seine vessels is, in general, more thorough than the information for longliners.

All Gears (LL, PS, SUPP, TRAW, FCA, HAND)										
FLAG	1997	1998	1999	2000	TOTAL	LLOYD	NRN	RCS	LOA	GRT
IDN		849	571		1108		7	8	6	1102
TWN	415	283	415	122	666	4	296	231	347	347
JPN	73	114	285	10	323		272	275	284	287
CHN	88	151	113	6	255		97	76	114	114
KOR	66	58	23	6	101		86	89	94	96
ESP	34	34	84	17	85	15	47	37	38	37
HND	33	63	64	9	74	9	4	37	44	43
FRA	42	44	39	15	53	15	30	33	52	53
PHL	7	48	24	8	51		11	16	48	48
BLZ	8	37	36	10	42	3	9	11	16	16
GNQ	7	8	18	18	28		2	6	13	13
PAN	4	25	28	3	26	3	13	8	10	10
SYC	5	11	10	9	12	3	10	11	7	10
PRT			9		9	1	8	8	8	7
ANT	4	4	4	4	6	3	5	5	6	4
IRN			5	2	4		1	1	3	4
KHM	4	4	4	3	4		1		4	3
SGP		1	3	1	4					
THA		3	3		4			3		3
LBR	3				3	3		3	3	3
KEN		2	2		2					
MUS	2	1	1	1	2	2	2	2	2	2
BEL			1		1				1	1
CRI		1	1		1					
GBR	1	1	1	1	1		1	1	1	1
HUN			1		1					
ITA	1				1		1	1	1	1
LKA			1		1				1	1
MOZ		1	1		1					
UKR		1	1		1					
USA	1				1				1	1
VCT		1			1				1	1
VEN				1	1					
VUT		1	1		1			1	1	1
UNKN			43		43					
TOTAL	798	1746	1792	246	2917	61	903	863	1106	2209

LEGEND: LLOYD (Lloyds' number), NRN (National Registration Number), RCS (Radio Call Sign), LOA (Length Overall) and GRT (Gross Registered Tonnage). UNKN refers to vessels which the flag was not reported.

NOTE: Boats reported under more than one flag have been recorded in the flag they were flying the last year of activity.

NOTE: 2000 figures preliminary.

Table 4: Total number of fishing boats in the IOTC Vessel Registry per country flag and number of them which the vessel characteristics were reported.

FOREIGN TUNA VESSELS ACTIVITY

Seven countries reported on the activity of the foreign fleets based in their ports More than 3,000 records regarding the arrivals and departures of vessels at different ports in the Indian Ocean have been reported. This database has also been used as a source of information for the vessel registry.

Both the Vessel Registry and the Foreign Tuna Vessels Activity Registry, which are usually computerized in the countries, are however sent in paper form to the IOTC. It is strongly recommended that countries do their best to provide this information in electronic format, to avoid a second entry by the IOTC.

QUALITY OF THE IOTC DATA HOLDINGS

Nominal Catches

The situation regarding the reporting of nominal catches during the years 1998 and 1999 is shown in the Table 5. Catches have been broken into three categories based on the source and the quality of the data:

- **Reported:** Includes the catches provided by liaison officers or from reliable sources and which did not need to be processed by the Secretariat (*i.e.* catches reported by gears and species).

- **Partially Estimated:** Includes the catches provided by liaison officers or from reliable sources that needed further processing by the Secretariat (*i.e.* catches were reported aggregated into gears and/or species and were split by the Secretariat).
- **Fully Estimated:** Includes the catches not reported or incomplete. The Secretariat had to estimate these catches using alternative sources (*i.e.* catches of longliners NEI calculated on the basis of the number of boats operating).

About 50% and 60% of the total catches are reported for the years 1998 and 1999, respectively. This improvement is undoubtedly a consequence of the reporting of the Taiwanese and Maldivian nominal catches for these years. It is also worth to mention a better reporting of the Sri Lankan nominal catches in 1999, which did not need any further processing by the Secretariat, as was the case in previous years. In spite of these improvements it should be said that the situation regarding other countries as Indonesia and some DWFN still causes concern. The quality of the Indonesian statistics gathered by the Secretariat has decreased since 1993, the last year the data was reported by Indonesian authorities. Since then, the nominal catches have been estimated using the information from FAO FishStat database. However, in this database catches are highly aggregated, both by species and gear. Species and gear composition in 1993 has been systematically used for the calculation of recent years catches. It is evident that the quality of these estimations is decreasing the further away they get from 1993. Regarding the species composition of the Indonesian longline catch it should be noted that a sound revision has been carried out this year aiming to reallocate all yellowfin and bigeye tuna catches and better estimate the catches of the other species from data provided by the CSIRO (Sampling Program in Benoa).

As it was mentioned before, during this year the Secretariat carried out a sound estimation of the catches by longline boats flying flags of convenience and operating in the Indian Ocean from 1985 to 1999. Although the figures obtained are thought to be more accurate than those from preceding estimates there is still ground for improvement, particularly for years prior to 1997. The retrieval of historic information regarding fleet activity is considered of utmost importance if a better estimate is envisaged.

It should be noted that there is a decreasing trend in the reporting of the nominal catches to the IOTC in recent years, especially catches from the artisanal fisheries. The alternative source for these catches is the FAO FishStat database, which as mentioned above, makes it difficult to allocate catches per gear, particularly for those countries that have never reported to the IOTC.

1999	M	REPO	PAES	FUES	TOTAL	%
NEI		60,014		110,341	170,355	70.5
ESP	X	144,438	576		145,014	
IDN				125,170	125,170	79.5
MDV		122,693	604		123,297	
CHN	X	6,162			6,162	
TWN		100,443			100,443	
IND	X	5,768		97,897	103,665	86.7
LKA	X	102,074			102,074	
IRN	X	90,204			90,204	
FRA	X	85,792			85,792	
PAK	X			48,624	48,624	90.2
JPN	X	6,999		39,990	46,989	93.1
THA	X		46,809		46,809	
SYC	X	29,387			29,387	
OMN	X	20,247			20,247	
ARE				18,943	18,943	94.5
AUS	X	12,739			12,739	
MYS	X	4,157	8,440		12,597	
MDG	X			12,000	12,000	95.4
EGY				10,843	10,843	96.1
SAU				9,074	9,074	96.8
COM				8,680	8,680	97.4
YEM				8,450	8,450	98.0
KOR	X			8,414	8,414	98.7
MOZ				8,179	8,179	99.3
ITA	X	6,890			6,890	
MUS	X			3,675	3,675	99.5
TZA				3,525	3,525	99.8
PHL		3,216			3,216	
KEN				1,892	1,892	99.9
ERI	X	756			756	
ZAF*				525	525	100.0
QAT		496			496	
KWT				290	290	100.0
PRT	X			110	110	100.0
BHR				100	100	100.0
DJI				75	75	100.0
BGD				60	60	100.0
TOTAL / %		802,475	56,429	516,857	1,375,761	
		58.33	4.10	37.57	100.00	

1998	M	REPO	PAES	FUES	TOTAL	%
NEI		51,121		110,341	161,462	96.6
IDN			83,132	42,038	125,170	99.9
MDV		114,518	606		115,124	
LKA	X		113,317		113,317	
CHN	X	2,816			2,816	
TWN		111,191			111,191	
ESP	X	110,150	409		110,559	
IND	X	2,994	97,897		100,891	
IRN	X	65,040			65,040	
FRA	X	63,310			63,310	
PAK	X		48,624		48,624	
JPN	X	48,604			48,604	
THA	X		47,289		47,289	
OMN			25,867		25,867	
SYC	X	20,720			20,720	
ARE			18,943		18,943	
MYS	X		14,246		14,246	
MDG	X		12,000		12,000	
EGY			10,843		10,843	
SAU		9,074			9,074	
COM			8,680		8,680	
YEM			8,450		8,450	
KOR	X	8,414			8,414	
MOZ			8,179		8,179	
AUS	X	8,166			8,166	
ITA	X	5,992			5,992	
MUS	X	3,164	511		3,675	
TZA			3,525		3,525	
PHL		3,248			3,248	
KEN				1,892	1,892	100.0
ERI	X	734			734	
QAT		552			552	
KWT			290		290	
PRT	X		110		110	
BHR		100			100	
DJI			75		75	
BGD			60		60	
ZAF				25	25	100.0
TOTAL / %		629,908	503,053	154,296	1,287,257	
		48.93	39.08	11.99	100.00	

Legend: IOTC Member (M); Data Reported (REPO); Data Partially Estimated by the Secretariat (PAES); Data Fully Estimated by the Secretariat (FUES).

Percent of total catch (right column, (%)) that would be considered reported if the data for that country is reported.

1998 catches were carried forward in case no data or only partial data were reported.

* Ten South African longliners targeting swordfish have been operating from Porth Elizabeth since 1999 (their catches were roughly estimated at 500 tonnes).

Table 5: Situation Regarding the Reporting of Nominal Catches to IOTC for the years 1998 and 1999.

Discards

Only three countries provided data regarding discards that occurred in their fisheries, but some countries, as Sri Lanka, do not have discards. As the data reported were not complete they have only qualitative value. Nevertheless, countries should be encouraged to provide or continue providing the Secretariat with discards statistics. These data can be used to create lists of species that are likely to be caught under given gears.

Fishing Craft Statistics

Countries reporting nominal catches are also usually reporting fishing craft statistics. Nineteen countries provided craft statistics including the number of boats fishing for tunas in the Indian Ocean per gear and size class. The data reported is still uneven and incomplete, and little is known about the number of boats and gears operating in many countries, in particular for the artisanal fleets.

The data regarding the industrial fleets, including the non-reporting foreign fleets, has improved thanks to the implementation of the Vessel Registry, however, the artisanal fleets can only be assessed through the fishing craft statistics database.

GENERAL DISCUSSION ON DATA COLLECTION

During the general discussion information regarding IOTC's holdings of Nominal Catches, Catch and Effort statistics and size frequency data were presented by the Secretariat (Tables 6 and 7). It was agreed that the overall situation of the holdings for nominal catches and catch and effort are good. In particular, it was pointed out that the importance of the Secretariat now having the full database for China (Taiwan) longline fishery and the recent data submissions from the Maldives baitboat fishery.

In contrast, the holdings of size frequency data are in poor condition. In particular, it was mentioned the Secretariat has not been able to obtain size-frequency information for the Taiwanese longline fleet since 1989, and that the submissions by Korea contained a rather small number of samples, but it is possible they do not have any more information.

It was indicated that the new sampling programs in Phuket, Penang and soon Indonesia, were expected to provide extremely valuable size frequency and biological information.

It was mentioned that processing plants and shippers could be a good source of weight data. However, it is well known that weights sampling along is a poor substitute for size frequency sampling. It was suggested that effort should be allocated as much as possible to establish sampling programs and increase the quantity and quality of size frequency data collection.

DATA PROCESSING

Progress done in the re-design and conversion of the Secretariat's database (IODB) were presented in document WPDCS-00-03. The database was completely re-designed implemented in MS SQL Server. The objectives of the new design were geared towards the following issues:

- Provide an unified framework for storing and retrieving information at any spatial or temporal resolution, including to multiple data sets referring to the same data aggregates
- Provide the necessary flexibility to allow storing data in the same units and stratification level in which it is originally reported. This allows a clear separation of raw data (as originally reported) and processed data (for which stratification parameters have been changed). Such a design would also be capable of handling heterogeneous space and time stratification.
- Provide the highest possible level of enforcement of data integrity.

The new design has been already implemented and is completely functional, although the Secretariat is still doing fine-tuning of some aspects of the database.

Document WPDCS-00-07 discusses the important elements of the design and development of WinTuna 2000. This is the new application being developed in the Secretariat to compile and analyze fishery data for tuna and tuna-like species. The application is composed of a main console that works as a coordinator and modules that can be added as plug-ins. This design provides great flexibility, makes the application easy to upgrade remotely, facilitates inter-institutional collaboration (modules are independent from each other), and simplify development (many issues, like access permissions to the database, are brokered by the central console application, so plug-in modules do not have to deal with them). Currently the main console has been completely developed, as well as many of the basic modules that will be distributed with the application (including a module to enter and analyze longline landings and one for handling a vessel registry). Two additional modules to handle logbook information for longliners and purse seine vessels will be developed starting January of 2001. The last module will be developed in cooperation with IRD to make it compatible with their data-entry program (AVDTH).

During the discussion, it was indicated that Seychelles Fishing Authority has been using a previous version of WinTuna since 1992, and they encouraged the development of this new version in collaboration with end-users.

It was indicated that the EU already has a standard program for data-entry (AVDTH) and that duplication of effort should be avoided. However, WinTuna 2000 covers a wider spectrum than pure data-entry or data-verification; it also provides the means for local agencies to manage and analyze their own data sets, a feature missing in AVDTH.

The Seychelles Fishing Authority noted that an important concern of them was support for this type application. They indicated that they have been using ORSTHON for portions of their data-entry and analysis, but that have had numerous problems to obtain support.

DATA DISSEMINATION

A summary of the data dissemination activities performed by the Secretariat was presented and discussed. These activities include three main areas, the Commission Web's site, the Secretariat's newsletter (published approximately every quarter) and scientific and data-report publications. The IOTC Web site has been recently updated with the most recent reports from the Working Parties and information concerning meetings. Among the new publications, the Proceedings of the 7th Expert Consultation on Indian Ocean Tunas was printed and distributed in late August, while the Data Summary No 20 covering information for the period 1989-1998 will be published soon.

It was suggested that the Secretariat should provide access to its data holdings through their web site. To this suggestion, the Secretariat indicated that nominal catch information is already available in the format of FishStat. Other database holding would be hard to publish, in part because the Secretariat's access to internet is slow and unreliable. It was also indicated that the web site has available for download almost all the publications produced by the Secretariat.

REVIEW OF THE SITUATION BY SPECIES

The chairman of the Working Party on Tropical Tunas presented the report on the data situation for tropical tunas (Document WPDCS-00-08). The report identifies a number of problems in this area, among them the poor knowledge of catches and effort of small longline vessels with convenience flags, the lack of information for the Indonesian longline fleet, lack of size-frequency information for the Korean longline fishery and lack of information for recent years of the Taiwanese longline fishery. The report also remarked the improvements by the Secretariat in the levels of catch reporting, collection of vessel registry information, estimation of NEI catches and effort, estimation of Indonesian longline catches, recovery of historical data, establishment of sampling programmes and obtaining Korean size-frequency data. The report of the WPTT elaborated on the data situation for yellowfin, bigeye and skipjack tunas.

The Chairman of the Working Party on Billfish reported on the data situation for billfishes (Document WPDCS-00-09). The report identifies several key issues that affect the quality of the data for billfishes, including mislabelling, underreporting and non-reporting, indicating that although data in the Secretariat's database are considered accurate and reliable, they are far from complete. The report reviews the data situation for billfishes caught by longliner and gillnets, the two gears responsible for most of the catches of these species.

The Secretariat presented information regarding the status of data collection and information available for temperate species of tunas. The catches of Albacore and Southern Bluefin Tuna have been almost fully reported since 1970. Nevertheless, it should be noted that in recent years the Secretariat had to specifically request catches of SBT from several countries, because they were not included in the original data submissions.

The catch and effort statistics for albacore tuna are in very good stand, as most of catches are done by longliners from China(Taiwan). In contrast, the size frequency statistics are poorly represented, because of the lack of reporting by this fleet.

The reporting of the catches of neritic tunas has also been worsening. In recent years catches have not been reported, or were reported aggregated. Of the neritic tunas, Longtail tuna and Kawakawa represent the larger share of the catches.

Regarding seerfish, the catches of narrow-barred Spanish mackerel amounted to more than third the total catches.

Catch and effort and size frequency statistics for these species are conspicuously absent from IOTC databases, because they are rarely included in the data submissions. It is thought, however, that many countries have collected information for these species.

It was concluded that although the Secretariat has good reports for some countries (*e.g.* Iran), the situation for most countries could be considered as poor. It was suggested that perhaps the activation of a Working Group on Neritic Tunas was necessary, and that this Group should concentrate initially in solving the problem of identifying sources and means for the collection of data these species.

DESCRIPTION OF NATIONAL STATISTICAL SYSTEMS

Document WPDCS-00-05 reported on a new possible source of information that could be used to produce accurate estimates of tuna catch statistics for Indonesia starting in 1995. Indonesia is about the third largest tuna fishing country in the Indian Ocean, however, catch statistics classified by gear and species have not been available for this country for many years. The presented document reports on the findings from a recent visit to WASKI (Indonesian Fish Monitoring, Control and Service Surveillance Agency). The data collection system is organized in several layers by provinces and by districts. Information collected at the district levels include monthly catch statistics of commercial fishing companies, monthly catch statistics of small-scale fisheries from public landing centers, and quarterly catch statistics of small-scale artisanal fisheries in small villages. It was noted that although the information reported by the districts is not classified by gear and is aggregated by species, the original logbook data (since 1995 and until this year) do contain classification information. This original logbook data can be recovered if appropriate funding and computer equipment for the data processing is provided. Starting this year, the Department of Fisheries will implement a computerized system to collect logbook information with provisions to classify data by gears and species.

It was suggested that the Secretariat's database could be greatly improved if the old logbook information is recovered, and that it is likely to continue in good shape, given the provisions of the new computerized system to collect information classified by gear and species. A first estimate of the costs of recovering the old logbook information and put it into electronic format was said to be about US \$20,000, including computer equipment, a system analyst, etc.

It was indicated that WASKI holdings do not contain size-frequency or biological data, a sampling program seems the only feasible solution to obtain such information.

Document WPDCS-00-04 presented the estimation of the catches by Japanese purse seine vessels in the eastern Indian Ocean from port sampling surveys. Length frequency sampling was conducted during three landings to a Japanese port of boats coming from the Indian Ocean. During the landings the stevedores usually sort the fish into species and commercial categories. 100 specimens were taken at random from each of the commercial categories and the species identified. The new estimates showed a bias in the amount of yellowfin and bigeye tuna declared both in the landing statistics and in the logbooks, with yellowfin tuna catches overestimated and bigeye catches underestimated. The necessity of port sampling to obtain more realistic estimates of the species composition of the catch was pointed out on the light of these results.

It was suggested that this problem, *i.e.* overestimation of yellowfin and underestimation of bigeye is not a problem unique to the sample studied by this document. Indeed it seems to be a generalized situation, in particular for young yellowfin and bigeye tunas. The reason for this situation is related to the similarities between the young

specimens of these species. In the specific case of the document discussed, it was considered that the main reason for the estimation bias was lack of technical knowledge on species identification by stevedores and fishermen.

PROBLEM AREAS AND POSSIBLE IMPROVEMENTS

The Working Party identified the following areas affecting the timeliness and completeness of data submissions and data collections. The following paragraphs summarize these discussions.

Document WPDCS-00-06 discussed the problems associated to the estimation of species and size composition of the catches on European owned purse seiners for the years 1998 and 1999, mainly due to deficiencies in the port sampling. The implementation of a completely new sampling scheme, the poor sampling coverage, and the quality of some of the samplings were quoted as the main reasons for these deficiencies to occur. The analysis carried out showed problems of misidentification between yellowfin and bigeye tunas, and in the size measuring the specimens (bias of the odd and even classes). It was indicated that the misidentification problem has an important effect in the quality of this dataset. New estimates of species and size composition of the catch were carried out after removing or correcting all the biased samplings. The remaining samples were then used to recalculate the catches, using the series 1993-96 as basis in case the stratum were the catch occurred had not been sampled. The new estimates obtained were submitted to the IOTC and should replace the last estimates set of estimates for this fleet.

The necessity of improving sampling schemes was discussed on the lights of the results presented in this document. It was suggested that part of the problem might lay in a misinterpretation of the rules for the sampling schemes in place, and that a perhaps a computer-assisted protocol would be useful to improve the situation. This however, would be complicated because for appropriate sampling knowledge of the content and origin of the wells is necessary. A split of samples by month and a better distribution of sample into the spatial strata would improve the sampling.

Regarding the estimations for NEI vessels, the Working party encourages the Secretariat to continue with efforts to continue improving the data collection and estimates of catches and size and species distribution for these fleets. The Working Party also encourages countries to make every possible effort to recover historical data on the activity of non-reporting, foreign vessels fishing for tunas in the Indian Ocean.

The Working Party also wants to re-issue their last year recommendation regarding the timeliness of data submissions, and encourages countries to provide their data before the stated deadlines. This is important to ensure the Secretariat can process this information in a timely manner for the activities of the Working Parties. Additionally, the Working Party recommends that countries make every possible effort to provide catch data classified by gears and species.

Finally, the Working party encourages the Secretariat to keep expanding the coverage of their port sampling programs, which would provide much needed size frequency and biological information. In this sense, the Working Party extends this recommendation to all countries and encourage them to make every possible effort to improve upon size frequency sampling for all species caught by their longline fleet through dedicated port sampling programmes. In the particular case of Japan, it is also recommended that they make every possible effort to recover historical weight data that might be available from longline skippers.

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Appendix II. Agenda of the Meeting.

1. Progress Report of the Secretariat.

The Secretariat will review its work on the compilation and processing of the information relevant to the fisheries for tunas and tuna-like species in the Indian Ocean. The Secretariat will also report on CWP and Inter-Agency meetings.

2. Review of the situation by species

The species' Working Parties will provide summaries of the data situation concerning their species of interest.

- WPTT
- WPB
- Other spp

3. Description of National Statistical Systems

Briefly review national reports describing the data collection systems utilised, currently and in the past.

4. Problem Areas in the Data Situation and Possible Improvements

The WP is invited to identify problem areas affecting the timeliness and completeness of data submissions in the data collection and to discuss possible solutions.

5. Other matters

6. Adoption of Report

Appendix III. List of Papers

- WPDCS-00-01 Calculation of the Nominal Catches of vessels Not elsewhere Included (NEI) within the IOTC Area. *IOTC Secretariat*.
- WPDCS-00-02 Landings of small fresh tuna longline vessels to ports in the Indian Ocean during the year 1999. *Herrera, M., P.Nootmorn, M.Mhd.Isa and S.Panjarat*.
- WPDCS-00-03 A description of the IOTC database system. *IOTC Secretariat*.
- WPDCS-00-04 Evaluation of Japanese purse seine catch by species in the eastern Indian Ocean based on the port sampling program. *Matsumoto.T. and T.Nishida*
- WPDCS-00-05 Possible approach to estimate accurate tuna catch statistics in the IOTC area of Indonesia after 1995. *Gafa.B. and T.Nishida*.
- WPDCS-00-06 Recent estimates of species composition and sizes sampling of EU purse seiners.(and) Problems in the estimated species and size composition. *Fonteneau, A., R-M. Bargain, R. Pianet and P. Pallares*.
- WPDCS-00-07 WINTUNA-2000. *Marco García*.
- WPDCS-00-08 Report from the WPTT on the data situation of tropical tunas. *WPTT*
- WPDCS-00-09 Report from the WPB on the data situation of billfish. *WPB*