Progress Report of the IOTC Secretariat

The IOTC Secretariat began its operations in January 1998, although it was not until July 1998 that the staff was complete. As this is the first meeting of the WPDCS, this report covers the activities undertaken since then by the IOTC Secretariat in relation to the compilation, processing and dissemination of the data pertaining the fisheries for tuna and tuna-like species. The report is divided into the following sections:

1. Design and implementation of databases and ancillary software.
2. Compilation and processing of the data received.
3. Dissemination of data.

Design and implementation of the databases

As reported by the Secretariat at the Seventh Expert Consultation, the structure of the databases that were received from the Indo-Pacific Tuna Programme (IPTP) was extensively modified. The changes were effected when porting the databases to MS Access and resulted in the implementation of a fully relational design. Such a design improves the internal consistency of the databases and facilitates maintenance. In fact, a number of inconsistencies were discovered in the original databases (such as duplicate or orphaned records in related tables) that were corrected at the time of conversion. Appendix 1 lists the basic structure of the tables and its main relationships. The single most significant modification was the separation of the catch-and-effort table into separate tables for catches and effort. Another change that will be evaluated is the possibility of normalizing the size-frequency table. In its current state, it lacks the flexibility to accommodate more that 100 size classes. Recent submissions of longline data of weight distributions extend beyond this limit. This table will likely be split into a table containing sample properties (like location, time, reporting country, etc.) and a table listing size classes and frequencies.

Foreseeing that future growth of the database might exceed the capabilities of MSAccess, the staff conducted a test conversion of the main database to SQL Server 7.0. The results of such test were satisfactory and will ensure that if concurrent demand of the databases grows it will be easy to upgrade to a client/server architecture.

Data Tracking System (DTS)

A major addition to the databases was to build a system of auxiliary databases that allow the Secretariat to track the flow of data from reporting countries and, at the same time, document the transactions performed on the data. The DTS is composed of a:

- **Data Request Status database**, a summary of the situation of data submissions for every country requested to provide information. Includes an average of the catches of the past three-years, pointers to the documentation of the different requests for data and provision to enter personal notes of the Data Manager.
- **Data Liaison Officers database**, listing the details of the contacts in each reporting country.
- **Data Correspondence database,** in which each record lists every communication with reporting countries regarding the submission of data or clarification of issues related to the data.
- **Data Revision database**, where every record summarises and documents a particular transaction (known as **Data Revision**) on the data. The record includes, besides information about the data affected by the revision and the author of the revision, a hyperlink to the type of document (such as a spreadsheet or word-processor file) that documents the specific transformation.

All this information is presented together through a single interface, built in MSAccess that facilitates the rapid assessment by the Data Manager of the situation in any country. A suite of reports, also running under MS Access is currently under development.

Compilation and processing of the information

Staff situation at the Secretariat

The Third Session of the IOTC, decided to increase the staff of the Secretariat by incorporating a Data Manager who would be primarily responsible for the handling of the data provided. The Secretariat advertised the post earlier in the year and received a total of 11 applications from candidates with very good qualifications. Among these candidates Mr Miguel Herrera, currently in the charge of the Spanish Fisheries Office in Seychelles, was selected and he is expected to start his job on October 3rd.
The post of Data Clerk at the Secretariat (a General Staff post) became vacant after the resignation of Mr Alex Adrienne, in June this year. The Secretariat has recently selected a replacement, Ms Laurain Zialor, who is expected to start in her functions in early October.

Requests for data submission

The first request for data submissions was sent in March 1999 when possible by e-mail, otherwise by fax or airmail,. This request covered the years 1997 and 1998, following the deadlines agreed upon during the IOTC Third Session. This request included six categories of data:

Nominal Catches (NC)
Catch and Effort (CE)
Fishing Craft Statistics (FC)
Size-frequency (SF)
Transshipment (TS)
Vessel Registry (VR)

For the first five categories, a form was submitted as an aid for identifying the information that needed to be submitted. However, reporting countries were encouraged to provide the information in any format, preferably on electronic media. In the case of the VR data, only a list of the information requested was included.
A reminder, sent in mid-June and a third one, when necessary, in July, followed this first request. These reminders were sent by fax or e-mail and, in some cases, direct telephone calls. Still, the response to the official requests was poor, as indicated in the Table 1. No country sent all the information requested (with the exception of Japan) and, in most cases, only NC data were reported.
The NC data that was not reported has been, in most cases, estimated by the Secretariat on the basis of FAO statistics as listed in the FAO FISHSTAT database. However, this information is not provided by gear. Therefore, the Secretariat had to estimate the proportion of catch by gear using past information. In the absence of direct information, this represents an important source of uncertainty at the time of estimating size composition in the catches. No alternative sources of information are available for the other types of information.

Overview of the data situation

General considerations

Timeliness of data submissions. The Third Session of the IOTC agreed that the deadlines for the submission of data would be:

a) **Surface fleets and other fleets operating in coastal zone** must provide their fishery data at the earliest possible date but **no later than the 30th of June each year** (previous year data).
b) **Longline fleets operating in the high seas** must provide the **provisional** fishery data at the earliest date, but **no later than before June 30th** (for the previous year data). They must provide the **final estimate** of their fishery data **before December 30th each year** (for the previous year data).

Most countries that have submitted the data have not met this deadline. Although in some cases involving longline fleets (which take a long time to get back to port) it is possible that data would be final by the required date, it is also necessary to remind reporting countries that provisional data should be submitted.

Completeness of data submissions. The overall completeness of the data that were officially reported varied among the countries involved (Table 1). Reporting countries need to be reminded that FAO's three-alpha codes for countries and species are the preferred codes to be used in the submissions. If this is not convenient, **codes used have to be properly documented** with the submission. Also, it is important to **provide raising factors** for data that has been raised to total catch. Otherwise, it is not possible to establish the actual sample sizes involved in the estimation of total catch.

Particularly in the case of the Vessel Registry (VR) data, only a small fraction of the data requested was supplied. In particular, given that the Lloyd's registration number is the only effective way of keeping track of vessels which might change flags (and radio-call signs), **it is necessary that the reporting countries make every effort possible to obtain the Lloyd's registration number for the vessels reported.**

Specific Data-type situation

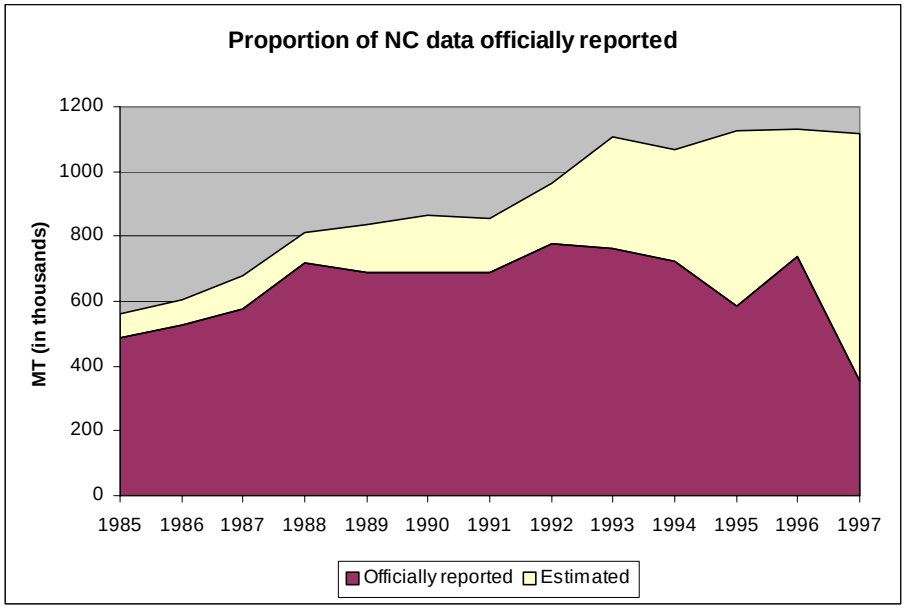
Table 1. Completeness of data submission for 1997 data. Y indicates complete data was submitted , P indicates that only partial data was submitted.

	VR	NC	CE	FC	SF	TS	1997 Catch	
AUSTRALIA		Y		Y				
BAHRAIN								
BANGLADESH								
CHINA	P	Y	Y	Y				
CHINA(TAIWAN)								
COMOROS								
DJIBOUTI								
EGYPT								
ERITREA								
FRANCE	P	Y	Y	Y	Y			
INDIA								
INDONESIA								
IRAN I R		P	P	Y	Y			
JAPAN	P	Y	Y	Y	Y			
KENYA								
KOREA REP								
KUWAIT								
MADAGASCAR								
MALAYSIA								
MALDIVES								
MAURITIUS								
MOZAMBIQUE								-
NEI	P	P	P	P	P			
OMAN								
PAKISTAN								
QATAR								
SAUDI ARABIA								
SEYCHELLES	P	P	P	Y				
SOUTH AFRICA								
SPAIN	P	Y	Y	Y	Y			
SRI LANKA	P	P	P	Y				
TANZANIA								-
THAILAND								
UNTD ARAB EM								
YEMEN AR RP								

NOMINAL CATCH (NC) DATA

The situation regarding official submission of nominal catches has not changed fundamentally over the past few years, indicating a declining trend in the data officially reported. Figure 1 illustrates the trend in the proportion of data that is reported officially, as opposed to that estimated by the Secretariat using alternative sources. Especially troubling is the relatively high proportion of data that were not provided by member countries which is indicated in Table 1. The Secretariat is working on a number of ways to try to improve this apparently deteriorating situation. Part of the problem originates in a lack of response to our communications. In some cases, there has been no direct reply to the Secretariat messages, even when automatic notifications indicated that the intended recipient had opened the e-mail message. Whenever possible, the staff established direct contacts with officials involved in the generation of national statistics and encouraged the submission of statistics in any format. Such direct contacts have proved in the past to improve the situation

significantly. However, in many cases, the national institutions are under-staffed and the preparation of the submission represents a heavy burden.



In some countries, lack of submission of data has been a repeated problem. In the case of India, data for the industrial fisheries have been regularly submitted with some delay. However, no data has been received for artisanal fisheries. Part of the problem relates to the fact that different institutions have the responsibility for the collection of industrial and artisanal fishery statistics.

The lack of reliable Indonesian statistics has been chronic. The problem is particularly serious because the fleet operating from Indonesia include a large component (over 600 vessels) of small longliners of Asian origin that catch large numbers of yellowfin and bigeye tunas. Currently, the Secretariat has initiated a month-long consultancy to attempt to obtain the missing data and to identify sources of information.

Table 2. Estimated non-reported catches in 1996 and 1997 by countries. An asterisk indicates IOTC member countries

	Estimated (non reported catch)	
	1996	1997
INDIA*	127300	127300
INDONESIA	109145	113850
CHINA(TAIWAN)		112340
MALDIVES		89721
SRI LANKA*		58408
IRAN ISLAMIC REPUBLIC	4680	53851
THAILAND*		47250
PAKISTAN*	31823	36361
OMAN	34483	32955
KOREA REP*		18054
UNITED ARAB EMIRATES		16399
MALAYSIA	9508	10079
MADAGASCAR*	10000	10000
EGYPT	2360	9258
YEMEN ARAB REPUBLIC	8299	8670
COMOROS	8860	8030
SAUDI ARABIA		6972
MAURITIUS*	311	5249
SEYCHELLES*	396	515
QATAR	307	411
KUWAIT	242	279
KENYA	274	236
ERITREA*	185	203
BAHRAIN	158	159
DJIBOUTI	80	75
BANGLADESH		50
SOUTH AFRICA		14
MOZAMBIQUE	2819	2819
TANZANIA	2179	2179

As shown in Table 2 the drop in level of official reporting in 1997 can also be traced to some specific cases. Data from Taiwan Province of China has not been obtained by the People's Republic of China (PRC) and the Secretariat has been instructed by the PRC that it should not accept data from Taiwan Province of China unless submitted through PRC authorities. Therefore, the Secretariat has not sent a request for data to officials from Taiwan Province of China. Further negotiations between the parties involved and the FAO Legal Office may result in an improvement of this situation.

In the case of Maldives, the policy towards IOTC is to provide only statistics that have been published. The Secretariat has requested such published statistics on several occasions with little result. In these cases, there is often a considerable delay in obtaining the published documents. However, the Secretariat is in contact with national scientists and hopes to obtain the mentioned publications shortly.

Other cases are also likely to be resolved in the near future. For example, Sri Lanka submitted partial statistics that, when used to estimate total catch, resulted in a figure well below the estimates submitted to FAO. The Secretariat will seek further clarification from Sri Lankan officials before entering the official statistics. Similar situations exist in the case of Iran, Thailand, Seychelles and Mauritius.

In the case of the Republic of Korea, in spite of the repeated attempts at contacting officials no reply was obtained. Further attempts will be carried out.

Catch-end-effort (CE) data and (SF) Size Frequency data

Table 1 shows the most recent data situation regarding CE and SF data. The pattern for both data types is similar. Of the two types of data, SF data is perhaps more crucial (depending of the fishery involved) to carry out age- or size-based analyses. CE data in principle could be used to provide an index of abundance, but the data requested is not sufficient for data standardization that go beyond time-area strata. CE data provide a way to raise SF data with a better weighting scheme and, to some extent, to assess the appropriateness of substitution schemes.

CE and SF information is available from a large proportion of the purse-seine fleet, most of which is under a statistically designed sampling programme. The situation is more irregular for the industrial longline fishery, where most of the size-sampling is done by fishermen on board the vessels. This might result in a less than adequate coverage for some time and area strata, a situation that might affect the estimation the size composition of the total catch. More troublesome is **the absence of any size-frequency (historical and current) for the Korean LL fleet,** and the **lack of size data for the Taiwanese fleet since 1989.**

When major groupings of species are considered, there are large differences in the quality and availability of data. While there are data on pelagic tunas targeted by industrial longline and surface fleets, there is much less reliable data on billfish and virtually no data on neritic tunas due to the larger presence of artisanal fleets in these fisheries.

Vessel Registry (VR) Data

The compilation of this information has just begun this year, following the mandate to that effect from the Third Session of the IOTC. However, it builds partially on previous attempts by IPTP to achieve the same goal. A database has been designed, implemented and links have been established to other relevant IOTC databases (see Appendix III for a layout of the design). Requests for data was sent to the countries involved and datasets received an initial review by the Secretariat. Table 3 lists the current situation concerning this type of data. This datasets covers a large number of vessels which have been operating in the Indian Ocean over the past ten years. Still, the list is far from complete. A large effort will have to be dedicated to identify duplicate records existing in these datasets, correct numerous mistakes still present in the data. It will also necessary to identify which of those vessels are still operating in the region.

Fishing Craft (FC) Data

Returns on this data have been uneven (Table 3), and, in some cases, these data listing the number of vessels operating by various categories, will be superseded by the VR data. However, primarily for artisanal fisheries, only data aggregated in this way can be obtained routinely as estimated figures.

Transhipment (TS) Data

The response to request for this type of data has been dismal to date. In fact, no data (other than large aggregates) has been submitted to the Secretariat. Transhipment data was original intended as a way to identify possible errors in catch data. However, given the low response in this respect, the priority of requesting such data might have to re-evaluated.

Table 3. List of datasets compiled by the Secretariat with information relevant to the VR database.

Data Item	Obligation	Japan	China	FoC (Japan)	Seychelles	Seychelles	Seychelles	EU	France	Iran	Pakistan	Pakistan	Pakistan	Thailand	Malaysia (Phuket SP)	India	India	Indonesia	Indonesia	BIOT	Mauritius
Date		1998	1998	1998	1990-1999	1983-1999		1998	1984-99	1997-98	1996	1991	1992	1997	1992-93	1993	1995	1993	1994	?	1992
No. of LONGLINE		254	148	135		843		1		1	15	16	44	242	262	28	18	814	230	114	81
No. of SUPPORT							?														
No. of PURSE SEINE		3			133?			37	155	3				4							
Vessel Name	Mandatory	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Vessel Type	Mandatory	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Lloyd's Registration No.	Mandatory >100GT				89											27	18			3	
National Registration No.	Mandatory	Y	52		Y	764		Y						Y		1				Y	33
International Radio Call Sign	Mandatory	26	50		Y	761		Y			13									Y	
Flag Country	Mandatory	Y	Y	Y	Y	Y		Y	Y	Y	?	Y	Y	Y	Y	Y	Y			Y	Y
Name and address of owner	Mandatory	Y	8			6		Y													
Name and address of operator	Mandatory				Y	Y															
Name and address of charterer	Mandatory	Y																			
LOA (Length overall)	Mandatory	Y	61		Y	Y		Y			Y				Y	Y	Y	Y	Y	Y	
GT (Gross Tonnage)	Preferred and/or				Y?			Y			Y?										
GRT (Gross Registered Tonnage)	If GT not known	Y?	61		Y?	Y		Y	Y	Y	?			Y	Y	Y	Y	Y	Y	Y	Y
Carrying capacity	Facultative				Y	Y									Y	Y	Y			Y	
BHP/kW	Facultative														Y	Y	Y			Y	
Year Built, Shipyard	Facultative				Y					Y										Y	
Hull material	Facultative														Y						
Home port	Facultative				Y										Y					Y	
Support vessels	Facultative				?	Y															
Operating port	Facultative			Y	Y									Y	Y					Y	
Area of operation	Facultative													Y		Y	Y	Y	Y		Y
Previous name	If any				Y																
Previous Flag	If any				Y																
Date licence operational	Facultative				Y	Y						Y	Y								
Date licence to	Facultative				Y	Y						Y	Y								

Proposed remedial measures

In some cases, the problem has been the lack of clearly identified data correspondents at the national level. In the Third Session of the Commission, it was agreed that member countries would submit the names of the official correspondents. However, very few countries have carried out this recommendation. There is a need to insist in this issue.

In some of the main fishing countries in the region, national data collection systems exist to some degree and better data could be obtained directly from the countries. The lack of official submission of data is in part due to a lack of understanding of the role that IOTC plays in the management of tuna resources and of the data needs of the organisation. Past experiences in IPTP indicate that there is always an improvement in the data flow after a mission to the country in question. This also increases the knowledge of the existing collection schemes and promotes a closer relationship with potential liaison officers. A number of such missions are contemplated for the next year by the Secretariat.

It also recognized that countries from the region might have difficulties, due to lack of resources, to aggregate the data at the level required by IOTC. For this reason, the Secretariat has offered assistance to carry out any additional processing that might be required. Countries facing this problem are encouraged to provide data at the higher level of resolution.

Additionally, the Secretariat has reached an agreement with the Institut de Recherche pour le Développement (IRD) from France, to collaborate in a joint-project to provide data entry, processing and reporting facilities in a single computer programme (based on the concepts behind WINTUNA and AVDTH) that could be suitable for longline and surface fisheries.

Traditionally, statistical bulletins published by the national institutions have been an important source of data, although the data do not always conforms to the IOTC data requirements. The Secretariat has built a database of institutions and publications listing such statistics and will send requests to be incorporated in the appropriate mailing lists. This work is currently underway.

The absence or incompleteness of SF data is troublesome but the problem ca be mitigated by **establishing or reinforcing sampling programmes**. This should not necessarily involved the direct participation of the Secretariat's staff, but rather close supervision and financial support for the expansion of existing sampling programmes. As an example, it can be mentioned the joint sampling programme that Australian and Indonesian scientists carry out in Bali, Indonesia. This is a major landing port for small longliners of Asian origin and flying either Indonesian or Taiwanese flags. Although the existing sampling programme is focused on the collection of data about catches and biological characteristics of southern bluefin tuna, it can easily extended to incorporate further sampling for yellowfin and bigeye, important component of the catches of those vessels. Another example is the sampling programme of non-Thai vessels carried out in Phuket with limited resources.

One particular problem area where a significant improvement can be made through coordinated sampling programmes is the monitoring of the activities of the longline vessels that are not being reported. Most of this large fleet comprising more than 1,000 vessels unloads at Bali, Jakarta, Phuket, Penang, Mauritius and, to a lesser extent, in Singapore. Monitoring in these ports could lead to a substantial improvement in the knowledge about a large portion of the catches of tuna in the Indian Ocean.

In summary, a list of specific proposals from the Secretariat to improve the overall quality of the fishery statistics follows for the consideration of the WPDCS:

- Establish or supplement sampling programmes in major unloading ports.
- Initiate a campaign for establishing direct contacts in countries from the region, including missions to clarify the role and the data needs of IOTC.
- Request the nomination of official data correspondents in each IOTC Member nation.

- Provide assistance to member and non-member countries in processing the data requested.
- Split the request for data in two 'installments': 1) NC and VR data; and 2) CE and SF data.
- Request the incorporation of the Secretariat to mailing distributions for statistical bulletins.
- Request that non-member countries be encouraged to participate through direct diplomatic channels by IOTC members.

Dissemination of the information

Dissemination of the information available at IOTC has been carried out through a number of ways. The most effective way has been through the Web site, from where a subset of the databases and most of the IOTC publications can be downloaded. The data provided electronically is the NC database in the FISHSTAT Plus format. The programme to query and display the database can be downloaded for free from the FAO Web site.
The Data Summary, which originated with IPTP, is a publication that summarizes the ten most recent years of NC data. For the dissemination of CE data, the Secretariat has been developing an Atlas programme that summarizes CE information in different ways. Lack of staff has resulted in a delay in the development efforts that will be resumed when another computer programmer is incorporated to the Secretariat staff (in the second half of October). The philosophy behind the programme is to provide a simple interface to a number of querying options, including the possibility of aggregating the data temporally. The information is then display through a data-aware ActiveX control (already developed by the staff). The creation of the ActiveX control means that the data could be accessed through a Web page. A similar programme has been conceived and a pilot version has been in used by the staff for the display of SF data.

Other auxiliary databases

The Secretariat also has been compiling a number of auxiliary databases which might be primarily of assistance to scientists of the region.
Environmental Data Sets. A number of public-domain databases have been obtained by the Secretariat and are currently available for scientists from the region. These include public domain databases from NASA on a number of environmental features (mean surface wind fields, sea-surface temperature) and the TOGA databases. Requests for further data have been already sent out to different institutions. Eventually a full description of the data available will be posted in the IOTC Web site.
Bibliographic Databases. The Secretariat has obtained a copy of the Aquatic Sciences and Fisheries Abstracts (ASFA) on CD-ROM. This bibliographic database, supplemented by searches on other databases provided by the FAO Library, constituted the main basis for a compilation of an annotated bibliography on tunas and tuna-like species, to be published in the IOTC Web Site. Scientists will have the opportunity to download the summary database for their own querying or to download a report, which could be printed independently.